
BIDDING INSTRUCTIONS & FORMS

MPS Child Care Facility
201 N. Eastern
Moore, OK 73160

OMNI CONSTRUCTION
1909 S Eastern Ave Moore, OK 73160

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MPS Child Care Facility

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MPS Child Care Facility
201 N. Eastern
Moore, OK 73160

Division 0

Bidding Instructions

&

Forms

ARCHITECT OF RECORD:

AGP– the Abla Griffin Partnership, LLC
313 SE 5th Street
Moore, OK 73160 405-735-
3477

CONSTRUCTION MANAGER:

OMNI Construction, LLC
1909 S. Eastern Ave.
Moore, OK 73160 405-
735-3992

DOCUMENT 100
SOLICITATION FOR BIDS
(BID NOTICE)

Sealed proposals will be received by the Board of Education, Independent School District No. I-002, Moore, Cleveland County, Oklahoma, at the Moore Public Schools Administration Service Center, 1500 SE 4th Street, Moore, Oklahoma, until 2:00 P.M., Central Standard Time, on Wednesday, the 8th day of January 2025, at which time said bids will be opened for furnishing all labor and materials for the construction of the MPS Child Care Facility including the following Bid Packages:

- Bid Package 1 – Demo/Sitework (REMOVED ADD #5)
- Bid Package 1A – Utilities
- Bid Package 1B – Asphalt Paving
- Bid Package 2 – Concrete
- Bid Package 3 – Masonry (Not Used)
- Bid Package 4 – Metal
- Bid Package 4A – Metal Erect
- Bid Package 5 – Wood & Plastic
- Bid Package 6 – Thermal & Moisture Protection
- Bid Package 6A - EIFS
- Bid Package 7 – Doors & Hardware
- Bid Package 7A – Entrances & Storefronts
- Bid Package 8 – Finishes (Ceiling Systems)
- Bid Package 9 – Specialties (Accessories)
- Bid Package 9A – Operable Partitions
- Bid Package 10 – Flooring
- Bid Package 11 – Painting
- Bid Package 12 – Fire Suppression
- Bid Package 13 – Mechanical
- Bid Package 14 – Plumbing
- Bid Package 15 – Electrical/Cabling/IT
- Bid Package 16 – Kitchen Equipment

Bids received more than ninety-six (96) hours, excluding Saturdays, Sundays, and holidays, before the time set for opening bids, as well as bids received after the time set for opening bids, will not be considered, and will be returned unopened.

Bids will be publicly opened and read aloud at the above-mentioned office immediately following the closing time stated above.

Complete sets of General Conditions, Plans, and Specifications, and other bidding documents may be obtained through OMNI Construction, LLC, and the RPG Plan Room.

OMNI Construction
1909 S. Eastern Ave.
Moore, OK 73160
405-735-3992
www.omnioklahoma.com

RPG Plan Room
www.rpgplanroom.com

A cashier's check, a certified check, or a surety bond in the amount of five percent (5%) of the bid shall accompany the sealed proposal of each bidder if the proposal has a value greater than \$50,000.00. Bid Guarantees will be returned to the unsuccessful bidders.

The Board of Education reserves the right to accept or reject any and all bids.

The time period within which a contract will be executed following award to the successful bidder will not exceed thirty (30) days.

DOCUMENT 200

INSTRUCTIONS TO BIDDERS

To be considered, bids must be made in accordance with these instructions to bidders.

- Section 1 Solicitation**
 - 1) Bid Submission
 - 2) Intent
 - 3) Work Identified in the Contract Documents
 - 4) Contract Time
- Section 2 Bid Documents and Contract Documents**
 - 1) Definitions
 - 2) Contract Documents Identification
 - 3) Availability
 - 4) Examination
 - 5) Queries/Addenda
 - 6) Product Substitution
- Section 3 Site Assessment**
 - 1) Site Examination
- Section 4 Qualifications**
 - 1) Evidence of Qualifications
 - 2) Subcontractors/Suppliers/Others
- Section 5 Bid Submission**
 - 1) Submission Procedure
 - 2) Bid Ineligibility
- Section 6 Bid Enclosure/Requirements**
 - 1) Security Deposit
 - 2) Performance Assurance
 - 3) Bid Form Requirements
 - 4) Bid Form Signature
- Section 7 Offer Acceptance/Rejection**
 - 1) Duration of Offer
 - 2) Acceptance of Offer

Section 1-
SOLICITATION

1.1) BID SUBMISSION

- A. Sealed proposals will be received by the Board of Education, Independent School District No. I-002, Moore, Cleveland County, Oklahoma, at the Moore Public Schools Administration Service Center, 1500 SE 4th Street, Moore, Oklahoma, until 2:00 P.M., Central Standard Time, on Wednesday, the 8th day of January 2025, at which time said bids will be opened for furnishing all labor and materials for the complete construction of the MPS Child Care Facility project.

Bid Packages: Bid Package 1 – Demo/Sitework (REMOVED ADD #5)

Bid Package 1A – Utilities

Bid Package 1B – Asphalt Paving

Bid Package 2 – Concrete

Bid Package 3 – Masonry (Not Used)

Bid Package 4 – Metal

Bid Package 4A – Metal Erect

Bid Package 5 – Wood & Plastic

Bid Package 6 – Thermal & Moisture Protection

Bid Package 6A - EIFS

Bid Package 7 – Doors & Hardware

Bid Package 7A – Entrances & Storefronts

Bid Package 8 – Finishes (Ceiling Systems)

Bid Package 9 – Specialties (Accessories)

Bid Package 9A – Operable Partitions

Bid Package 10 – Flooring

Bid Package 11 – Painting

Bid Package 12 – Fire Suppression

Bid Package 13 – Mechanical

Bid Package 14 – Plumbing

Bid Package 15 – Electrical/Cabling/IT

Bid Package 16 – Kitchen Equipment

- B. Bids received more than ninety-six (96) hours, excluding Saturdays, Sundays, and holidays, before the time set for opening bids, as well as bids received after the above time set for opening bids, will not be considered, and will be returned unopened.
- C. All forms identified in Section 300 shall be properly filled out and notarized.
- D. Bids will be publicly opened and read aloud at the above-mentioned office immediately following the closing time stated above.
- E. Amendments to submitted Bids will be permitted when received in writing prior to bid deadline and when endorsed by the same party or parties who signed and sealed the Bid.
- F. Bidders may withdraw their Bid by written request at any time before bid deadline.

1.2) INTENT

- A. The intent of this bid request is to obtain an offer to perform work to complete the construction of the MPS Child Care Facility, 201 N. Eastern, Moore, OK 73160, for a Stipulated Price contract, in accordance with the Contract Documents.
- B. The Owner has contracted with OMNI Construction to act as Construction Manager for the total Project. Selected parts of the work of the Project may be completed by the Construction Manager and other

parts may be contracted by acceptance of public bids.

1.3) WORK IDENTIFIED IN THE CONTRACT DOCUMENTS

- A. Work of this proposed Contract comprises of bid package 1 thru 16 as noted in the Bid Manual
- B. The Scope of the work consists of furnishing all labor and materials for the complete construction, in accordance with the Contract Documents,
- C. The Base Proposal shall include all work as described in the Drawings, Project Manual and bid day instructions and forms. Each trade shall be responsible to review all sheets identified in the plan set and work that may pertain to their respected bid package.

1.4) CONTRACT TIME

- A. Construction Start Date = 1/15/2025
- B. Construction Completion Date = 8/13/2025

Section 2

BID DOCUMENTS AND CONTRACT DOCUMENTS

2.1) DEFINITIONS

- A. Bid Documents: Project Plans, Project Manual, Bidding Instructions and Forms.
- B. Bid: Executed Bid Form and required attachments submitted in accordance with these Instructions to Bidders.
- C. Bid Price: Monetary lumpsum identified by the Bidder in the Bid Form.

2.2) CONTRACT DOCUMENTS IDENTIFICATION

- A. The Contract Documents (Drawings and Project Manual) are identified as prepared by the Architect, AGP – the Abla Griffin Partnership, LLC, and identified in their respective Table of Contents.

2.3) AVAILABILITY

- A. Refer to section 2.4- for availability of drawings.

2.4) EXAMINATION

- A. Bid Documents are on display at the offices of the following construction association plan room facilities:
 - [1] OMNI Construction,
LLC 1909 S. Eastern
Ave. Moore, OK 73160
405- 735-3992
www.omnioklahoma.com
 - [2] RPG Plan Room
www.rpgplanroom.com
- B. Upon receipt of Bid Documents verify that documents are complete. Notify the Architect or Construction Manager, OMNI Construction, LLC, should the documents be incomplete.

- C. Immediately notify the Architect or Construction Manager upon finding discrepancies or omissions in the Bid Documents.

2.5) QUERIES/ADDENDA

- A. Direct questions to AGP – the Abla Griffin Partnership L.L.C., 313 SE 5th Street, Moore, Oklahoma 73160, 405-735-3477 or AGP@theAGP.net. OMNI Construction, LLC, PO Box 892245 Oklahoma City, OK 73189, 405-735-3992 or omniconstructionllc@coxinet.net.
- B. Verbal answers are not binding on any party.
- C. Submit questions not less than 3 days before date set for receipt of Bids. Replies will be made by Addenda.
- D. Addenda may be issued during the Bidding period. Addenda become part of the Contract Documents. Include resultant costs in the Bid Price.
- E. List any addenda received on the Bid Form. Failure to receive any addenda shall not release the bidder from any obligations under his bid.

2.6) PRODUCT SUBSTITUTION

- A. Where the Bid Documents stipulate a particular Product, substitutions will be considered by the Architect up to seven (7) days before receipt of Bids.
- B. With each substitution request, provide sufficient information for Architect to determine acceptability of proposed products.
- C. When a request to substitute a Product is made, Architect may approve the substitution. Approved substitutions will be identified by Addenda.
- D. In submission of substitutions to products specified, Bidders shall include in their Bid, any changes required in the Work to accommodate such substitutions. Later claims by the Bidder for an addition to the Contract Time or Contract Sum/Price because of changes in Work necessitated by use of substitutions shall not be considered.

Section 3

SITE ASSESSMENT

3.1) SITE EXAMINATION

- A. Examine the project site before submitting a Bid.
- B. Each bidder shall carefully examine the project site, compared it to the Drawings and Project Manual, including all Addenda, and satisfied themselves as to the existing conditions under which their trade will be required to work, or that will affect the work under this contract.
- C. No allowances will be made on behalf of the Contractor for any error or negligence in determining these existing conditions. By submission of a bid on this project, the bidders agree to accept the existing project site in its present condition.
- D. Any and all site visits shall be scheduled through the Project Manager of record, OMNI Construction, LLC 405-735-3992.

Section 4

QUALIFICATIONS

4.1) EVIDENCE OF QUALIFICATIONS

- A. To demonstrate qualifications for performing the Work of this Contract, Bidders may be required to submit in writing, evidence of financial position, previous experience, and current commitments. The financial statement shall reflect the true financial condition of the bidder within three months prior to the date of the bid opening. To be eligible for the Contract a bidder, must be able to show his financial ability to carry on work until such time as he receives the first payment on the Contract agreement, and to finance the work between payments until the project is complete and accepted by the Owner.

4.2) SUBCONTRACTORS/SUPPLIERS/OTHERS

- A. The Owner reserves the right to reject a proposed Subcontractor for reasonable cause.
- B. Refer to OMNI Construction's Master Service Agreement when OMNI is Construction Manager.

Section 5

BID SUBMISSION

5.1) SUBMISSION PROCEDURE

- A. Bidders shall be solely responsible for the delivery of their Bids in the manner and time prescribed.
- B. **Submit one copy of the executed offer on the Bid Forms provided, signed, and sealed with the required security in a closed opaque envelope, clearly identified with Bidder's name, project name, Owner's name, Bid Manual 1, Bid Package Number and Description, and Bid Date on the outside of the envelope.**
- C. Contents of the Proposal Packet:
 - 1. Complete Bid Forms (Document 300).
 - 2. Non-collusion Affidavit signed and notarized.
 - 3. Non-Kickback Affidavit signed and notarized.
 - 4. Affidavit of Asbestos Free Materials and Construction signed and notarized.
 - 5. Non-Sex Offender Affidavit signed and notarized.
 - 6. Business Relationship Affidavit signed and notarized.
 - 7. A cashier's check, a certified check, or surety bond.
- D. An abstract summary of submitted Bids will be made available to all Bidders following Bid opening.

5.2) BID INELIGIBILITY

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may be declared unacceptable at Owner's discretion.
- B. Bid Forms, Appendices, and enclosures which are improperly prepared, may at the discretion of the Owner, be declared unacceptable.
- C. Failure to provide security deposit, bonding or insurance requirements will at the discretion of the Owner, invalidate the Bid.

Section 6

BID ENCLOSURES/REQUIREMENTS

6.1) SECURITY DEPOSIT

- A. Bids shall be accompanied by a security deposit if the proposal has a value greater than \$50,000.00 for a sum not less than five percent (5%) of the Bid Price/Sum submitted, as a guarantee that the successful bidder will properly execute a Contract and file performance assurance bonds within seven (7) days of the date of notification of award, as follows:
 - 1. Bid Bond or
 - 2. Certified or cashier's check.
- B. Should the successful bidder fail to enter into a Contract Agreement or to comply with the specified requirements, the bidder's check or bond will become the property of the Owner as liquidated damages, but not as penalty.
- C. Endorse the Bid Bond in the name of the Owner as obliged, signed, and sealed by the Contractor as principal and the Surety. Surety Bonds shall be issued by a surety licensed to conduct business in the State of Oklahoma and shall be accompanied by the bond agent's power-of-attorney.
- D. Endorse the certified or cashier's check in the name of the Owner.
- E. The security deposit will be returned after delivery to the Owner of the required Performance and Statutory Payment Bonds by the accepted Bidder.
- F. The security deposit will be returned after delivery to the Owner of the required Performance and Labor and Material Payment Bond(s) by the accepted Bidder.
- G. Include the cost of Bid Security in the Bid Price.
- H. After a bid has been accepted, all securities will be returned to the respective Bidders and other requested enclosures.
- I. If no contract is awarded, all security deposits will be returned.

6.2) PERFORMANCE ASSURANCE

- A. Accepted Bidder: Provide Performance and Statutory Bonds in one hundred percent (100%) of the contract amount covering faithful performance of the contract, and payment of all obligations arising there-under, will be required by the Owner.
- B. Provide a Defect Bond in the amount of one hundred percent (100%) of the contract amount covering defective workmanship and materials for a period of one year after the acceptance of the project.
- C. Include the cost of performance assurance bonds in the Bid Price.
- D. Oklahoma law allows substitution of an Irrevocable Letter of Credit is included herewith. One such letter shall be required for each of the bonds noted above.
- E. Construction Manager reserves the right to enforce or waive the surety bond requirements.

6.3) BID FORM REQUIREMENTS

- A. Complete all requested information in Section 300 of the Bidding Instructions and Forms.

6.4) BID FORM SIGNATURE

- A. The Bid Form shall be signed by the Bidder, as follows:
 - 1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature.
 - 2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature.

3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the Bid is signed by officials other than the President and Secretary of the company, or the President/Secretary/Treasurer of the company, a copy of the by-law resolution of the Board of Directors authorizing them to do so, must also be submitted with the Bid Form in the Bid Envelope.
4. Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

Section 7

OFFER ACCEPTANCE/REJECTION

7.1) DURATION OF OFFER

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of thirty (30) days after the Bid closing date.

7.2) ACCEPTANCE OF OFFER

- A. The Owner reserves the right to accept or reject any or all bids, or to accept any bid he considers advantageous and to waive formalities and irregularities.
- B. The Owner reserves the right to disqualify bids, before and after opening, upon evidence of collusion with intent to defraud or other illegal practices upon the part of the bidder.
- C. The Contract will be awarded based on the lowest responsible bid.
- D. In case of a difference in written words and figures on the Bid Form, the amount stated in written words shall govern.
- E. After acceptance by the Owner, the Architect, on behalf of the Owner, will issue to the successful Bidder, a written Notice to Proceed.
- F. The time Period within which a contract will be executed following award to the successful bidder will not exceed thirty (30) days.
- G. In the event of a tie bid the coin toss method will be administered by the Construction Manager to determine the successful bidder.

DOCUMENT 300

BID FORMS

PROJECT NAME: MPS Child Care Facility

DATE OF BID OPENING: _____

COMPANY NAME: _____

COMPANY ADDRESS: _____

CONTACT NAME: _____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

EMAIL ADDRESS: _____

PACKAGENO. / DESCRIPTION	COMPLETE DESCRIPTION AS TO SCOPE OF WORK	AMOUNT

****Any proposal containing clarifications or exclusions shall not be considered.**

Base Bid: _____ (Written Words)

\$ _____ (Numeric Form)

IT IS UNDERSTOOD THE BASE BID DOES NOT INCLUDE THE COST OF THE PERFORMANCE BOND COVERING 100% OF THE CONTRACT AMOUNT. PRIOR TO AWARD, THE OWNER AND CONTRACTOR RESERVE THE RIGHT TO ADD A PERFORMANCE BOND FROM THE TRADE CONTRACT AGREEMENT. PLEASE INDICATE THE FOLLOWING INFORMATION WITH REGARDS TO YOUR PERFORMANCE BOND:

PERFORMANCE BOND RATE (%): _____

COST OF PERFORMANCE BOND (\$): _____ (Dollars)

Alternates:

Description of Alternate: _____

Add or Deduct: _____

****Please note that any and all items of the given package which are not specifically excluded in the bid document will be considered to be a part of the bid package.**

SIGNATURE OF BIDDING PARTY

DATE

By initialing the line next to each item below you are acknowledging that you have included the following items:

_____ A cashier's check, a certified check, or a surety bond if bid is \$50,000 or greater.

_____ Non-Collusion Affidavit (Signed and Notarized)

_____ Non-Kickback Affidavit (Signed and Notarized)

_____ Affidavit of Asbestos Free Materials and Construction (Signed and Notarized)

_____ Non-Sex Offender Affidavit (Signed and Notarized)

_____ Business Relations Affidavit (Signed and Notarized)

_____ Acknowledge receipt of Addenda Numbers _through _ issued for bidding.

SUBMITTED BY:

COMPANY NAME: _____

FULL PRINTED NAME: _____

SIGNATURE: _____

DATE: _____

NON-COLLUSION AFFIDAVIT

STATE OF _____)

)ss.

COUNTY OF _____)

_____, of lawful age, being first duly sworn on oath says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any state official or employee as to quantity, quality or price in the prospective contract, or any other terms of said prospective contract; or in any discussions between bidders and any state official concerning exchange of money or other things of value for special consideration in the letting of contract.

Subscribed and sworn to me before this _____ day of _____, 20____

Notary Public

My Commission Expires:

NON-KICKBACK AFFIDAVIT

COMPANY NAME: _____

As required by Oklahoma State Statutes, Title 62, § 310.9, any contract for \$25,000.00 or more for the purchase of materials, goods, or services, must be accompanied by the signed statement described below. Please sign this statement as indicated below and return to Moore Public Schools at the address shown below.

MOOREPUBLICSCHOOLS
Attn: PurchasingDepartment
1500 S.E. 4th Street
Moore, OK 73160-8232

The undersigned (architect, contractor, supplier, or engineer), of lawful age, being first duly sworn on oath says that this contract is true and correct. Affiant further states that the (work, services, or materials) will be (completed or supplied) in accordance with the plans, specifications, orders, or requests furnished the affiant. Affiant further states that (s)he has made no payment directly or indirectly to any elected official, officer, or employee of the State of Oklahoma, any county or local subdivision of the state, of money or any other thing of value to obtain or procure the contract or purchase order.

(Signature of contractor, supplier, engineer, or architect)

Subscribed and sworn to me before this _____ day of _____, 20__

Notary Public

My Commission Expires: _____

NON-ASBESTOS AFFIDAVIT

STATE OF OKLAHOMA _____)

SS)

COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by bidder to submit the attached bid. Affiant further states that the bidder has not included as a part of the bid and will not include in the finished construction, nor will said bidder allow any sub-contractor or workman to include in the finished construction, any material which contains asbestos in any form in the amount equal to or in excess of the one percent (1%) by weight or volume.

Subscribed and sworn to me before this _____ day of _____, 20_____

Notary Public

My commission Expires:

NON-SEX OFFENDER AFFIDAVIT

The undersigned, _____ represents that he/she is the owner or an officer of _____, who has the authority to make this declaration to Moore Public Schools, as required by Section 6-101.48 of Title 70 of the Oklahoma Statutes.

I declare that no employee on school premises during normal working hours under the authority of the above-named company or business has been convicted in the State, the United States, or another state of any offense subject to the sex Offenders Registration Act or is subject to other states or the federal sex offender registration provisions.

I further declare that no employee working on school premises during normal working hours under the authority of the above-named company or business has been convicted of a felony offense within the past ten (10) years in this State the United States, or another state.

I further understand that Title 57, Oklahoma Statutes, Section 589 provides as follows, to wit:

It is unlawful for any person registered pursuant to the Sex Offenders Registration Act to work with or provide services to children or to work on school premises, or for any person or business who offers or provides services to children or contracts for work to be performed on school premises to knowingly and willfully allow any employee to work with children or to work on school premises who is registered pursuant to the Sex Offenders Registration Act. Upon conviction for any violation of the provisions of the subsection, the violator shall be guilty of a misdemeanor punishable by a fine not to exceed One Thousand Dollars (\$1,000.00). In addition, the violator may be liable for civil damages.

Dated this _____ day of _____, 20__

Vendor / Contractor's Name and Address

Authorized Signer

Subscribed and sworn to me before this _____ day of _____, 20__

Notary Public

My Commission Expires:

300-5

Business Relations Affidavit

State of _____

)ss.

County of _____

_____, of lawful age, being first duly sworn on oath that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of any partnership, joint venture, or other business relationship presently in effect of which existed within one (1) year prior to the date of this statement which the architect, engineer, or other part of the project is as follows:

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any official or director of the architectural or engineering firm or any other party to the project is as follows:

Affiant further states that the names of all persons who have any such business relationship and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationships hereinabove mentioned exists, affiant should so state)

Name: _____

Title: _____

Subscribed and sworn before me this _____ day of _____, 20____

Notary Public

My Commission Expires: _____

DOCUMENT 400
GENERALBID PACKAGE ITEMS

Each Bid Package shall include, but is not necessarily limited to the following General Bid Package Items:

Section1-
General

- A. Subcontractor acknowledges that they have performed an onsite investigation, if desired, of the site conditions and acknowledges that all activities must be performed in close coordination with other Subcontractors. The Subcontractor shall be responsible for all means and methods for performing the work according to the contract documents, site conditions, and all applicable codes.
- B. Subcontractor shall comply with all provisions of the OMNI Construction contract, insurance, safety, and EEOC requirements.
- C. In addition to the Conditions of Specification, drawings, submittals, and Closeout Submittals the Subcontractor shall provide the following:
 - o Each Submittal shall be submitted under separate coversheet indicating the specific Specification Section to which it pertains.
 - o Subcontractor shall submit three (3) hard copies and one (1) digital copy of each submittal.
 - o Subcontractor shall submit two (2) hardcopies and one (1) digital copy of Close-out Documents.
 - a. Subcontractor shall be responsible for timely submission of all submittals, including but not limited to: shop drawings, samples, product data sheets MSDS information, and all other submittals required by the contract documents.
 - b. Miscellaneous– This contract will be provided by OMNI Construction. All warranties and guarantees are to be transferred to Owner at the completion of this project.
 - c. Subcontractor shall sequence work as directed by OMNI without exception.
 - d. All correspondence for this project shall be directed to the designated Project Manager – OMNI Construction.
 - e. Coordination– Subcontractor shall have a designated Project Superintendent who will regularly attend construction meetings as required involving this project. The Superintendent/representative attending the meeting shall have the authority and ability to make binding commitments regarding the timing of the performance of Subcontractor’s work. Subcontractor, Field Project Manager or Superintendent may not be changed without mutual agreement with OMNI Construction. Subcontractor shall attend all schedule related meetings to coordinate access to work areas with the other Subcontractors, OMNI Construction and Owner work forces that are on site.
 - f. Subcontractor shall engage a qualified surveyor to establish exact points to act as working points as needed. Subcontractor shall include the cost to resurvey as needed to establish final dimensions and protect and maintain working points and survey control points from disturbance caused during construction. Construction Manager will provide two (2) Benchmarks to establish the layout.

- g. Subcontractor shall include all layout and field dimensions associated with this work.
- h. Subcontractor shall coordinate delivery of materials. Subcontractor shall provide equipment and personnel necessary to unload, stack, and store onsite. Subcontractor shall inventory all delivered items and inspect for damage or missing items. Any damaged or missing items shall be noted on the Bill of Lading. Subcontractor shall notify suppliers and arrange for replacement items to be shipped. Subcontractor shall file all damage claims with insurance carriers. Placement of staged items shall be coordinated with OMNI Construction.
- i. Subcontractor shall be responsible for any damage caused by the Subcontractor to any adjoining areas that remain.
- j. Subcontractor shall pay for all repairs to other Subcontractor's work damaged by contractor's personnel, suppliers, or subcontractors during construction.
- k. Subcontractor shall be responsible for daily clean-up to include but not limited to: Removal and/or proper storage of tools, equipment, and materials as required by the Construction Manager, disposal of scrap and waste material, and the sweeping of any dust and dirt generated by construction activities, including general foot traffic of the subcontractor. All debris will be removed from the working area and deposited in the dumpster or proper location by the subcontractor, as directed by the Construction Manager.
- l. Subcontractor is responsible for the proper back fill and testing of work put in place by the subcontractor in accordance with specification section 02200 Earthwork.
- m. Subcontractor is responsible for fire caulking and sealing of all penetrations, with an equal fire rating to that of the wall being penetrated by the subcontractor's work.

Section 2-
Project Schedule

Project Sequence: Bidders will be required to adhere to the project schedule, which will be provided by OMNI Construction. Work will be performed as required to meet the overall completion date.

- A. The Subcontractor agrees that it will provide adequate manpower to complete the Subcontractor's Work in accordance with the time established by the Schedule during regular working hours. The Schedule is based on a 40-hour work week. The Work Week is Monday – Friday, from 7:00 a.m. – 4:00 p.m. It shall be the Subcontractor's responsibility to meet the Schedule. Any cost associated with additional manpower and or overtime hours required to meet the schedule are the responsibility of the Subcontractor. In addition, the Subcontractor will be liable to the Construction Manager in connection with any overtime required to meet the schedule due to Subcontractor's inability to meet the schedule during regular hours, including but not limited to, additional supervision and a reasonable markup for overhead and profit.
- B. Off hour and or Overtime may be required to complete select activities as may be directed by the Construction Manager and or Owner to meet the need of the school. These activities will be scheduled in advance.

- C. It shall be the responsibility of Subcontractor to provide in writing the following information on a weekly basis, in order to update the Master Project Schedule:
- Detailed Schedule including activities, anticipate durations and man loading
 - Subcontractor's daily report shall be submitted to OMNI Project Superintendent
 - Planned crew size and man-hours by week
 - Actual crew size and man-hours expended by week
 - Planned units by week
 - Actual units installed by week
- D. Subcontractor shall provide an estimated man-loading curve for the duration of the project. This curve will be used as a guide for man loading throughout project. Subcontractor shall coordinate with OMNI Construction to refine the schedule for manpower loading and timely completion of the project. This responsibility will be ongoing as updates are required.

Section3-
Safety

- 3.1 Subcontractor shall implement a safety program meeting or exceed the requirements set forth by OSHA.
- 3.2 High visibility clothing and proper PPE will be required 100% of the time for the duration of this project.

DOCUMENT 500
BIDPACKAGE1-16

BIDPACKAGE 1: DEMO/SITEWORK (REMOVED ADD #5)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 02050	Demolition	As applicable to Site Prep and Concrete
Section 02100	Site Preparation	Complete
Section 02200	Earthwork	As applicable to Site Prep and Concrete
Section 02910	Temporary Erosion Control	Complete
Section 02920	Landscape Grading	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the DEMO/SITEWORK BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials, and equipment necessary to complete demo/sitework.
2. Testing to be paid for by others, but to be coordinated by contractor.
3. Include all dewatering required to perform this scope of work.
4. Provide construction entrance as set forth in specifications.
5. All miscellaneous equipment and material required for the proper completion of this scope of work.
6. The subcontractor is to ensure that all elevated work areas are made ready to protect all areas below and have OSHA approved fall protection for work to proceed.

BIDPACKAGE 1A: UTILITIES

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 02202	Earthwork for Utilities	Complete
Section 02550	Sanitary Sewer Gravity	Complete
Section 02551	Water Lines	Complete
Section 220515	Plumbing Earthwork	As applicable to utilities
Section 260516	Excavating, Backfilling and Compacting for Electrical	As applicable to utilities

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the UTILITIES BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials, and equipment necessary to complete utilities.
2. Provide all miscellaneous equipment and material required for the proper completion of this scope of work.
3. The subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
4. Clean your work area daily.

BIDPACKAGE 1B: ASPHALT PAVING

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 02741	Hot Mix Asphalt Paving and Seal Coat	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the UTILITIES BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Provide all material, labor, and equipment required for complete and proper installation of hot mix asphalt paving and seal coat.
2. The subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
3. Clean your work area daily.
4. Demo milling as applicable to this bid package.
5. Provide any traffic control measures as applicable to this bid package.

BIDPACKAGE2: CONCRETE

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 02500	Paving and Surfacing	Complete
Section 03300	Cast-In-Place Concrete	Complete
Section 06100	Rough Carpentry	As applicable to concrete
Section 07200	Insulation	As applicable to concrete
Section 07260	Vapor Barrier	As applicable to concrete
Section 07900	Sealants	As applicable to concrete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the CONCRETE BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish and install all concrete complete.
2. Furnish and install all rebar, dowels, and accessories associated with concrete. Furnish and maintain all rebar caps on dowels until next trade begins tie in. **(Rebar associated with Masonry will be provided and installed in Masonry Bid package.)**
3. Furnish and install all required formwork.
4. Excavate and fill as required for all concrete work.
5. Furnish all sand & gravel base required for concrete work.
6. Include all necessary layout and surveying from a provided benchmark for concrete work.
7. Include all termite treatments.
8. Testing to be paid for by others but coordinated by contractor.
9. Include all concrete related weather and temperature protection.
10. Include all dewatering required to perform this scope of work.
11. Include concrete repairs including but not limited to patching, rubbing, grinding, fill, sandblast, and caulk as indicated on the drawings and specifications.
12. Furnish and install board insulation under slab and at foundation perimeter per plans and specifications.

13. All miscellaneous equipment and material required for the proper completion of this scope of work.
14. Subcontractor is to ensure that all elevated pours are made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
15. Furnish and install sidewalks/paving as detailed.
16. Subcontractor is responsible for and must provide their own disposal for washout and concrete debris waste.
17. Clean your work area daily.

BID PACKAGE 3: MASONRY (Not Used)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 04810	Unit Masonry Assemblies	Complete
Section 05500	Metal Fabrications	As Applicable to Masonry

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the MASONRY BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the follow items:

1. Furnish and install all necessary materials to complete masonry work, inclusive of rebar related to masonry scope of work.
2. Provide all necessary equipment and materials required for completion of this scope of work.
3. Subcontractor to ensure that all elevated work areas are made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
4. Install all loose steel lintels over openings.
5. Subcontractor is responsible for and must provide their own disposal for masonry/brick debris waste.
6. Clean you work area daily.

BIDPACKAGE 4: METALS-STRUCTURAL STEEL (MATERIAL ONLY)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 05120	Structural Steel	Material Complete
Section 05310	Metal Deck	Material Complete
Section 05500	Metal Fabrications	As per plans and applicable

This bid package shall include all material, equipment, services, insurances, and incidentals for the METAL (MATERIAL ONLY) BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Supply all structural steel framing, joist, and steel decking.
2. Supply all anchors for embedding into concrete.
3. Supply all anchors for embedding into masonry.
4. Supply all bridging and seats.
5. Supply all bearings and angles.
6. Supply all lintels.
7. Supply all required fasteners to include but not limited to bolts, nuts, lag bolts, machine screws, plain washers, drilled-in expansion bolts, toggle bolts, epoxy, anchors, screens, and concrete inserts as indicated in the documents.
8. Include delivery of all material associated with this bid package. Delivery must be coordinated with the Construction Manager and steel erector.
9. Supply all seismic bracing steel.

BIDPACKAGE4A: METALS-STRUCTURAL STEEL (ERECTION ONLY)

Project: MPS Child Care Facility
Location: 201 N. Eastern Moore, OK 73160

Specification Section	Description	
Division 0	Bidding& Contract Documents	Complete
Division 1	General Requirements	Complete
Section05120	Structural Steel	As Applicable to Erection
Section05310	Metal Deck	As Applicable to Erection
Section 05500	Metal Fabrications	As Applicable to Erection

This bid package shall include all, equipment, services, insurances, and incidentals for the METAL (ERECTION ONLY) BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Supply all labor, tools, and equipment needed to erect the structural steel framing, joist, and steel decking.
2. Work with superintendent and (metal)material provider regarding the delivery of materials.

BIDPACKAGE 5: WOOD & PLASTIC

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 06100	Rough Carpentry	As applicable to custom casework/millwork
Section 06200	Finish Carpentry	As applicable to custom casework/millwork
Section 06300	Wood Treatment	As applicable to custom casework/millwork
Section 06410	Custom Casework	Complete
Section 06420	Custom Laminated Casework (Contractors Option)	As applicable to custom casework/millwork

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the WOODS & PLASTICS BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish and install all necessary materials to complete carpentry work.
2. Provide all necessary equipment and materials required for the proper completion of this scope of work.
3. Subcontractor to ensure that all elevated work areas are made ready to protect all areas below and have OSHA approved fall protection for work to proceed.

BIDPACKAGE 6: THERMAL & MOISTURE PROTECTION

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 07200	Insulation	Complete except as to concrete, roofing and interior finish
Section 07600	Flashing & Sheet Metal	Complete except as to concrete, roofing and interior finish
Section 07840	Firestopping	Complete
Section 07900	Sealants	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the THERMAL & MOISTURE PROTECTION BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish and install all necessary materials to complete the waterproofing/insulation/firestopping work.
2. Provide all necessary equipment and materials required for completion of this scope of work.
3. Subcontractor to ensure that all elevated work areas are made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
4. Clean your work area daily.

BIDPACKAGE 6A: EIFS

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division0	Bidding & Contract Documents	Complete
Division1	General Requirements	Complete
Section 07240	Exterior Wall Insulation & Finish System	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the UTILITIES BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Provide all material, labor, and equipment required for proper repair & preparation of the existing EIFS system to receive new paint. Paint to be provided by others.
2. Subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
3. Clean your work area daily.

BID PACKAGE 7: DOORS/HARDWARE (MATERIAL ONLY)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 06100	Rough Carpentry	As applicable to this bid package
Section 06200	Finish Carpentry	As applicable to this bid package
Section 06300	Wood Treatment	As applicable to this bid package
Section 08100	Metal Doors and Frames	As applicable to this bid package
Section 08200	Wood Doors	As applicable to this bid package
Section 08310	Tornado Doors	As applicable to this bid package
Section 08700	Finish Hardware	As applicable to this bid package

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the DOORS/HARDWARE BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish all wood and metal doors, frames and hardware per plans and specifications installation by others.

BID PACKAGE 7A:Entrances & Storefronts

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 08400	Entrances & Storefronts	Complete
Section 08800	Glazing	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the SPECIALTIES (ACCESSORIES) BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish all labor, materials, and hardware necessary per the plans and specifications to complete this scope of work.

BIDPACKAGE 8: FINISHES (CEILINGSYSTEM)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 05400	Cold Formed Metal Framing	Complete
Section 06100	Rough Carpentry	As applicable to this bid package
Section 06200	Finish Carpentry	As applicable to this bid package
Section 06300	Wood Treatment	As applicable to this bid package
Section 07200	Insulation	As applicable to this bid package
Section 09120	Ceiling Suspension Systems	Complete
Section 09250	Gypsum Wallboard	Complete
Section 09500	Acoustical Treatment	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the FINISHES (CEILING SYSTEM) BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials, and equipment necessary to complete the ceiling system/finish framing/sheetrock.
2. All miscellaneous equipment and material required for the proper completion of this scope of work.
3. Subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
4. Clean your work area daily.

BID PACKAGE 9: SPECIALTIES (ACCESSORIES)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 10100	Chalkboards and Tackboards	Complete
Section 10150	Compartments & Cubicles	Complete
Section 10520	Fire Protection Specialties	Complete
Section 10800	Toilet & Bath Accessories	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the SPECIALTIES (ACCESSORIES) BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish all materials necessary for installation of accessories per the plans and specifications, installation to be provided by others.

BID PACKAGE 9A:Operable Partitions (Materials Only)

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 10650	Operable Partitions	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the SPECIALTIES (ACCESSORIES) BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish all materials necessary for installation of operable partition per the plans and specifications, installation to be provided by others.

BIDPACKAGE 10: FLOORING

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 09300	Tile	Complete
Section 09650	Resilient Flooring	Complete
Section 09670	Resinous Flooring	Complete
Section 09681	Carpet Tile	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the FLOORING BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials, and equipment necessary to complete flooring.
2. All miscellaneous equipment and material required for the proper completion of this scope of work.
3. Clean your work area daily.

BID PACKAGE 11: PAINTING

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 09900	Painting	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the PAINTING BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials, and equipment necessary to complete painting.
2. Provide all miscellaneous equipment and material required for the proper completion of this scope of work.
3. Subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
4. Clean your work area daily.
5. Paint scope of work to include EIFS areas (EIFS repair & replace to be performed by others).

BID PACKAGE 12: FIRESUPPRESSION

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 210100	Fire Protection Operating and Maintenance Manuals	Complete
Section 210500	Fire Protection General Provisions	Complete
Section 210510	Fire Protection Contract Quality Control	Complete
Section 210512	Fire Protection Shop Drawings, Coord Drawings, & Product Data	Complete
Section 211000	Fire Sprinkler Systems	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the FIRE SUPPRESSION BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials and equipment necessary to complete fire suppression.
2. All miscellaneous equipment and material required for the proper completion of this scope of work.
3. Subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
4. Clean your work area daily.

BID PACKAGE 13: MECHANICAL

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 230500	Mechanical General Provisions	Complete
Section 230512	HVAC Shop Drawings, Coord Drawings, & Product Data	Complete
Section 230513	Electrical Provisions of HVAC Work	Complete
Section 230514	HVAC Condensate Drain Piping Variable Frequency Drives	Complete
Section 230593	Testing, Adjusting, & Balancing for HVAC	Complete
Section 230719	HVAC Piping Insulation	Complete
Section 232000	HVAC Pipe & Pipe Fittings - General	Complete
Section 233113	Ductwork	Complete
Section 233416	Fans	Complete
Section 233713	Air Devices	Complete
Section 237416	Packaged Makeup Air Direct Gas Fired Furnace with Cooling	Complete
Section 238118	Single Package Rooftop Air Conditioners (100 outside air)	Complete
Section 238121	Single Package Rooftop Air Conditioners (Gas Heat)	Complete
Section 238239	Electric Unit Heaters	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the MECHANICAL BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Furnish labor, materials and equipment necessary to complete mechanical.
2. Testing to be coordinated by mechanical contractor.
3. All miscellaneous equipment and material required for the proper completion of this scope of work.
4. Coring, patching and caulking of penetrations required for this scope of work.
5. Subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
6. Clean your work area daily

BID PACKAGE 14: PLUMBING

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification

Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 220100	Plumbing Operating and Maintenance Manuals	Complete
Section 220500	Plumbing General Provisions	Complete
Section 220510	Plumbing Contract Quality Control	Complete
Section 220512	Plumbing Shop Drawings, Coord Drawings & Product Data	Complete
Section 220517	Plumbing Access Doors	Complete
Section 220519	Pressure & Temperature Instruments	Complete
Section 220523	Valves, Strainers, & Vents	Complete
Section 220719	Plumbing Piping Insulation	Complete
Section 220800	Plumbing Commissioning Coordination	Complete
Section 221116	Domestic Water Piping & Appurtenances	Complete
Section 221121	PEX Pipe Fittings	Complete
Section 221123	Domestic Water Pumps	Complete
Section 221316	Soil, Waste & Sanitary Drain Piping, Vent Piping & Appurtenances	Complete
Section 222000	Plumbing Pipe & Pipe Fittings – General	Complete
Section 223334	Electric Water Heater (Commercial – Non-ASME)	Complete
Section 223516	Instantaneous Gas-Fired Tankless Water Heater	Complete
Section 224000	Plumbing Fixtures & Fixture Carriers	Complete
Section 226311	Gas Piping & Appurtenances	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the PLUMBING BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the follow items:

1. Provide all material labor, and equipment required for proper installation of complete plumbing system.
2. All piping, fittings, valves, cleanouts, fixtures, and accessories as required for complete and proper installation of plumbing.
3. Any sleeves and penetrations required in walls, floors, roof, etc. for this work including fire/smoke sealing inside and outside of sleeves and patching/fire caulking of the penetrations.
4. All supports, hangers and in-wall blocking required for this work.
5. All identification as called for and/or required per code.
6. Coring, patching and caulking of penetrations required for this scope of work.

7. Caulking of all fixtures.
8. Furnishing and installing all plumbing equipment.
9. Provide all necessary sleeving and or block-outs at CMU required for the proper installation of all plumbing systems included in this contract agreement. Contractor will provide adequate layout and coordination with the Masonry Contractor to ensure proper installation of the work.
10. All permits, fees and inspections as required.
11. All cutting and patching as required for the work of this proposal.
12. Subcontractor is responsible for backfilling and compactions per section 00202.
13. All testing to be paid for by others and coordinated by subcontractor associated with backfilling and compaction.
14. Subcontractor is responsible for removal of excess spoils from site.
15. Subcontractor to coordinate with utilities subcontractor to tie into utilities.
16. Subcontractor shall furnish and install steel, lockable, and primed access panels in any location required to allow for proper access to the plumbing system. Access panels shall be large enough to accommodate easy access for repairs, maintenance, and inspection.
17. All penetrations through CMU walls must have block-outs. Core drilling will not be allowed.
18. Clean your work area daily.
19. Stub out connections 5' feet from building.

BID PACKAGE 15: ELECTRICAL/CABLING/IT

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification		
Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 260500	Electrical General Provisions	Complete
Section 260509	Electrical Utility Coordination & Service Entrance	Complete
Section 260512	Electric Shop Drawings, Coord Drawings, & Product Data	Complete
Section 260519	Conductor & Connectors– 600 Volt	Complete
Section 260526	Electrical Grounding	Complete
Section 260533	Conduit Systems	Complete
Section 260535	Electrical Connections for Equipment	Complete
Section 260537	Electrical Boxes & Fittings	Complete
Section 260540	Electrical Gutters & Wireways	Complete
Section 260550	Firestops	Complete
Section 260944	Lighting Controls	Complete
Section 262413	Switchboards	Complete
Section 262416	Panelboards & Enclosures	Complete
Section 263213	Natural Gas/Propane Standby Generator Sets & Transfer Switch	Complete
Section 264300	Surge Protection Devices	Complete
Section 265113	Lighting Fixtures	Complete
Section 265600	Site Lighting	Complete
Plan Sheets T000-T403	Low Voltage & Technology	Complete

This bid package shall include all labor, material, equipment, services, insurances, and incidentals for the ELECTRICAL/CABLING/IT BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the Bid Manual and shall also include, but not be limited to the following items:

1. Furnish and install the complete building and site electrical systems as specified.
2. Furnish, install, and coordinate all permanent fire alarm and communication systems.
3. Provide, coordinate, and maintain all temporary building/jobsite trailer and site electrical power and lighting services, including temporary construction facilities.
4. Subcontractor is responsible for coordinating all systems with the Fire Sprinkler, Mechanical, and Plumbing Contractors.

5. All associated inspections, permits, and required fees.
6. Subcontractor is responsible for all layout associated with this bid package.
7. Furnish and install all sleeves for associated electrical work.
8. Subcontractor is responsible for any and all wiring to others equipment.

9. Subcontractor is responsible for all fire-stopping where this scope of work creates penetrations.

10. Furnish and install all conduit and boxes for specification divisions 26000 through 28000.

11. Furnish and install all conduit and boxes for all mechanical controls systems.

12. Subcontractor shall furnish and install steel, lockable, and primed access panels in any location required to allow for proper access to the electrical system. Access panels shall be large enough to accommodate easy access for repairs, maintenance, and inspection.

13. All penetrations through CMU walls must have block-outs. Core drilling will not be allowed.

14. Subcontractor is responsible for coordinating all systems with the Fire Sprinkler, Mechanical, and Plumbing Contractors.

15. All associated inspections, permits, and required fees.

16. Subcontractor is responsible for all layout associated with this bid package.

17. Furnish and install all sleeves for associated electrical work.

18. Subcontractor is responsible for any and all wiring to others equipment.

19. Subcontractor is responsible for all fire-stopping where this scope of work creates penetrations.

20. Furnish and install all conduit and boxes for specification divisions 26000 through 28000.

21. Furnish and install all conduit and boxes for all mechanical controls systems.

22. Subcontractor shall furnish and install steel, lockable, and primed access panels in any location required to allow for proper access to the electrical system. Access panels shall be large enough to accommodate easy access for repairs, maintenance, and inspection.

23. All penetrations through CMU walls must have block-outs. Core drilling will not be allowed.

24. Clean your work area daily.

BID PACKAGE 18: KITCHEN EQUIPMENT

Project: MPS Child Care Facility
Location: 201 N. Eastern, Moore, OK 73160

Specification Section	Description	
Division 0	Bidding & Contract Documents	Complete
Division 1	General Requirements	Complete
Section 114000	Kitchen Equipment	Complete

This bid package shall include all labor, materials, equipment, services, insurances, and incidentals for the UTILITIES BID PACKAGE, including work from referenced specifications and other work normally associated with this trade.

The scope of work shall include all General Bid Package Items as listed in section 400 of Division 0 of the bid manual and shall also include, but not be limited to the following items:

1. Provide all material, labor, and equipment required for proper installation of complete Kitchen Equipment system.
2. Subcontractor is to ensure that all elevated work is made ready to protect all areas below and have OSHA approved fall protection for work to proceed.
3. Clean your work area daily.

END

SECTION 26 05 00

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Except as modified in this Section, General Conditions, and Supplementary Conditions, applicable provisions of Division 1 General Requirements, and other provisions and requirements of the Contract Documents apply to work of Division 26 Electrical.
- B. Applicable provisions of this section apply to all sections of Division 26, Electrical.

1.2 CODE REQUIREMENTS AND FEES

- A. Perform work in accordance with applicable statutes, ordinances, codes and regulations of governmental authorities having jurisdiction.
- B. Electrical work shall comply with applicable inspection services:
 - 1. Underwriters Laboratories.
 - 2. National Fire Protection Association.
 - 3. State Health Department.
 - 4. Local Municipal Building Inspection Department adopted codes with amendments.
 - 5. National Electrical Code with local amendments.
 - 6. State Regulatory Agencies.
 - 7. Where the project is located outside a municipal jurisdiction, and has no municipal inspection services, the National Electrical Code with amendments of the municipality with extraterritorial jurisdiction shall govern.
 - 8. Where the project is located outside any municipal jurisdiction, including extraterritorial jurisdictions, the National Electrical Code with local adopted amendments of the largest municipality located in the same county or parish shall govern.
 - 9. International Energy Conservation Code.
 - 10. National Electrical Safety Code.
- C. Resolve any code violations discovered in contract documents with the Engineer prior to award of the contract. After Contract award, any correction or additions necessary for compliance with applicable codes shall be made at no additional cost to the Owner.
- D. This Contractor shall be responsible for being aware of and complying with asbestos NESHAP regulations, as well as all other applicable codes, laws and regulations.
- E. Obtain all permits required.

1.3 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, and skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that has served their Owners satisfactorily for not less than 3 years.

1.4 REFERENCE SPECIFICATIONS AND STANDARDS

- A. Materials which are specified by reference to Federal Specifications; ASTM, ASME, ANSI, APWA, or AWWA Specifications; Federal Standards; or other standard specifications must comply with latest editions, revisions, amendments or supplements in effect on date proposals are received. Referenced specifications and standards are minimum requirements for all equipment, material and work. In instances where specified capacities, size or other features of equipment, devices or materials exceed these minimums, meet specified capacities.
- B. Use electrical materials and equipment that is constructed and tested in accordance with the standards of NEMA, ANSI, ASTM, or another recognized commercial standard. If materials and equipment is labeled, listed, or recognized by any Nationally Recognized Testing Laboratory (NRTL) acceptable to the Occupational Safety and Health Administration (OSHA), then provide NRTL-labeled, listed, or recognized material and equipment. Acceptable NRTLs include but are not limited to:
 - 1. Underwriters Laboratories, Inc. (UL).
 - 2. Factory Mutual Research Corp. (FMRC) (also referred to as "Factory Mutual Global," or "FM Global").
 - 3. Intertek Testing Services NA, Inc. (ITSNA, formerly ETL).
 - 4. Canadian Standards Association (CSA).
 - 5. A complete listing of acceptable NRTLs is published on the OSHA website at <http://www.osha.gov/dts/otpca/nrtl/>.
- C. Where material and equipment are not labeled, listed, or recognized by any NRTL, provide a manufacturer's Certificate of Compliance indicating complete compliance of each item with applicable standards of NEMA, ANSI, ASTM, or other recognized commercial standard.
- D. Do not install or use electrical material or equipment for any use other than that for which it was designed, labeled, listed, or identified unless formally approved for such use by the Owner's AHJ. This *National Electrical Code*® requirement is re-stated for emphasis.
- E. Codes and Standards applicable to this Division:
 - 1. ANSI – American National Standards Institute
 - a. ANSI Z535.1, Safety Colors.
 - b. ANSI Z535.2, Environmental and Facility Safety Signs.
 - c. ANSI Z535.3, Criteria for Safety Symbols.
 - d. ANSI Z535.4, Product Safety Signs and Labels.
 - 2. ASHRAE – American Society of Heating, Refrigeration, and Air Conditioning Engineers:
 - a. ASHRAE Standard 90.1, *Energy Standards for Buildings Except for Low Rise Residential Buildings* [ANSI, IESNA].
 - 3. ASTM – American Society for Testing and Materials.
 - 4. CBM – Certified Ballast Manufacturers.
 - 5. ICC – International Code Council
 - a. International Building Code® (IBC).
 - b. International Existing Building Code® (IEBC).
 - 6. ICEA – Insulated Cable Engineers Association
 - a. ICEA S-93-639, *Shielded Power Cables 5-46kV* (NEMA WC-74).
 - 7. IEEE® - Institute of Electronics and Electrical Engineers
 - a. IEEE C2™, *National Electrical Safety Code* (NESC) [ANSI].
 - b. IEEE Std 141™, *Recommended Practice for Electric Power Distribution for Industrial Plants* ("Red Book") .
 - c. IEEE Std 143™, *Recommended Practice for Grounding of Industrial and Commercial Power Systems* ("Green Book").

- d. IEEE Std 241™, *Recommended Practice for Electric Power Systems in Commercial Buildings* (“Gray Book”).
- e. IEEE Std 242™, *Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems* (“Buff Book”).
- f. IEEE Std 315™, *Graphic Symbols for Electrical and Electronics Diagrams*.
- g. IEEE Std 399™, *Recommended Practice for Power Systems Analysis* (“Brown Book”).
- h. IEEE Std 446™, *Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications* (“Orange Book”).
- i. IEEE Std 493™, *Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems* (“Gold Book”).
- j. IEEE Std 519™, *Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems*.
- k. IEEE Std 739™, *Recommended Practice for Energy Management in Industrial and Commercial Facilities* (“Bronze Book”).
- l. IEEE Std 902™, *Guide for Maintenance, Operation, and Safety of Industrial and Commercial Power Systems* (“Yellow Book”).
- m. IEEE Std 1015™, *Recommended Practice Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems* (“Blue Book”).
- n. IEEE Std 1100™, *Recommended Practice for Powering and Grounding Electronic Equipment* (“Emerald Book”).
- o. IEEE Std 1584™, *Guide for Performing Arc-Flash Hazard Calculations*.
- 8. IESNA – Illuminating Engineering Society of North America
 - a. IESNA *Lighting Handbook*, Ninth Edition.
 - b. IESNA RP-1, *American National Standard Practice for Office Lighting*.
 - c. IESNA RP-7, *American National Standard Practice for Lighting Industrial Facilities*.
- 9. NECA – National Electrical Contractors Association:
 - a. NECA 1, *Good Workmanship in Electrical Construction* [ANSI].
 - b. NECA 90, *Recommended Practice for Commissioning Building Electrical Systems* [ANSI].
 - c. NECA 100, *Symbols for Electrical Construction Drawings* [ANSI].
 - d. NECA 101, *Standard for Installing Steel Conduits (Rigid, IMC, EMT)* [ANSI].
 - e. NECA 104, *Recommended Practice for Installing Aluminum Building Wire and Cable* [ANSI].
 - f. NECA / NEMA 105, *Recommended Practice for Installing Metal Cable Tray Systems* [ANSI].
 - g. NECA 111, *Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC)* [ANSI].
 - h. NECA / NACNA 120, *Standard for Installing Armored Cable (Type AC) and Metal-Clad Cable (Type MC)* [ANSI].
 - i. NECA 202, *Recommended Practice for Installing and Maintaining Industrial Heat Tracing Systems* [ANSI].
 - j. NECA 230, *Standard for Selecting, Installing and Maintaining Electric Motors and Motor Controllers* [ANSI].
 - k. NECA 331, *Standard for Building and Service Entrance Grounding and Bonding*.
 - l. NECA 400, *Standard for Installing and Maintaining Switchboards* [ANSI].
 - m. NECA 402, *Standard for Installing and Maintaining Motor Control Centers* [ANSI].
 - n. NECA / EGSA 404, *Standard for Installing Generator Sets* [ANSI].

- o. NECA 407, *Recommended Practice for Installing and Maintaining Panelboards* [ANSI].
- p. NECA 408, *Recommended Practice for Installing and Maintaining Busways* [ANSI].
- q. NECA 409, *Recommended Practice for Installing and Maintaining Dry-Type Transformers* [ANSI].
- r. NECA 410, *Recommended Practice for Installing and Maintaining Liquid-Filled Transformers* [ANSI].
- s. NECA 411, *Recommended Practice for Installing and Maintaining Uninterruptible Power Supplied (UPS)* (ANSI).
- t. NECA 420, *Standard for Fuse Applications* [ANSI].
- u. NECA 430, *Standard for Installing Medium-Voltage Metal-Clad Switchgear* [ANSI].
- v. NECA / IESNA 500, *Recommended Practice for Installing Indoor Lighting Systems* [ANSI].
- w. NECA / IESNA 501, *Recommended Practice for Installing Exterior Lighting Systems* [ANSI].
- x. NECA / IESNA 502, *Recommended Practice for Installing Industrial Lighting Systems* [ANSI].
- y. NECA / MACSCB 600, *Recommended Practice for Installing and Maintaining Medium-Voltage Cable* [ANSI].
- z. NECA / NEMA 605, *Installing Underground Nonmetallic Utility Duct* [ANSI].
- 10. NEMA – National Electrical Manufacturers Association.
- 11. NETA – International Electrical Testing Association, Inc.:
 - a. NETA ATS, *Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems*.
 - b. NETA MTS, *Maintenance Testing Specifications for Electrical Power Distribution Equipment and Systems*.
 - c. NETA ETT, *Standard for Certification of Electrical Testing Technicians* [ANSI].
- 12. NFPA – National Fire Protection Association:
 - a. NFPA 20®, *Standard for the Installation of Stationary Pumps for Fire Protection*®.
 - b. NFPA 70™, *National Electrical Code*® (NEC®).
 - c. NFPA 70E, *Standard for Electrical Safety in the Workplace*.
 - d. NFPA 101®, *Life Safety Code*®.
 - e. NFPA 110, *Standard for Emergency and Standby Power Systems*.
 - f. NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*.
 - g. NFPA 780, *Standard for the Installation of Lightning Protection Systems*.
 - h. All other NFPA codes and standards except NFPA 5000.
- 13. OSHA – Occupational Safety and Health Administration.
- 14. IECC – International Energy Conservation Code.
- 15. ISO – International Organization for Standardization.
- 16. State and Local Energy Conservation Code.
- 17. Applicable County and Municipal Codes.

1.5 CONTRACT DRAWINGS

- A. Contract drawings are diagrammatic only and do not give fully dimensioned locations of various elements of work. Determine exact locations from field measurements.
- B. Every effort has been made by the Engineer to indicate wiring of all receptacles, light fixtures, switches, telephone outlets, HVAC equipment, other equipment, elevator equipment, and all other devices / appliances requiring electrical power. It is the intent of

the Engineer that all light fixtures be powered and controlled unless specifically noted on the plans; that all wiring devices (receptacles and direct connected equipment) be circuited to a power source of the correct voltage and that all HVAC, elevator equipment and other equipment be properly wired to the correct voltage power source; that all communications and security systems devices and equipment and all fire alarm system devices and equipment are installed, wired and systems are fully operational.

- C. It is the responsibility of the Contractor to review the construction drawings (reflected ceiling plans) for light fixtures, casework elevation details for electrical devices which are not indicated on the electrical drawings; to review the mechanical and plumbing documents and all other drawings to determine the electrical rough-ins for all equipment requiring power connections, and to include in their proposals the correct and complete electrical rough-ins for all of these items which were inadvertently not indicated on the electrical drawings, OR the Contractor shall specifically enumerate each item requiring electrical rough-in which is not specifically shown on the electrical drawings, and indicate the electrical provisions of these items as specifically excluded from his proposal.
- D. It is the responsibility of the Contractor to compare the scale of all electrical drawings with the scale of the architectural drawings and make adjustments to all electrical drawings which have the incorrect drawing scale so that his material takeoffs are not in error due to an incorrectly labeled drawing scale and his proposal is complete.
- E. No proposal shall be accepted which specifically excludes any of the provisions of paragraphs B, C, or D above.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain at the job site a separate set of white prints (black line) of the contract drawings for the sole purpose of recording the "as-built" changes and diagrams of those portions of work in which actual construction is significantly at variance with the contract drawings. Mark the drawings with a colored pencil. Prepare, as the work progresses and upon completion of work, reproducible drawings clearly indicating locations of various major and minor feeders, equipment, and other pertinent items, as installed. Record underground and under slab service and feeders installed, dimensioning exact location and elevation of such installations.
- B. At conclusion of project, obtain without cost to the Owner, electronic PDF and AutoCAD 2014 and / or Revit CAD files of the original drawings and transfer as-built changes to these. Provide the following as-built documents including all contract drawings regardless of whether corrections were necessary and include in the transmittal: "2 sets of CDs and prints for Owner's use, one set of CDs, prints, and mylars for Architect / Engineers Records". Delivery of these as-built electronic, reproducible and prints is a condition of final acceptance.
 - 1. 3 sets of electronic AutoCAD (2014 dwg) and / or Revit CAD drawing files, on CD-ROM media, of each contract as-built drawing.
 - 2. One reproducible Dayrex Mylar film positive of each contract as-built drawing.
 - 3. Three sets of blue-line prints of each contract as-built drawing.
 - 4. Three sets of pdf prints of each contract as-built drawing on CD.
- C. As-Built Drawings should indicate the following information as a minimum:
 - 1. Indicate all addendum changes to documents.
 - 2. Remove Engineer's Seal, name, address, and logo from drawings.
 - 3. Mark documents RECORD DRAWINGS.
 - 4. Clearly indicate: DOCUMENT PRODUCED BY:
 - 5. Indicate all changes to construction during construction. Indicate actual routing of all conduits, etc. that was deviated from construction drawings.

6. Indicate exact location of all underground electrical raceways, and elevations.
7. Correct schedules to reflect (actual) equipment furnished and manufacturer.
8. During the execution of work, maintain a complete set of Drawings and specifications upon which all locations of equipment, devices, and all deviations and changes from the construction documents in the work shall be recorded.
9. Exact location of all electrical equipment in building. Label panel schedules to indicate actual location.
10. Exact location of all electrical equipment in and outside of the building.
11. Exact location of all outdoor lighting poles and equipment.
12. Location, size and routing of all feeder conduits, equipment, etc. shall be accurately and neatly shown to dimension.
13. Exact location of all roof mounted equipment, wall, roof and floor penetrations.
14. Cloud all changes.
15. Update all panel schedules with all additional circuits added or deleted through construction. Identify each circuit to include all information specified for directory cards for circuit identification in panelboards.

1.7 SPACE REQUIREMENTS

- A. Consider space limitations imposed by contiguous work in selection and location of equipment and material. Do not provide equipment or material that is not suitable in this respect.

1.8 RELATION WITH OTHER TRADES

- A. Carefully study all matters and conditions concerning the project. Submit notification of conflict in ample time to prevent unwarranted changes in any work. Review other Divisions of these specifications to determine their requirements. Extend electrical services and final connections to all items requiring same.
- B. Because of the complicated relationship of this work to the total project, conscientiously study the relation and cooperate as necessary to accomplish the full intent of the documents.
- C. Provide sleeves and inserts in forms as required for the work. Stub up and protect open ends of pipe before any concrete is placed. Furnish sizes of required equipment pads. Furnish and locate bolts and fittings required to be cast in them.
- D. Locate and size openings required for installation of work specified in this Division in sufficient time to prevent delay in the work.
- E. Refer to other Divisions of the specifications for the scope of required connections to equipment furnished under other Division. Determine from the General Contractor / Construction Manager for the various trades, the Owner, and by direction from the Architect / Engineer, the exact location of all items. The construction trades involved shall furnish all roughing-in drawings and wiring diagrams required for proper installation of the electrical work.
 1. Make final electrical connections to all electrically operated equipment indicated on the drawings, except as noted.
 2. The responsibility for alignment of motor and driven equipment is specified in the related division.
- F. Request all Shop Drawings required in ample time to permit proper installation of all electrical provisions.

- G. Extend services as indicated to the various items of equipment furnished by others. Rough-in for the various items and make final connections ready for operation upon placing of the equipment.

1.9 CONCEALED AND EXPOSED WORK

- A. When the word "concealed" is defined as hidden from sight as in chases, furred spaces or above ceilings. "Exposed" is defined as open to view, in plain sight.

1.10 GUARANTEE

- A. Guarantee work for 1 year from the date of substantial completion of the project. During that period make good any faults or imperfections that may arise due to defects or omissions in material, equipment or workmanship. Replacement of failed parts or equipment shall be provided.

1.11 MATERIAL AND EQUIPMENT

- A. Furnish new and unused materials and equipment meeting the requirements of the paragraph specifying acceptable manufacturers. Where two or more units of the same type or class of equipment are required, provide units of a single manufacturer.

1.12 NOISE AND VIBRATION

- A. Select equipment to operate with minimum noise and vibration. If noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of work, and judged objectionable by the Owner, Architect, or Engineer, rectify such conditions at no additional cost to the Owner. If the item of equipment is judged to produce objectionable noise or vibration, demonstrate at no additional cost that equipment performs within designated limits on a vibration chart.

1.13 ACCEPTABLE MANUFACTURERS

- A. Manufacturers names and catalog number specified under sections of Division 26 are used to establish standards of design, performance, quality and serviceability and not to limit competition. Equipment of similar design, materials, energy efficiency characteristics (where applicable) and lighting performance characteristics (where applicable) equal to that specified, manufactured by a named manufacturer shall be acceptable on approval. Written notification of intent to use manufacturers other than those specified is required ten days prior to bid. Submittals shall be reviewed only after bidding and may be rejected if any aspect of the equivalent product is deemed lesser than that of the specified product by the specifier. The contractor shall be responsible for ensuring alternates are equivalent to those specified. Submit a marked-up set of the relevant specification section indicating all variances, a comparison to the specified product, and of construction and performance criteria, complete design and performance data for the specified product and the proposed substitution for comparison to the Engineer. The Architect issues approvals of acceptable manufacturers as addenda to the Construction Proposal Documents.

1.14 UTILITIES, LOCATIONS AND ELEVATIONS

- A. Locations and elevations of the various utilities included within the scope of this work:
 1. Obtained from utility maps and other substantially reliable sources.
 2. Are offered separate from the Contract Documents as a general guide only without guarantees to accuracy.

- B. Examine the site and verify the location and elevation of all utilities and of their relation to the work. Existing utilities indicated on the site plans are for reference only and shall be field verified by the Contractor with the respective public or private utility.

1.15 OPERATING TESTS

- A. After all electrical systems have been completed and put into operation, subject each system to an operating test under design conditions to ensure proper sequencing and operation throughout the range of operation. Tests shall be made in the presence of the Architect / Engineer and Owner. Provide minimum 24-hour advance notice of scheduling of all tests. Make adjustments as required to ensure proper functioning of all systems. Special tests on individual systems are specified under individual sections. Submit 3 copies of all certifications and test reports adequately in advance of completion of the work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

1.16 WARRANTIES

- A. All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, normal freight / shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service calls required to diagnose and correct warranty problems.
- B. Manufacturer's warranty shall be from one year from date of substantial completion. Contractor shall be responsible for extending the warranties regardless of date of installation or commissioning.
- C. Submit 3 copies of all warranties and guarantees for systems, equipment, devices and materials. These shall be included in the Operating and Maintenance Manuals.

1.17 BUILDING CONSTRUCTION

- A. It shall be the responsibility of the sub-contractor to consult the Contract Drawings, details and specifications and thoroughly familiarize himself as to the construction and all job-related requirements. All construction trades shall cooperate with the General Contractor / Construction Manager Job site superintendent and lay out work so that all raceways and other items are placed in the walls, furred spaces, chases, etc., so that there shall be no delay in the job.

1.18 TEMPORARY FACILITIES

- A. General: Refer to Division 1 for general requirements on temporary facilities.
- B. Temporary Wiring: Temporary power and lighting for construction purposes shall be provided under this Division. Installation of temporary power shall be in accordance with NEC Article 527.
- C. Temporary facilities, wire, lights and devices are the property of this Contractor and shall be removed by this Contractor at the completion of the Contract.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 IDENTIFICATION OF EQUIPMENT

- A. Identification of Equipment:
1. All major equipment shall have a manufacturer's label identifying the manufacturer's address, equipment model and serial numbers, equipment size, and other pertinent data. Take care not to obliterate this nameplate. The legend on all nameplates or tags shall correspond to the identification shown on the Operating Instructions. All panels, cabinets, or equipment requiring 120 volt or higher power shall be labeled as required which includes circuit designation and circuit panelboard location, regardless of which discipline installs the equipment.
 2. Three layer laminated plastic engraved identifying nameplate shall be permanently secured to each switchboard, distribution panel, motor control center, transformer, panelboard, safety disconnect switch, enclosed circuit breaker, transfer switches, remote generator transfer devices not installed inside light fixtures, wireway, busduct plug, terminal cabinet, surge protective device, capacitor, individual motor controller, contactor, fire alarm panels (main and remote booster), and communications (voice, data, video) cabinet or rack, security panels, time clocks, BMCS cabinets, sound reinforcement cabinets and racks, miscellaneous control cabinets, equipment integral disconnect switches, toggle or motor switches, disconnects for equipment, exterior junction boxes, exterior pull boxes, exterior wireways and gutters, and rooftop equipment (i.e.: supply and exhaust fans, rooftop HVAC equipment) with stainless steel screws.
 - a. Utility Power: White letters on black background
Generator Power (White letters on red background
UPS Power: White letters on blue background
Load Bank Circuits: White letters on green background
Solar or Wind Power Generation: White on orange background
 - b. Identifying nameplates shall have 1/2-inch high, engraved letters for equipment designation and 1/4-inch letters indicating source circuit designation, (i.e.: "PANEL HA –fed from MDP-6 located in Mech. Rm. 100"). The words "fed from" and "located" shall be included in the labeling.
Example: Panel HA
Fed From MSB
Located Main Elec. RM 100
Example: Disconnect for Panel LK
Location: Kitchen
Fed From Transformer TLK
Located Main Elec. RM 100
 - c. Each switchboard, distribution panel, transfer switch, generator transfer device (GTD) for emergency lighting, and motor control center feeder or branch circuit device shall have a nameplate showing the load and location of load served in 1/4-inch high, engraved letters. Circuit breaker name and kirk key designation if applicable
 - d. Each section of multiple section panelboards shall also indicate panelboard section number (i.e.: Panel "HA-Section 2 – fed from MDP-6 located in Mech. Rm. 100")
 - e. Motor Controllers, starters, and contactors: Provide neatly typed label inside each motor controller and contactor enclosure door identifying motor or load served, nameplate horsepower, full load amperes, code letter, service factor, and voltage / phase rating.
 - f. Individual motor controller and contactor nameplates shall include load served, location of load served, panel and circuit numbers serving load, location of panel serving load, panel and circuit number serving control

circuit, location of panel serving control circuit (if different from panel serving load), description and location (if applicable) of control controlling contactor (i.e. Controlled: Switch in RM 100, and Controlled: BMCS). Contactor nameplate is to include whether it is a lighting or receptacle contactor and name of contactor. i.e., C-1.

Lighting Contactor Example	Receptacle Contactor Example
Lighting Contactor C1 West Parking Lot Pole Lights Fed From Panel HA-2,4,6 Located Main Elec. Rm. 100 Control Circuit-Panel LA 42 Located Main Elec. Rm. 100 Controlled-BMCS	Receptacle Contactor C2 Table Recpts Lab Rm 100 Fed From Panel LA-2,4,6,8 Located Mech. Rm. 110 Control Circuit-Panel LA-42 Controlled-Emer Shut Off Mushroom Switch Rm 101
GTD Example	
Exterior lighting wall packs / north soffit / west metal canopy Fed from Panels EHA-2 located in Elec. RM 105 and HA-1 via Lighting Contactor controlled by BMCS located in Elec. RM 200.	

- g. Exterior J-boxes, pull boxes, and gutters shall have panel identification, circuit numbers, and location of panel listed on name plate. Low voltage shall be identified per contents, examples: DATA, BMCS, F/A.
- h. Name plates on equipment served from switchboards, distribution panels, I-Line panels, and motor control centers are not to include circuit numbers shown on drawings as the circuit numbers are for construction drawing purposes only.
- i. Panel names for 277/480v shall start with the letter "H" and 120/208v, 120/240v shall start with the letter "L". No panel shall be named to include a number other than multi sectional panels, example HA-section 2. New panels installed in renovation or site additions shall have names approved or designated by Owner's electrical representative. Panel names shall not include the letter "I". Transformer names shall start with the letter "T" followed by the panel name it serves, i.e., TLA.
- j. Main service ATS label shall include equipment name, emergency source and location, normal power source and location, panel served and location. Wall mounted ATS serving lighting loads shall include type of lighting and location, emergency panel and circuit ID and location of panel, normal panel and circuit ID and location of panel.

Main Service ATS Example	Wall Mounted Lighting ATS Example
ATS-1	ATS
Emer Power-Emer Generator Located Chiller Yard	Exterior Wall Packs/Soffit Lights North/West Metal Canopy Lights
Normal Power-MSB Located-Mech Rm 100	Fed from EHA-2 Located Mech Rm 200
Serves Panel EHA Located-Mech Rm 100	Fed From HB-4 Located Mech Rm 150
- k. Name plates shall include rated bus amperage, voltage, number of phases, number of wires and type of essential electrical system as applicable.
- l. Switchgear, switchboards, panelboards, motor control centers, or service equipment available fault current labeling: Provide a 2x3 inch permanently affixed (notice) label with white lettering on contrasting blue background permanently affixed to the equipment prior to energizing the equipment. The label shall include the date of installation and the date of

calculation and comply with ANSI Z535.4 current standards design and durability. The date of calculation shall be the date indicated by the Engineer of Record's seal on the Construction Documents. Example:

AVAILABLE FAULT CURRENT: ##, ### AMPS.

DATE OF INSTALLATION: MM/DD/YY.

DATE OF CALCULATION: MM/DD/YY.

3. Cardholders and directory cards shall be furnished for circuit identification in panelboards. Cardholder shall be located on inside of panel door and shall be in a metal frame with clear plastic front. Circuit lists shall be typewritten. Circuit descriptions shall include explicit description and identification of items controlled by each individual breaker, including final graphics room number or name designation and name of each item served. If no building appointed room number or name is given, list locations per the following examples – A. Storage in Rm 100 – B. Office in Rm 100 – C. Storage west of Rm. 100. List corridors as "corridors". Identify circuits controlled by contactors using a separate notation for each contactor used. List notation at bottom of schedule stating the circuits are controlled by a contactor, list exact location of contactor, and how switched. Do not use architectural room number designation shown on plans. Obtain final graphics room number identification from Architect's final room number graphics plan. All locations served by breakers shall be listed on schedule. Panel schedule shall be large enough to contain all information required. Also refer to Section 26 24 16.
 4. Permanent, waterproof, black markers shall be used to identify each lighting and power grid junction box, gutter and wireway. Clearly indicate the panel and branch circuit numbers available at that junction box, gutter or wireway. Where low voltage relay panels are used for lighting control, identify the low voltage relay panel and number in addition to the branch circuit panel and number.
 5. Pull Boxes, Transformers, Disconnect Switches, etc.: Field work each with a name plate showing identity, voltage and phase and identifying equipment connected to it. The transformer rating shall be shown on the panels or enclosures. For an enclosure containing a motor starter, the nameplate shall include the Owner's motor number, motor voltage, number of motor phases, motor load being serviced, motor horsepower, and motor full load current. Nameplates shall also indicate where panel is fed from.
- B. Prohibited Markings: Markings intended to identify the manufacturer, vendor, or other source from whom the material has been obtained are prohibited for installation in public, tenant, or common areas within the project. Also prohibited are materials or devices that bear evidence that markings or insignias have been removed. Certification, testing (example, Underwriters Laboratories), and approval labels are exceptions to this requirement.
- C. Warning Signs: Provide warning signs where there is hazardous exposure associated with access to or operation of electrical facilities. Provide text of sufficient size to convey adequate information at each location, mount permanently in an appropriate and effective location. Comply with industry standards for color and design.
- D. Wire and Cable Markers: Provide vinyl cloth markers with split sleeve or tubing type, except in manholes provide stainless steel with plastic ties.
- E. Wire and Cable Labeling: Provide wire markers on each conductor in all boxes, pull boxes, gutters, wireways, contactors, and motor controllers and load connection. Identify with panelboard / switchboard branch circuit or feeder number for power and lighting

circuits, and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring.

- F. Underground Warning Tape: Thomas and Betts or approved equal. Six-inch wide plastic tape, colored red for 50 volts or above electrical, or orange for communications and control with suitable warning legend describing buried electrical lines; telephone lines and data lines per APWA recommendations. All underground electrical conduits shall be so identified. Tape shall be buried at a depth of 6-inches below grade and directly above conduits or ductbanks. Provide magnetic marking tape below all underground electrical conduits.
- G. Lighting Controls and Equipment: Provide self-adhesive machine typed tape labels with $\frac{1}{4}$ " high white letters on $\frac{1}{2}$ " tall black background for digital lighting modules as "DLM". Modules or relays located above ceiling: adhere label to bottom of ceiling T-grid below relay location. Modules or relays located in mechanical or electrical rooms or other areas other than above ceiling: Adhere label to the cover of the module or relay and identify the area they control as "MAIN GYM", "BAND HALL", or "CORRIDOR 100", etc. Remote lighting control switches or push-button stations located remotely from the area they control: Adhere label to device face plate, not obstructing screw fasteners, and intuitively identify function such as "GYM LTG LOW-HIGH" or "CAFE LTG DIM", etc.

3.2 CUTTING AND PATCHING

- A. General: Comply with the requirements of Division 1 for the cutting and patching of other work to accommodate the installation of electrical work. Except as authorized by the Architect / Engineer, cutting and patching of electrical work to accommodate the installation of other work is not permitted.

3.3 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to substantial completion, conduct an on-site training program to instruct Owner's operating personnel in the operation and maintenance of the electrical systems.
 - 1. Provide the training during regular working day.
 - 2. The instructors shall be experienced in their phase of operation and maintenance of the electrical systems and with the project.
 - 3. Refer to other specification sections for additional training and commissioning requirements.
- B. Time to be allocated for instructions.
 - 1. Minimum of 20 hours dedicated instructor time.
 - 2. 4 hours on each of 5 days
 - 3. Additional instruction time for specific systems as specified in other Sections.
- C. Before on-site training, submit the program syllabus; proposed time and dates; for review and approval, minimum 48 hours prior to proposed training time and date.
 - 1. One copy to the Owner
 - 2. One copy to the Architect / Engineer
- D. The Owner shall provide a list of personnel to receive instructions and shall coordinate their attendance at the agreed upon times.
- E. Use operation and maintenance manuals as the basis of instruction. Review manual with personnel in detail. Explain all aspects of operation and maintenance.
- F. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shut down of each item of equipment.

- G. Demonstrate equipment functions (both individually and as part of the total integrated system).
- H. Prepare and insert additional data in the operating and maintenance manuals when the need for additional data becomes apparent during instructions.
- I. Submit a report within one week after completion of training. List time and date of each demonstration, hours devoted to the demonstration, and a list of people present, with their respective signatures.
- J. At the conclusion of the on-site training program, have the person designated by the Owner sign a certificate to certify that he / she has a proper understanding of the system, that the demonstrations and instructions have been satisfactorily completed, and the scope and content of the operating and maintenance manuals used for the training program are satisfactory.
- K. Provide a copy of the report and the certificate in an appropriately tabbed section of each Operating and Maintenance Manual.

3.4 OPENINGS

- A. Framed, cast or masonry openings for boxes, equipment or conduits are specified under other divisions. Drawings and layout work for exact size and location of all openings are included under this division.

3.5 HOUSEKEEPING PADS

- A. Provide concrete equipment housekeeping pads under all floor and outdoor mounted electrical equipment.
- B. Concrete and reinforcing steel shall be as specified in Division 3, or as indicated or noted.
- C. Concrete pads:
 1. 6-inches thick minimum indoors; 8-inches thick minimum outdoors or match existing if indicated on the drawings to extend existing pads, or in other sections of the specifications.
 2. Chamfer strips at edges and corner of forms.
 3. Smooth steel trowel finish.
 4. Extend 3-inches minimum indoors beyond perimeter of equipment unless otherwise shown.
 5. 6-inch x 6-inch #8 wire reinforcement mesh.

3.6 OBSTRUCTIONS

- A. The drawings indicate certain information pertaining to surface and subsurface obstructions, which has been taken from available drawings. Such information is not guaranteed, however, as to accuracy of location or complete information.
 1. Before any cutting or trenching operations are begun, verify with Owner's representative, utility companies, municipalities, and other interested parties that all available information has been provided.
 2. Should obstruction be encountered, whether shown or not, alter routing of new work, reroute existing lines, remove obstruction where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of the new work and leave existing services and structures in a satisfactory and serviceable condition.

- B. Assume total responsibility for and repair any damage to existing utilities or construction, whether or not such existing facilities are shown.

3.7 VANDAL RESISTANT DEVICES

- A. Where vandal resistant screws or bolts are employed on the project, deliver to the Owner 2 suitable tools for use with each type of fastener used, and 25 percent spare fasteners.
- B. Proof of delivery of these items to the Owner shall be included in the Operating and Maintenance Manuals.

3.8 PROTECTION

- A. Protect work, equipment, fixtures, and materials. At work completion, work must be clean and in original manufacturer's condition.
- B. Do not deliver equipment to this project site until progress of construction has reached the stage where equipment is actually needed or until building is closed in enough to protect the equipment from weather. Equipment allowed to stand in the weather shall be rejected, and the contractor is obligated to furnish new equipment of a like kind at no additional cost to the Owner.

3.9 COORDINATION OF BRANCH CIRCUIT OVERCURRENT AND PROTECTION DEVICES

- A. Review with equipment specified which requires electrical connections. Review equipment shop drawings and manufacturer's nameplate data and coordinate exact branch circuit overcurrent protective device and conductors with equipment provided.
 - 1. Provide equipment manufacturer's recommended overcurrent protective device indicated on nameplate at no additional cost to the Owner.
 - 2. If branch circuit conductors and / or conduit sizing is less than the minimum required by equipment manufacturer, notify the Architect / Engineer immediately, prior to rough-in.
 - 3. If equipment manufacturer is a substitution to the specified equipment manufacturer, provide the greater of the conductors specified or those required for the installed equipment manufacturer's minimum circuit conductors, at no additional cost to the Owner.
 - 4. If conductors indicated on plans are in excess of that permitted by equipment manufacturer, notify Architect / Engineer immediately, prior to rough-in.
 - 5. If conductors indicated on plans are in excess of that permitted by the equipment manufacturer, provide the maximum conductors permitted by the equipment manufacturer based on NEC ampacity tables, either in a single set, or as a set of parallel conductors as permitted by the NEC. Conductor size and quantity entering the equipment enclosures shall not exceed the equipment manufacturer's maximum recommendations.

3.10 FAULT CURRENT AND ARC FLASH STUDY FOR OVERCURRENT DEVICE COORDINATION

- A. Contractor shall provide a coordination study, fault current analysis, and Arc-Flash study report for new electrical distribution equipment downstream to the last new overcurrent device in each feeder or branch circuit, conducted and prepared by the switchgear manufacturer. The coordination study and fault current analysis shall include the manufacturer's recommendations for all adjustable overcurrent devices specified or provided. Study does not require inclusion of existing switchgear, except it shall include existing or new overcurrent devices in existing switchgear serving new switchgear. Contractor shall submit the report results prior to submitting switchgear submittals to allow changes or modifications to equipment selection.

- B. Contractor shall adjust all overcurrent device settings based on manufacturer's recommendations, or as directed by Owner / Architect at no additional cost to Owner. Settings for GFI shall be set at maximum as permitted by the NEC.
- C. Arc-Flash & Shock-Hazard Warning Labels: Provide arc-flash and shock hazard-warning labels that comply with ANSI Z535.4 on switchgear, switchboards, transformers, motor control centers, panelboards, motor controllers, safety switches, industrial control panels and other equipment that is likely to require examination, adjustment, servicing, or maintenance while energized. Locate the marking to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment. On renovation projects, install arc-flash warning labels on existing equipment where lock-out / tag-out will be required for the renovation work. Provide the information listed below on each label. Specify that arc-flash warning label information be produced by the electrical equipment manufacturer or supplier as a part of the final power system studies to be submitted by the Contractor in accordance with the electrical acceptance testing.
1. Note: In addition to the final arc-flash analysis, the final power system studies include load flow and fault-current calculations, and an overcurrent protective device (OCPD) coordination study based on the actual equipment to be installed for the project.
- D. Information to be determined and applied to electrical equipment:
1. Arc-Flash Protection Boundary.
 2. Arc-Flash incident energy calculated in accordance with IEEE Std 1584TM
 3. Working distance calculated in accordance with IEEE Std 1584aTM
 4. NFPA 70E Hazard / Risk Category Number or the appropriate personal protective equipment (PPE) for operations with doors closed and covers on.
 - a. Typical operations include operating circuit breakers, fused switches, and meter selector switches.
 5. System phase-to-phase voltage.
 6. Condition(s) when a shock hazard exists (e.g., "With cover off").
 7. Limited Approach Boundary as determined from NFPA 70E, Table 130.2(C).
 8. Restricted Approach Boundary as determined from NFPA 70E, Table 130.2(C).
 9. Prohibited Approach Boundary as determined from NFPA 70E, Table 130.2(C).
 10. Unique equipment designation or code (described under "Component Identification").
 11. Class for insulating gloves based on system voltage (e.g., Class 00 up to 500V).
 12. Voltage rating for insulated or insulating tools based on system voltage (e.g., 1000V).
 13. Date that the hazard analysis was performed.
 14. "Served from" circuit directory information including the serving equipment designation, location (e.g., room number), circuit number, and circuit voltage / number of phases / number of wires.
 15. If applicable, the "serves" circuit directory information including the served equipment designation, location (e.g., room number), circuit number, and circuit voltage / number of phases / number of wires.
 16. An abbreviated warning label may be used where it has been determined that no dangerous arc-flash hazard exists in accordance with IEEE 1584aTM, paragraph 9.2.3.
 17. Use a "DANGER" label where the calculated arc-flash incident energy exceeds 40 cal/cm.
- E. Submittals: Submit four copies of coordination study and certified fault current study results to the Architect for review.

3.11 EQUIPMENT BACKBOARDS

- A. Backboards: ¾ inch, fire retardant, exterior grade plywood, painted gray, both sides.
 - 1. Provide minimum of two 4-ft. by 8-ft. sheets of plywood for each new telephone equipment terminal location.
 - 2. Provide minimum of two 4-ft. by 4-ft. sheets of plywood for each new data / voice / video / communications equipment location / cable TV head end equipment, or security equipment location.

3.12 TESTING

- A. The contractors for the various sub-systems shall submit proposed testing procedures for their systems, subject to review and approval and Owner acceptance. The contract will not be declared to be substantially complete until the functional operation of the subsystems have been demonstrated and verified and reports have been provided, reviewed and accepted.
- B. The project will not be declared substantially complete until the following has taken place.
 - 1. The "As-Built" drawings have been submitted, reviewed and accepted by the Architect / Owner / Owner's Construction Representative.
 - 2. The building emergency lighting system and other systems including but not limited to those listed below have been tested, completed factory start-up and programming and adjusting as required for a complete and fully operational system acceptable to the Architect and Owner.
 - a. Occupancy Sensor and Lighting Controls.
 - b. Surge protective device equipment.
 - c. Overcurrent devices.
 - d. Motor Controllers.
 - e. Emergency Lighting.
 - f. Building Fire Alarm System.
 - g. Clock System.
 - h. Television Distribution System.
 - i. Building Data / Voice Cabling System.
 - j. Surveillance and Security System.
 - k. Intercom / Telephone.
 - l. Sound Reinforcement Systems.
 - m. Building Lightning protection System.

3.13 LOAD BALANCING

- A. Balance the loads on each low-voltage feeder so that the voltage on each phase is within +/- 1.0% of the average voltage of the three phases. Refer to the DOE Office of Industrial Technologies, "Motor Tip Sheet #7" dated September 2005 available for download to PDF format at no charge at:
http://www1.eere.energy.gov/industry/bestpractices/pdfs/eliminate_voltage_un_balanced_motor-systems7.pdf.

END OF SECTION

SECTION 26 05 09

ELECTRIC UTILITY COORDINATION AND SERVICE ENTRANCE

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. General: Electrical service shall be provided by local utility company.
- B. Power Company Data: Obtain from utility company information and installation standards for electrical service installation.
- C. Responsibilities: Determine what equipment and labor is provided by utility company and what equipment and labor is required of this Contractor.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Service Data: Ensure that utility company service data is accurate and verified.

2.2 PRIMARY SERVICE

- A. General: Division 26 shall provide primary service conduit, concrete transformer pads, concrete duct bank, utility service and metering equipment enclosures, manholes, and pull boxes as required and as specified.
- B. Utility company shall provide primary cables, splices, utility metering instruments, terminations, and primary underground and overhead service conductors.

2.3 TRANSFORMERS AND SWITCHGEAR

- A. General: Division 26 shall make provisions for service as required by utility company, including, but not limited to permanent or removable/lockable vehicular barriers, grounding rods, grounding conductors, and sleeves.
- B. The utility company shall provide service transformers, primary switchgear, primary protective relaying, and connections to the customer service.

2.4 SECONDARY SERVICE CONDUCTORS

- A. General: Division 26 shall provide secondary service entrance conductors, conduit and concrete duct bank.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Standards: The installation of the service entrance provisions shall comply with the published standards and requirements of the utility company, the utility company's specific construction requirements for this project, and with requirements of this Division.
- B. Correction: Any failure to meet the standards and requirements shall be corrected to the satisfaction of the utility company and Owner without any additional cost to the Owner.

- C. Contractor shall provide all construction materials and labor that the utility company determines to be the responsibility of the customer, at no additional cost to the Owner.
- D. The materials and labor required by the for a complete installation shall be provided by the contractor and includes, but is not limited to permanent or removable / lockable vehicular barriers, grounding rods, grounding conductors, sleeves, concrete pads, concrete reinforced ductbanks, conduits, metering racks and metering enclosures.
- E. Utility distribution poles and service entrance ductbank locations shall be staked and surveyed prior to pole installation by the Contractor to verify their proper placement is within the Owner's property and respective utility easements. Contractor shall verify by survey that the pole and service entrance ductbank location and easements do not interfere with existing easements, right-of-ways, or other restricted properties. Conflicts with existing easements and restrictions shall be brought to the attention of the Architect prior to construction.
- F. Contractor shall initiate contact with the power provider (retail seller), utility (transmission and distribution), and Owner within 14 days of Notice to Proceed to ensure permanent power will be available to the site. Any delays resulting from lack of this coordination shall be the responsibility of the Contractor.

END OF SECTION

SECTION 26 05 12

ELECTRICAL SHOP DRAWINGS, COORDINATION DRAWINGS & PRODUCT DATA

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Prepare submittals as required by Division 01 and as outlined below.
- B. Provide individual submittals based on the project specification section number and description and only items specified or required in that specific project specification section.
- C. Submit product data shop drawings only for the following items indicated below when included as part of the project specifications, and for items specifically requested elsewhere in the Contract Drawings and Specifications. Architect / Engineer reserves the right to refuse shop drawings not requested for review, typically for basic materials and commodity off-the-shelf materials, and/or to imply that materials shall be provided as specified without exception.
- D. The term submittal, as used herein, refers to all:
 - 1. Shop Drawings.
 - 2. Coordination Drawings.
 - 3. Product data.
- E. Submittals shall be prepared and produced for:
 - 1. Distribution as specified.
 - 2. Inclusion in the Operating and Maintenance Manual, in the related O&M manual section.

1.2 ARCHITECT / ENGINEER REVIEW OF SUBMITTALS

- A. The Architect / Engineer will:
 - 1. Review requested submittals with reasonable promptness. Specific equipment submittal within a materials specification section that may be required to be expedited shall be submitted separately without other submittal items not requiring the same prompt attention.
 - 2. Affix stamp and initials or signature and indicate requirements for resubmittal or exceptions to submittal as submitted.
 - 3. Return submittals to Contractor for distribution or for resubmission.
- B. Review of submittals will not extend to design data reflected in submittals that is peculiarly within the special expertise of the Contractor or any party dealing directly with the Contractor.
- C. Architect / Engineer's review is only for conformance with the design concept of the project and for compliance with the information given in the contract.
 - 1. The review shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.
 - 2. The review shall not extend to review of quantities, dimensions, weights or gauges, fabrication processes, or coordination with the work of other trades.
- D. The review of a separate item as such will not indicate approval of the assembly in which the item functions.

1.3 SUBSTITUTIONS

- A. Do not make requests for product or material substitution employing the procedures of this Section. The procedure for making a formal request for substitution is specified in Division 01.

PART 2 - PRODUCTS

- A. Each individual submittal shall be an individual specific electronic data file with the file name resembling the product specification section number and title. Refer to Division 01 for additional data file format and media requirements.

PART 3 - EXECUTION

3.1 SPECIFICATION COMPLIANCE REVIEW

- A. Do not submit an outline form of compliance, submit a complete copy with the product data.
- B. Mark up a complete copy of the complete specification section for the product to indicate a) acknowledgement of the specification requirement (Comply), or b) acknowledgement that the particular specification requirement does not apply to this specific project (Not Applicable) or, c) acknowledgement that the specification requirement cannot be made or that a variance is being submitted for review to the Architect / Engineer / Owner (Does Not Comply, Explanation:).
- C. Variances for product or materials typically include updated model numbers or updated versions of the specified product from the same manufacture or an equal or better product from the approved manufactures list. Substitutions from manufacture's not on the approved manufacture's will not be reviewed unless prior approval using one of the procedures for substitutions or changes in the contract documents are followed as required in Division 01.

3.2 COMPOSITE COORDINATION DRAWINGS

- A. Produce a set of composite coordination drawings for above ceiling, below ceiling, and below floor of electrical, mechanical, and technology equipment rooms and equipment yards for review and comment within four (4) weeks of receipt of Owner's official Notice to Proceed. Show coordination of items including but not limited to structural and architectural elements, all mechanical and plumbing piping, ductwork, equipment, electrical conduit, low voltage communications and safety/security systems cabling, cable trays, lighting, electrical switchgear, generators and UPSs, and any public or private building utility services.
 1. Prepare the composite plans at one-quarter inch (1/4") equals one-foot scale. Include larger scale sections with vertical elevations of elements as required to confirm coordinate of all elements.
 2. For each room containing major electrical switchgear and each outside equipment area with major electrical switchgear and other equipment also include NEC working space, NEC equipment space, and NEC access to NEC working space, and housekeeping pad location and dimensions.
 3. Prepare coordination drawings to coordinate installations for efficient use of available space allowing for future additional equipment wherever possible, for proper sequence of installation, and to resolve conflicts. Coordinate with work specified in other sections and other divisions of the specifications.
 4. Identify field dimensions. Show relation to adjacent or critical features of work or products.

- B. Submit composite coordination shop drawings in plan, elevation and sections, showing receptacles, outlets, electrical and telecommunication devices in casework, cabinetwork and built-in furniture.
 - 1. Verify location of wiring devices and outlets, communication devices and outlets, safety and security devices, and other work specified in this Division.
 - 2. Coordinate with drawing details, site conditions, composite coordination drawings, and millwork other equipment shop drawings prior to installation.
 - 3. Submit coordination and shop drawings prior to rough-in and fabrication.

3.3 EQUIPMENT SHOP DRAWINGS AND PRODUCT DATA

- A. Submittals shall not be combined or bound together with any other material submittal. Do not submit entire product catalogs, submit only specific data sheets indicating required product information and available product options or accessories.
- B. Submittal Specification Information:
 - 1. Every submittal document shall bear the following information as used in the project manual:
 - a. The related specification section number.
 - b. The exact specification section title.
 - c. Additional identifiers as required in Division 01.
 - 2. Submittals delivered to the Architect / Engineer without the specified information will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been submitted or delivered.
- C. All product options specified shall be clearly indicated on the product data submittal. All options listed on the standard product printed data not clearly identified as either part of or not part of the product data submitted shall become part of the Contract and shall be assumed to be provided with the product submitted.
- D. Mark each copy of standard manufacturer's printed data to identify pertinent products, referenced to specification section and article number.
- E. Show reference standards, performance characteristics and capacities; wiring diagrams and controls; component parts; finishes; dimensions and required clearances.
- F. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete or strike through information not applicable.
- G. Submit drawings in a clear and thorough manner. Identify details by reference to sheet and detail, schedule, or room numbers shown on Contract Drawings.
- H. Show all dimensions of each item of equipment in its to be installed assembled condition with all components assembled. Include a series of drawings of individual components as necessary for reference.
- I. Identify field dimensions; show relation to adjacent or critical features or work or products.
- J. Submit individually bound shop drawings and product data for the following when specified or provided.
- K. The Fault Current and Overcurrent Device Coordination Analysis shall be submitted prior to other electrical switchgear dependent on the results of the study for specific product selection by the vendor or contractor for compliance with the study.
 - 1. The emergency life safety power system equipment shall be fully coordinated as

- required by the NEC.
- 2. The AIC and WCR ratings of all products meet or exceed the available fault current at that equipment's location.
- 3. Electrical systems other than life safety power systems shall be coordinated as much as practicable while reducing arc flash energy as much as practical.

L. Required submittals when products are indicated or specified:

- 1. Fault Current and Overcurrent Device Coordination Analysis. Submit this analysis at a minimum of three (3) weeks prior to any overcurrent device submittal to allow review for modifications to overcurrent device product selection submittal based on the manufacture's analysis and recommendations. Manufacture's recommendations for code compliance equipment fault tolerance are a project requirement and shall be provided at no additional cost to the Owner. Manufacture's recommendations for arc flash reduction that result in no additional cost to the Owner shall be provided. Manufacture's recommendations for arch flash reduction which would result in additional cost to the Owner are considered recommendations only and will be reviewed by the Engineer during the submittal review and may or may not result in changes to the specified or submitted equipment.
- 2. Enclosed Switches, non-fused, fused, or circuit breaker.
- 3. Panelboards.
- 4. Load centers.
- 5. Wiring devices.
- 6. Lighting fixtures.
- 7. Lighting Controls.
- 8. Surge Protection Devices.
- 9. Transformers.
- 10. Electrical Contactors.
- 11. Enclosed Motor Controllers.
- 12. Site Lighting Photometrics, Poles, and Fixtures.
- 13. Switchboards, including renewal components for existing switchboards.
- 14. Elevator Power Module fused switches.
- 15. Fuses.
- 16. Recessed floor boxes and fittings.
- 17. Metering equipment for building management energy monitoring, usage, IECC compliance.
- 18. Modular metering equipment for multi-tenant utility electrical services.
- 19. Emergency/Standby generators.
- 20. Automatic transfer switches.
- 21. Manual transfer switches with or without integral generator docking stations.
- 22. Remote generator docking stations.
- 23. Emergency lighting inverters.
- 24. Theatrical Lighting Systems.
- 25. Architectural Dimming Systems.
- 26. Electrical cable trays
- 22. Sports Lighting Equipment., Photometrics, Fixtures, and Poles.
- 27. Surface Raceways.
- 28. Electrical controls and time switches.
- 29. Motor control centers, including renewal components for existing motor control centers.
- 30. Busway.
- 31. Uninterrupted Power Supply systems.
- 32. Power quality improvement filters or capacitors.
- 33. Lightning protection system.
- 34. Fire Rated Cables and Connectors.
- 35. Low Voltage Switchgear.

- 36. Medium Voltage Cable and Connectors.
- 37. Medium Voltage Switchgear.

3.4 MANUFACTURERS INSTRUCTIONS

- A. Submit Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, calibrating, balancing and finishing.

3.5 CONTRACTOR RESPONSIBILITIES

- A. Review, make corrections or annotations for clarification of manufacturer supplied data, stamp and sign submittals prior to transmittal.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Manufacturer's catalog numbers.
 - 4. Conformance with the Contract Documents.
- C. Coordinate submittals with requirements of the work and of the Contract Documents.
- D. Notify the Architect / Engineer in writing at time of submission of any deviations in the submittals from requirements of the Contract Documents.
- E. Do not fabricate products, or begin work for which submittals are required, until such submittals have been produced and bear contractor's stamp of acceptance or approval. Do not fabricate products or begin work until return of reviewed submittals with Architect / Engineer's acceptance.
- F. Contractor's responsibility for errors, omissions, or un-approved substitutions in submittals is not relieved whether Architect / Engineer reviews submittals or not.
- G. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved whether Architect / Engineer reviews submittals or not, unless Architect / Engineer gives written acceptance of the specific deviations identified by the Contractor on reviewed documents.
- H. Submittals shall show sufficient data to indicate complete compliance with Contract Documents:
 - 1. Proper sizes and capacities.
 - 2. That the item will fit in the available space in a manner that will allow proper service; manufacture's and code required clearances.
 - 3. Construction methods, materials and finishes.
- I. Schedule submissions at least 15 days before date reviewed submittals will be needed by the Contractor for processing or for making corrections for re-submittal.
- J. General and Electrical Contractor's Stamp of Approval
 - 1. The general contractor and the electrical contractor shall stamp and sign each document certifying to the review of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.
 - 2. Contractor's stamp of approval on any submittal shall constitute a representation to Owner and Architect / Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that

Contractor has reviewed or coordinated each submittal with the requirements of the work and the Contract Documents.

3. Do not deliver any submittals to the Architect / Engineer that do not bear the Contractor's stamp of approval and signature.
4. Submittals delivered to the Architect / Engineer without Contractor's stamp of approval and signature will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

3.6 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Project or in the work of any other Contractor. Product and equipment related to site work or other trades which require extensive rough-in, foundations, or structural support shall be submitted as soon as possible after given notice to proceed with construction.
- B. Number of submittals required:
 1. Coordination Drawings: Submit one electronic data file (pdf) and three opaque reproductions or coordination drawings.
 2. Product Data: Submit electronic data PDF files. Refer to Division 01 for specific requirements. PDF files that are 20MB or larger may indicate that a submittal includes information not specifically relevant to the specific product being provided, information not required for the review of the specific product such as a complete product catalog or catalog section. Contractor shall include only the product data required to review the specific products characteristics for compliance with the contract documents.
- C. Accompany submittals with transmittal letter containing:
 1. Date.
 2. Project title and number.
 3. Contractor's name, address and contact information.
 4. The number of each Shop Drawing, Project Datum and Sample submitted.
 5. Other pertinent data as required in Division 01.
- D. Submittals shall include:
 1. The date of submission.
 2. The project title and number.
 3. Contract Identification.
 4. The names of:
 - a. Contractor.
 - b. Subcontractor.
 - c. Supplier.
 - d. Manufacturer.
 5. Identification of the product.
 6. Field dimensions, clearly identified as such.
 7. Relation to adjacent or critical features of the work or materials.
 8. Applicable standards.
 9. Identification of deviations from contract documents.
 10. Suitable blank space for General Contractor and Architect / Engineer stamps.
 11. Contractor's signed and dated Stamp of Approval.
- E. Coordinate submittals into logical groupings to facilitate interrelation of the several items.
 1. Finishes which involve Architect / Engineer selection of colors, textures or patterns.
 2. Associated items requiring correlation for efficient function or for installation.

3.7 RESUBMISSION REQUIREMENTS

- A. Make resubmittals under procedures specified for initial submittals. Re-submittals shall be a complete submittal as if it were the initial submittal unless otherwise instructed in the review comments on the original submittal.
 - 1. Indicate that the document or sample is a resubmittal.
 - 2. Identify changes made since previous submittals.

- B. Indicate any additional changes which have been made by the contractor other than those requested by the Architect / Engineer.

END OF SECTION

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SECTION 26 05 16

EXCAVATING, BACKFILLING AND COMPACTING FOR ELECTRICAL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 apply to this section.
- B. Refer to Instructions for substitution of materials and products.
- C. Addenda issued during the bidding period that affect this section of the specifications.

1.2 WORK INCLUDED

- A. Coordinating all excavating and backfilling for the electrical underground, and all related appurtenances. Provide concrete duct banks as specified in other related Division 26 specification sections.
- B. The extent of raceways, excavation, and backfill shall be in conformance with the locations, raceways, elevations and grades shown on the drawings.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM) Use current edition.
 - 1. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - 2. ASTM D1556, Standard Test method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - 4. ASTM D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- B. Local Authority Having Jurisdiction Standards.
- C. Local Governing Agencies or Utilities.

1.4 WARRANTY

- A. Provide written warranty against defects in the material and workmanship for the work of this Section for a period of one year from the Date of Substantial Completion of the Project. Refer to Division 1 for Warranty form.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Concrete: Refer to other Division 26 specification section where concrete encasement is required or specified.
- B. Cement-Stabilized Sand: Clean, local sand mixed with not less than 1-1/2 sacks of Portland cement per ton; mix in a mill-type mixer.

- C. Sand: Clean, local sand.
- D. Earth Backfill: Clean local material consistent with the surrounding earth material and free of large clods, roots, organic materials, rocks or other debris.

PART 3 – EXECUTION

3.1 EXCAVATION

- A. General:
 - 1. All utility trenches shall be constructed in conformance with OSHA trench safety standards.
 - 2. Refer to project Geotechnical Report for additional requirements for excavating and backfilling of utility trenches.
 - 3. Sheet piling and shoring shall be accomplished to the extent necessary to maintain the sides of the trench in a vertical position throughout the construction period for trenches five feet in depth or deeper. Where approved, trench sides may be laid back in lieu of shoring to meet OSHA safety standards.
 - 4. Utilities shall not be constructed or laid in a trench in the presence of water. All water shall be sufficiently removed from the trench prior to the raceway placing operation to ensure a dry, firm bed on which to place the raceway.
- B. Appurtenances:
 - 1. Any overdepth excavation below appurtenances shall be refilled with cement-stabilized sand.
- C. Electrical Trenches:
 - 1. Electrical underground raceways must be the minimum depth required by the local governing authority and Power Company.
 - 2. Trench width for the electrical raceway shall be a minimum of the outside raceway encasement plus 12 inches.
 - 3. Trenches shall be excavated to a depth of at least 6 inches below the conduit raceway. The conduit raceway bedding or concrete encasement shall then be placed in accordance with the specifications, local governing authority, and Power Company standard details.

3.2 BEDDING AND BACKFILL

- A. Electrical Trenches:
 - 1. Place backfill, consisting of sand or cement stabilized sand, to a depth of one foot above top of raceway or concrete duct bank and compact to 90% maximum density.
 - 2. Backfill the remainder of the trench in 6 inch lifts with select excavated material and compact as required to achieve density of soil of surrounding area.
- B. Utility Locators:
 - 1. Provide metallic locators for utility company raceways as required by respective utility.
 - 2. Refer to other specification sections for additional requirements for underground raceway locators and markers.

END OF SECTION

SECTION 26 05 19

CONDUCTORS AND CONNECTORS – 600 VOLT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide electrical conductors, wire and connector work as shown, and specified.
- B. Types: The types of conductors and connectors required for the project include the following:
 - 1. 600V building conductors.
 - 2. 600V building conductor connectors.
- C. Application: The applications for conductors and connectors required on the project are as follows:
 - 1. Power distribution circuitry.
 - 2. Lighting branch circuitry.
 - 3. Appliance, receptacle, and equipment branch circuitry.
 - 4. Motor branch circuitry.
 - 5. Control wiring.
 - 6. Line voltage.
- D. Refer to other specific specification sections for voice, video, data, alarm and instrumentation cables.

1.2 QUALITY ASSURANCE

- A. UL Label: Conductors and connectors shall be UL labeled.

1.3 REFERENCES

- A. Refer to other specific specification sections regarding specialized wiring and connections.

PART 2 – PRODUCTS – Provide products manufactured in the USA

2.1 CONDUCTORS AND CONNECTORS

- A. General: Except as indicated, provide conductors and connectors of manufacturer's standard materials, as indicated by published product information, designed and constructed as instructed by the manufacturer, and as required for the installation.
- B. Cable Lubricant: Fire resistant, nonflammable, water-based type for standard building conductors. Provide cable lubricants for fire rated cables as recommended by the cable manufacturer.
- C. Conductors: Provide factory-fabricated conductors of the size, rating, material, and type as indicated for each use. Conductors shall be soft or annealed copper wires meeting, before stranding, the requirements of ASTM B 3, Standard Specification for Soft or Annealed Copper Wire for Electrical Purposes, latest edition.
 - 1. Conductors for control wiring sized #14 AWG through #10 AWG shall be stranded.
 - 2. Conductors for power and lighting shall be stranded. Stranding shall be Class B meeting the requirements of ASTM B 8, Standard Specification for Concentric-

Lay-Stranded Copper Conductors, Hard, Medium Hard, or Soft.

- D. Insulation for standard building conductors: Insulation shall meet or exceed the requirements of UL 83, Standard for Thermoplastic Insulated Wires.
1. All wiring inside lighting fixtures shall be temperature rated per NEC.
 2. Insulation for copper conductors shall be UL Type THHN/THWN, 90 degrees C.

2.2 COLOR CODES FOR CONDUCTORS FOR BRANCH CIRCUITS AND FEEDERS

- A. Color coding for conductors as required by NEC 210.5. Color coding for phase and voltage shall be as required by local codes and local standards. Where such standards do not exist, color coding shall be as follows:

Color Code Table	USE CONTINUOUS COLOR CODED INSULATION THROUGHOUT					
	A	B	C	N	G	IG
120/208 3 Ph	Black	Red	Blue	White	Green	Green/Yellow Stripe
120/240 3 Ph	Black	Orange	Blue	White	Green	Green/Yellow Stripe
120/240 1 Ph	Black	N/A	Blue			
277/480	Brown	Purple	Yellow	Gray	Green	Green/Yellow Stripe

Notes to Color Code Table:

1. 120/208, 120/240, and 277/480 Volt Systems shall be routed in separate raceways.
2. Switched legs of phase conductors for lighting and appliance branch circuits shall be of the same color as described above throughout the entire circuit.
3. Conductors shall be the same color from breaker to device or outlet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install electrical conductors and connectors as shown, in accordance with the manufacturer's written instructions, the requirements of NEC, the NECA Standard of Installation, and industry practices.
- B. Coordination: Coordinate conductor installation work with electrical raceway and equipment installation work, as necessary for interface.
- C. Conductors:
1. Provide a grounded (neutral) conductor for each branch circuit. Do not share grounded (neutral) conductors.
 2. No more than six phase conductors shall be installed in a single raceway. Any combination of phase conductors and grounded (neutral) conductors in any raceway shall not exceed nine.
 3. When any combination of four or more phase and grounded (neutral) conductors are installed in a raceway, the minimum size for all conductors including equipment ground conductor shall be #10 AWG, and they shall be de-rated accordingly.
 4. When more than four (4) conductors are size #10 AWG, they shall be installed in

- a one-inch conduit.
5. Pull conductors together when more than one is being installed in a raceway. Whenever possible, pull conductors into their respective conduits by hand. Use pulling lubricant when necessary.
 6. Before any conductor is pulled into any conduit, thoroughly swab the conduit to remove foreign material and to permit the wire to be pulled into a clean, dry conduit.
 7. Run feeders their entire length in continuous section without joints or splices.
 8. No wire smaller than #12 AWG shall be permitted for any lighting or power circuit. No wire smaller than #14 AWG shall be used for any control circuit, unless shown otherwise.
 9. Provide the same size wire from the panelboard to last outlet on circuit. For 20 amp branch circuits operating at 150V or less, provide #10 AWG wire when the first outlet is over 75-feet from the panelboard. For branch circuits operating at 150 to 600 volts, provide #10 AWG wire when the first outlet is over 150-feet from the panelboard.
 10. Branch circuit voltage drop shall not exceed 3% of rated voltage.
 - a. Total voltage drop from the point of service to the last outlet or utilization equipment of the same voltage shall not exceed five-percent of rated voltage.
 - b. Total voltage drop from the point of service to transformers with adjustable taps, buck-boost transformers, uninterruptable power supplies (UPS), or voltage regulators shall not exceed five-percent of rated voltage.
 - c. Total voltage drop from a separately derived system, transformer with adjustable taps, buck-boost transformer, uninterruptable power supply (UPS), or voltage regulator to the last outlet or utilization equipment of the same voltage shall not exceed five-percent of rated voltage.
 - d. Total voltage drop from the point of service to distribution equipment of the same voltage shall not exceed two-percent of rated voltage.
 - e. Branch circuit voltage drop from distribution equipment to the last outlet or utilization equipment shall not exceed three-percent of rated voltage.
 - f. Provide the same size branch circuit conductors to last outlet on circuit unless specifically noted or indicated otherwise on the drawings. For 20 amp branch circuits operating at 150-Volts or less, provide #10 AWG wire when the first outlet is over 75-feet from the panelboard. For branch circuits operating above 150-Volts to 600-Volts, provide #10 AWG wire when the first outlet is over 150-feet from the panelboard.
 11. No tap or splice shall be made in any conductor except in outlet boxes, pull boxes, junction boxes, splice boxes, or other accessible locations. Make taps and splices using an approved compression connector. Insulate taps and splices equal to the adjoining conductor. Make splices or taps only on conductors that are a component part of a single circuit, protected by approved methods. Taps or splices in feed through branch circuits for connection to light switches or receptacles shall be made by pigtail connection to the device.
 12. Support conductors in vertical raceways, as required by the NEC.
 13. Do not permit conductors entering or leaving a junction or pull box to deflect to create pressure on the conductor insulation.
 14. Make joints in branch circuits only where circuits divide. These shall consist of one through circuit to which the branch from the circuit shall be spliced.
 15. Make connections in conductors up to a maximum of one #6 AWG wire with two #8 AWG wires using twist-on pressure connectors of required size.
 16. Make connections in conductors or combinations of conductors larger than specified using cable fittings of type and size required for specific duty.
 17. After a splice is made, insulate entire assembly with UL-approved insulating tape

- to a value equivalent to the adjacent insulation.
18. Make splices and connections in control circuit conductors using UL-approved solderless crimp connectors.
 19. All conduits shall be installed with an insulated grounding conductor per NEC 250.122. Where green conductor insulation is not available, the ground conductor shall be identified with green phasing tape at all accessible locations.
 20. Neatly train and lace wiring inside boxes, equipment and panelboards. Provide tie-straps around conductors with their shared neutral conductor where there are more than two neutral conductors in a conduit.
 21. Clean conductor surfaces before installing lugs and connectors.
 22. Make splices, taps and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 23. Provide stranded conductors connected with pressure type connectors / compression fittings and terminal lugs UL listed for the type of conductor used (AL-CU) and correctly sized to the diameter of the bare conductors.
 24. Run mains and feeders their entire length in continuous pieces without splices or joints.
 25. Color code conductors.
 26. Do not install a pull string in conduits containing conductors.
 27. Conductors shall be the same color from load side of overcurrent protection device to outlet or utilization equipment.
 28. Spare conductors shall not be installed in any conduit, gutter, raceway, panel or enclosure unless noted otherwise.
- D. Identification: Label each phase conductor in each junction box with corresponding circuit number, using self-adhesive wire markers.
- E. Splices and Joints:
1. In accordance with UL 486A, C, D, E, and NEC.
 2. Aboveground Circuits (No. 10 AWG and smaller):
 - a. Connectors: Solderless, screw-on, reusable pressure cable type, rated 600 V, 220° F, with integral insulation, approved for copper and aluminum conductors.
 - b. The integral insulator shall have a skirt to completely cover the stripped wires.
 - c. The number, size, and combination of conductors, as listed on the manufacturers' packaging, shall be strictly followed.
 3. Motor connections:
 - a. All AHU motors connections shall be split bolt connectors.
 - b. All non-AHU motors 10 HP and larger shall be split bolt connectors.
 - c. All non-AHU motors less than 10 HP shall be split bolt connectors or as recommended by the manufacturer.
- F. Aboveground Circuits (No. 8 AWG and larger):
1. Connectors shall be indent, hex screw, or bolt clamp type of high conductivity and corrosion resistant material, listed for use with copper and aluminum conductors.
 2. Provide field-installed compression connectors for cable sizes 250 kcmil and larger with not less than two clamping elements or compression indents per wire.
 3. Insulate splices and joints with materials approved for the particular use, location, voltage, and temperature. Splice and joint insulation level shall be not less than the insulation level of the conductors being joined.
 4. Plastic electrical insulating tape: Per ASTM D2304, flame-retardant, cold and weather resistant.

- G. Underground Branch Circuits and Feeders:
 1. Submersible connectors in accordance with UL 486D, rated 600 V, 190°F, with integral insulation.

3.2 TESTING

- A. Pre-Energization Check: Before energizing, check cable and conductors for circuit continuity and short circuits. Correct malfunctions.
- B. Service Entrance and Feeder Insulation Resistance Test: Each main service entrance conductor and each feeder conductor shall have its insulation resistance tested after the installation is complete except for connection at its source and point of termination. Testing shall be performed by qualified technicians who have been trained in testing procedures and in the use of all test equipment.

1. Make tests using a Biddle Megger or equivalent test instrument at a voltage of not less than 1000 VDC; measure resistance from conductor to conductor, conductor to neutral (if present) and from conductor to ground. Insulation resistance shall not be less than the following:

Wire Size (AWG)	Insulation Resistance (Ohms)
#8	250 K
#6 through #2	100 K
#1 through #4/0	50 K
Larger than #4/0	25 K

2. Conductors that do not meet or exceed the insulation resistance values listed above shall be removed, replaced, and retested.
- C. Submittals: Contractor shall furnish instruments and personnel required for tests. Submit 4 copies of certified test results to Architect for review. Test reports shall include conductor tested, date and time of test, relative humidity, temperature, and weather conditions.
 - D. Voltage and Current Values: The voltage and current in each conductor shall be measured and recorded after connections have been made and the conductor is under load.

SAMPLE DC HIGH VOLTAGE CABLE TEST REPORT
(Specification Paragraph 3.2, C)

Date _____

Contract and Work Location: _____
 Contract (Project) No.: _____
 Circuit Identification: _____
 (Dwg., Title, Number and Ckt. Number)

Test Equipment: _____
 (Make, Model, Serial No., Etc.)
 Applied Test Voltage _____
 Normal Oper. Voltage _____
 Cable Installation: New _____ Used _____
 (Date) _____ (No. Years) _____
 Cable Size _____ AWG
 Cable Length _____ Ft.
 Cable Material _____ Cu _____ Al
 Temperature _____ Humidity _____

TEST DATA - RESISTANCE IN KILO OHMS

CONDUCTOR PER PHASE	A-N	B-N	C-N	A-G	B-G	C-G	A-B	B-C	A-C

END OF SECTION

SECTION 26 05 26

ELECTRICAL GROUNDING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Grounding shall conform to the requirements of:
 - 1. National Electrical Code.
 - 2. Governing local codes.
 - 3. All Local Utility Companies.

- B. Ground effectively and permanently.
 - 1. Neutral conductor at the main service disconnect and other separately derived systems.
 - 2. All conduit systems.
 - 3. All electrical equipment and related current carrying supports or structures.
 - 4. All metal piping systems.
 - 5. All building structural metal frames.
 - 6. All telephone/voice/video/CATV/data utilities

1.2 REFERENCE STANDARDS

- A. ANSI/IEEE Standard 142 - "Recommended Practice for Grounding of Industrial and Commercial Power Systems."
- B. ANSI/UL 467 - "Safety Standard for Grounding and Bonding Equipment."
- C. Article 250 of the NEC (NFPA 70) for grounding.
- D. NECA – Standard of Installation.
- E. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- F. EIA / TIA 607.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Copperweld.
- B. nVent ERICO.
- C. Burndy.
- D. O. Z Gedney.
- E. Eaton.

2.2 GROUNDING ELECTRODES

- A. Driven Rod Electrode.
 - 1. 3/4" x 10'-0" copper clad grounding electrode.

- 2. UL listed.
 - 3. Approved thermal fusion connector methods (exothermic).
- B. Metal frame of building or enclosure.
 - C. Foundation concrete encased rebar.

2.3 DATA / VOICE COMMUNICATIONS CLOSET GROUND BAR

- A. MDF closets/head end rooms: Erico Cadweld #B544A028 ground bar with 7/16-inch holes.
- B. IDF closets, Erico Cadweld #B542A004 ground bar with 7/16-inch holes.
- C. Heavy-duty, two bolt type, copper alloy or bronze for grounding and bonding applications, in configurations required for particular installation.

2.4 EXOTHERMIC CONNECTIONS

- A. Exothermic type for underground and structural steel; Cadweld.
- B. Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

2.5 WIRE

- A. Stranded, copper cable.
- B. Foundation Electrodes: 4/0 AWG.
- C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

PART 3 - EXECUTION

3.1 GROUNDING AND BONDING

- A. In the service equipment, provide a separate (dedicated) ground bus.
 - 1. Bond the ground bus with copper bus bar or cable, of equal or greater current carrying capacity of the service grounding conductor, to the neutral bar.
 - 2. Resistance of neutral to ground shall not exceed 10 Ohms.
 - 3. Connect the electric service grounding electrode conductors to the incoming metal water pipe system (when available, using a suitable ground clamp) and to a supplemental electrode such as a ground rod or ground ring.
 - 4. Provide grounding and bonding at the power company's metering equipment.
 - 5. Provide access and cover for access to the ground grid and removable connections for testing the system.
- B. Connect the grounding electrode conductor between the ground bus and the grounding electrode system.
 - 1. In rigid PVC conduit.
 - 2. Provide thermo fusion connection for each rod ground electrode.
 - a. All rod electrodes shall be located outside the building in non-paved areas where available. Access cover top shall be flush with finish grade or floor.
 - b. Install rod electrodes as required. Install additional rod electrodes as required to achieve specified resistance to ground.

- c. The minimum distance between driven ground rod electrodes shall be 10'.
 - 3. The total ground resistance shall not exceed 10 Ohms for service entrance grounds and 25 Ohms for equipment grounds.
 - a. Where this condition cannot be obtained with one electrode, install a longer electrode, deep-driven sectional electrodes, or additional grounding electrodes until the required ground resistance is obtained.
- C. Provide an insulated equipment grounding conductor inside all conduits, raceways, surface raceways, gutters and wireways. The ground wire shall be bonded to each box to suitable lug, bus, or bushing. All bonding jumpers shall be routed inside conduit or raceway.
- D. Provide an insulated isolated equipment grounding conductor in addition to the insulated equipment grounding conductor for all isolated grounding feeders, branch circuits, outlets and isolated grounding receptacles.
- E. Provide all conduit terminating in switchgear, transformers, switchboards, panelboards and voice/data outlets with grounding bushings, where required, and ground wire extended to ground bus in equipment. Install grounding bushings where reducing washers are used and concentric and eccentric knock-outs are used.
- F. Main bus and building grounding electrode conductor installation shall be witnessed by the Architect / Engineer.
- G. Provide bonding to meet Regulatory Requirements.
- H. Interface with lightning protection system when lightning protection system is specified.
- I. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
- J. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- K. Do not use spring steel clips and clamps.
- L. Do not use powder-actuated anchors.
- M. Do not drill or cut structural members.
- N. Do not use compression or mechanical connectors underground.
- O. Do not use sheetmetal or self-drilling screws for bonding connections. Provide listed or approved connectors.
- P. Provide grounding access well for each driven ground electrode, not located in manholes or pull boxes.
 - 1. Access well top shall be flush with finish paved surfaces.
 - 2. Ground access wells located in non-paved areas shall be set two-inches above surrounding finished grade. Provide 12-inch wide by 8-inch deep reinforced concrete crown around neck or opening and sloped down away from pull box opening.
 - 3. Provide thermal fusion (exothermic) connectors approved for direct burial.

3.2 METAL FRAME OF BUILDING OR STRUCTURE

- A. Effectively ground the building steel or structure per NEC 250-52 (2).

3.3 UFER GROUND

- A. Provide a UFER ground at bottom of building slab per NEC 250.52 (3), bond to building steel.

3.4 MISCELLANEOUS REQUIREMENTS

- A. Continuity of the equipment grounding system shall be maintained throughout the project. Equipment grounding jumpers shall be installed across conduit expansion fittings, liquid-tight flexible metal and flexible metal conduit, and other non-electrically continuous raceway fittings.
- B. Equipment grounding conductors and grounding electrode conductor shall be stranded copper conductors and run in a suitable raceway. Grounding conductors and grounding electrode conductor shall be continuous, without joints or splices over their entire length, except as allowed by NFPA 70/NEC.
- C. For separately derived alternating current system grounds, bond the case and neutral of each transformer secondary winding directly to the nearest available effectively grounded structural metal member as required in NEC 250.
- D. Exterior Electrical Equipment Racks:
 - 1. Provide driven ground electrode.
- E. Technology/Data/Voice Communications, CATV, CCTV, and MATV Equipment Grounding: Provide grounding electrode conductor from the communications service equipment to the building grounding system as required. Grounding shall conform to ANSI/TIA/EIA 607(A) – Commercial Building Grounding and Bonding Requirements for Telecommunications, National Electrical Code®, ANSI/NECA/BICSI-568 and manufacturer's grounding requirements as minimum. Bonding shall be of low impedance to assure electrical continuity between bonded elements.
 - 1. MDF Closets Telecommunications Main Ground Bar (TMGB): Provide Erico #EGBA14424MM ground bar, wall mounted to the telecommunications plywood backboard. Provide one #3 AWG insulated ground conductor from ground bar to building steel. Provide #2/0 AWG insulated ground conductor to the building electrical service ground at the nearest electrical switchboard or panelboard.
 - 2. IDF Closets Telecommunications Ground Bar (TGB): Provide Erico #EGBA14410FF ground bar mounted to the telecommunications plywood backboard. Provide one #6 AWG insulated ground conductor from ground bar to building steel and to ground bus of nearest electrical panelboard or switchboard.
 - 3. Provide #2/0 AWG insulated ground conductor between each TMGB and all TGBs.
 - 4. Provide #2/0 AWG insulated ground conductor from TMGB to electrical service ground bus at main electrical service switch.
 - 5. Bond each equipment rack, cabinets, frames, together and with #6 AWG insulated ground conductor to the local TMGB / TGB. Bond and ground equipment racks, housings, messenger cables, raceways, and rack-mounted conduit.
 - 6. Route TMGB – TGB ground conductor using the shortest, straightest, route practical with long radius curves.
 - 7. All conduits terminating to cable trays, wireways, and racks shall be mechanically fastened. When connected to a cable tray or rack, it must be connected with

ground bushings, wire bonded to the tray or rack, and grounded to the main building grounding system or IDF room grounding bar using #6 AWG copper.

- F. Ground lighting fixture bodies to the conduit grounding system.
- G. Bond receptacle ground to the box and conduit ground system, except where and insulated/isolated grounding receptacle or outlet is specified.
- H. Ground connections to building steel, grounding electrodes and all underground connections shall be by thermal fusion (exothermic).
- I. Provide OZ Type "BJ" bonding jumper at all expansion joints, points of electrical discontinuity or connections in conduit where firm mechanical bond is not possible, such as flexible connections, insulating couplings, etc.
- J. Ground each lighting and power panelboard by connecting the grounding conductors to the grounding stud.
- K. Ground each secondary dry-type transformer to the ground bus of the primary side panelboard. Provide a bonding jumper between the ground stud and the neutral. Ground transformer ground stud to ground ring if a ground ring is installed or the nearest structural steel member.
- L. Bond every item of equipment served by the electrical system to the building equipment ground system. This includes, but is not limited to, switchboards, panelboards, disconnect switches, receptacles, cable trays, controls, fans, air handling units, pumps and flexible duct connections.
- M. Ground each light pole, power distribution poles, and metal conduit stub-ups at each light pole base.
- N. Ground all metal conduit including metal conduit used for bends and penetrations through concrete.
- O. Bond hot water and cold water piping together at each domestic water heater.

3.5 MANHOLE AND/OR PULL BOX GROUNDING

- A. Provide a driven ground rod and ground bond ring in each power and telephone manhole or pull box. Bond cable racks and medium voltage cable shields at splices and terminations, ductbank conduit ground bushings and all other metal components in manholes or pull box to the ground ring.

3.6 COORDINATION

- A. General: Coordinate installation of grounding connections for equipment with equipment installation work.

3.7 TESTING

- A. Ground Resistance Test: Perform a ground resistance test for comparison to future inspection and testing data by the Owner. Test shall be performed using a Biddle Megger Earth Tester or equivalent test instrument. The test shall not be performed within 48 hours after the last rainfall.
 - 1. Inspect and test in accordance with NETA ATS except Section 4
 - 2. Grounding and Bonding: Perform inspections and tests listed in NETA ATS,

Section 7.13

- B. True Root Mean Square (RMS) AC measurements: The True RMS AC Measure test should be performed for all bonding conductors. The recommended maximum AC current value on any bonding conductor should be less than 1 ampere (A). The recommended maximum DC current value should be less than 500 milliamperes (mA). If abnormally high AC current levels are present on any bonding conductor, a dangerous faulty wiring condition likely exists within the room.
- C. Two-Point Bonding Measurements: The Two-point Bonding test should be performed for all bonding conductors. This test should be performed using an earth grounding resistance tester configured for a continuity test. The test is performed by connecting the meter leads between the nearest available grounding electrode (e.g., structural steel) and the TMGB or TGB. The recommended maximum value for the bonding resistance between these two points is 0.1 Ohms (100 milliohms).
- D. Submittals: Furnish instruments and personnel required for tests. Personnel shall be trained in all aspects of testing grounding systems and shall be formally trained on using all test equipment required. Submit 2 copies of certified test results for Owner's record and submit 4 copies of certified test results to Architect / Engineer for review. Test reports shall include date and time of tests, relative humidity, temperature, and weather conditions.

END OF SECTION

SECTION 26 05 33

CONDUIT SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install a complete system of electrical conduits and fittings.

1.2 REFERENCE STANDARDS

- A. National Electrical Code.
- B. Local codes and ordinances.
- C. UL.
- D. ETL.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS – Provide products manufactured in the USA

- A. Raceways:
 - 1. Allied, International Metal Hose, Ipex, Heritage Plastics, Wheatland, Can-Tex, Carlon, Certain-Teed, Anamet, Inc., Electri-Flex Co., Western Tube and Conduit, Sentinel Conduit.
 - 2. PVC Coated RGC: Robroy Perma Cote, Robroy Plasti-Bond, or Calbond – no exceptions.
 - 3. Stainless Steel: Robroy, Calbrite, Gibson.
 - 4. Aluminum: Penn Aluminum, American Conduit, Wheatland, Eaton B-Line, Patriot Aluminum Products.
 - 5. Reinforced Thermosetting Resin Conduit (RTRC): FRE Composites, Champion Fiberglass, United Fiberglass.
- B. Fittings:
 - 1. Appleton, Crouse Hinds, Topaz, Steel City, O.Z. Gedney, Carlon, Heritage Plastics, Raco, Ipex, International Metal Hose, Lew Electric Fittings Co.
 - 2. PVC Coated ferrous fittings: Robroy Perma Cote, Robroy Plasti-Bond, or Calbond – no exceptions.
 - 3. Stainless Steel: Robroy, Calbrite, Gibson, Crouse Hinds.
 - 4. Aluminum: Penn Aluminum, American Conduit, Wheatland, Eaton B-Line, Patriot Aluminum Products.
 - 5. Reinforced Thermosetting Resin Conduit (RTRC): FRE Composites, Champion Fiberglass.
- C. Condulets and Conduit Bodies:
 - 1. Appleton, Form 85.
 - 2. PVC Coated: Robroy Perma-cote or Plasti-Bond, – no exceptions.
 - 3. Stainless Steel: Robroy, Calbrite, Gibson, Crouse Hinds.
 - 4. Reinforced Thermosetting Resin Conduit (RTRC): FRE Composites, Champion Fiberglass.
- D. Steel MC Cable for light fixture whips:
 - 1. AFC.

2. Southwire.
3. General Cable.
4. Kaf-Tech.

2.2 GENERAL

- A. The minimum conduit size shall be ¾-inch unless indicated otherwise in Divisions 26, 27 or 28.
 1. Branch Circuits: Minimum conduit size shall be ¾-inch.
 2. Feeder Circuits: Minimum conduit size shall be ¾-inches.
 3. Technology, telecommunications, and low voltage systems: The minimum conduit size shall be ¾-inches unless noted or indicated otherwise.
 4. The minimum conduit size between buildings for technology, voice, data, fire alarm, video, security, surveillance, BMCS, and other telecommunications shall be 2-inch unless indicated otherwise.
- B. The minimum conduit size for flexible metallic conduit for tap connections to individual light fixtures shall be ½ inch, or steel metal clad (MC) cable with insulated ground conductor maximum 6 feet.
- C. Electrical nonmetallic tubing, flexible polyethylene or PVC tubing shall not be used on this project.
- D. BX and AC cable shall not be used on this project.
- E. PVC elbows shall not be used on this project.
- F. Intermediate metal conduit (IMC) shall not be used on this project.

2.3 RIGID METAL CONDUIT

- A. UL labeled, Schedule 40:
 1. Mild steel pipe, zinc coated inside and out.
 2. Aluminum Alloy 6063, T-1 temper.
 3. Threaded ends.
 4. Insulated bushings.
- B. Fittings shall meet the same requirements as rigid metal conduits.
 1. UL labeled.
 2. Threaded fittings.

2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. UL labeled, standard weight:
 1. Cold rolled steel tubing, zinc coated inside and out.
 2. Aluminum Alloy 6005, 6063. Temper T-1.
- B. Fittings shall meet the same requirements as EMT conduits.
 1. UL labeled.
 2. Insulated throat connectors.
 3. Steel fittings with setscrews with lock nuts on threaded ends, no snap locks.
 4. Cast metal fittings are not approved.
 5. Uni-couple type connectors are not approved.
 6. Split ring, anti-short bushings are not approved.

2.5 RTRC CONDUIT FITTINGS AND CONDUIT BODIES

- A. UL listed.
- B. Standard wall thickness sizes ¼-inch through 4-inch.
- C. Underground medium wall thickness sizes 5 and 6-inch.
- D. Conduit interface joints above grade, gasket joint below grade
- E. Extra heavy wall for above ground and/or UL Class 1 Division 2 and Class 1 Zone 2 applications.

2.6 PVC COATED RIGID STEEL WITH URETHANE INTERIOR COATING

- A. The PVC coated galvanized rigid conduit and fittings must be ETL Listed and Verified. The PVC coating must have been investigated and verified by ETL as providing the primary corrosion protection for the rigid metal conduit. Ferrous fittings for general service locations must be ETL Listed with PVC as the primary corrosion protection. Hazardous location fittings, prior to plastic coating must be UL listed for the hazard conditions to which they are to be used. All conduit and fittings must be new, unused material. Applicable UL standards may include UL 6 Standard for Safety, Rigid Metal Conduit, and UL514B Standard for Safety, Fittings for Conduit and Outlet Boxes.
- B. The PVC coated galvanized rigid conduit and fittings must be ETL Verified to the Intertek ETL SEMKO High Temperature H₂O PVC Coating Adhesion Test Procedure for 200 hours. The PVC coated galvanized rigid conduit must bear the ETL Verified PVC-001 label to signify compliance to the adhesion performance standard.
- C. The conduit shall be hot dip galvanized inside and out with hot galvanized threads.
- D. A PVC sleeve extending one pipe diameter or two inches, whichever is less, shall be formed at every female fitting opening except unions. The inside sleeve diameter shall be matched to the outside diameter of the conduit.
- E. The PVC coating on the outside of conduit couplings shall have a series of longitudinal ribs 40 mils in thickness to protect the coating from tool damage during installation.
- F. Form 8 Condulets, ½-inch through 2-inch diameters, shall have a tongue-in-groove gasket to effectively seal against the elements. The design shall be equipped with a positive placement feature to ease and assure proper installation. Certified results confirming seal performance at 15 psig (positive) and 25 inches of mercury (vacuum) for 72 hours shall be available.
- G. Form 8 Condulets shall be supplied with plastic encapsulated stainless-steel cover screws.
- H. A urethane coating shall be uniformly and consistently applied to the interior of all conduit and fittings. This internal coating shall be a nominal 2 mil thickness. Conduit or fittings having areas with thin or no coating shall be unacceptable.
- I. The PVC exterior and urethane interior coatings applied to the conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above 30°F (-1°C).
- J. All male threads on conduit, elbows and nipples shall be protected by application of a

urethane coating.

- K. All female threads on fittings or conduit couplings shall be protected by application of a urethane coating.
- L. Independent certified test results shall be available to confirm coating adhesion under the following conditions
 1. Conduit and conduit exposure to 150°F (65°C) and 95% relative humidity with a minimum mean time to failure of 30 days. (ASTM D1151)
 2. The interior coating bond shall be confirmed using the Standard Method of Adhesion by Tape Test (ASTM D3359).
 3. No trace of the internal coating shall be visible on a white cloth following six wipes over the coating which has been wetted with acetone (ASTM D1308).
 4. The exterior coating bond shall be confirmed using the methods described in Section 3.8, NEMA RN1. After these tests the physical properties of the exterior coating shall exceed the minimum requirements specified in Table 3.1, NEMA RN1.
- M. Right angle beam clamps and U bolts shall be specially formed and sized to snugly fit the outside diameter of the coated conduit. All U bolts shall be provided with plastic encapsulated nuts that cover the exposed portions of the threads.
- N. All fittings, clamps, straps, struts, and hardware used with PVC coated conduit shall be PVC coated or 316 stainless steel

2.7 STEEL FLEXIBLE CONDUIT

- A. Steel flexible metallic conduit:
 1. Zinc coated inside and out.
 2. 18-inches minimum length, 24-inches maximum length.
- B. Steel flexible metallic conduit for tap connections to light fixtures where steel MC Cable fixture whips are not used:
 1. 18 inches minimum length; 6 feet maximum length.
- C. Liquid tight flexible steel conduit
 1. Type L.A. - Grounded - UL Approved.
 2. 18-inches minimum length, 24-inches maximum length.

2.8 PVC CONDUIT

- A. UL labeled Schedule 40 and Schedule 80.
- B. PVC fittings and solvent welded joints.
- C. Acceptable PVC conduit manufacturer: Ipex, Cantex.

2.9 CONDULETS AND CONDUIT BODIES

- A. UL Labeled.
- B. Form 85.
- C. PVC Coated: Form 8.
- D. LBC Condulets shall be used for size 2 inch and above.

- E. LL and LR Condulets shall not be used for 2 inch and above.

2.10 ROOF MOUNTED CONDUIT AND BOX SUPPORTS

- A. Conduit supports and pads suitable for direct sunlight, conduit size, weight, quantity and roof system with unistrut supports and accessories. Conduit supports shall allow for conduit expansion and contraction.
- B. Refer to roofing specifications for additional information. The limitations and restrictions contained in any roofing specification shall prevail and supercede these specifications for roof mounted supports for conduits and boxes.
- C. Approved Manufacturer:
 - 1. Portable Pipe Hangers.
 - 2. Eaton B-Line.
 - 3. Miro Industries, Inc.

2.11 ALUMINUM CONDUIT

- A. UL Labeled.
- B. Aluminum fittings shall meet the same requirements of aluminum conduits, compatible steel fittings.
 - 1. UL Labeled for use with aluminum conduit.

2.12 STAINLESS STEEL CONDUIT

- A. UL Labeled.
- B. Rigid Stainless Steel:
 - 1. Type 304 Stainless Steel.
 - 2. Threaded ends.
 - 3. Insulated Bushings.
- C. EMT:
 - 1. Type 304 Stainless Steel.
 - 2. Compression Fittings.
 - 3. Insulated Bushings.
- D. Fittings, elbows, nipples, strut, device box, clamps straps, etc.
 - 1. Type 304 Stainless Steel.

2.13 ELECTRICAL NON-METALLIC TUBING (ENT)

- A. UL labeled Schedule 40.
- B. PVC fittings and solvent welded joints.
- C. Acceptable manufacture: Carlon .

2.14 EXTERIOR IN-GRADE PULL BOXES

- A. Enclosures, boxes and covers are required to conform to all test provisions of the most current American Association of State Highway and Transportation Officials (AASHTO) standards for H-20 loading applications.

1. AASHTO H-20 certified precast concrete, cast iron or other AASHTO recognized materials, rated for deliberate traffic.
2. Conduit entry knock-outs as required.
3. Bolt down galvanized steel/cast iron covers.
4. Thin wall knocks outs as required .
4. Integral bottom.
5. Box height as required for specified conduit depth and required top elevation.
6. Concrete design strength of minimum 5,500 PSI at 28-days.
7. Place enclosures on a minimum of 6 inches of coarse gravel with a border of 6-inches beyond the enclosures exterior dimension.
8. Size and volume as required for application.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install electrical conduits and fittings for all wiring of any type unless specifically specified or instructed to do otherwise. Install conduits and fittings in accordance with local codes and applicable sections of the NECA "Standard of Installation", concealed where possible.
 1. Fasten conduit supports to building structure and surfaces; do not support to roof deck.
 2. Arrange supports to prevent misalignment during wiring installation.
 3. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
 4. Do not attach conduit to ceiling support wires.
 5. Arrange conduit to maintain head room and present neat appearance.
 6. Maintain 4-inch clearance between conduit and rooftop surfaces.
 7. Cut conduit square using saw or pipe cutter; de-burr cut ends.
 8. Bring conduit to shoulder of fittings; fasten securely.
 9. Conduit penetrations to all individual motor controllers, VFDs, and motor control cabinets shall only be made at the bottom of the enclosure. For other equipment, provide listed water sealing conduit hubs to fasten conduit to sides or tops of electrical equipment enclosures, device box, gutter, wireway, disconnect, etc.
 10. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
 11. Ground and bond conduit as required.
 12. Identify conduit as required.
 13. Route all conduits above building slab perpendicular or parallel to building lines.
 14. Do not use no-thread couplings and connectors for galvanized steel, PVC coated galvanized steel, or aluminum rigid conduit.
- B. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
- C. In areas where raceway systems are exposed and acoustical or thermal insulating material is to be installed on walls, partitions, and ceilings, raceways shall be blocked out proper distance to allow insulating material to pass without cutting or fitting. Also provide Kindorf galvanized steel channels to serve as standoffs for panels, cabinets and gutters.
- D. Securely fasten conduits, supports and boxes, to ceiling (not roof deck), walls, with Rawl Plugs or approved equal anchors. Use lead cinch anchors or pressed anchors. Use only cadmium plated or galvanized bolts, screws. Plastic anchors and lead anchors shall not be used for overhead applications.
- E. Provide separate raceway systems for each of the following when specified, indicated or

required:

1. 120/208 volt circuits.
 2. 277/480 volt circuits
 3. Emergency
 - a. Life safety branch..
 - b. Critical branch.
 - c. Equipment branch.
 4. Voice/Data.
 5. Sound reinforcement.
 6. Theatrical and Architectural Dimming Controls.
 7. MATV/CATV.
 8. Security CCTV.
 9. Security System.
 10. Communications / PA Systems / Sound System Line Input and Speakers.
 11. Fire Alarm.
 12. Lighting Control Systems.
 13. Building Management Control Systems.
- F. Unless shown otherwise, do not install conduit in or below concrete building slabs.
- G. Unless shown otherwise, do not install conduit horizontally in concrete slabs.
- H. Roof penetrations shall be made in adequate time to allow the roofing installer to make proper flashing. Conduit for equipment mounted on roof curbs shall be routed through the roof curb. Conduit, gutters, pull boxes, junction boxes, etc. shall not be routed on roof unless specified otherwise. Where specifically indicated to be routed or mounted on the roof, supports shall be as specified, as recommended by roofing manufacturer and roof support manufacturer and as required by NEC. Place supports every five feet along conduit run and within 3 feet of all bends, condulets, and junction boxes. Provide roofing pad under stands as directed by Architect and as recommended by roofing manufacturer and roof support manufacturer. Provide additional unistrut supports and accessories as required.
- I. PVC coated conduit shall have all nicks and cuts to the protective coating repaired using manufacturer's approved touch-up material as recommended by manufacturer. Provide a minimum of two-wraps of 3M-50 type tape over touch-up.
- J. Installation of the PVC Coated Conduit System shall be performed in accordance with the Manufacturer's Installation Manual. To assure correct installation, the installer shall be certified by Manufacturer to install coated conduit. Submit copies of training certification with submittal. Contractor shall coordinate installation with manufacturer's representative for field training and observation of installed PVC coated rigid galvanized conduit and fittings. Manufacturer's representative shall certify the installation is in accordance with manufacturer's installation instructions. Submit copies of installation certification prior to cover-up of underground installation.
- K. All conduit terminations at locations including but not limited to, switchgear, pull boxes, outlet boxes, stub-up, and stub-outs:
 1. Provide insulated throat connectors for EMT conduits.
 2. Provide insulated bushing on all rigid conduit terminations.
 3. Provide locknuts inside and outside of all boxes and enclosures.
 4. Provide threaded type plastic bushing at all boxes and enclosures
- L. In suspended ceilings, support conduit runs from the structure, not the ceiling system construction.
 1. Do not support from structural bridging.

2. Do not support from metal roof deck.
- M. Completely install each conduit run prior to pulling conductors. All boxes are to be accessible after completion of construction.
- N. All conduits must be kept dry and free of water or debris with approved pipe plugs or caps. Cap or plug conduit ends prior to concrete pours.
- O. Ream ends of conduits after cutting and application of cutting die to remove rough edges.
- P. Install all above concrete slab conduits perpendicular or parallel to building lines in the most direct, neat and workmanlike manner.
1. Cable Tension:
 - a. 0.008 lb./cmil for up to 3 conductors, not to exceed 10,000 pounds.
 - b. 0.0064 lb./cmil for more than 3 conductors, not to exceed 10,000 pounds
 - c. 1000 lbs. per basket grip.
 2. Sidewall pressure: 500 lbs./ft.
 3. Conduit runs within the following limits of bends and conduit length between pull points shall not exceed the above installation pulling tension and sidewall pressure limits.
 - a. Three (3) equivalent 90-degree bends: not more than fifty feet (50') between pull points.
 - b. Two (2) equivalent 90-degree bends: not more than one hundred feet (100') between pull points.
 - c. One (1) equivalent 90-degree bend: not more than one hundred fifty feet (150') between pull points.
 - d. Straight pull: not more than two hundred feet (200') between pull points.
 4. Indicate sizes of conduits, wireway sections, and cable tray sections on the as-built drawings.
 5. Hold horizontal and vertical conduits as close as possible to walls, ceilings and other elements of the building construction. Conduits shall be kept a minimum of 6 inches clear of roof deck / insulation, and 2 inches clear of above floor deck / insulation.
 6. Install conduits to conserve building space and not obstruct equipment service space or interfere with use of space. Conduit shall not be routed on floors, paved areas or grade.
 7. Where a piece of equipment is wired from a switch or box on adjacent wall, the wiring shall go up the wall from the box, across at or near the ceiling, and back down to the equipment. Wiring shall not block the walkway between wall and equipment.
 8. Horizontal runs of conduit on exposed walls shall be kept to a minimum.
 9. Conduit for mechanical / plumbing equipment installed outdoors shall be routed with the associated mechanical / plumbing pipe support rack system where practical, coordinate with Divisions 22 and 23.
 10. Conduits installed in public areas, not concealed by architectural ceilings, shall be supported by galvanized steel channel racks to bottom of roof deck or floor deck. Conduits shall be grouped for neat workman-like appearance.
- Q. Install expansion and deflection fittings and bonding jumpers on straight runs which exceed 200-feet, on center, and at 200-feet maximum, on center, on straight runs which exceed 400-feet, and where conduits cross building expansion joints.
- R. Provide grounding bushings at concentric/eccentric knockouts or where reducing washers are used.
- S. Run conduit to avoid proximity to heat producing equipment, piping surfaces with

temperatures exceeding 104 degrees F., and flues, keeping a minimum of 13-inches clear.

- T. Install conduit as a complete system, without conductors, continuous from outlet to outlet and from fitting to fitting. Make up threaded joints of conduit carefully in a manner to ensure a tight joint. Fasten the entire conduit system into position. A run of conduit between outlet and outlet, between fitting and fitting, or between outlet and fitting shall not contain more than the equivalent of four quarter bends, including those bends located immediately at the outlet or fitting.
- U. Conceal conduit systems in finished areas. Conduit may be exposed in mechanical and electrical rooms, and where otherwise shown or indicated only. Run the conduit parallel and perpendicular to the structural features of the building and support with malleable iron conduit clamps at intervals as required by NEC or on conduit racks, neatly racked and bent in a smooth radius at corners.
- V. Conduit bends shall be factory elbows or shall be bent using equipment specifically designed to bend conduit of the type used to maintain the conduit's UL listing. Conduit hanger spacing shall be 10 feet or less and as required by the NEC for all conduit. Beam clamp attachments to steel joist chords is prohibited. Beam clamps may only be used at beams, no exceptions. Connections to joists shall be made with galvanized channel extended between joist chords or with galvanized channel bearing on the vertical legs of joist chord angles.
- W. Support conduit on galvanized channel, using compatible galvanized fittings (bolts, beam clamps, and similar items), and galvanized threaded rod pendants at each end of channel and secure raceway to channel and channel to structure. Where rod pendants are not used, channel supports are to be secured to structure at each end. Conduit supports are to be secured to structure using washers, lock washers, nuts and bolts or rod pendants; use of toggle bolt "wings" are not acceptable. Support single conduit runs using a properly sized galvanized conduit hanger with galvanized closure bolt and nut and threaded rod. Raceway support system materials shall be galvanized and manufactured by Kindorf, Unistrut, Superstrut, Caddy, or Spring Steel Fasteners, Inc. Provide chrome or nickel-plated escutcheon plates on conduit passing through walls and ceilings in finished areas. Do not support conduit from other conduit, structural bridging or fire rated ceiling system. Do not support more than one conduit from a single all-thread rod support. Provide electrical insulating sleeve or wrapping for aluminum conduit supported by zinc coated supports or fasteners. Channel supports shall have cut ends filed smooth. When installed outside of the building, or in areas subject to moisture, the cut ends shall be painted with ZRC galvanized paint or equivalent.
- X. Terminate all motor connection conduits in mechanical room spaces with a floor pedestal and with "Tee" conduit at motor outlet height for flexible conduit.
- Y. Where conduit is not embedded in concrete or masonry, conduit shall be firmly secured by approved clamps, half-straps or hangers. Tie wire and short pieces of conduit used as supports and or hangers are not approved.
- Z. Where "LB" condulets are used, 2-inches and larger shall be type "LBD".
- AA. No more than 12 conduits containing branch circuits may be installed in junction boxes, pull boxes or gutters.
- BB. Flexible metal conduit and liquid tight flexible metal conduit shall only be used for final connections from junction box to equipment, light fixtures, power poles, etc. They are not to be used in lieu of conduit runs. They shall not be used for wall or roof penetrations

unless they are installed in a PVC coated RGC conduit sleeve at least one size larger than the OD of the flexible conduit.

- CC. Where 3-1/2-inch conduit is specified and the required or specified material is Schedule 80 PVC, provide 4-inch conduit.
- DD. "Daisy Chaining" light fixtures installed for lay-in ceiling areas is not allowed. Each light fixture shall have its own fixture whip from junction box. The only exception being light fixtures installed end to end using chase nipples between them, or light fixtures recessed in non-accessible ceilings.
- EE. In above ceiling applications, do not install raceways, junction boxes, gutters, disconnects, etc. within 36 inches directly in front of HVAC control boxes or other equipment requiring access from a point starting from the top of control box / equipment down to ceiling.
- FF. Do not install conduit, junction boxes, etc. within 18 inches of outside edges of roof access openings.
- GG. Install minimum size 2-inch nipple, at least one, between multi-sectional panels for branch circuit independent of feeder conductors.

3.2 CONDUITS

- A. Conduit above grade indoors:
 - 1. Concealed Conduits: EMT with set screw fittings
 - 2. Exposed conduits:
 - a. Below nine feet AFF where not directly attached and against building walls, ceiling, or structure: Rigid metal conduit or x-wall RTRC.
 - b. Where subject to physical damage: Rigid metal conduit or x-wall RTRC.
 - c. Wet locations: PVC coated galvanized rigid steel or aluminum conduit
 - d. Damp Locations: Aluminum rigid conduit or x-wall RTRC.
 - e. Exposed conduits in mechanical rooms or electrical rooms shall be rigid galvanized steel or x-wall RTRC when installed below 18-inches above finished floor.
- B. Conduit installed above grade outdoors:
 - 1. Galvanized rigid steel or x-wall RTRC for conduits up utility poles and where subject to physical damage or where located less than four feet above finished floor.
 - 2. Aluminum or x-wall RTRC where not subject to physical damage and where located four feet above finished floor.
- C. Conduit where indicated underground:
 - 1. PVC Coated Galvanized rigid steel or RTRC conduit elbows and Schedule 80 PVC, RTRC, or PVC coated galvanized steel straight run conduits. PVC conduits for underground branch circuits shall be Schedule 80 or Schedule 40 PVC.
 - a. PVC conduit and fittings shall be used only for straight horizontal runs and for vertical risers at site lighting pole bases. Bending straight sections of PVC conduit to less than 25-foot radius or the use of PVC factory bends is not allowed.
 - b. Change in direction of conduit runs, either vertical or horizontal, shall be with RTRC or PVC coated galvanized steel elbows or long sweep bends of straight PVC conduit sections. Long sweep bends of straight PVC 20-foot sections shall have a minimum radius of curvature of 25 feet and a maximum arc of 22.5degrees. Multiple long sweep bends of straight PVC

- sections shall be separated by a minimum of 20-feet of straight, linear, PVC sections.
- c. Provide RTRC or PVC coated rigid galvanized steel conduit elbows and fittings with urethane interior coating at all changes in direction with radius of less than 25-feet and at all vertical runs to 18 inches above finished floor elevation. For interior slab penetrations, provide continuous RTRC or PVC coated rigid galvanized steel conduit and fittings with urethane interior coating from change in direction to 18 inches above finished floor elevation, except where stubbed-up under and inside equipment or switchgear where conduit shall be terminated at minimum two inches above concrete housekeeping pad.
 - d. Elbows for underground electrical service entrance, feeders, transformer primary / secondary, telecommunication, and low voltage conduits shall be RTRC or PVC coated rigid galvanized steel with long radius as follows:
 - 1) Up to 1-inch conduit, minimum 12-inch radius.
 - 2) 1.5-inch conduit, minimum 18-inch radius.
 - 3) 2-inch conduit, minimum 24-inch radius.
 - 4) 2.5-inch conduit, minimum 30-inch radius.
 - 5) 3-inch conduit, minimum 36-inch radius.
 - 6) 3.5 to 6-inch conduit, minimum 48-inch radius.
 - e. Conduit for all floor boxes shall be routed below building slab from floor box to nearest column, wall, or as indicated.
 - f. Conduits shall not be routed horizontally in building slab, grade beams or pavement.
2. Encase all underground conduits in concrete.
 - a. Concrete shall be tinted red throughout with a ratio of 10 pounds of dye per yard of concrete unless prohibited by utility for utility conduits. Concrete encasement for utility installed conductors shall be as specified by the utility and comply with their standards and specifications. Where utility does not require but allows concrete encasement of conduits, provide concrete encasement as specified herein.
 - b. Provide minimum 3-inch concrete encasement around conduits.
 - c. Provide conduit spacers for parallel branch/feeder conduits.
 - d. When prior written approval from Owner and Architect to omit concrete encasement of conduits below building slab is given, conduits either specified or approved in writing to be routed under building slab without concrete encasement for electrical branch circuits or voice / data / video / communications horizontal drops or outlets shall be installed 18 inches below finished floor and on select fill. All other conduits, including but not limited to electrical feeders, voice / data / video / communications vertical, riser, tie, trunk, or service cable conduits shall be installed 48-inches below finished floor and on select fill.
 - e. Use suitable manufactured separators and chairs installed 4 feet on centers. Securely anchor conduit at each chair to prevent movement during backfill placement.
 3. Install building voice / data / video / communications main service conduits and electrical service transformer primary and secondary conduits with top of concrete encasement minimum 48-inches below finished grade or pavement. Voice / data / video / communications conduits and electrical service primary conduits for utility owned electrical service transformers shall also comply with the respective utility company requirements and standards. All other underground conduits outside of building other than voice / data / video / communications main service conduits and electrical service transformer primary and secondary conduits shall have top of concrete encasement at 36 inches minimum below finished grade or pavement.

4. Provide two "caution" plastic tapes at 6-inches and 18-inches below finished slab, grade, or pavement; identify as specified in Section 26 05 00.
 5. Conduits located outside building, provide magnetic locator tape at top of first compacted layer of backfill or concrete.
 6. During construction, partially completed underground conduits shall be protected from the entrance of debris such as mud, sand, and dirt by means of conduit plugs. As each section of the underground conduit is completed, a testing mandrel with diameter ¼-inch smaller than the conduit, shall be drawn through each conduit. A brush with stiff bristles shall be drawn through until conduit is clear of particles of earth, sand, or gravel. Conduit plugs shall then be installed.
 7. Utility underground conduit for Utility Company cable shall be installed per Utility Company standards, and their specifications for this project.
 8. Concrete shall be Portland Cement conforming to ASTM-C-150, Type 1, Type III or Type V if specified. Cement content shall be sufficient to product minimum strength of 2,500 PSI.
 9. Contractor shall stake out routing and location of underground conduits using actual field measurements. He shall obtain approval of the Owner and Architect before beginning trenching, horizontal drilling, and excavation.
 10. Verify location and routing of all new and existing underground utilities with the Owner and Architect on the job site. Stake out these existing utilities so that they will not be damaged. Stake out new utilities to provide coordination with other trades and with new and existing utilities, easements, property lines, restricted land use areas, and right-of-ways. Verify existing public utilities with Call811.
- D. Conduit shown in concrete walls, floor or roof slab:
1. PVC Coated Galvanized Rigid steel.
- E. Conduits that penetrate concrete slab, or within 100 feet of cooling towers, or at designated corrosive locations.
1. RTRC
 2. PVC coated galvanized rigid steel.
- F. Connections to equipment mounted on roof, rotating equipment, transformers, and kitchen or food processing equipment, or where flexible conduit is required outdoors.
1. Liquid tight flexible metal conduit (1/2 inch may be used for roof top supply / exhaust fans only).
 2. Liquid tight flexible metal conduit for 24-inch maximum length.
 3. Conduit for roof-mounted equipment shall be routed inside the roof curb assembly roof opening. Provide permanent lock-off device at panelboard circuit breakers serving roof equipment and accessories to enable tag-out procedures for all power routed through roof curb and to the roof mounted equipment and accessories.
- G. Light fixture whips:
1. Accessible ceilings and open structure: ½-inch flexible steel conduit or steel MC cable, length not to exceed 6-feet.
 2. Non-accessible ceilings: ½-inch flexible steel conduit. Length as required to make a tap at an accessible j-box. Recessed light fixtures in non-accessible ceilings may be daisy chained using the light fixture's integral, UL listed j-box or internal wire way that is accessible through fixture from below the ceiling.
 3. Dedicated insulated ground wire.
 4. Light fixture whips shall not rest on ceiling grid or tile.
 5. Light fixture whips shall not be supported from the ceiling suspension system. Support from the structure with #13 AWG galvanized iron wire pendants and Caddy clips. Do not support conduit from structural bridging. Flexible conduit and steel MC cable shall be kept a minimum of 2 inches clear of roof deck.

- H. Conduits at Natatorium or therapeutic pool areas:
 1. Underground conduit shall be as specified in this section.
 2. Exterior conduits and boxes within 100 feet of exhaust openings shall be x-wall RTRC or PVC coated galvanized rigid steel or stainless steel.
 3. Exposed conduits in chemical storage rooms, pool mechanical equipment (pump rooms, and pool equipment storage rooms shall be Schedule 80 PVC. Boxes shall be PVC, or 304 Stainless Steel.
 4. Exposed conduits and boxes in indoor pool areas and all other indoor public areas shall be Type 304 Stainless Steel.

- I. Conduits located inside greenhouses and natatorium pump and water treatment rooms:
 1. X-wall RTRC.
 2. Schedule 80 PVC.
 3. PVC coated galvanized rigid steel conduit and fittings.

- J. Conduits in classified hazardous (Classified) locations:
 1. Conduit fittings and seals UL listed for the classification.

- K. Conduits embedded in parking structure traffic wearing surface and concrete support structures:
 1. Schedule 40 PVC, RTRC, PVC coated rigid galvanized conduit.
 2. Schedule 40 ENT may only be used for flat runs embedded in traffic wearing surface concrete topping.
 2. Solvent welded fittings only for PVC conduit and ENT.
 3. Verify with Structural Engineer prior to construction for any additional limitations for raceway installation restrictions installed in parking structure including but not limited to maximum outside diameter of raceways permitted to be used in the wearing surface, and field cutting or drilling through parking structure structural members or support structures.
 4. All raceways shall be securely fastened to prevent floating during concrete installation. ENT raceways shall be completely embedded in concrete material to maintain fire and smoke integratory as required by the NEC.
 5. When using ENT or PVC conduits, provide transition to x-wall RTRC or PVC coated rigid galvanized conduit elbows and vertical risers to ensure that only flat horizontal runs of PVC conduit or ENT are used along the top of the parking structure structural support deck and that they are completely concealed and embedded by the wearing surface concrete material topping.

3.3 CONDUIT PENETRATIONS, SLEEVES AND ESCUTCHEONS

- A. Furnish sleeves for placing in construction for all conduit passing through concrete or masonry walls, partitions, beams, all floors other than grade level, and roofs. A conduit sleeve shall be one size larger than the size of conduit, which it serves except where larger sizes are required for manufactured water, fire, or smoke stop fittings.
 1. Sleeves set in concrete floor construction shall be minimum Schedule 40 galvanized steel.
 2. Sleeves shall extend 3-inches above the finished floor.

- B. Sleeves in concrete or masonry walls shall be RTRC or Schedule 40 galvanized steel. Sleeves shall be set flush with finished wall.

- C. Install manufactured UL listed water, fire, and smoke stop fittings, or caulk around conduit or cables in sleeves with sufficient UL listed fire safe insulation or foam to maintain wall or floor slab fire or smoke rating. Refer to Architecture drawings for locations of rated walls.

- D. Provide Linkseal Mechanical Seals around conduit penetrations through walls below grade. Provide a pull box to install a water stop inside wall penetration. Internally seal low voltage cabling conduit penetrations with waterproof caulking.
- E. Sleeves penetrating walls below grade shall be Schedule 40 black steel pipe with ¼-inch thick steel plate secured to the pipe with continuous fillet weld. The plate shall be located in the middle of the wall and shall be 2-inches wider all around than the sleeve that it encircles. The sleeve should extend a minimum of 24-inches on either side of the penetration. The entire assembly shall be hot-dipped galvanized after fabrication. Do not sleeve or penetrate grade beams.
- F. Conduit passing through the housing on connected equipment shall pass through a cleanly cut hole protected with a threaded steel bushing. Route conduit through roof openings, for piping and ductwork or through suitable roof jack, with pitch pocket. Coordinate location with roofing installation as required.
- G. Conduit passing through fire rated wall shall be sealed with Fire Stop. Route conduit to preserve fire resistance rating of partitions and other elements, using materials and methods under the provisions of Division 7.

3.4 POWER DISTRIBUTION UNDERGROUND FEEDER CONDUIT AND UNDERGROUND SERVICE ENTRANCE CONDUIT

- A. Power underground feeder and service entrance shall be of individual conduit encased in concrete. Unless shown otherwise, the type of conduit used shall not be mixed in any one underground conduit and shall be the size indicated on the drawings. The concrete encasement surrounding the underground conduit shall be rectangular in cross-section, having a minimum concrete thickness of 3-inches, except that conduit for 120V and above shall be separated from control and signal conduits by a minimum concrete thickness of 3-inches. Encasement concrete shall be tinted in red.
- B. During construction, partially completed underground conduits shall be protected from the entrance of debris such as mud, sand, and dirt by means of conduit plugs. As each section of the underground conduit is completed, a testing mandrel shall be drawn through until each conduit is clear of particles of earth, sand, or gravel. Conduit plugs shall then be installed.
- C. Furnish the exact dimensions and location of power underground conduit to be encased in time to prevent delay in the concrete work.
- D. Conduit for service entrance underground conduits shall be as indicated on the drawings.
- E. Primary power underground conduit shall be installed in accordance with utility company standards and the utility company specifications for this project.

3.5 TELECOMMUNICATIONS, LOW VOLTAGE AND EMPTY CONDUIT SYSTEM RACEWAYS

- A. Conduit shall be installed in accordance with the specified requirements for conduit and with the additional requirements that no length of run shall exceed 100-feet for 1 inch or smaller trade sizes and shall not contain more than two 90-degree bends or the equivalent. Pull or junction boxes shall be installed to comply with these requirements. Provide plastic bushings at all conduit terminations. Provide a grounding bushing on each data and voice conduit.
- B. Conduits shall be installed from outlet box to above an accessible ceiling. All cables routed through open spaces (no-ceiling below roof deck or above floor deck) shall be

routed in conduit. Telecommunications systems, CATV, CCTV, fire alarm and BMCS cables can be installed above accessible ceilings without conduit. Cables installed above accessible ceiling shall be plenum rated. Conduit rough in of these cables shall include a 90-degree turn-out to an accessible location with insulated bushings on the end of the conduit.

1. Provide conduit from each telecommunications outlet box to accessible ceiling plenum.
 2. Provide conduit from each security / surveillance device outlet box to accessible ceiling plenum.
 3. Provide two conduits for each multi-media outlet box and each outlet box indicated to contain more than four data, audio, or video drops to accessible ceiling plenum.
 4. Provide the following minimum conduits for telecommunications and multi-media wall, floor, and ceiling mounted outlet boxes. Use the largest diameter conduit indicated below unless instructed otherwise in writing from the Architect:
 - a. Non-masonry outlet box: Two 1-inch conduits.
 - b. Masonry outlet box: Two 1-inch conduits, or three 3/4-inch conduits.
 - c. Where indicated differently on plans or where conflicts arise, notify the Architect / Engineer prior to installation.
- C. All conduit in which cable is to be installed by others shall have pull string installed. The nylon pull string shall have not less than 200 lb. tensile strength. Not less than 12-inches of slack shall be left at each end. Provide blank cover plate before substantial completion if box is for a future installation after substantial completion of the project. Conduit shall extend to a minimum six inches above nearest accessible ceiling and be turned horizontally with plastic bushing at terminations.
- D. Conduits for Building Entrance Facilities:
1. Underground Outside Plant: Install a pull box every 300-feet or after 180 degree turns.
 2. Inside Plant: Install a pull box every 150-feet or after 180 degree turns. All turns shall be large sweeps, not sharp 90s, with the radius of the sweep at least 10X the diameter of the conduit. Hence, a 4-inch conduit requires a 40-inch minimum radial sweep. If field conditions absolutely mandate a sharp 90-degree bend to be installed, then a pull box shall be installed at that location regardless of distance.
 3. Building entrance facilities shall not terminate in an IDF or any other space except the MDF.
 4. Coordinate the termination location of the building entrance facilities in the MDF with the room layout and equipment configuration.
 5. Provide 4-inch conduit unless indicated otherwise. Provide (3) fabric innerducts in each 4-inch conduit.

3.6 EXTERIOR IN-GRADE PULL BOXES

- A. Provide pull boxes where specified and as required.
- B. Pull boxes located in pavement shall be set with proper extensions so that top of cover is flush with pavement.
- C. Pull boxes located in non-paved areas shall be set two-inches above surrounding finished grade. Provide 12-inch wide by 8-inch deep reinforced concrete crown around neck or opening and sloped down away from pull box opening.

3.7 ALUMINUM ALLOY CONDUCTORS

- A. Where aluminum alloy conductors are specified, approved and substituted for copper conductors, provide the required conduit size based on conduit fill using NEC or recognized cable manufacturer's conduit fill tables for aluminum alloy compact conductors.

3.8 IDENTIFICATION

- A. Conduit Systems: Provide adequate marking of conduit larger than one inch exposed or concealed in interior accessible spaces to distinguish each run as either a power (120/208V or 277/480V) or signal / telecommunication conduit (Fire Alarm, BAS, BMCS, Security, CCTV, Access Control, Intrusion Detection, Telecom, etc.). Except as otherwise indicated, use orange banding with black lettering. Provide self-adhesive or snap-on type plastic markers. Locate markers at ends of conduit runs, near switches and other control devices, near items of equipment served by the conductors, at points where conduit passes through walls or floors or enters non-accessible construction, and at spacing of not more than 50-feet along each run of exposed conduit. Switch-leg conduit and short branches for power connections need not be marked, except where conduit is larger than 1-inch.

END OF SECTION

SECTION 26 05 35

ELECTRICAL CONNECTIONS FOR EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Electrical connections as required and scheduled, and as specified.

1.2 RELATED WORK

- A. Refer to other Divisions for specific individual equipment electrical requirements.

1.3 QUALITY ASSURANCE

- A. UL Label: Products shall be UL listed to the extent possible.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

- A. General: For each electrical connection indicated, provide a complete assembly including, but not limited to, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire nuts, and other items and accessories needed to complete splices and terminations.
- B. Raceways: Refer to related sections.
- C. Conductors and Connectors: Refer to related section. Conductors at equipment terminations shall be copper.
- D. Terminals: Provide electrical terminals as indicated by the terminal manufacturer for the application.

PART 3 - EXECUTION

3.1 INSTALLATION OF ELECTRICAL CONNECTIONS

- A. General: Install electrical connections as shown, in accordance with applicable portions of the NECA Standard of Installation, and industry practices.
- B. Conductors: Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Where possible, match conductors of the electrical connection for interface between the electrical supply and the installed equipment.
- C. Splice Insulation: Cover splices with electrical insulation equivalent to, or of a higher rating than, insulation on the conductors being spliced.
- D. Appearance: Prepare conductors by cutting and stripping covering, jacket, and insulation to ensure a uniform and neat appearance where cables and wires are terminated.
- E. Routing: Trim cables and wires to be as short as practical. Arrange routing to facilitate inspection, testing, and maintenance.

- F. Motor Connections: Where possible, terminate conduit in conduit boxes at motors. Where motors are not provided with conduit boxes, terminate the conduit in a suitable conduit, and make motor connections. Conduit passing through the housing on connected equipment shall pass through a cleanly cut hole protected with an approved grommet. For all AHU or fan motors and all other motors 10 HP and larger, at the motor connection do not use wire nuts. Provide copper alloy split bolt connectors or compression lugs and bolts. Insulate connection with Scotch Super 88 vinyl electrical tape over rubber tape, or Tyco Gelcap Motor Connection Kit.
- G. Conduit connections to equipment including, but not limited to, Variable Frequency Drives, Manual and Automatic Transfer Switches, Surge Suppression Devices, motor controllers, electrical disconnects, food service / processing equipment, electronics, control panels and Owner furnished equipment:
1. Make conduit penetrations only at the bottom flat surface of the equipment and only where permitted by the equipment manufacturer to avoid un-intentional water entry. Coordinate installation of electrical connections for equipment with equipment installation work. Where equipment manufacture does not permit a bottom conduit entry, verify with Owner/Engineer and locate the conduit entry at the side surface as close as possible to the bottom of the enclosure.
 2. Where conduit originates from an elevation above the conduit entry, provide a "T" conduit below the enclosure's bottom elevation. Provide conduit from the conduit up to the enclosure bottom horizontal surface for electrical connection.
- H. Identification: Refer to Electrical General Provisions for identification of electrical power supply conductor terminations with markers approved as to type, color, letter and marker size by the Architect. Fasten markers at each termination point, as close as possible to each connecting point.
- I. Equipment and Furnishings: Refer to other Divisions. Coordinate power and control provisions shown for equipment and furnishings with the provisions required for the furnished equipment and furnishings. Where the power and control requirements are less than or equal to those specified, modifications to power and control provisions shall be made at no cost as a part of coordination. Where power and control requirements are in excess of those shown, notify the Architect in writing of the requirements.

END OF SECTION

SECTION 26 05 37

ELECTRICAL BOXES AND FITTINGS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide electrical box and fitting work as required, scheduled, indicated, and specified.

1.2 QUALITY ASSURANCE

- A. UL Label: Electrical boxes and fittings shall be UL listed.

PART 2 - PRODUCTS

2.1 FABRICATED MATERIALS

- A. Interior Outlet Boxes: Provide galvanized steel interior outlet wiring boxes, of the type, shape, and size, including depth of box, to suit respective locations and installation. Construct with stamped knockouts in back and sides. Provide gang boxes where devices are shown grouped. Single box design; sectional boxes are not acceptable, except for wall mounted electronic displays.
1. Type of Various Locations:
 - a. Wall mounted interactive media boards, video displays, televisions, electronic signage and similar installations; recessed wall mounted box for power and/or multi-media (low voltage) outlets: Arlington Industries #TVBS 613, 4-gang steel box with white trim plate.
 - b. Technology, data, voice, video and multi-media outlet boxes at locations other than wall mounted interactive media boards, video displays, televisions, electronic signage and similar installations: minimum 4-inch square (2-gang), 3-inch deep interior outlet boxes. Raco #260H large capacity box with ½ through 2-inch knockouts.
 - c. Security, access control, and video surveillance outlet boxes: single gang, 3-inch deep outlet boxes mounted long axis vertically.
 - d. All other applications: minimum 4-inch square (2-gang) 2-1/8-inch deep boxes.
 - e. Masonry Walls: Galvanized switch boxes made especially for masonry installations; depths of boxes must be coordinated for each installation.
 - f. Surface: Type FS or FD box with surface cover.
 - g. Corrosive locations or natatorium areas: 316 stainless steel construction suitable for the installation.
 - h. Hazardous (Classified) Locations: Explosion proof boxes, seals and fittings.
 - i. Special: Where above types are not suitable, boxes as required, taking into account space available, appearance, and Code requirements
 2. Interior Outlet Box Accessories: Outlet box accessories required as for installation, including covers or wall device plates, mounting brackets, wallboard hangers, extension rings, plaster rings for boxes in plaster construction, fixture studs, cable clamps and metal straps for supporting outlet boxes. Accessories shall be compatible with outlet boxes used and meet requirements of individual wiring.
- B. Damp Location Outlet and Damp or Wet Location Switch Boxes: Deep type, hot dipped galvanized cast-metal weatherproof outlet wiring boxes, of type, shape, and size required. Include depth of box, threaded conduit ends, and stainless steel cover plate

with spring-hinged waterproof caps suitable for application. Include faceplate gasket and corrosion-resistant, tamper / vandal proof fasteners.

- C. Wet Location Outlet Boxes: Hot dipped galvanized cast-iron weatherproof outlet wiring boxes, of type, shape, and size required. Include depth of box, threaded conduit ends.
- D. Junction and Pull Boxes: Galvanized sheet steel junction and pull boxes, with screw-on covers, of type, shape, and size, to suit respective location and installation.
 - 1. Type for Various Locations:
 - a. Minimum Size: 4-inch square, 2-1/8-inches deep.
 - b. 150 Cubic Inches in Volume or Larger: Code gauge steel with sides formed and welded, screw covers unless shown or required to have hinged doors. All boxes mounted above ceiling shall have screw covers. Boxes in all other areas with covers larger than 12-inches shall have hinged with screw covers. Knockouts factory stamped or formed in field with a cutting tool to provide a clean symmetrically cut hole.
 - c. Exterior or Wet Areas: 304 stainless steel NEMA 4X construction with gaskets and corrosion-resistant fasteners
- E. Conduit Bodies: Provide galvanized cast-metal conduit bodies, of type, shape, and size, to suit location and installation. Construct with threaded conduit ends, removable cover, and corrosion-resistant screws.
- F. Bushings, Knockout Closures, and Locknuts: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts, and insulated conduit bushings of type and size to suit use and installation.
- G. Outlet boxes in fire rated walls: Provide 2-hour rated gasket within box and below cover, equal to Rectorseal Metacaulk box guard and cover guard.

PART 3 - EXECUTION

3.1 INSTALLATION OF BOXES AND FITTINGS

- A. Install electrical boxes and fittings as shown and as required, in compliance with NEC requirements, in accordance with the manufacturer's written instructions, in accordance with industry practices.
- B. Provide recessed device boxes for wall mounted interactive media boards, video displays, televisions, electronic signage and similar installations.
- C. Provide minimum 4-inch square (2-gang), 3-inch deep interior outlet boxes for technology, data, voice, video, and multi-media outlet boxes at locations other than wall mounted interactive boards, video or visual displays. Provide single gang only, 3-inch deep outlet boxes mounted long axis vertically for security, access control, and video surveillance, coordinate with security equipment installation. Provide minimum 4-inch square (2-gang) 2-1/8-inch deep boxes for all other applications. Where indicated differently on plans or where conflicts arise, notify the Architect / Engineer prior to installation. Box extenders or plaster rings shall not be used to increase size. Provide increased box size as required.
- D. Junction and pull boxes, condulets, gutters, located above grid ceilings shall be mounted within 18-inches of ceiling grid. Junction and pull boxes above grid ceilings shall be mounted in the same room served. Junction boxes and pull boxes required for areas with inaccessible ceilings shall be located above the nearest accessible ceiling area. All junction box or pull box openings shall be side or bottom accessible. Removal of light

fixtures, mechanical equipment or other devices shall not be required to access boxes. Outlet boxes above ceiling for low voltage terminations shall face towards the floor.

- E. Use outlet and switch boxes for junctions on concealed conduit systems except in utility areas where exposed junction or pull boxes can be used.
- F. Determine from the drawings and by measurement the location of each outlet. Locate electrical boxes to accommodate millwork, fixtures, marker boards, and other room equipment at no additional cost to the Owner. The outlet locations shall be modified from those shown to accommodate changes in door swing or to clear interferences that arise from construction as well as modifying them to center in rooms. The modifications shall be made with no cost as part of coordination. Check the conditions throughout the job and notify the Architect of discrepancies. Verify modifications before proceeding with installation. Set wall boxes in advance of wall construction, blocked in place and secured. Set all wall boxes flush with the finish and install extension rings as required extending boxes to the finished surfaces of special furring or wall finishes. Provide wall box support legs attached to stud to prevent movement of box in wall.
- G. Unless noted or directed otherwise at installation, place outlet boxes as indicated on architectural elevations and as required by local codes.
- H. Outlets above counters, mount long axis horizontally. Refer to architectural elevations and coordinate to clear backsplash and millwork.
- I. Provide pull boxes, junction boxes, wiring troughs, and cabinets where necessary for installation of electrical systems. Surface mounted boxes below 9 feet and accessible to the public shall not have stamped knockouts.
- J. Provide weatherproof boxes for interior and exterior locations exposed to weather or moisture.
- K. Provide knockout closures to cap unused knockout holes in boxes.
- L. Locate boxes and conduit bodies to ensure access to electrical wiring. Provide minimum 12-inch clearance in front of box or conduit body access.
- M. Secure boxes to the substrate where they are mounted, or embed boxes in concrete or masonry.
- N. Boxes for any conduit system shall not be secured to the ceiling system, HVAC ductwork or piping system.
- O. Provide junction and pull boxes for feeders and branch circuits where shown and where required by NEC, regardless of whether or not boxes are shown.
- P. Coordinate locations of boxes in fire rated partitions and slabs to not affect the fire rating of the partition or slab. Notify the Architect in writing where modification or construction is required to maintain the partition or slab fire rating.
- Q. Exterior boxes installed within 50-feet of cooling towers or water treatment areas shall be of 304 stainless steel, weatherproof NEMA 4X construction.
- R. Identification: Paint the exterior and cover plates of building interior junction boxes and pull boxes located above accessible ceilings or non-finished areas to correspond to the following colors:
 - 1. Orange: - 480/277 VAC systems.

2. Light Blue: - 240 VAC three phase delta systems.
 3. Red – All Emergency circuits, regardless of voltage, and fire alarm system.
 4. Light Green - 120/208 VAC 3 phase and 120/240 VAC single-phase systems.
 5. Yellow – Building Management and Control System – BMCS.
 6. White - Security and Surveillance equipment circuits.
- S. All box covers shall be labeled with Panel ID and circuit numbers of all circuits available in box using permanent black marker. Boxes containing main feeders are to list where fed from and load (example “MSB to Panel HA”). Information listed is to be legible, markovers are not acceptable. Multi-sectional panel numbers are not to be listed on covers (example “LA2” referring to Panel LA sec. 2 is to be listed as “LA”). Label covers for special applications explaining contents (example “Emerg. Gen. Annunciator controls”, “IDF ground”). Do not attach box covers that have both sides painted or labeled differently. In public areas where boxes are painted same color as room per architect, label inside covers. Boxes that are not used shall be labeled as not used and include panel ID. Example “Not Used Panel LA”. Unused raceways not in sight of panel shall be terminated in a box and labeled not used and include panel identification.
- T. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- U. Use flush mounting outlet box in finished areas unless specifically indicated as being used with exposed conduit.
- V. Locate flush-mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- W. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches with stud separation. Provide minimum 24 inches with separation in acoustic rated walls.
- X. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness. Provide UL listed materials to support boxes in walls to prevent movement. Ensure box cannot be pushed inside wall.
- Y. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- Z. Install flush mounting box without damaging vapor barriers, wall insulation or reducing its effectiveness.
- AA. Use adjustable steel channel fasteners for hung ceiling outlet box.
- BB. Do not fasten boxes to ceiling support wires.
- CC. Support systems are to hang vertically straight down. All-thread supports, when used, are not to be installed at an angle or bent.
- DD. Use gang box where more than one device is mounted together. Do not use sectional box.
- EE. Use gang box with plaster ring for single device outlets.
- FF. Support outlets flush with suspended ceilings to the building structure.
- GG. Mount boxes to the building structure with supporting facilities independent of the conduits or raceways.

- HH. Where multiple feeders are in one pull box, conductors shall be wrapped with 3M No. 7700 Arc and fireproof tape.
- II. Provide plaster rings of suitable depth on all outlet boxes. Face of plaster ring shall be within 1/8 inch from finished surface.
- JJ. Equip boxes supporting fixtures designed to accept fixture studs with 3/8-inch stud (galvanized malleable iron) inserted through back of box and secured by locknut. Boxes not equipped with outlets shall have level metal covers with rust-resisting screws.
- KK. Do not mount junction boxes above inaccessible ceilings or in inaccessible spaces. Do not mount junction boxes above ceilings accessible only by removing light fixture, mechanical equipment or other devices. At inaccessible spaces use junction box furnished with light fixture or light fixture wiring compartment UL listed for through wiring.
- LL. No more than 12 conduits containing branch circuits may be installed in any junction or pull box.
- MM. All junction boxes shall be protected from building finish painters' over spray and from fire proofing overspray. Remove protective coverings when painting and fire proofing are complete.
- NN. Bond equipment grounding conductor to all junction and pull boxes.
- OO. Do not mount boxes or conduit bodies on walls directly above electrical panels or switchgear located next to walls.
- PP. Do not mount boxes or conduit bodies within 18 inches of outside edges of roof access openings.
- QQ. Box extenders or plaster rings shall not be used to increase the Code mandated cable capacity of a box. Provide proper size box.

3.2 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused box openings.

END OF SECTION

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SECTION 26 05 40

ELECTRICAL GUTTERS AND WIREWAYS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide electrical gutter work as shown, as specified and as required.
- B. Application: The types of electrical gutters required for the project include the following:
 - 1. Electrical wiring gutters.
 - 2. Voice / Data / Video / Communication and signal distribution wireway.

1.2 QUALITY ASSURANCE

- A. UL Label: Gutters and wireways shall be UL labeled.

PART 2 - PRODUCTS

2.1 ELECTRICAL GUTTERS AND WIREWAYS

- A. General: Provide hinged electrical gutters and wireways in the types and sizes indicated or required, minimum 16 gauge thickness, with rounded edges and smooth surfaces; constructed in compliance with applicable standards; with features required.
- B. Size: Provide size indicated. Where size is not indicated, construct in accordance with the NEC and other standards. Gutters shall be of manufacturer's standard lengths, without field cutting or field extensions.
- C. Accessories: Provide gutter and wireway accessories where indicated, constructed of same metal and finish as gutters or wireways.
- D. Supports: Provide gutter and wireway supports indicated, conforming to NEC, and as recommended by the manufacturer, and as specified in Section 26 05 33 Conduit Systems.
- E. Materials and Finishes: NEMA 1 gutters and wireways shall have gray powder coat finish over galvanized steel. Gutters and wireways installed outside shall be NEMA 3RX minimum. Gutters or wireways installed within 100-feet of cooling towers, at kitchen or food preparation areas, and natatorium, spa or therapy pool areas shall be of 304 stainless steel NEMA 4X construction.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide gutters and wireways only where specified or required. Use of gutters and wireways shall be kept to a minimum.
- B. Finishing: Remove burrs and sharp edges of gutters and wireways wherever they could be injurious to conductor insulation or jacket.
- C. Installation: Install gutters and wireways where shown or required, in accordance with the manufacturer's written instructions, NEC, NECA "Standard of Installation," and with recognized industry practices to ensure that the gutters and wireways comply with the

specified requirements. Comply with requirements of NEMA and the NEC pertaining to installation of electrical gutters.

- D. Grounding: Electrically ground gutters and wireways to ensure continuous electrical conductivity. Provide equipment grounding conductor.
- E. Conductors:
 - 1. Complete gutter and wireway installation before starting the installation of conductors.
 - 2. Provide sufficient space to permit access for installing, splicing, and maintaining the conductors.
- F. A maximum of 12 conduits containing branch circuits shall be allowed to be installed in any gutter or wireway.

END OF SECTION

SECTION 26 05 50

FIRESTOPS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide firestop as required, and as specified. Refer to Architectural drawings for all fire and smoke rated partitions, walls, floors, etc.
- B. Types: Firestop required for the project includes smokestop.

1.2 QUALITY ASSURANCE

- A. UL Label: Firestops shall be UL labeled.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Nelson.
- B. 3M (Minnesota Mining Manufacturing).
- C. Hilti.
- D. Specified Technologies, Inc.
- E. Metacaulk.

2.2 MATERIAL AND COMPONENTS

- A. General: Except as otherwise indicated, provide firestop manufacturer's standard materials and components as indicated by published product information, designed and constructed as recommended by the manufacturer, and as required for installation.

2.3 FIRESTOP

- A. Conduits: Provide a soft, permanently flexible sealant for 1-1/2 to 2 hour rated fireproofing for steel conduits (up to 4" diameter).
- B. Low Voltage Cables, Fiber Optic Cable and Innerduct: Provide Specified Technologies, Inc. EZ-Path single, double, or triple pathways as required.

PART 3 - EXECUTION

3.1 INSTALLATION OF FIRESTOPS

- A. General: Install firestops in accordance with the manufacturer's installation instructions and industry practices to ensure that the firestops comply with requirements. Comply with UL and NFPA standards for the installation of firestops.

END OF SECTION

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SECTION 26 09 44

LIGHTING CONTROLS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Lighting control system and components:
 - 1. Touch panel controls.
 - 2. Low and line voltage wall stations.
 - 3. Power interfaces.
 - 4. Sensors.

1.2 SUMMARY

- A. The lighting control system specified in this section shall provide manual lighting control, sensor-based (both occupancy and daylight control when indicated, specified, or required by AHJ).
- B. The system shall be capable of turning lighting and plug loads on/off as well as dimming lights (if lighting load is capable and indicated to be dimmed). Dimmers shall be capable of smooth dimming lights to off.
- C. All system devices within a group or controlled area shall be networked together, enabling wired or wireless digital communication between devices within that group.
- D. The system architecture shall be stand-alone groups (areas) of devices.
- E. The system shall not require any centrally hardwired switching equipment.
- F. The system shall be capable of wireless, wired, or hybrid wireless/wired communication architectures. All powered devices shall be wired for power. Battery operation shall not be used unless specifically indicated on the drawings, typically due to existing conditions which prohibit wired power sources.
- G. The term “occupancy sensor” shall be interchangeable with the term “vacancy sensor” as the control hardware shall be the same device and be capable of either function.

1.3 SUBMITTALS

- A. Specification line-by-line compliance review consisting of a marked-up copy of these specifications with contractor comments. Refer to Submittals specification section for additional instructions.
- B. Product Datasheets (general device descriptions, dimensions, electrical specifications, wiring details, nomenclature).
- C. Riser Diagrams – typical per room type (detailed drawings showing device interconnectivity of devices).
- D. Other Diagrams – as needed for special operation or interaction with other system(s).
- E. Example Contractor Startup/Commissioning Worksheet – must be completed prior to factory start-up and commissioning.

- F. Hardware Operation Manuals.
- G. Other operational descriptions as needed.

1.4 PROJECT CLOSEOUT DOCUMENTATION

- A. Provide a factory published manual.
 - 1. Warranty.
 - 2. Technical support contact.
 - 3. Electronic manual on manufacturer's website for free download.
- B. Completed Startup/Commissioning Worksheet with Owner's acceptance and date clearly noted.

1.5 QUALITY ASSURANCE

- A. All components and the manufacturing facility where product was manufactured must be RoHS compliant.
- B. In high humidity or cold environments, the sensors shall be conformably coated and rated for condensing humidity and -40 degrees Fahrenheit (and Celsius) operation.
- C. All applicable products must be UL or ETL Listed or other acceptable national testing organization.

1.6 PROJECT CONDITIONS

- A. Only install equipment after the following site conditions are maintained:
 - 1. Ambient Temperature 14 to 105 degrees F (-10 to 40 degrees C).
 - 2. Relative Humidity less than 90% non-condensing.
- B. Standard electrical enclosures shall be permanently installed.
- C. Equipment shall be protected from dust, debris and moisture.

1.7 WARRANTY

- A. Five (5) year manufacturer's warranty parts replacement beginning upon completion of Factory Start-up and Commissioning date as noted on the Owner accepted Startup / Commissioning Worksheet.

1.8 MAINTENANCE & SUSTAINABILITY

- A. Provide new parts, upgrades, and/or replacements available for a minimum of 5 years available to the end user.
- B. Provide free telephone technical support.
- C. Spare Parts: Provide minimum of 1 unit up to 5% of each hardware device product used, whichever is greater.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Acuity Brands Lighting, Inc.

2. Legrand North America, LLC.
3. Cooper Lighting Solutions.
4. Douglas Lighting Controls.
5. Lutron – Athena.
6. Leviton.
7. Crestron.
8. Hubbell.
9. ILC – Intelligent Lighting Controls.

2.2 SYSTEM REQUIREMENTS

- A. System shall have an architecture that is based upon three main concepts; 1) intelligent lighting control devices 2) standalone lighting control zones. Intelligent lighting control devices shall consist of one or more basic lighting control components; occupancy sensors, photocell sensors, relays, UL 924 emergency lighting relays, dimming outputs, manual switch stations, manual dimming stations. Combining one or more of these components into a single device enclosure is permissible so as to minimize overall device count of system.
- B. Lighting control zones shall consist of one or more intelligent lighting control components and fully functional in stand-alone operation.
- C. Low voltage devices within a lighting control zone shall be capable of being connected with low voltage cabling in any order.
- D. Lighting control zone shall be capable of automatically configuring itself for default operation without any start-up labor required.
- E. Power for devices within a lighting control zone shall come from either resident devices already present for that zone. Standalone power supplies are not acceptable.
- F. All switching and dimming for a specific lighting zone shall take place within the devices located in the zone itself (i.e. not in remotely located devices such as panels) to facilitate system robustness and minimize wiring requirements.
- G. Individual lighting zones requiring or indicated with intelligent room controllers shall be capable of being segmented into several local channels of occupancy, photocell, and switch functionality for more advanced configurations and sequences of operation.
- H. Operating modes shall be utilized only in manners consistent with local energy codes. Where daylight controls are indicated or required the photocell functions noted below shall be incorporated.
 1. Auto-On / Auto-Off (via occupancy sensors)
 - a. Zones with occupancy sensors automatically turn lights on when occupant is detected.
 - b. Zones with occupancy and/or photocell sensors turn lights off when vacancy or sufficient daylight is detected.
 - c. Pressing a switch will turn lights off. The lights will remain off regardless of occupancy until switch is pressed again, restoring the sensor to Automatic On functionality.
 2. Manual-On / Auto-Off (also called Semi-Automatic or Vacancy)
 - a. Pushing a switch will turn lights on.
 - b. Zones with occupancy and/or photocell sensors turn lights off when vacancy or sufficient daylight is detected.

3. Auto On / Predictive Off
 - a. Zones with occupancy sensors automatically turn lights on when occupant is detected.
 - b. Zones with occupancy and/or photocell sensors turn lights off when vacancy or sufficient daylight is detected.
 - c. Pressing the switch will turn the lights off and a short "exit timer" begins. After the timer expires, sensor scans the room to detect whether occupant is still present. If no occupancy is detected, zone returns to auto-on. If occupancy is detected, lights must be turned on via the switch.
4. Auto ON at 50% or less / Auto Off (Occupancy with dimming)
 - a. Operating mode designed specifically IECC compliance using occupancy mode for specific areas.
 - b. Zones with occupancy sensors automatically turn lights on to maximum 50-percent (adjustable and programmable to 50-percent max) when occupant is detected.
 - c. Pushing a switch will raise or lower light levels.
 - d. Zones with occupancy and/or photocell sensors turn lights off when vacancy or dim accordingly when daylight is detected to maintain desired light level.
 - e. Pushing a switch will turn lights off.
5. Manual-On to Auto-On/Auto-Off
 - a. Pushing a switch will turn lights on.
 - b. After initial lights on, zones with occupancy and/or photocell sensors turn lights on/off according to occupancy/vacancy and/or daylight conditions.

2.3 INDIVIDUAL DEVICE SPECIFICATIONS

- A. Occupancy sensors:
 1. Occupancy sensors shall sense the presence of human activity within the desired space and fully control the on/off function of the lights.
 2. Only passive infrared (PIR) technology, which detects occupant motion, shall be used to initially turn lights on from an off state, thus preventing false on conditions.
 3. Dual technology sensors shall be used. Only where ultrasonic or microphonic technology might create a false occupied state, not allowing the lights to automatically turn off shall PIR only be used. Acceptable dual technology includes PIR/Microphonics technology (also known as Passive Dual Technology or PDT) which both looks for occupant motion and listens for sounds indicating occupants or PIR/Ultrasonic technology.
 4. Sensors shall include a minimum of one integrated dry contact switching relay, capable of switching 1 amp at 24 VAC/VDC (resistive only) for BAS/BMCS control.
 5. Sensors shall be available in multiple lens options which are customized for specific applications.
 6. Embedded luminaire sensors shall be capable of both PIR and Dual Technology occupancy detection. Embedded sensors shall have an optional photocell.
 7. Ceiling, fixture, recessed, & corner mounted sensors shall be available.
 8. Sensors shall have optional features for photocell/daylight override, dimming control, and low temperature/high humidity operation.
- B. Daylight (photocell and/or dimming) sensors:
 1. Photocell shall provide for an on/off set-point, and a deadband to prevent the artificial light from cycling. Delay shall be incorporated into the photocell to prevent rapid response to passing clouds.
 2. Photocell and dimming sensor's set-point and deadband shall be automatically calibrated through the sensor's microprocessor by initiating an "Automatic Set-point Programming" procedure. Min and max dim settings as well as set-point may be manually entered.

3. Deadband setting shall be verified and modified by the sensor automatically every time the lights cycle to accommodate physical changes in the space (i.e., furniture layouts, luminaire depreciation, or luminaire outages).
4. Combination units that have all features of on/off photocell and dimming sensors may be used.
5. Luminaire mounted dimming photocells shall be embedded into luminaire such that only the lens shows on luminaire face.

C. Power (Relay) Packs:

1. Power Packs shall incorporate one Class 1 relay, a 0-10 VDC dimming output, and contribute low voltage power to the rest of the system.
2. Power Packs shall accept 120 or 277 VAC, rated for a minimum 16 Amps for any type of lighting load or motor load rated to 1 HP, provide 0-10 VDC dimming control, be plenum rated, and provide Class 2 power to the system.
3. Every Power Pack parameter shall be available and configurable locally.
4. Power Pack shall securely mount to junction location through a threaded ½ inch chase nipple or be capable of being secured within a luminaire ballast channel. Plastic clips into junction box shall not be accepted. All Class 1 wiring shall pass through chase nipple into adjacent junction box without any exposure of wire leads. Note: UL Listing under Energy Management or Industrial Control Equipment automatically meets this requirement, whereas Appliance Control Listing does not meet this safety requirement.
5. When required by local code, Power Pack shall install inside standard electrical enclosure and provide UL recognized support to junction box. All Class 1 wiring is to pass through chase nipple into adjacent junction box without any exposure of wire leads.
6. Secondary Packs shall be available that provide up to 5 Amps of switching and can line voltage dim 120 VAC incandescent/halogen lighting loads.
7. Secondary Packs shall be available that provide up to 5 Amps of switching and can dim line voltage 120/277 VAC magnetic low voltage transformers.
8. Secondary Packs shall be available that provide up to 4 Amps of switching and can dim 120 VAC electronic low voltage transformers.
9. Power/Secondary Packs shall be available that are UL924 listed for switching of Emergency Power circuits and control of 0-10 VDC dimming circuit.
10. Secondary Packs shall be available that control louver/damper motors for skylights.
11. Secondary Packs shall be available that provide a pulse on/pulse off signal for purposes of controlling shade systems via relay inputs.
12. Power (Secondary) Packs shall be available that provide up to 20 Amps switching of general purposed receptacle (plug-load) control.

D. Relay & Dimming Room Controller (Panel)

1. Panel shall incorporate up to 3 normally closed latching relays capable of switching 120/277 VAC or up to 2 Dual Phase relays capable of switching 208/240/480 VAC loads.
2. Relays shall be rated to switch up to a 30A ballast load at 277 VAC.
3. Panel shall provide one 0-10VDC dimming output paired with each relay.
4. Panel shall power itself from an integrated 120/277 VAC supply.
5. Panel shall supply current limited low voltage power to other devices in the same lighting zone.
6. Panel shall provide auxiliary low voltage device power connected wired directly to a dedicated terminal connection.

E. Auxiliary Input / Output (I/O) Devices for enhanced room controls:

1. Devices shall be plenum rated and be inline wired, screw mountable, or have an extended chase nipple for mounting to a ½" knockout.

2. Specific I/O devices shall have a dimming control output that can control 0-10 VDC LED drivers by sinking up to 20 mA of current.
 3. Specific I/O devices shall have an input that reads a 0-10 VDC signal from an external device.
 4. Specific I/O devices shall have a switch input that can interface with either a maintained or momentary switch and run a switch event (toggle the lighting load) or run a local/remote control profile.
 5. Specific I/O devices shall sense state of low voltage outdoor photocells.
 6. Specific I/O devices shall enable RS-232 communication between lighting control system and Touch Screen based A/V control systems.
 7. Specific I/O devices shall sense momentary and maintained contact closures, and either toggle a connected load after a momentary contact or ramp the load high/low during a maintained contact (stopping when the contact releases).
- F. Low Voltage Wall Switches & Dimmers:
1. Devices shall provide toggle on/off switch control.
 2. Devices color shall match building standard line voltage wiring device color.
 3. Devices with mechanical push-buttons shall provide tactile with LED user feedback.
 4. Devices with mechanical push-buttons shall be made available with custom button labeling.
- G. Graphic Wall Station:
1. Minimum 3.5-inch full color touch screen for selecting up to 16 programmable lighting control preset scenes or acting as up to 16 on/off/dim control switches.
 2. Color shall match building standard for line voltage switching.
 3. Device shall enable configuration of all switches, dimmers, and lighting preset scenes via password protected setup screens.
 4. Device shall enable user supplied .jpg screen saver image to be uploaded.
 5. Surface mount to single-gang recessed switch box.
 6. Micro-USB style connector for local computer connectivity.
- H. Scene Controllers:
1. Two, three, four, or eight buttons for selecting programmable lighting control profiles or acting as on/off switches.
 2. Color shall match building standard for line voltage switching.
 3. Devices shall provide LED user feedback.
 4. Device shall be capable of reprogramming other devices in its zone so as to implement user selected lighting scene.
 5. Device shall have LEDs indicating current selection.

2.4 START-UP & SUPPORT FEATURES

- A. To facilitate start-up, all devices daisy-chained together shall automatically be grouped together into a functional lighting control zone.
- B. All lighting control zones shall be able to function according to default settings once adequate power is applied and before any field programming is performed.

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide the quantity of sensors required for complete and proper coverage to completely cover the controlled areas. Contractor shall verify room coverage and ceiling heights with manufacturer and provide the quantity and type of occupancy sensors as required. Rooms

shall have one hundred (100) percent coverage of small motion detection to completely cover the controlled areas to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only rooms that are to be provided with sensors. Proper judgment must be exercised in executing the work so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components, architectural components, or Owner installed equipment which may cause obstructions to sensor coverage.

- B. Provide ceiling mounted sensors. Wall mounted sensors shall only be used where ceiling mounted sensors are proven by the manufacturer to be impractical, or if specifically indicated on the drawings.
- C. For ceilings up to 12-feet AFF, control equipment shall be mounted above an accessible ceiling. Control equipment shall be wall mounted on 24x24-inch fire resistive 0.75-inch thick plywood back board mounted to the wall above the ceiling. Do not paint fire resistive plywood or obliterate the fire resistive labeling. Locate the control equipment directly above the space/area main entry wall switch station, observing good installation practice and shall be consistent throughout the project. Where the ceiling is over 12-feet, the control equipment shall be located in an adjoining ancillary room/area where the ceiling is 12-feet AFF or lower, typically adjacent to the ancillary room/area above ceiling control equipment location, verify exact location with Owner.
- D. Control units used for the security or fire systems shall be powered from the emergency power source as indicated on the drawings. Other control units shall be powered from the lighting circuit, which they control.
- E. Refer to other specification sections for line voltage wiring device requirements, including momentary on/off toggle switches used with low voltage sensors.

3.2 INSTALLATION

- A. Use lighting control wiring with jacket color that matches Owner's cable color standards.
- B. Install the work of this Section in accordance with manufacturer's printed instructions unless otherwise indicated.
- C. The installing electrical contractor shall complete, prior to request of factory start up and site commissioning, complete installation of all devices, their respective loads landed and confirmed operations, switches installed, and confirmed operational.
- D. The installing contractor shall, prior to request of factory start up and site commissioning, request an on-site meeting by including the manufacture's local authorized representative, the Owner and the general contractor, to assist in identification of any open-ended issues, thereby eliminating potential for delays and system commission interruptions.
- E. Upon confirmation of progress by local factory representative, the installing electrical contractor shall complete the manufacture's start up request form(s), including any field changes from the contract documents.
- F. The installing electrical contractor shall provide a preliminary as-built drawing prior to commissioning to the manufacturer's representative. Drawing shall include all wire routing, room by room device ID's and locations of all lighting control devices.

- G. Install sensors in accordance with manufacturer's written instructions, requirements of NEC, and in accordance with industry practices. Do not install devices until wall construction and wiring is completed.
- H. Install sensors and switches only in electrical boxes that are clean, free from excess building materials, debris, and similar matter.
- I. Install sensors plumb and aligned in the plane of the wall, or ceiling in where they are installed.
- J. Install wall occupancy sensor switches in boxes on the strike side of doors as hung. Where more than one switch is in the same location, install switches in a multi gang box with a single cover plate.
- K. Provide a cover plate for every switch. Refer to Architectural drawing, elevations, etc. for exact location of wall switches where indicated on the Architectural plans. Coordinate location of all wall switches with other specialty items and millwork and avoid conflicts. Coordinate with all trades to avoid conflicts during construction. Mounting heights of all switches shall comply with current Accessibility Standards and local codes.
- L. Unless indicated otherwise, circuit relays/switchpacks ahead of local control switches. Source → relay/switchpack → local toggle switch(s).
- M. Coordinate with BMCS/BAS Contractor for interface of BMCS/BAS System and wiring connections.
- N. Low voltage cabling installed above ceiling shall be supported every 5 feet at a minimum height of 3 feet above grid/ceiling but no closer than six inches below deck. Support system shall be ceiling wire attached to structure and clipped to ceiling support grid using Caddy drop wire securing clip #EC311. Cabling shall hang plumb to devices.

3.3 SENSOR TESTING AND ADJUSTMENT

- A. At the time of installation, the contractor shall test and adjust each sensor for proper detection of motion appropriate to room usage. The contractor shall follow the testing and adjustment procedures as written in the manufacturer's installation instructions for each sensor model. Relocate sensors as needed for proper coverage.
- B. Prior to testing and adjusting, verify with Owner/Architect the initial settings for each type of area based on its intended function and use.
- C. Verify with Owner all adjustable functions of each type of occupancy sensor prior to installation. Set all adjustable functions of each type of occupancy sensor as directed by Owner. Initial settings unless directed by Owner / Architect (some settings may not apply to all sensors):
 - 1. Time delay = 10-minutes.
 - 2. Zero Time Delay = OFF.
 - 3. Auto-On = OFF.
 - 4. Manual-On = ON.
 - 5. Self-Adjust = OFF.
 - 6. Disable Self-Adjust = OFF.
 - 7. Energy Saver (Dual Level) = ON.
 - 8. Manual Override = OFF.
- D. Bi-level occupancy wall switches shall be initially set with the energy saver feature enabled.

- E. Before energizing, check for continuity of circuits, short circuits, and grounding connections. After energizing, check devices to demonstrate proper operation.
- F. Operate each wall switch with circuit energized and verify proper operation.

3.4 FACTORY COMMISSIONING

- A. Upon completion of the installation, the system shall be commissioned by the manufacturer's factory authorized representative who will verify a complete fully functional system.
- B. The factory commissioning shall include the following services. Programming of all button stations, configuration and of all occupancy sensors and photocells.
- C. Provide written or computer-generated documentation on the commissioning of the system including room by room description including:
 - 1. Sensor parameters, time delays, sensitivities, and daylighting set points.
 - 2. Sequence of operation, (e.g. manual ON, Auto OFF, etc.).
 - 3. Load Parameters.
- D. The electrical contractor shall provide in writing to the manufacturer, General Contractor, Architect, and the Owner with 21 Owner's business days' written notice of the requested system startup and adjustment date.
- E. The electrical contractor shall provide at least (1) journeyman electrician familiar with the installation of the system dedicated to assisting the factory start-up technician for the entire duration of the commissioning process.
- F. Upon completion of the system commissioning the factory-authorized technician shall provide the proper training to the Owner's personnel on the adjustment and maintenance of the system.
- G. Re-commissioning – After 90 days from full certificate of occupancy, re-calibrate all sensor time delays and sensitivities to meet the Owner's Project Requirements. Provide a detailed report to the Architect / Owner of re-commissioning activity.

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SECTION 26 24 13

SWITCHBOARDS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work Included: Switchboard work as shown, scheduled, indicated, required, and specified.

1.2 QUALITY ASSURANCE

- A. UL Labels: Provide switchboards UL labeled for service entrance and meeting requirements of UL 891.
- B. NEMA Compliance: Comply with National Electrical Manufacturers Association (NEMA) Standard PB2, "Dead-Front Distribution Switchboards."

1.3 SUBMITTALS

- A. Indicate:
 - 1. Detailed dimensions for equipment foot print, front and side elevations.
 - 2. Conduit entrance locations and requirements and restrictions.
 - 3. Enclosure material, finish, and NEMA classification type.
 - 4. Nameplate legends.
 - 5. Size and number of bus bars
 - 6. Switchboard instrument details.
 - 7. Electrical characteristics including voltage, ampacity, overcurrent device frame size and trip ratings, withstand ratings, and time current curves of all overcurrent devices and components.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Schneider Electric - Square D.
- B. ABB General Electric Co.
- C. Siemens.
- D. Eaton.

2.2 MATERIALS AND COMPONENTS

- A. Except as otherwise indicated, provide switchboard manufacturer's materials and components as indicated and as required for a complete installation.

2.3 DEAD-FRONT DISTRIBUTION SWITCHBOARDS

- A. The overcurrent protective device short circuit, coordination and arch flash studies performed by the overcurrent protective device manufacturer shall be used by the respective switchgear vendor(s) to select appropriate equipment, switchgear, and overcurrent protective device characteristics such as but not limited to: equipment bracing, AIC rating, circuit breaker frame size and trip settings, and fuse type/class.

The appropriate equipment suitable and required by the studies for code compliance shall be included with the submittal data for review and provided at no additional cost to the Owner. The appropriate equipment recommended by the studies for enhanced selective coordination or enhanced arc flash energy reduction beyond code compliance shall be included with the submittal data for review and consideration purposes by the engineer.

- B. Provide a factory-assembled, dead-front construction, metal enclosed, self supporting, switchboard of voltage, phase, ampacity, and short circuit interrupting rating and bracing shown.
1. Switchboard shall consist of the required number of front and rear aligned vertical sections bolted together to form one metal enclosed rigid switchboard. The switchboard shall be designed as a free-standing with only front access. Rear and/or side access only where indicated to reduce switchboard depth and where NEC required rear access clearance is available.
 2. Switchboard shall include protective devices and equipment shown with interconnections, instrumentation, and control wiring. Small wiring, necessary fuse blocks, and terminal blocks in the switchboard shall be provided. Groups of control wires leaving the switchboard shall be furnished with terminal blocks with numbering strips.
 3. Factory installed permanent lock-off provision for pad-locking in the off position for all protective devices.
- C. Enclosure Construction: The switchboard framework shall be fabricated for floor mounting. The framework shall be formed code gauge steel, welded and bolted together to support cover plates, busing, and component devices.
1. Each section shall have an open bottom and individually removable top plates for installation and termination of conduit. Top and bottom conduit areas shall be shown and dimensioned on the shop drawings. Front plates used for mounting meters, selector switches, or other front-mounted devices shall be hinged, with wiring installed and laced, and with flexibility at the hinged side. Closure plates shall be screw removable and small enough for easy handling by one technician.
 2. Weatherproof enclosure front door(s) shall be pad-lockable and suitable for the intended environmental conditions. When indicated or specified, rear doors shall also be pad-lockable.
- D. Busing: The switchboard busing shall be copper.
1. The bus bars shall be braced to comply with the integrated equipment rating of the switchboard. The main horizontal bus bars between sections shall be located on the back of the switchboard to permit maximum available conduit entry area. The horizontal main bus bar supports, connections, and joints shall be bolted or welded, as required, so as not to require periodic maintenance. Bolted joint connections shall have at least two bolts per joint per phase. Half lapped bus joint construction is not acceptable.
 2. Buses shall be arranged A-B-C, left-to-right, top-to-bottom, and front-to-rear throughout. A ground bus shall be secured to each vertical section structure and extend the entire length of the switchboard.
 3. The main horizontal bus and incoming line shall be isolated and insulated from outgoing busing and cable connections.
 4. Each group mounted section shall have maximum full height bus. Where space is indicated, space shall be bused to install future switches or future circuit breakers sized as shown or a 600 Amp frame size circuit breaker or switch, whichever is greater.
 5. The main horizontal bus shall be non-tapered, fully rated, extended and drilled for future additions and splice plates.

- E. Integrated Equipment Rating: Each switchboard, as a complete unit, shall be given a single integrated equipment rating by the manufacturer. The integrated equipment short circuit rating shall certify that equipment can withstand the stresses of a fault equal to that shown in RMS symmetrical amperes. Ratings shall have been established by actual tests by the manufacturer on similar equipment construction as the subject switchboard. This test data shall be available and furnished, if requested, with or before the submittal of shop drawings.
- F. Indicating Instruments: Switchboard instrumentation shall be digital display, panel mounted, rated for 120V, 60 hertz. The display unit shall be UL listed in accordance with UL 508. The electronic metering device shall have the following features:
1. Voltmeter, phase to phase and phase to ground or neutral.
 2. Current, per phase RMS and 3 phase coverage.
 3. Demand current per phase.
 4. Power factor per phase and 3 phase average.
 5. Real power, 3 phase total.
 6. Reactive power, 3 phase total.
 7. Apparent power, 3 phase total.
 8. Frequency.
 9. Average demand real power.
 10. Adjustable demand interval (5 to 60 minutes).
 11. Nonvolatile memory.
 12. Password protected set-up and reset.
 13. 3 current transformers with primary to match bus size and 5 ampere secondary with metering class accuracy.
 14. Full scale readouts with the following accuracy:
 - a. Current and voltage measurement +/-0.1%.
 - b. Power and energy +/-0.2%.
 - c. Frequency +/-0.5%.
 - d. Power Factor +/-1.0%.
 - e. Data update time 0.5 seconds (4 wire).
 15. Metering Output.
 - a. Pulse output based on kWh, kvarh, or kVAh.
 - b. Analog output 4-20mA based on kWh, kvarh, or kVAh.
 16. Monitoring:
 - a. Harmonic analysis through 63rd with THD and TIF.
 - b. Event recorder.
 - c. Waveform capture.
 - d. Data logger.
 - e. Triggered trace memory.
 17. Communication:
 - a. Front port and dual rear mounted RS485 ports.
 - b. BACnet protocol (coordinate with BMCS contractor).
 - c. Mini RTU: digital 4 in/4 out.
 - d. Analog 1 in/4 out.
 - e. Local/remote display of all values.
 18. Software:
 - a. Windows based software shall be provided to enable setpoint programming.
- G. The Main Protective Device(s) shall be individually mounted molded case circuit breaker(s):
1. Adjustable: current, I²t settings, ground fault (where required), instantaneous trip, and short time trip. Solid state true RMS sensing, without fusible elements, 100-percent continuous current rating.
 2. Main protective devices with frame rated at 1000 Amps or greater shall have

- integral ground fault interrupter and provided with a portable test set or test switch.
3. Circuit breakers with 1,200 Amp frame and above shall have Energy Reducing Maintenance System switch with local status indicator (ERMS).
 4. Provide shunt trip capability and wiring to terminal block for remote shunt trip switch wiring termination weather remote trip device is indicated or not.
- H. Feeder and Branch Protective Devices greater than 1,200 Amps shall be individually mounted:
1. Molded case circuit breakers:
 - a. Adjustable: current, I^2t settings, ground fault (where required), instantaneous trip, and short time trip. Solid state trip true RMS sensing, without fusible elements; 100-percent continuous current rating.
 - b. Energy Reducing Maintenance System switch with local status indicator (ERMS).
 - c. Shunt trip capability and wiring to terminal block for remote shunt trip switch wiring termination weather remote trip device is indicated or not.
 2. Fusible switches:
 - a. Each switch shall have an individual door over the front, equipped with a voidable interlock that prevents the door from being opened when the switch is in the ON position unless the interlock is purposely defeated by activation of the voiding mechanism. All switches shall have externally operated handles.
 - b. Fused switches 600 Amps and below, equipped for class J fuses.
 - c. Fused switches 601 Amps and above shall be equipped with Class R or L rejection type fuse holders. Class RK1 or L of ampere rating and type as indicated on the plans suitable for application of the system.
 - d. When required by the latest edition of the NEC or the AHJ, 1,200 Amp switches regardless of fuse size installed shall have Energy Reducing Maintenance System switch with local status indicator (ERMS).
- I. Feeder and Branch Protective Devices 1,200 Amps and below shall be group mounted:
1. Molded case circuit breakers:
 - a. Greater than 250 Amp: Solid state true RMS sensing with adjustable: current, I^2t settings, ground fault (where required), instantaneous trip, and short time trip; 80-percent continuous current rating.
 - b. 250 Amp and smaller: Solid state true RMS sensing with fixed current setting by rating plug or dial. Breaker shall have adjustable instantaneous trip function with short time tracking.
 - c. 1,200 Amp frame circuit breakers regardless of trip shall have Energy Reducing Maintenance System switch with local status indicator (ERMS).
 2. Fusible switches:
 - a. Quick-make, quick-break units utilizing the double-break principle of circuit interrupting to minimize arcing and pitting and shall conform to the ratings shown.
 - b. Individual door over the front, equipped with a voidable interlock that prevents the door from being opened when the switch is in the ON position unless the interlock is purposely defeated by activation of the voiding mechanism. All switches shall have externally operated handles.
 - c. 600 Amps and below equipped for Class J fuses.
 - d. 601 Amps and above shall be equipped for Class R or L rejection type fuse holders.
 - e. When required by the latest edition of the NEC or the AHJ, 1,200 Amp fused switches regardless of fuse size installed shall have Energy Reducing Maintenance System switch with local status indicator

(ERMS).

- J. Ground Fault Interrupter (GFI) protection: Where shown or required, ground fault protection shall be achieved with adjustable pickup for ground fault currents, field-adjustable from 200 amperes and instantaneous to 60 cycle time delay. The ground fault protection system shall include necessary current sensors, internal wiring, and relays to coordinate opening the monitored faulted circuits.
1. Ground fault protection shall be set at minimum setting for both current and time during construction. The switchboard manufacturer shall include in the submittal data for the switchboard, the minimum setting of the devices and the recommended setting for normal building operation.
 2. The ground fault system shall be factory-tested before shipment as specified:
 - a. The switchboard manufacturer shall provide a factory ground fault protection system test for circuit testing and verification of tripping characteristics. The manufacturer shall pass predetermined values of current through the sensors and measure the tripping time for each phase and neutral. The measured time-current relationships shall be compared to the trip-characteristic curves. If the ground fault device trips outside the range of values indicated on the curve, the ground fault device shall be replaced or recalibrated.
 - b. Relays, electrically operated switches, shunt-trip switches, circuit breakers, and similar items shall have proper voltages applied to their circuits and satisfactory operation demonstrated.
 - c. Upon completion of the factory ground fault protection system test, the current and time on each ground fault device shall be set to minimum values.
- K. Mimic bus: Indicate busing, connections, and devices in single line form on the front panels of the switchboard using red colored plastic strips, fastened flat against the panel face with screws.

PART 3 - EXECUTION

3.1 INSTALLATION OF SWITCHBOARDS

- A. Install switchboards where shown, in accordance with the manufacturer's written instructions, and industry practices to ensure that the switchboards meet the specifications. Provide weatherproof NEMA 3R enclosure housing outdoors, at wet locations, or where indicated on the drawings. Provide NEMA 3RX enclosure housing at corrosive locations of either aluminum or stainless-steel construction suitable for the intended environment when indicated on the drawings.
- B. Comply with the requirements of NEMA and NEC, and NECA Standard of Installation, for installation of switchboards.
- C. Where switchboard is used or indicated as the utility service building disconnect, provide main bonding jumper and neutral to ground bond connected to the building's grounding system. Do not bond neutral to ground when there is a neutral to ground bond upstream from the same derived neutral system serving the switchboard.
- D. Torque bus connections and tighten mechanical fasteners.
- E. Install fuses, of ratings shown, in each switchboard. Provide spare fuse cabinet with three fuses of each size provided. Locate in central plant as directed by Owner.
- F. Concrete Pads: Install switchboards on a 4" reinforced concrete housekeeping pad. The

housekeeping pad shall extend 3" beyond the housing of the switchboard unless shown otherwise. Switchboard shall be bolted to the housekeeping pad using 3/8" minimum galvanized bolts and anchors on 30" maximum centers. Furnish the exact position of any block outs, dimensions, and location of the housekeeping pads to prevent delay of the concrete work.

- G. Adjustment: Adjust operating mechanisms for free mechanical movement. Adjust circuit breaker time characteristic curves as recommended by the Fault Current and Coordination Analysis or as directed by the Engineer.
- H. Indicating Instruments: Provide initial factory start-up and programming with Owner present. Integrate with the Building Management System for monitoring and logging of all system data.

3.2 TESTING

- A. Notify Owner's Commissioning Authority (CxA) prior to performing any tests so that the CxA may witness tests at the CxA's discretion.
- B. Pre-energization checks: Before energizing, check switchboards for continuous of circuits and for short circuits.
- C. Switchboard insulation resistance test: Each switchboard bus shall be insulation resistance tested after installation is complete except for line and load side connections. Tests shall be made using Biddle Megger or equivalent test instrument at a voltage of not less than 1000 vDC. Resistance shall be measured from phase-to-phase and from phase-to-ground. Minimum acceptable value for insulation resistance is 2 megohms.
- D. Ground Fault Interrupter (GFI) test: After completion of construction and before final acceptance testing, the ground fault protection system shall be field-tested and reset to the manufacturer's settings for both current and time by a representative of the manufacturer's engineering service department. After the test, set ground fault to 50 percent of overcurrent device rating or 1,200 Amperes, whichever is lower.
- E. Provide thermal infrared scan of switchboard under full load as directed and witnessed by Owner. Correct any deficiencies causing abnormal heating and repeat the scan. Provide digital video documentation with deficiencies corrected for comparison to future test. Make corrections as needed as soon as possible as directed by the Owner. Repeat the scan at the 11-month prior to closeout, and make corrections prior to close-out.
- F. Submittals: Furnish instruments and personnel required for tests. Submit 4 copies of certified test results to the Architect for review. Test reports shall include switchboard tested, date and time of test, relative humidity, temperature, and weather conditions.

3.3 TRAINING

- A. Provide minimum 2 hours of dedicated training provided by a factory authorized representative to Owner's personnel regarding programming, operating, and use of switchboard components including all indicating instruments and safety features.

END OF SECTION

SECTION 26 24 16

PANELBOARDS AND ENCLOSURES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Panelboards and enclosures, including cabinet, as shown, scheduled, indicated, and specified.

1.2 QUALITY ASSURANCE

- A. UL Standards: Panelboards and enclosures shall confirm to all applicable UL standards and shall be UL labeled.

1.3 SUBMITTALS

- A. Indicate:
 1. Detailed dimensions.
 2. Enclosure material, finish, and NEMA classification type.
 3. Location of main circuit breaker.
 4. Mounting and trim.
 5. Acceptable incoming conductors' size.
 6. Electrical characteristics including voltage, ampacity, overcurrent device frame size and trip ratings, bus material and rating, withstand ratings, lugs, and time current curves of all overcurrent devices and components.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Schneider Electric - Square D.
- B. ABB-General Electric Co.
- C. Siemens.
- D. Eaton.

2.2 MATERIALS AND COMPONENTS

- A. General: Panelboards shall be dead-front type equipped with fusible switches or circuit breakers as shown and as required.
- B. The overcurrent protective device short circuit, coordination and arch flash studies performed by the overcurrent protective device manufacturer shall be used by the respective switchgear vendor(s) to select appropriate equipment, switchgear, and overcurrent protective device characteristics such as but not limited to: equipment bracing, AIC rating, circuit breaker frame size and trip settings, and fuse type/class. The appropriate equipment suitable and required by the studies for code compliance shall be included with the submittal data for review and provided at no additional cost to the Owner. The appropriate equipment recommended by the studies for enhanced selective coordination or enhanced arc flash energy reduction beyond code compliance shall be included with the submittal data for review and consideration purposes by the engineer.

- C. Busing Assembly: Panelboard phase, neutral, and equipment ground busing shall be copper. Bus structure and mains shall have ratings as shown and scheduled. Furnish a bare uninsulated ground bus inside each panelboard enclosure. Two section panelboards shall be connected with copper cable, with an ampacity conforming to the upstream overcurrent device. Neutral bus termination quantity for branch circuit panelboards shall match or exceed the maximum number of single pole circuit breakers the panelboard will accept.
- D. Main circuit breakers and feeder / branch circuit breakers:
1. Less than 125 Amps: Thermal magnetic with factory fixed trip.
 2. 125-600 Amps: Thermal magnetic with adjustable instantaneous trip of 5X – 10X with short time tracking.
 3. 601 Amps and larger: Solid state true RMS sensing with adjustable: current set by rating plug or adjustable dial, I²t settings, ground fault (where required), instantaneous trip, and short time trip; 80-percent continuous current rating.
 4. Provide permanent lock-off device for all fire alarm system branch circuit breakers, for all smoke control fans and equipment, and where indicated or required for circuit breaker to be used as a remote safety disconnect switch.
 5. General requirements:
 - a. Make prepared space provisions for additional breakers or fused switches so that no additional bus or connectors will be required to add circuit breakers or fused switches in the available device mounting space.
 - b. Two and three pole breakers shall have internal common trips.
 - c. All circuit breakers used as the main or branch mounted back-fed main shall be bolt-on. All circuit breakers used in 600 Amp and smaller panelboards shall be bolt-on breakers. Circuit breakers for distribution panelboards rated 601 amps and larger shall have plug-on or bolt-on circuit breakers.
 - d. Branch circuit panelboard shall have interrupting capacity as shown or as required, but in no case less 10k AIC for 120/208/240-Volt systems, and 18k AIC for 277/480-Volt systems.
 - e. 15 and 20 Amp circuit breakers for lighting circuits shall be UL listed switch duty (SWD).
 - f. Personnel ground fault interrupter (GFI) circuit breakers, where shown, shall be maximum 5 mA ground fault trip and shall include a TEST button.
 - g. Equipment ground fault interrupter (EGFI/EGPD) circuit breakers, where shown or required shall be 30mA ground fault trip and shall include TEST button.
 - h. Circuit breakers with 1,200 Amp and larger frame shall have Energy Reducing Maintenance Switching with local status indicator (ERMS).
- E. Fusible Switches for distribution panelboards: Fusible switches shall be quick-make, quick-break type. Each switch shall be enclosed in a separate steel enclosure. The enclosure shall employ a hinged cover for access to the fuses. Interlock cover with the operating handle to prevent opening the cover when the switch is in the ON position. This interlock shall be constructed so that it can be overridden for testing fuses without interrupting service. The switches shall have padlocking provisions in the OFF position. Switches shall include positive pressure rejection type fuse clips for use with UL Class J fuses and be UL labeled for 200,000 AIC.
- F. Spaces: Where space for future breakers or switches is shown, panelboard enclosure shall include removable blank panels or knockouts to allow installation of future breakers or switches, prepared spaces, and panelboard busing shall be complete, including required connectors.

- G. Integrated Equipment Rating: Do not apply series ratings. Each panelboard, as a complete unit, shall have a short-circuit rating equal or greater than the available short circuit current. Rating shall have been established by tests on similar panelboards with the circuit breakers or fusible switches installed.
- H. GFCI circuit breakers not available in the required panel AIC rating shall be series rated with the upstream over current protection device to provide the panelboard with required AIC rating. Coordinate series rating requirements with manufacturer. Mark the panel per NEC 110. The marking shall be visible and state the following: "CAUTION-ENGINEERED SERIES COMBINATION SYSTEM RATED XXX AMPERS. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED".
- I. Panelboard Enclosures:
 - 1. Provide sheet steel enclosures, minimum 16-gauge nominal thickness, with multiple knockouts, unless shown otherwise. Provide all NEMA 1 panelboard fronts with spring-loaded door pulls, and flush lock and key, panelboard enclosures keyed alike to match the Owner's standard key system; coordinate with Owner.
 - 2. All NEMA 1 enclosure panelboards shall be hinged "door-in-door" type with interior hinged door with hand operated latch or latches, as required providing access only to circuit breaker or fusible switch operating handles, not to exposed energized parts. Outer hinged door shall be securely mounted to the panelboard box with factory bolts, screws, clips, or other fasteners, requiring a tool for entry. Hand operated latches are not acceptable. Push inner and outer doors shall open left to right. Manufacturer hardware (OEM), screws, and bolts shall be used to secure dead fronts and covers. Do not use third party hardware. Do not use power tools to secure panel hardware. Provide gray powder coat finish over a rust inhibitor.
 - 3. Equip with interior circuit directory frame, card, and clear plastic covering for panelboards.
 - 4. Panelboards located in kitchen preparation or natatorium areas shall have Type 316 stainless steel front, door, and trim with a NEMA 1 rating for the entire enclosure.
 - 5. Panelboards at exterior locations shall be NEMA 4X Type 316 stainless steel.
 - 6. Panelboards at hose down areas, cooling towers, in greenhouses, and other corrosive locations shall be NEMA 4X 316 stainless steel.
 - 7. Enclosure shall be for recessed or surface mounting as shown or as required.
 - 8. Enclosures shall be fabricated by the same manufacturer as panelboards to be enclosed. Multi-section panelboards shall have same physical dimensions.

PART 3 - EXECUTION

3.1 INSTALLATION OF PANELBOARDS AND ENCLOSURES

- A. General: Install panelboards and enclosures, as shown, including electrical connections, in accordance with the manufacturer's written instructions, the requirements of NEC, NECA Standard of Installation, and industry practices. Circuit breakers shall be factory installed except for required field modifications due to actual site conditions.
- B. Coordination: Coordinate installation of panelboards and enclosures with conductor and raceways installation work.
- C. Anchoring: Anchor enclosures to walls and structural surfaces ensuring that they are permanently and mechanically secured.

- D. Directory Card: Provide a typed circuit directory card(s) upon completion of work. Directory card shall be of super heavy-weight index card stock, 110 lb, white. Directory shall include type of load (i.e.: receptacles, lighting, exhaust fan, etc.) and location (i.e.: Room 102, Office, etc.) Room number shall be identified as the actual graphics room number assigned to the space and not the room number identified on the Plans. Circuits with shunt trip shall be identified with the control circuit operating the shunt trip (i.e.: Kitchen Hood No. 2). Shunt trip breakers with common trip circuit shall be grouped in the panelboard (i.e.: circuits 1, 3, 5 and 7).
- E. Fuses: Install fuses, of the ratings and class shown.
- F. Circuit Arrangement: Branch circuits shall be arranged to provide the best possible phase balance, unless shown otherwise.
- G. Panelboards not intended to be used as service entrance (SE) rated or for establishing a separately derived neutral system shall have the factory installed neutral to ground bonding screws and straps removed and disposed of.
- H. Recessed or flush mounted panelboards: Terminate spare conduits in junction box 18-inches above accessible ceiling close to panelboard location. Label junction box cover as "not used" and include panel identification.
1. Provide (3) 1-inch and (3) $\frac{3}{4}$ -inch spare conduits above accessible ceiling to j-box from each panelboard section.
 2. Where recessed panelboard is located above another building floor, also provide (3) 1-inch and (3) $\frac{3}{4}$ -inch conduits to j-box in ceiling space on floor below.
- I. Conductors shall be bent neatly opposite the fuse switch or circuit breaker to which they are to be attached. Vertically installed conductors shall be neatly tie-wrapped. Conductors shall be connected in a neat and professional manner. Conductors brought in from the top or bottom of the cabinet shall be bent neatly opposite the fuse or circuit breaker to which they are to be attached. Each conductor shall be run along the full height of the panel and returned to the circuit breaker or fuse location to allow relocation of the conductor to any position along the bus. Panelboard shall be cleaned of all construction debris prior to substantial completion review. Neutral and grounding conductors shall be installed similar to the phase conductors.
- J. Circuit breakers and conductors installed for SPD devices shall be located on the same side as the SPD to allow the shortest and straightest run of conductors in respect to the location of the SPD device. Route all conductors to the SPD device with straight as possible run, using longest sweep bends and the shortest conductor length possible. Twist all SPD conductors and secure with tie straps wherever possible.
- K. Install copper ground bus for copper ground conductors. Ground conductors size #1 and larger are to be landed to panelboard enclosure with mechanical lugs and not to ground bus.
- L. Install panels so that breaker number 1 is the top left breaker.
- M. In panels that contain multi-layered neutral bus, install neutrals beginning with the back neutral bus row and work forward. Do not make up neutrals on front neutral bus row unless all other rows are full.
- N. Label breaker mounting space with stick-on number labels.
- O. Mount the fully aligned panelboard such that the maximum height of the top circuit breaker above the finished floor shall not exceed 78-inches. Mount panelboards as high

as practical and such that the bottom of the cabinets will not be less than 6 inches above the finished floor.

3.2 TESTING

- A. Before energizing, energization, check for continuity of circuits and short circuits.
- B. Provide thermal infrared scan of panelboards under full load as directed and witnessed by Owner. Correct any deficiencies causing abnormal heating and repeat the scan. Provide digital video documentation with deficiencies corrected for comparison to future test. Make corrections as needed as soon as possible as directed by the Owner. Repeat the scan at the 11-month prior to closeout, and make corrections prior to close-out.

END OF SECTION

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SECTION 26 32 13

NATURAL GAS/ PROPANESTANDBY GENERATOR SETS and TRANSFER SWITCH

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Conditions of the Contract and applicable requirements of Division 1 and Section 26 05 00 govern this Section.

1.2 WORK INCLUDED

- A. Furnish and install standby engine-driven generator system, complete with wiring and controls as shown on the drawings and as specified herein.
- B. The standby emergency system shall consist of an engine-driven generator set designed and sized for project site ambient conditions and project site altitude, complete for outdoor installation where specified or required outdoors, automatic transfer switches and associated fuel system.

1.3 QUALITY ASSURANCE

- A. Acceptable Manufacturers:
 - 1. Engine-Driven Generator Sets:
 - a. Cummins.
 - b. Taylor Power.
 - c. Generac Industrial.
 - d. Caterpillar.
 - e. Kohler.
 - 2. Automatic Transfer Switch.
 - a. Cummins.
 - b. Russelectric.
 - c. ASCO.
 - d. Zenith.
 - e. Eaton.
 - f. Standby electric generating system manufacturer (as an integral part of a complete system).
- B. NEC and NFPA Compliance: Comply with applicable portions of the NEC (NFPA 70) including, but not limited to, emergency and standby power generation systems (NFPA 99 & 110), and with NFPA 37 Installation and Use of Stationary Combustion Engines and Gas Turbines.
- C. IEEE Compliance: Comply with applicable Institute of Electrical and Electronics Engineers, Inc. (IEEE) standards pertaining to generator construction.
- D. EPA Compliance: Comply with all EPA Standards for permanently installed natural gas emergency generators.
- E. Testing: The generator set shall receive the manufacturer's standard factory load testing.
- F. Supplier: All equipment provided shall be supplied by an authorized distributor of the manufacturer who has been continuously engaged in the distribution of industrial grade Power System products for a minimum of 15 years. The supplier shall provide initial start-up services, conduct field acceptance testing, and warranty service. The supplier is to be

authorized to perform warranty service on all products provided. Within 50 miles of the job site, the supplier shall maintain; a minimum of 6 factory-trained and qualified field technicians; a proper supply of spare parts for the supplied equipment; a shop with overhaul capabilities; and be able to provide 24 hour, 7 day per week, 365 day per year field service capability.

1.4 SUBMITTALS

- A. Submit manufacturer's certified computer-generated performance and capacity data in accordance with specification requirements. Indicate and include all ambient and altitude de-ratings and calculations.
- B. Submittal drawings and information on the transfer switches including installation drawings, wiring diagrams, dimensions, weights, etc. shall be provided. Full descriptive information on accessory items shall be furnished.
- C. Submit manufacturers' "Installation, Start-Up and Service" instructions, recommended conductors, overcurrent protection, and electrical interlocks.
- D. Submit recommended clearance dimensions.
- E. Submit sequence of operation in narrative form.
- F. Instruction Data and Drawings: Commercial type operating instructions shall be provided consisting of operating and maintenance manuals, parts books, dimensional drawings and wiring diagrams.

1.5 WARRANTY

- A. Provide five-year parts and labor warranty from date of substantial completion for generator set(s) and transfer switch(es).

PART 2 - PRODUCTS

2.1 ENGINE-GENERATOR SETS

- A. The engine-generator set shall be furnished as a complete working system. The model provided shall be a standard model that is quality assurance tested and prototype tested, not one of a kind without supporting literature.
- B. Engine shall be liquid cooled, reciprocating engine, 12V DC electric start, natural gas/propane dual-fueled with automatic fuel source switchover, electronic isochronous governed with manual speed adjustment plus/minus 5%, with belt-driven battery charging alternator.
- C. The set shall provide the following performance:
 - 1. Rated power for the duration of any utility power outage, in ambient conditions to 500-feet altitude and an outside air ambient temperature of 10 degrees F to 110 degrees F. Liquid coolant system ratings for natural gas sets through 140KW shall be rated at 122 degrees F ambient.
 - 2. Start and accept rated load within 10 seconds of utility power outage.
 - 3. Voltage regulation of plus/minus 2% no load to full load with random voltage variation, at any constant load, less than plus/minus 1%.
 - 4. Isochronous frequency regulation, less than plus/minus 0.5% at any steady state load from no load to full load.

- D. Engine Coupling: Engine shall be directly connected to the generator through a suitable flexible coupling.
- E. Generator:
1. The generator shall be a standard make, 4-pole, revolving field, single bearing, synchronous, brushless type with the following characteristics:
 - a. Capacity as shown on the drawings and shall operate at 1800 rpm.
 - b. Dripproof, self-ventilating, permanently aligned and complete with rotating brushless exciter and shall be of ball bearing construction and connected to the engine with flexible disc coupling.
 - c. Conform to the latest applicable IEEE and NEMA standards.
 - d. Provided with generator overload protection or generator manufacturer's overload protective circuitry.
 - e. Output main circuit breaker(s) with adjustable LIS trip for cable protection shall be provided when shown on drawings. Circuit breaker manufacturer shall be the same as switchgear manufacturers specified and submitted to be used on this project.
 - f. Voltage Regulator: Include a full wave rectified automatic digital voltage regulation system matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from mis-operation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three-phase RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate, and be capable of being curve-matched to the engine torque curve with adjustments in the field.
 - g. Alternator: The generator shall be capable of withstanding a three phase load of 300% rated current for 10 seconds, and sustaining 150% of continuous load current for 2 minutes with field set for normal rated load excitation.
 2. Provide the generator with the following:
 - a. Minimum 130°C rise stand-by rating
 - b. NEMA Class F or H insulation as defined by NEMA MG1.65
 - c. Temperature rise by resistance and embedded detector measurements at rated load within NEMA MG1-22.40 definition.
 - d. Pre-lubricated, maintenance free ball bearing, lubricated for life.
 - e. Direct drive centrifugal blower cooling.
 - f. RFI filters on the exciter to eliminate radio frequency interference on electronic equipment.
 - g. Thermostatically controlled block strip heater mounted for condensation control.
- F. Sub-Base: The engine power plant shall be mounted on an I beam, box type sub-base of fabricated steel construction. The assembly shall be installed on a vibration-absorbing base on a concrete pad as shown on the drawings.
- G. Automatic Starting Sequence of Events:
1. Upon drop in normal source voltage to 65 to 70% of rated voltage, or upon failure of the normal source of electrical supply, the engine shall be automatically cranked and brought up to the full operating speed.
 2. The cranking motor circuit shall be instantly broken when the engine starts.
 3. Within 10 seconds the generator shall be brought up to operating speed; the

generator voltage shall operate the automatic transfer switch, disconnecting the load from the normal source of supply and connecting the emergency power to the load.

4. Upon restoration of the normal source voltage to 92 to 95% of rated voltage or restoration of normal source of supply, the sequence shall be reversed, restoring the transfer switch to the automatic normal operating position, disconnecting the load from the emergency generator and reconnecting the load to the normal source of supply. The emergency generator set will continue to operate for a period of from 1 to 5 minutes after the restoration of the normal source of supply. Should the engine fail to start upon the first crank, there shall be two additional cranking attempts made with a 15 second rest between cranks, after which the cranking cycle shall cease and an alarm shall sound to indicate malfunctioning of the system.
5. The controls shall automatically stop the engine in the event the cooling water temperature becomes too high, if the coolant level becomes too low, if the oil pressure drops below a pre-determined pressure, or if the engine overspeeds. Upon the failure of the engine for any of the above reasons, an indicating lamp will operate indicating the condition under which the engine was shut down. Also, the alarm signal shall be energized.

H. Engine Control Panel & Accessories:

1. Provide a comprehensive monitoring and control system integral to the Generator Set control to guard the electrical integrity of the alternator and power system. Provide single and 3-phase fault current regulation, so that downstream protective devices have the maximum current available to quickly clear fault conditions, without subjecting the alternator to potentially catastrophic failure conditions. Include provisions to either prevent over voltage due to single phase faults, or to shut down the generator set if line to neutral voltage on any phase exceeds 115% for more than 0.5 seconds. Acceptable methods are a fully rated (100%) 600 volt Circuit Breaker, mounted in the generator enclosure, Schneider Electric - Square D Programmable Micrologic of size as indicated on drawings with handheld programmer or inherent protection provided by microprocessor-based GenSet AmpSentry protection. Submittals shall demonstrate that the protective device provides proper protection for the alternator by a comparison of the trip characteristic of the breaker with the thermal damage characteristic of the alternator. Field circuit breakers shall not be acceptable for generator overcurrent protection. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed. The governing system shall include a programmable warm up at idle and cool-down at idle function. While operating in idle state, the control system shall disable the alternator excitation system. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The Control Panel shall include, but is not be limited to, the following instruments and protective devices:
 - a. AC Ammeter.
 - b. Phase Selector Switch.
 - c. Current Transformers.
 - d. AC Voltmeter.
 - e. Automatic Solid State Voltage Regulator with immunity to severe induced waveshape distortion from nonlinear loads.
 - f. Rheostat for Adjusting voltage \pm 5% of Rated Voltage.
 - g. Engine Malfunction Warning Lights/Audible Alarm:
 - 1) Anticipating High Engine Temperature.

- 2) Anticipatory Low Oil Pressure.
 - 3) Low Fuel.
 - 4) Control Switch not in Automatic Position.
 - 5) Low Water Temperature.
 - 6) Low Oil Pressure.
 - 7) High Water Temperature.
 - 8) Engine Overcrank.
 - 9) Engine Overspeed.
 - h. Frequency Meter.
 - i. Non-resettable Elapsed Time Meter with a 9,999.9 Hour Maximum Indication.
 - j. Coolant Temperature Gauge.
 - k. Oil Pressure Gauge.
 - l. Provisions for Remote Emergency Shutdown.
 - m. Combination alarm shutdown system with manual reset and indicating lights for high engine temperature, low oil pressure, engine overspeed, and engine failed to start. Include an additional set of contacts for remote alarms.
 - n. Manual run/off/automatic selector switch for control of engine with flashing red light, and shall allow manual starting of plant without assuming load.
2. Provide low coolant level shutdown, which shall activate high engine temperature lamp and shutdown.
 3. Solid-state cranking cycle device preset at 15 second cranking cycle and 15 second rest cycle followed by a 15 second cranking cycle. If engine fails to start after 3 crank cycles and 2 rest cycles, an overcranking alarm shall sound and cranking cycle shall stop. Provide adjustments in accordance with manufacturers recommendations, but cumulative crank-rest timing shall not be less than 75 seconds.
 4. In the event of engine failure, the panel shall close alarm circuit, indicate the fault on the appropriate lamp and shut down the engine. The panel shall include a manual reset switch so that the panel can be reset immediately after a fault condition. Reset devices that require a waiting period are not acceptable.
- I. Options and accessories shall include the following:
1. Housing: The complete engine generator set shall be enclosed in a free-standing weather protective, aluminum (0.063-inch) panel construction housing with lockable, removable hinged door panels, hinged instrument panel door and panel light. Housing shall be wind rated to a minimum 150 mph.
 - a. All parts shall be adequately protected against oxidation and corrosion and finish painted with durable machinery enamel, minimum of 3 mils applied in a maximum of 1-1/2 mils per application.
 - b. Include within the enclosure a switched 12 or 24-Volt LED luminaire on each side of the engine and a GFCI receptacle.
 - c. The enclosure must maintain the engine and generator at 40°F or be equipped with space heaters to maintain starting batteries between 50°F and 90°F.
 2. 12V or 24-volt battery starting with maintenance free lead acid batteries with dual rate solid state automatic battery charger, with equalize timer, low and high battery voltage indicators and alarm terminals, charger malfunction indicator and alarm. Batteries shall be capable of providing two 45 second continuous cranking cycles. Provide battery racks, and charger shall be protected from any other charging source.
 3. Muffler, critical silencing, with condensation drain; stainless steel flexible exhaust connector. Silencer shall mount horizontally on structural support inside of housing with 90° elbow termination with rain cap.

4. Premium exhaust rain cap, cast aluminum, stainless steel hardware, brass bushing hinge.
 5. Gas line accessories as required for the set to include but not limited to gas line strainer, 12" braided metallic flexible fuel line, battery power operated gas line shut-off solenoid valve, pressure reducing regulator fuel pressure gauge.
 - a. Contractor shall provide natural gas fuel piping for the emergency generator set. Contractor shall install natural gas line fittings obtained from electrical contractor (as supplied with the engine generator). Plumbing line work for natural gas for the engine generator shall be with as few elbows and bends as possible (as near a straight line run from the gas supply tee-off as possible).
 6. Coolant heater, 120VAC, 1 phase, 1000-2500 watts.
 7. Unit mounted emergency shut-off mushroom type pushbutton switch.
- J. Testing: The unit shall be given a complete shop test before shipment. It shall be installed on the job under supervision of the manufacturer's representative and shall receive start-up / commissioning service from that representative.
1. The unit shall be started cold and run for a one-hour test with building load connected. Provide additional load bank as required to achieve 100 percent loading.
 2. Retransfer the load after test.
 3. After this test, the set shall cool for five minutes, then must start and carry full building load for four hours.
 4. Demonstrate the cranking cycle and all engine safety devices. The Owner's authorized representative shall be instructed in the operation and maintenance of the unit.
- K. Instruction Data and Drawings: Commercial type operating instructions shall be provided consisting of operating and maintenance manuals, parts books, dimensional drawings and wiring diagrams. Three copies of dimensional drawings and wiring diagrams shall be provided as specified.
1. Operating Instructions: Provide and install in a suitable enclosure operating instructions for the engine generator set.
 2. Contractor shall fill the radiator with a combination of water and ethylene-glycol to protect the radiator to -20°F after completion of the test.

2.2 AUTOMATIC TRANSFER SWITCHES

- A. Rating and Construction:
1. Refer to the project drawings for specifications on the sizes and types of transfer switch equipment, withstand and closing ratings, voltage and ampere ratings, enclosures and accessories. All transfer switches shall have switched neutrals and shall be electrically operated and mechanically held.
 2. Automatic transfer switches shall be included in a factory assembly with bypass-isolation switch equipment for the emergency life safety branch, two-source type for bypassing to normal or emergency. Bypass isolation not required for equipment branch.
 3. All transfer switches and accessories shall be UL listed and labeled, tested per UL Standard 1008, and CSA Approved, and comply with NEMA ICS 2-447. When protected by molded case breaker withstand and closing ratings shall not be less than the following RMS symmetrical amps at 600 VAC:

Switch Size in Amps	WCR @ 480 Volts
Up to 260	30,000
300 to 1000	65,000
1200	85,000
1600 and larger	100,000

4. Provide one of the following standard products:
 - a. Onan OTPC Series as required.
 - b. Standby Generator System Manufacturer, provided as a complete system.
 - c. ASCO 300 Series.
 - d. Russelectric RMT/RMTD Series.
 - e. Zenith ZTSD Series.
 5. Electrical operation shall be accomplished by a momentarily energized single solenoid operating mechanism which receives power from the source to which the load is being transferred. Fuse or thermal protection of the main operator is prohibited. The operating transfer time shall be 1/6 of a second or less. Mechanical locking in each position shall be accomplished without the aid of permanent magnets, latching solenoid, or motor operators.
 6. Operation shall be inherently double-throw whereby all contacts move simultaneously and with no programmed delay in a neutral position. Electrical spacing shall be equal to or exceed those listed in table 15.1 of UL 1008. Only those main contact structures specifically manufactured for transfer switch service shall be acceptable. An overload or short circuit shall not cause the switch to go to a neutral position.
 7. Inspection of all contacts (movable and stationary) shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The maintenance handle shall permit the operator to stop the contacts at any point throughout the entire travel to properly inspect and service the contacts when required.
 8. All switches for systems with switched neutrals shall have fully rated neutral transfer contacts that momentarily interconnect the neutrals of the sources and load for 100 milliseconds maximum, during the transfer/retransfer operation. The neutrals shall remain so interconnected until the line contacts close on the alternate source. Line and neutral contacts shall be driven by a single main operator.
- B. Controls and Accessories:
1. Controls shall provide for the automatic starting sequence of the generator set.
 2. Automatic controls shall signal the engine-generator set to start upon signal from normal source sensors. Solid state time delay start, adjustable from 0 to 5 seconds (factory set at 2 seconds) shall avoid nuisance start-ups. Battery voltage starting contacts shall be gold, dry type contacts factory wired to a field wiring terminal block.
 3. The switch shall transfer when the emergency source reaches the set point voltage and frequency. Provide a solid-state time delay on transfer, adjustable from 0 to 120 seconds.
 4. The switch shall retransfer the load to the normal source after a time delay retransfer, adjustable from 0 to 30 minutes. Retransfer time delay shall be immediately bypassed if the emergency power source fails.
 5. Control shall be solid state and designed for a high level of immunity to power line surges and transients, demonstrated by test to IEEE Standard 587-1980. The control shall have optically isolated logic inputs, high isolation transformers for AC inputs, and relays on all outputs. Control shall be quick disconnect for ease of service.
 6. Automatic transfer switches shall have inherent phase balance protection logic to detect a 'single phasing' Solid state undervoltage sensors shall simultaneously monitor all phases of both sources. Pick-up and dropout settings shall be adjustable. Voltage sensors shall allow for adjustment to sense partial loss of voltage on any phase. Voltage sensors shall have field calibration of actual supply voltage to nominal system voltage. The transfer switch controller shall be

equipped with a fault output terminal interconnected to a 24Vdc shunt trip, integral to the transfer switch and with built-in time delay, that functions to disconnect the utility source from the load should the standby emergency source fail to start.

7. For transfer switches serving non-disconnected motor loads, equip with a field adjustable time delay during switching in both directions, during which time the load is isolated from both power sources, to allow load residual voltage to decay before closure to the opposite source. The delay feature shall have an adjustable range covering 0 to 7.5 seconds. Transfer switches serving life safety equipment shall have this time delay set at 0 at startup/commissioning.
8. Controls shall signal the engine-generator set to stop after a time delay, adjustable from 0 to 10 minutes, beginning on return to the normal source.
9. Power for transfer operation shall be from the source to which the load is being transferred.
10. The control shall include latching diagnostic indicators to pinpoint the last successful step in the sequence of control functions, and to indicate the present status of the control functions in real time.
11. The control shall include provisions for remote transfer inhibit and area protection.
12. Provide front panel devices mounted on cabinet front consisting of:
 - a. A key operated selector switch to provide the following positions and functions:
 - 1) Test - Simulates normal power loss to control for testing of generator set. Refer to Part 3 for programming requirements.
 - 2) Normal - Normal operating position.
 - 3) Retransfer - Momentary position to override retransfer time delay and cause immediate return to normal source, if available.
13. Exerciser Clock: Provide solid state exerciser clock to set the day, time, and duration of generator set exercise/test period. Provide a with/without load selector switch for the exercise period. Refer to Part 3 for programming requirements.
14. Provide Phase Sequence Monitor/Balance Module to protect against inadvertent phase rotation hookup and monitor for voltage phase imbalance between phases.
15. Each transfer switch shall be provided with a control panel to allow the operator to view the status and control operation of the transfer switch. The control panel shall be a sealed membrane panel rated NEMA 3R/IP53 or better (regardless of enclosure rating) that is permanently labeled for switch and control functions. The control panel shall communicate with the engine generator, including display of all engine and alternator data, and other transfer switch data in the power system. The control panel shall allow starting and stopping of the generator set via the transfer switch control panel in both test and emergency modes.

2.3 REMOTE ANNUNCIATION PANEL

- A. Locate next to ATS. Provide flush mounted with stainless steel plate containing the following:
 1. Trouble sonnet horn with silence switch.
 2. Illuminated annunciators with nameplates in accordance with the following table:

Lamp Legend	Generator Set Condition Indicated	Light	Audible Alarm
High Battery Voltage	Battery charger too high	Red	No
Low Battery Voltage	Battery voltage too low	Red	No
Normal Battery Voltage	Battery voltage ok	Green	No

Lamp Legend	Generator Set Condition Indicated	Light	Audible Alarm
Generator Running	Generator has output voltage	Green	No
Normal Utility Power	Utility power supplying the load	Green	No
EPS Supplying Load	Genset supplying the load	Green	No
Pre-Low Oil Pressure	Oil pressure approaching low limit	Yellow	Yes
Low Oil Pressure	Engine has shut down due to low oil pressure	Red	Yes
Pre-High Coolant Temp.	Temperature of coolant approaching high limit	Yellow	Yes
High Coolant Temp.	Genset has shut down due to high coolant temp.	Red	Yes
Low Engine Temp.	Engine heater has malfunctioned	Red	Yes
Overspeed	Engine has shut down due to overspeed	Red	Yes
Overcrank	Engine failed to start	Red	Yes
Not In Auto	Engine control switch not in AUTO position	Flashing Red	Yes
Battery Charger Malfunction	Charger is signaling a failure	Red	Yes
Low Fuel	Fuel level below preset minimum	Red	Yes
Fault	Customer preselected condition	Red	Yes

B. Name plates shall be laminated black with white letters engraved. Letter size shall be a minimum of 3/8" high.

C. Illuminated annunciators shall be 1 inch minimum.

2.4 ELECTRICAL AND MECHANICAL PERFORMANCE

A. The switch must comply with UL 1008 and NEMA Standard Publication ICS 2-447. In addition, the switch must meet or exceed the following requirements and if so requested, be verified by certified laboratory test report.

1. Temperature Rise: Measurements shall be made after the overload and the endurance tests.
2. Withstand: UL listed to withstand the magnitude of fault current available at the switch terminals when coordinated with respective protective devices at an X/R ratio of 6.6 or less. The main contacts of the transfer switch shall not trip open or weld when subjected to fault currents.
3. Dielectric: Test, following the withstand current rating test, at 1960 volts AC rms minimum.
4. Transient Withstandability: Control panel voltage surge withstand capability test per IEEE Standard 472-1974 and voltage impulse withstand test per NEMA Standard publication ICS-1-109.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install standby engine driven generator set where shown, in accordance with the equipment manufacturer's written instructions and recognized industry practices, to ensure that the set complies with the specified requirements and serve the intended purposes. Provide and install in a Plexiglas enclosure complete operating instructions for each type of transfer switch.

B. Standard: Comply with NEMA standards, requirements of the NEC, and applicable

portions of NECA Standard of Installation pertaining to installation of standby engine-driven generator sets and accessories.

- C. Vibration Isolation:
 - 1. Outside Mounted: Ribbed Neoprene Vibration Isolation.
 - 2. Roof Mounted: Install units on properly sized spring-type vibration mounts and ribbed Neoprene vibrations isolators.
 - 3. Generator installed inside building: Install units on properly sized spring-type vibration mounts and ribbed Neoprene vibration isolators.
- D. Concrete Pad: Install generator set on a reinforced concrete pad. The generator pad shall extend 6" beyond the generator set base, unless shown otherwise. Furnish the exact position of any block outs, mounting bolts, and the dimensions and location of the generator pad in a timely manner so as to prevent delay of the concrete work. Refer to Section 26 05 00 for housekeeping pads and Division 3 for Concrete Work.
- E. Options and Accessories: Provide circuits, conductors, and raceways as required for generator options and accessories as required and specified. Provide separate dedicated circuits from the emergency branch circuit panel board to the generator for (1) engine/coolant heaters, (2) GFCI convenience receptacle(s), (3) battery charger (LED work lights on battery), etc. Provide additional circuits as required, for a fully operational system.
- F. Provide remote alarm annunciator. Coordinate final location of annunciator with Owner / Architect prior to installation. It shall be installed near ATS.
- G. Provide dry contacts and outputs to monitor transfer switch and generator alarm conditions and notify Owner's Police or security personnel, and building management controls system and personnel, both when transfer to emergency occurs and when transfer to normal occurs.
- H. Adjust main output circuit breaker(s) adjustable trip setting based on manufacturer's fault current and coordination analysis or as directed by Engineer.

3.2 GROUNDING

- A. Install the generator as a separately derived system. Ground the generator neutral to the generator frame. Ground the generator frame to the building grounding system and provide a driven ground electrode at the generator location.

3.3 CONTROLS

- A. Provide generator start-up control wiring and raceway from each automatic transfer switch to the respective standby generator set as required.

3.4 TESTING

- A. Notify Owner's Commissioning Authority (CxA) prior to performing any tests so the CxA may witness tests at his/her discretion. Refer to Section 26 01 00 Commissioning of Electrical Systems. Testing shall be witnessed by owner and Engineer.
- B. Provide testing in accordance with NFPA 110. Upon completion of installation of engine-driven generator set and after building circuitry has been energized with normal power source. Provide manufacturer's start-up service to test emergency power system to demonstrate standby capability and compliance with specified requirements, including automatic start-up, controls and full load acceptance. Test shall include operation of standby power system with voltage check while the system is loaded to ensure proper

operation of the emergency generator, transfer switches, and other system components. Operation of the system shall simulate standby power conditions, that is, loss of main electrical power to the building. Test period shall be trouble-free operation with at least four automatic transfer switch operations (each switch) within the period of operation.

1. The unit shall be started and run for 30-minute break-in period at no-load unless recommended otherwise by manufacturer.
 2. The unit shall be started cold and run for a four-hour test with building load connected and load bank to achieve 90 percent of rated generator capacity. Monitor and record available natural gas pressure and verify supply is adequate and stable during the entire test.
 3. Retransfer the load after test.
 4. After this test, the set shall cool for five minutes, then must start and carry 90% rated capacity load for four hours.
 5. Provide additional Owner witnessed testing for all ancillary equipment on generator. Demonstrate all specified functions and alarms.
 6. Demonstrate the cranking cycle and all engine safety devices. The Owner's authorized representative shall be instructed in the operation and maintenance of the unit. Provide minimum 4-hours training at each campus for 4-persons; one hour on four separate days.
- C. Contractor shall furnish all instruments, load banks, and personnel required for test. Submit 4 copies of certified test results to Architect/Engineer for review. Test reports shall include date and time of test, relative humidity, temperature and weather conditions.

3.5 MISCELLANEOUS

- A. Provide circuits and receptacles to serve loads as directed by Owner / Architect, including, but not limited to:
1. Telecommunications equipment.
 2. Public Address Communication & Master Clock System.
 3. Fire Detection Alarm and Signaling Systems including remote transponder panels and alarm power supply panels.
 4. Security Systems including remote power supplies (except for battery powered access control door hardware).
 5. Video Surveillance CCTV System including remote camera power supplies
 6. All receptacles and outlets in MDF/IDF rooms.
 7. Technology MDF/IDF room dedicated HVAC equipment.
 8. Walk-in coolers/freezers and selected reach-in refrigeration equipment.
 9. Clinic refrigerator and selected clinic receptacles.
 10. Building Access control System including remote power supplies, except do not power door electric strike or hinge hardware on emergency power.
 11. Owner's Radio Base Station and handset charging equipment / Radio Repeaters / Distributive Antennae Systems (DAS).
 12. Elevators, ADA chair/personnel lifts.
 13. Point of Sale Stations.
 14. Kitchen Manager's Workstation.
 15. Building Management and Control System (BMCS).
 16. Special education receptacles, minimum one in each room.
 17. First responder Bi-Directional Distributive Antennae System (DAS) Systems
- B. Mount annunciator alarm as directed by Owner / Architect. Coordinate final location of ATS with Owner / Architect prior to installation. Install next to ATS.

3.6 PROGRAMMING

- A. Program automatic transfer switches for delayed transfer to emergency and sequential

operation to transfer loads by priority based on manufacturer recommendation or as indicated below:

1. Life Safety Loads – less than 10 seconds.
 2. Critical Loads – more than 15 seconds, less than 30 seconds.
 3. Equipment Loads – more than 40 seconds, less than 60 seconds.
 4. Non-Legally required loads – more than 75 seconds, less than 120 seconds.
- B. Program automatic transfer switch voltage and frequency pick-up and drop out for load shedding based on load priority for voltage and frequency based on manufacturer recommendations or as indicated below:
1. Life Safety pick-up 10%; drop out 20%.
 2. Critical Loads pick-up 10%; drop out 15%.
 3. Equipment Loads pick-up 8%; drop out 15%.
 4. Non-Legally required loads pick-up 5%; drop out 10%.
- C. Exerciser clock: Program automatic transfer switch exerciser clock for generator to run every Tuesday, 8:00 AM, for 15-minute run time, without load. Verify with Owner.
- D. Test switch: Program automatic transfer test switch for generator to run with load, for minimum 30-minutes to comply with NFPA 110 requirements for monthly testing. Maximum test time shall not exceed 35-minutes unless directed otherwise by Owner.
- E. Program engine cooldown time as recommended by the manufacturer.

3.7 TRAINING

- A. Provide 4 hours training, one hour each for four persons, four separate days.

END OF SECTION

SECTION 26 43 00

SURGE PROTECTION DEVICES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Surge Protection Device (SPD) covered under this section includes service entrance type surge protection devices suitable for use as Type 1 or Type 2 Devices per UL1449 5th Edition, applied to the line or load side of the utility feed inside the facility. SPDs shall be connected in parallel with the facility's wiring system. The unit shall be manufactured in the USA by a qualified manufacturer of suppression filter system equipment, which has been engaged in the commercial design and manufacture of such products for a minimum of five years.
- B. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified and required to finish and install surge protection devices.

1.2 QUALITY ASSURANCE

- A. Reference Standard: Comply with the latest edition of the applicable provisions and recommendations of the following, except as otherwise stated in this document:
 - 1. UL 1449 Fifth Edition
 - 2. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
 - 3. ANSI/IEEE C62.45, Guide for Surge Testing for equipment connected to Low-Voltage AC Power Circuits.
 - 4. IEEE 1100 Emerald Book.
 - 5. National Fire Protection Association (NFPA 70 (NEC), 75, and 78).
 - 6. UL 1283 – Electromagnetic Interference Filters
- B. When requested for verification, provide copies of the following:
 - 1. Copies of actual let through voltage data in the form of oscilloscope results for both ANSI/IEEE C62.41 Category C3 (combination wave) and B3 (Ring wave) tested in accordance with ANSI/IEEE C6245.
 - 2. Copies of test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor components can survive published surge current rating on both a per mode and per phase basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Test data on an individual module is not acceptable.

1.3 SUBMITTALS

- A. Submit shop drawings complete with all technical information for specific unit dimensions, let through voltage data, detailed installation instructions, maintenance manual, and wiring configuration.
- B. Provide detailed marked-up copy of this specification with line-by-line compliance or exception statements to all provisions of this specification.
- C. Copies of Manufacturer's catalog data, technical information and specifications on equipment.
- D. Copies of documentation stating that the Surge Protection Device is listed from a Nationally Recognized Testing Laboratory (NRTL) (UL, ETL, etc.) and are tested and

multi-listed to UL 1449 5th Edition and UL 1283.

- F. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

1.4 WARRANTY

- A. The manufacturer shall provide a minimum 20-year warranty for high and very high exposure SPDs. Very high exposure unit warranties shall include exposure to temporary extended over-voltage conditions. Provide a minimum 15-year warranty for all medium exposure SPDs, and a minimum 10-year warranty for all other SPDs for parts from date of substantial completion against failure. Contractor shall assist the Owner with manufacturer warranty registration.

PART 2 – PRODUCTS

2.1 APPROVED MANUFACTURER

- A. Low exposure, minimum 10-year parts warranty, minimum 50k Amps per mode, 100k Amps per phase, Type 1 and Type 2.
 - 1. Recessed mount panelboard extension with brushed stainless-steel front:
 - a. ACT Communications:471- ###V-050-SS-F-PB flush series.
 - b. ABB Current Technology PX3-050-VVV- #X-SF-X-F- # series.
 - c. SSI Surge Suppression, Inc. CSMx12-FMPxSS series.
 - d. SST Southern Tier Technologies T45-VVVV-50-AWAJ2-C-RKSS(Stainless Steel front).
 - 2. Branch panelboard surface mounted:
 - a. ACT Communications 455 series.
 - b. ABB Current Technology CG3 60 series.
 - c. SSI Surge Suppression, Inc. CSMx12 series.
 - d. SST Southern Tier Technologies T45-VVVV-50AWAJ2-C.
- B. Medium exposure, minimum 15-year parts warranty, minimum 120k Amps per mode, 240k Amps per phase, Type 2.
 - 1. ACT Communications 471 series.
 - 2. ABB Current Technology CGP3 125 series.
 - 3. SSI Surge Suppression, Inc. CSMx24 series.
 - 4. SST Southern Tier Technologies T45-VVVV-120A series.
- C. High exposure, minimum 20-year parts warranty, minimum 200k Amps per mode, 400k Amps per phase, Type 2 SPD.
 - 1. ACT Communications 471 x200 series.
 - 2. ABB Current Technology TG3 200 series.
 - 3. SSI Surge Suppression, Inc. CHLxM series.
 - 4. SST Southern Tier Technologies T45-VVVV-200A series.
- D. Very high exposure at service entrance 1,201 Amps and above: Minimum 20-year parts warranty; minimum 200k Amps per mode; 400k Amps per phase, Type 1 and 2 SPD:
 - 1. ACT Communications 471 x200 SEL series.
 - 2. ABB Current Technology SEL3 200 series.

The service entrance protector shall incorporate a combination of TPMOV and Selenium technology allowing for transient surge and temporary over voltage protection. The unit shall be able to prevent common temporary over voltages and high impedance faults from damaging the MOVs, increasing their longevity and ability to protect the critical load. Limited and Intermediate current TOVs can be caused by a loss of the neutral conductor

in a split phase or three phase power system. The available fault current will be determined by the impedance of the loads connected to the phases opposite the SPD and are typically in the range of 30A to 1000A. Minimum 20-year parts warranty, extended over-voltage protection, minimum 200k Amps per mode, 400k Amps per phase, Type 2 SPD. The Selenium elements must limit voltage to the MOV as a percent of nominal as outlined below:

Overvoltage seen by MOVs as % of Nominal				
	available current			
time	30A	100A	500A	1000A
1 cycle	120%	130%	150%	160%
10 cycles	130%	150%	160%	160%
30 cycles	140%	150%	160%	160%

*To verify damage to the MOVs has been mitigated, the percent overvoltage seen at the MOV must be less than 200% for split-phase applications or 173% for three-phase applications (100% is nominal).

2.2 MANUFACTURED UNITS / ELECTRICAL REQUIREMENTS

- A. Declared Maximum Continuous Operating Voltage (MCOV) shall be greater than 115 percent of the nominal system operating voltage and in compliance with test and evaluation procedures outlined in the nominal discharge surge current test of UL1449, section 37.7.3. MCOV values claimed based on the component's value or on the 30-minute 115% overvoltage test in UL1449 will not be accepted.
- B. Unit shall have not more than 10% deterioration or degradation of the UL1449, Voltage Protection Rating (VPR) due to repeated surges.
- C. Protection Modes SVR (6kV, 500A) and UL1449 VPR (6kV, 3kA) for grounded WYE/delta and High Leg Delta circuits with voltages of (480Y/277), (208Y/120), (600Y/347). 3-Phase, 4 wire circuits, (120/240) split phase shall be as follows and comply with test procedures outlined in UL1449: Values Depicted are based on a system Without Disconnect / With Disconnect

System Voltage	Mode	MCOV	C3 Wave	UL 1449 VPR Rating
120/240	L-N	150	650/775	700/800
120/208	L-G	150	650/825	700/900
	N-G	0	500/500	900/1000
	L-L	300	950/1250	900/1200
277/480	L-N	320	1125/1225	900/1200
	L-G	320	1075/1225	1200/1200
	N-G	0	900/900	1200/1500
	L-L	550	1950/2200	1800/1800

- D. Electrical Noise Filter- each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric noise shall be as follows using the MIL-STD-220A insertion loss test method.
 1. 14 dB from 10 kHz to 1 MHz.
- E. Each Unit shall provide the following features:
 1. Phase Indicator lights, Form C dry contacts, counter and audible alarm.
 2. Field testable while installed.
 3. High performance interconnecting cable.
 4. The UL 1449 Voltage Protection Rating (VPR) shall be permanently affixed to the SPD unit.

5. The UL 1449 Nominal Discharge Surge Current Rating shall be 20kA
6. The SCCR rating of the SPD shall be 200kAIC without requiring an upstream protection device for safe operation.
7. The unit shall be listed as a Type 2 SPD per UL1449.
8. Power wiring: SPD shall be equipped with mechanical lugs that can accept up to #2 AWG wire on High Exposure units and up to #6 on Medium and Low Exposure units.

2.3 POWER CABLES FOR CONNECTION

- A. Power wiring: Conductors between all high and very-high SPDs and switchgear shall be high performance interconnect system "Low Z Cable" cables with Ultra Low impedance characteristics at 10kHz and above.
- B. High Performance Low Impedance cable shall be #6 AWG minimum for Very High, High, and Medium Exposure SPDs and #10 AWG minimum for Low Exposure SPDs.

PART 3 – EXECUTION

3.1 GENERAL INSTALLATION

- A. The unit shall be installed as close as practical to the facility's wiring system in accordance with applicable national/local electrical codes and the manufacturer's recommended installation instructions. Connection shall be with high performance, low impedance cables in conduit and shall not be any longer than necessary, avoiding unnecessary bends. Minimum wire size and overcurrent protection device for disconnect shall be provided and as recommended by the manufacturer.
- B. Units specified for lighting and appliance panel boards as panelboard extensions (EGPE) shall be mounted directly above or below the first section of the panel board it is protecting. Any other mounting location will not be acceptable and shall be corrected, without exception, at no additional cost to the Owner.
- C. Units specified for panelboards, switchboards, or motor control centers shall be mounted directly above or adjacent to the panelboard, switchboard or motor control center using unistrut supports secured to structure as required. Conduit length between power distribution panelboard or switchboard shall be less than two inches. Mounting above equipment is not acceptable.
- D. Overcurrent device and conductors for devices shall be the maximum recommended by the manufacturer. Manufacturer's recommendations shall prevail over the information given in the plans and specifications.
- E. Provide recessed mounted panelboard extension type enclosures for devices protecting recessed panelboards. Enclosure front shall match panelboard front material and finish. Provide brushed stainless-steel front at kitchens and food processing areas.

3.2 UNIT SELECTION BASED ON EXPOSURE LEVEL

- A. (SPDVH) Provide very-high exposure SPDs with Selenium and TPMOV technology for the following new electrical equipment or where indicated:
 1. Service entrance rated 1,201 Amps and above.
- B. (SPDH) Provide high exposure SPDs for the following new electrical equipment or where indicated:
 1. Service entrance rated 801 – 1,200 Amps.

2. Switchboards located outside.
- C. (SPDM): Provide medium exposure SPDs at the following new electrical equipment or where indicated:
1. Service entrance rated 401 - 800 Amps.
 2. Panelboards above 600 Amps.
 3. Motor control centers.
 4. Non-service entrance switchboards.
- D. (SPDL): Provide low exposure SPDs at the following new electrical equipment or where indicated:
1. Service entrance rated 400 Amps and below.
 2. Panelboards 600 Amps and below.

3.3 TESTING

- A. Factory Trained Representative shall provide start-up to include initial verification of proper installation, shortest cable connection, and initiate factory warranty. The technician will be required to do the following as a minimum:
1. Verify the installation follows applicable national / local electrical codes related to SPDs and the manufacturer's Installation, Operation and Maintenance Instructions and recommendations.
 2. Verify overcurrent device rating.
 2. Verify all wiring connections and installation conforms to manufacturer's recommendations.
 3. Record information for each product installed and include in O&M Manual
- B. A copy of the Factory diagnostic test report and written approval of the installation shall be included with the Electrical Operating and Maintenance Manual. The Contractor shall make all adjustments, changes, corrections, etc. as required by the Factory Trained Representative so that the installation follows the manufacturer's installation and operation instructions without additional charge to the Owner.

END OF SECTION

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SECTION 26 51 13
LIGHTING FIXTURES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work Included: Lighting fixture work is as shown, scheduled and specified.
- B. Applications: The applications of lighting fixtures required for the project include the following:
 - 1. General lighting.
 - 2. Emergency lighting.
 - 3. Outdoor area lighting.

1.2 QUALITY ASSURANCE

- A. Provide interior building LED fixtures that comply with the Design Lights Consortium (DLC) standards and are DLC or DLC Premium listed as a Qualifying Product at time of proposal submittal date.
- B. UL Standards: Lighting fixtures shall conform to applicable UL standards, and be UL or ETL labeled.
- C. Light fixtures shall conform to the requirements of NFPA 101, and 70 (NEC).

1.3 SUBMITTALS

- A. Submit product data for light fixtures, and emergency lighting equipment, including generator transfer devices.
- B. Specification Compliance Review: Mark up a complete copy of the specification section for the product to indicate a) acknowledgement of the specification requirement (Comply), or b) acknowledgement that the particular specification requirement does not apply to this specific project (Not Applicable) or, c) acknowledgement that the specification requirement cannot be made or that a variance is being submitted for review to the Architect / Engineer / Owner (Does Not Comply, Explanation:). Do not submit an outline form of compliance, submit a complete copy with the product data.
- C. Submittal data shall include luminaire efficiency parameters.
- D. Submittal data for exterior luminaires shall include IESNA BUG ratings, backlight, uplight, and glare ratings of each unique luminaire for the orientation and tile specified. Indicate total absolute lumens per luminaire and absolute lumens emitted above horizontal based by each luminaire for the orientation and tile specified.

1.4 WARRANTY

- A. Provide 5-year warranty on all light fixtures, including internal or remote LED drivers, all other electrical internal electrical or electronic components except for emergency battery packs or emergency load control device relays. Refer to other specific component warranty requirements below.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Provide products produced by manufacturers shown or scheduled for each type of lighting fixture. Refer to drawings for additional approved manufacturers.
1. Where alternate fixtures to those specified are provided, notification of alternates are required prior to bid in accordance with Section 26 05 12. Full photometric drawings and a spreadsheet indicating the differences between the specified fixtures and alternate fixtures shall be provided as part of the pre-bid notification. The spreadsheet shall indicate all aspects of the alternate fixture that differ from the specified fixture, including, but not limited to the following:
 1. Physical Dimensions.
 2. Mounting Type.
 3. Fixture Ratings/Listings.
 4. Housing Materials/Construction.
 5. Lumen Output.
 6. Fixture Voltage.
 7. Fixture Wattage.
 8. Fixture Efficacy.
 9. CCT.
 10. CRI.
 11. Beam Angles/Distribution.
 12. Manufacturer Warranty.
 13. Emergency Power.
 14. Controls Requirements.
 3. Emergency Battery Packs with self-testing drivers/inverters: Shall be the same manufacturer as the low voltage lighting controls provided on this project. Where there are no low voltage lighting controls specified or provided, the manufacturer shall be Bodine.
Bodine.
Chloride.
Lithonia.
Dual Lite.
IOTA.
 4. Emergency Generator/Inverter Load Control Bypass Relay (ELC); UL924 listed and 0-10Vdc compatible: Shall be the same manufacturer as the low voltage lighting controls provided on this project. Where there are no low voltage lighting controls specified or provided, the manufacturer shall be Bodine.
 5. Emergency Generator / Inverter Branch Circuit Transfer Switch, UL 1008 listed and 0-10Vdc compatible:
Bodine GTD20A.

2.2 MATERIALS AND COMPONENTS

- A. General: Provide lighting fixtures of the size, type, and rating indicated, with all accessories for a complete aesthetic installation.
- B. Fixture Types:
1. General:
 - a. LED Lay-in edge lit or back flat panel / troffer fixtures: Opaque, edge or back lighted, 4000 Kelvin color temperature. 0-10 Vdc dimmable, L70: 60,000 minimum hours.
 - b. Safety chains and wire guards at fixtures in mechanical and electrical rooms, and high abuse areas. Provide safety chains only for gymnasium fixtures which shall be inherently vandal proof, no wire guards.

- c. Fixtures located outdoors, in interior unconditioned spaces, and in wet locations shall be of aluminum construction.
 - d. Fixtures with door frames shall be of aluminum construction, white finish where located in kitchens, food prep areas, toilets, restrooms, locker rooms, dressing rooms, showers, and unconditioned spaces.
 - e. DLC, DLC Premium or Energy Star qualified unless specified otherwise.
 - f. Outdoor fixtures shall include a discrete / replaceable surge suppression device in addition to the surge suppression incorporated in the LED driver.
 - g. Operating temperature rating shall be between -40 degrees F and 120 degrees F.
 - i. Color Rendering Index (CRI): ≥ 80 Indoor; ≥ 65 Outdoor
 - j. The manufacturer shall have performed JEDEC (Joint Electron Devices Engineering Council) reliability tests on the LEDs as follows: High Temperature Operating Life (HTOL), Room Temperature Operating Life (RTOL), Low Temperature Operating Life (LTOL), Powered Temperature Cycle (PTMCL), Non-Operating Thermal Shock (TMSK), Mechanical Shock Variable Vibration Frequency, and Solder Heat Resistance (SHR).
2. Downlight Fixtures: Provide recessed downlight fixtures with trim rings compatible with the ceiling material where fixture is to be installed.
 3. LED Exit Signs: Provide red lettering. Exit lighting fixtures shall meet the requirements of Federal, State, and Local Codes. Edge-lit exit signs shall have a silver background so that "EXIT" cannot be read backwards from the opposite side.
 - a. Gymnasiums, locker rooms, athletic/PE wing and associated corridors, black box theaters, auditorium stages, cafeteriums and kitchens: Vandal resistant, wet location cast aluminum with polycarbonate protective cover exit signs, Lithonia Extreme Series.
 4. Emergency Lighting Units: Lead Calcium batteries with self-diagnostics. Provide full light output at 90 minutes of battery operation. LED lamps.
 5. Gymnasium light fixtures, glass or acrylic refractors or lenses, round profile, single point swivel pendant or hook mounting, designed to be vandal proof without the need for wire guards, no wire guards.
- C. LED drivers:
1. NEMA 410 compliant for in-rush current.
 2. Starting Temperature: -40° F [-40° C].
 3. Input Voltage: 120 to 480 ($\pm 10\%$) V.
 4. Power Supplies: Class I or II output.
 5. Surge Protection: The system must survive 250 repetitive strikes of "C Low" (C Low: $6\text{kV}/1.2 \times 50 \mu\text{s}$, $10\text{kA}/8 \times 20 \mu\text{s}$) waveforms at 1-minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ASNI C62.41.2-2002, Scenario 1 Location Category C.
 6. Power Factor (PF): ≥ 0.90 .
 7. Total Harmonic Distortion (THD): $\leq 20\%$.
 8. Comply with FCC Title 47 CFR Part 18 Non-consumer RFI/EMI Standards.
 9. Drivers shall be reduction of hazardous substances (ROHS)-compliant.
- D. Voltage: Equipment for use on 120V systems shall be suitable and guaranteed for voltage range of 100V to 130V. Equipment on 277V systems shall be suitable and guaranteed for voltage range of 225V to 290V. Universal voltage equipment shall be suitable and guaranteed for a voltage range of 100V to 290V.
- E. Light fixture housing for exterior use: Provide aluminum or stainless housing. Where stainless steel hardware is used, both male and female fasteners shall be stainless steel.

- F. Emergency LED battery self-testing drivers and inverters; 5-year warranty. Basis of Design:
 1. Bodine BSL-ST Series for OEM installation.
 2. Bodine BSL310-SI Series for field installation.
 3. Bodine ELI-S Series for line voltage sine wave inverter field installation.
- G. Emergency Battery Packs – Exit Signs: Nickel Cadmium battery with self- diagnostics; Minimum 3-year non-prorated replacement warranty.
- H. Emergency Generator / Inverter Load Control Device (ELC):
 1. 16 Amp minimum ballast / driver load.
 2. Compatible with 0-10 Volt dimmer switches.
 3. UL 924.
 4. Minimum 3-year warranty.
 5. Integral or remove test switch.
- I. Emergency Generator / Inverter branch circuit transfer switch:
 1. UL 1008.
 2. 20 Amp ballast/driver load.
 3. 0-10Vdc dimming compatible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install lighting fixtures of the types indicated, where shown, and at indicated heights in accordance with the fixture manufacturer's written instructions and industry practices to ensure that the fixtures meet the specifications. Fixtures shall fit the type of ceiling system scheduled.
- B. Standards: Comply with NEMA standards, applicable requirements of NEC pertaining to installation of interior lighting fixtures, and with NECA Standard of Installation.
- C. Attachment: Fasten fixtures to the indicated structural support members of the building. Provide four separate wire supports for recessed ceiling mounted lighting fixtures, one at each corner of fixture. Check to ensure that solid pendant fixtures are plumb. Provide T-bar locking clips on all four sides for lay-in fixtures.
- D. Coordination: Field coordinate and locate lighting fixtures in open ceiling areas including mechanical and electrical rooms so that light is not obstructed by piping, ductwork, etc. Locate light fixtures in front of electrical and mechanical equipment to provide adequate illumination for testing and maintenance. Relocate installed light fixtures as directed by Owner / Architect at no additional cost.
- E. Final adjustment of all aimable exterior light fixtures shall be in coordination with, and to the satisfaction of, the Owner's designated representative. Pre-aim all fixtures prior to scheduled final aiming and adjustment with Architect / Owner. Verify that all rotatable optics are in their proper orientation prior to final aiming.
- F. Provide vandal resistant exit signs without wire guards in all physical education and athletic sports areas, including egress corridors adjacent to these areas, black box theaters, auditorium stages, vocational shops, cafeteriums and kitchens.
- G. Provide exit sign directional arrows as required. Provide a minimum of two and a maximum of 10% spare exit signs to be installed as directed by Architect.

- H. Install in accordance with manufacturers instructions.
- I. Install suspended luminaires using pendants supported from swivel hangers. Provide pendant length required to suspend luminary at indicated height.
- J. Locate recessed ceiling luminaires as indicated on the Architectural reflected ceiling plan.
- K. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prohibit movement.
- L. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure. Provide auxiliary members spanning ceiling Ts to support surface mounted luminaires. Fasten surface mounted luminaires to ceiling T using bolts, screws, rivets, or suitable clips.
- M. Install recessed luminaires to permit removal from below.
- N. Install recessed luminaires using accessories and fire stopping materials to meet regulatory requirements for fire rating.
- O. Install wall-mounted luminaires at height as directed by Architect.
- P. Install accessories furnished with each luminary.
- Q. Connect luminaires to branch circuit outlets using flexible conduit as specified.
- R. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaires.
- S. Bond products and metal accessories to branch circuit equipment grounding conductor.
- T. Provide emergency transfer devices for light fixtures powered by generator or inverter emergency lighting circuits which are used for normal lighting and to be switched with the switched normal lighting circuit in the same room, corridor or area.
- U. Provide un-switched, constant-hot circuit to all battery powered emergency lighting equipment and emergency load control devices (ELC). Where normal light fixture circuit is switched or contactor controlled, non-switched battery charging or ELC circuit shall originate from same branch circuit breaker as switched lighting circuit.
- V. Provide emergency powered light fixture in front of all electrical switchgear, including but not limited to panelboards, switchboards, motor control centers, low voltage control panels, transfer switches, motor controllers and disconnect switches.
- W. Provide emergency battery operated light fixtures at all transfer switch locations and at all central battery emergency lighting inverters.
- X. Provide automatic controls for exterior light fixtures. Exterior building mounted light fixtures shall be circuited through lighting contactors. Lighting contactors shall be controlled by the Building Management System. Provide separate lighting contactors for:
 - 1. Parking Lot Lighting.
 - 2. Building Mounted Lighting.
 - 3. Exterior Signage.
- Y. Lighting contactors shall not be installed above ceiling and shall be readily accessible, located in same room as panelboard serving load.

- Z. Wall mounted light fixtures shall be attached to the studs in the walls. Attachment to gypsum board only is not acceptable. Where wall mounted fixtures attach to junction box only, firmly secure junction box to adjoining studs in wall.
- AA. Lighting Fixture Supports:
 - 1. Shall provide support for all of the fixtures. Supports may be anchored to channels of the ceiling construction to the structural slab or to structural members within a partition, or above a suspended ceiling.
 - 2. Shall maintain the fixture positions after cleaning and relamping.
 - 3. Shall support the lighting fixtures without causing the ceiling or partition to deflect.
- BB. Hardware for surface mounting fixtures to suspended ceilings:
 - 1. In addition to being secured to any required outlet box, fixtures shall be bolted to a grid ceiling system at four points spaced near the corners of each fixture. The bolts shall be not less than 1/4 inch secured to channel members attached to and spanning the tops of the ceiling structural grid members. Non-turning studs may be attached to the ceiling structural grid members or spanning channels by special clips designed for the purpose, provided they lock into place and require simple tools for removal.
 - 2. In addition to being secured to any required outlet box, fixtures shall be bolted to ceiling structural members at four points spaced near the corners of each fixture. Pre-positioned 1/4-inch studs or threaded plaster inserts secured to ceiling structural members shall be used to bolt the fixtures to the ceiling. In lieu of the above, 1/4-inch toggle bolts may be used on new or existing ceiling provided the plaster and lath can safely support the fixtures without sagging or cracking.
- CC. Lighting Fixture Supports for aluminum canopies:
 - 1. Light fixtures mounted under aluminum canopies shall be UL wet location from above listed without a protective ceiling or cover. Light fixture shall not have conduit penetrations or mounting hole penetrations field made in the top of the fixture. Conduit penetration shall be at the end of the fixture only.

3.2 TESTING

- A. General: Upon installation of lighting fixtures, and after building circuits are energized, apply electrical energy to demonstrate proper operations of lighting fixtures, emergency lighting, and controls. When possible, correct malfunctioning units at the site, then retest to demonstrate proper operation; otherwise, remove and replace with new units, and proceed with retesting.
- B. Pre-Inspection Tasks: Immediately before final inspection, clean fixtures inside and out, including plastics and glassware, adjust trim to fit adjacent surfaces, replace broken or damaged parts, and lamp and test fixtures for electrical and mechanical operations. Any fixtures, or parts of fixtures that show signs of rust or corrosion at the time of completion, shall be removed, and replaced with protected metal parts.
- C. Final aiming and adjustment: Aim and adjust lighting fixtures for their intended purpose as specified or as required. Adjustments may include but not be limited to directional aiming, adjusting selectable lumen output, selectable correlative color temperature (CCT), selectable beam pattern, replacing/installing fixture manufacture's optional optical lens used for adjusting beam patterns or for softening beam edges, replacing/installing manufacture's optional theatrical/specialty color lens colors. Re-aim and re-adjust as required to the satisfaction of the Architect / Owner, including nighttime adjustment of exterior lighting in the presence of the Architect / Owner.

END OF SECTION

SECTION 26 56 00

SITE LIGHTING

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The extent of site lighting required is indicated on the drawings and schedules and by the requirements of this Section and Section 26 05 00 General Electrical Provisions.
- B. Poles and Standards specified in this Section are for outdoor use for the support of luminaires and include the following: Aluminum and/or steel

1.2 QUALITY ASSURANCE

- A. Codes and Standards: Provide luminaires, poles standards and appurtenances conforming to the following:
 - 1. Conform to applicable sections of American Association of State Highway and Transportation Officials (AASHTO): LTS-1 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.
 - 2. American National Standards Institute (ANSI):
 - a. C2 National Electrical Safety Code.
 - 3. Conform to applicable sections of American Society for Testing and Materials (ASTM)B 429, Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
 - 4. National Electrical Manufacturers Association (NEMA):
 - a. FA 1 Outdoor Floodlighting Equipment.
 - b. OD 3 Physical and Electrical Interchangeability of Photo Control Devices and Mating Receptacles.
 - 5. Conform to applicable sections of National Fire Protection Association (NFPA) 70, National Electrical Code.
 - 6. Underwriters Laboratories, Inc. (UL):.
 - 7. Design Lights Consortium (DLC).

1.3 SUBMITTALS

- A. Refer to Section 26 05 00 General Electrical Provisions. Submittal must include photometric reports, otherwise they will be rejected as incomplete.
- B. Contractor shall not rough-in, build concrete foundations, etc. for site lighting until all site lighting submittals have been approved. Contractor shall submit site lighting photometrics with product data. The review of site lighting submittals may include the relocation, addition or deletion of lighting fixtures, poles and standards due to the photometric performance of substituted manufacturers. Any changes required due to the contractor's substitution shall be at no cost to the Owner.
- C. Submittal sheets shall be sequentially numbered with the format: Sheet number of number total. Example 1 of 3
- D. Submit manufacturer's product data including the following:
 - 1. Line-by-line compliance of the specification indicating compliance or description of deviation.
 - 2. Submit a computer generated point-by-point calculations for all outside lighting.
 - 3. Dimensioned and detailed drawings in booklet form with separate sheet or sheets for each fixture, assembled in luminaire "type" alphabetical order and

showing: materials of construction; arrangement of components and wiring; gasketing for weather tightness; means of mounting luminaire and adjusting aspect; finishes; photometric data with lamp or lamps specified; electrical data including volts, amperes and watts; and for roadway type luminaires, distribution data according to Illuminating Engineering Society (IES) roadway classification type.

4. LED Driver and light engine, initial and mean lumen output, and color rendering index. LED drivers and related electrical characteristics and operating conditions.
5. Poles and standards dimensions, details of hand holes and wire entries, mast or bracket arms and connection to poles, wind load and deflection, and finishes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers acceptable contingent upon Product's compliance with the specifications: refer to Lighting Fixture Schedules on the drawings for acceptable manufacturers of light fixtures. Acceptable Pole Manufacturers: Valmont, KW, WJM.
- B. Where lighting regulations exist by the Authority Having Jurisdiction, the Contractor shall be responsible for submission of all documentation and approval from the Authority Having Jurisdiction of the exterior lighting were alternate manufacturers are proposed other than specified. Where approval from an Authority Having Jurisdiction is required, Contractor shall submit, with those product data, confirmation of approval from the Authority Having Jurisdiction.

2.2 LUMINAIRES

- A. Refer to Section 26 51 13 Lighting Fixtures and Lamps, for ballast, drivers, and lamp requirements.
- B. Provide luminaires of the sizes, type and ratings indicated, complete with housings, lenses, refractors, lamps, lamp holders, reflectors, ballasts, starters, igniters, mounting brackets or hardware with adjusting means and wiring.
- C. Provide luminaires with rigidly formed, weather and light tight enclosures that will not warp, sag, or deform in use. Provide housings free from burrs, sharp edges or corners.
- D. Provide captive hardware hinged doors, operating freely, to allow lamp installation and removal without the use of tools. Equip door mechanism to preclude accidental falling of the door when opening or closing or when secured in the closed position. Provide for door removal for cleaning or replacing lens.
- E. Provide stainless steel hinges, latches, fasteners, and hardware to prevent corrosion of hardware or the staining of adjacent surfaces.
- F. Use interior formed and supported light reflecting surfaces having reflectances of not less than 85 percent for white surfaces, 85 percent for specular surfaces, and 75 percent for specular diffuse surfaces.
- G. Use borosilicate tempered glass, lenses and refractors. Use heat and aging resistant resilient gaskets to seal and cushion lens and refractor mounting in luminaire doors.
- H. Provide finishes of the color and type indicated and having the following properties:
 1. Protection of metal from corrosion - 5 year warranty against perforation or erosion of the finish from weathering.

2. Color retention – 5-year warranty against fading, staining, or chalking from weathering, including solar radiation.
 3. Provide finish of uniform thickness and color, free from streaks, stains or orange peel texture.
- I. LED sources shall meet the following requirements:
1. Operating temperature rating shall be between -40 degrees F and 120 degrees F.
 2. Color Rendering Index (CRI): ≥ 65 .
 3. The manufacturer shall have performed JEDEC (Joint Electron Devices Engineering Council) reliability tests on the LEDs as follows: High Temperature Operating Life (HTOL), Room Temperature Operating Life (RTOL), Low Temperature Operating Life (LTOL), Powered Temperature Cycle (PTMCL), Non-Operating Thermal Shock (TMSK), Mechanical Shock Variable Vibration Frequency, and Solder Heat Resistance (SHR).
- J. LED drivers shall meet the following requirements:
1. Drivers shall have a minimum efficiency of 85%.
 2. Starting Temperature: -40° F.
 3. Input Voltage: 120 to 480 ($\pm 10\%$) V.
 4. Power Supplies: Class I or II output.
 5. Surge Protection: The system must survive 250 repetitive strikes of “C Low” (C Low: 6kV/1.2 x 50 μ s, 10kA/8 x 20 μ s) waveforms at 1-minute intervals with less than 10% degradation in clamping voltage. “C Low” waveforms are as defined in IEEE/ASNI C62.41.2-2002, Scenario 1 Location Category C.
 6. Power Factor (PF): ≥ 0.90 .
 7. Total Harmonic Distortion (THD): $\leq 20\%$.
 8. Comply with FCC Title 47 CFR Part 18 Non-consumer RFI/EMI Standards.
 9. Drivers shall be reduction of hazardous substances (ROHS)-compliant.

2.3 POLES AND STANDARDS

- A. Provide poles of the types and heights indicated. Provide internal raceway for underground power supply, with luminaire support pole base indicated. Provide poles that will carry the indicated supports, luminaires and appurtenances, at the required heights above grade, without excessive deflection or whipping of the luminaire when subjected to 120 mph basic wind speed with 1.3 gust factor. Pole structural integrity shall rely solely on the anchor bolts, nuts and washers. Pole shall not be in direct contact with concrete base or mortar.
- B. Provide metal lighting poles with steel or aluminum shaft; equipped for post top or mast arm luminaire mounting. Provide wiring access hand hole with welded $\frac{1}{2}$ " NC ground lug, readily accessible from hand hole opening. Provide features as follows:
1. Provide a one-piece pole shaft fabricated from a weldable grade carbon structural steel tubing with a uniform thickness as required. Material shall conform to ASTM A-500, Grade C.
 2. Provide anchor base of the same material and finish as the pole, welded to the pole. Provide adequately sized (at least 15 square inches) hand hole with screwed cover. Provide galvanized steel hold-down or anchor bolts and leveling nuts. Provide full base cover.
 3. Factory prime coat with polyester powder-coat paint. Steel poles shall be hot dipped galvanized, with prime coat, with 8 mil minimum polyester powder-coat paint. Color to match light fixture.
- C. Anchor bolts:
1. Provide zinc coated anchor bolts and nuts. Length shall be per pole

manufacturer's shop drawings, complete with 3 inch right angle bend on one end and 6 inches of thread on the other end. Provide zinc coated flat washers, lock washers, and hexagonal nuts for each pole.

2. Provide template for positioning of anchor bolts.

D. Accessories:

1. Full base covers, finish to match pole.
2. Hand hole with cover plate and vandal resistant hardware.

2.4 LUMINAIRE MOUNTING

- A. Provide corrosion resistant metal luminaire mounting compatible with the poles and fixtures that will not cause galvanic action at contact points. Provide mounting that will correctly position the luminaire to provide the required light distribution. Provide drill mounting to pole shaft unless specified otherwise.
- B. Provide brackets, cantilevered and without under brace, of the sizes, styles, and finishes indicated with straight tubular end section to accommodate the luminaire.
- C. Provide steel tenon only for single fixture yoke or spider post top mounting securely fastened to the top of the pole shaft, fabricated to accept and rigidly support the luminaire to be mounted thereon. Set screws shall have pole shaft drilled to prevent rotational movement.

PART 3 - EXECUTION

3.1 LIGHTING POLE INSTALLATION

- A. Contractor shall not rough-in conduit, drill or pour concrete foundations for site lighting until review of the site lighting submittals is complete. This is to ensure coordination with the current site plan paving and utilities and photometric performance of the submitted product.
- B. Install lighting poles as follows:
 1. Install lighting poles and standards as indicated, in accordance with manufacturer's written instructions, and in compliance with ANSI C2.
 2. Provide excavation and poured concrete bases using 3,000 pound 28-day concrete, and provide anchor hook-bolts, nuts and washers in conformance with the details and manufacturer's requirements. Refer to Division 3 for concrete work. Project anchor bolts 2-inches minimum above base. Use double nuts for adjustment.
 3. To protect finish, use fabric web slings (not chain or cable) to raise and set finished poles and standards.
 4. Install pole clear of contact of concrete base or mortar.
- C. Grounding: Provide equipment bonding and grounding connections, sufficiently tight to assure permanent and effective grounds. Bond all metal, non-current carrying parts to ground. Provide 25-foot #4 solid ground electrode from pole base hand holes encased in concrete pier, to bottom of concrete pier with excess ground electrode coiled at bottom of concrete pier. Secure the ground electrode to the reinforcement steel to prevent movement during concrete pour. Bond all metal parts of the pole shaft ground lug. Provide #6 electrode grounding conductor from pole base ground lug to the ground conductor, using thermal fusion (exothermic) methods.
- D. Wiring:
 1. Provide Type SO cord from base of pole lights to top of poles. Do not use single

- conductors.
2. Install inline fuse holders, fuses, at base of pole lights on each lighting circuit. Provide Bussman Insulating boot Catalog # 2A0660 installed over conductor terminations. Fuse size shall be as follows:

WATTAGE	# OF Fixtures	208V	240V	277V	480V
0-400	1	5	5	5	5
0-400	2	8	8	5	5
0-400	3	10	10	8	5
0-400	4	15	10	10	8
401-1000	1	10	8	8	5
401-1000	2	15	15	15	8

3. Provide Styrofoam wedge at midpoint of pole to stabilize conductor.
4. Provide strain/stress relief on SO cord at top of pole.

3.2 LUMINAIRE INSTALLATION

- A. Install exterior luminaires at locations and heights as indicated, in accordance with the manufacturer's written instructions, applicable requirements of NFPA 70, ANSI C2 and with recognized industry practices to ensure that lighting installation fulfills requirements.
- B. Fasten luminaires securely to indicated structural supports and check to ensure that the required degree of freedom is provided to allow alignment or aiming of the fixtures for indicated light distribution.
- C. Clean exterior luminaires of dirt and debris upon completion of installation. Do not damage finishes or lens or refractor surfaces.
- D. Provide equipment grounding connections using branch circuit equipment and connected sufficiently tight to assure a permanent and effective ground.

3.3 TESTS AND DEMONSTRATIONS

- A. Upon installation of lighting fixtures, and after building circuits are energized, apply electrical energy to demonstrate proper operations of lighting fixtures, emergency lighting, and controls. Correct malfunctioning units, then retest to demonstrate proper operation; otherwise, remove and replace with new units, and proceed with retesting. Verify correct reflector types and orientation prior to final aiming.
- B. Pre-Inspection Tasks: Immediately before final inspection, clean fixtures inside and out, including reflectors, plastics and glassware, adjust trim to fit adjacent surfaces, replace broken or damaged parts, and lamp and test fixtures for electrical and mechanical operations. Any fixtures, or parts of fixtures that show signs of rust or corrosion at the time of completion, shall be removed, and replaced with protected metal parts. Pre-aim lighting fixtures as practical prior to final aiming and adjustment.
- C. Final aiming and adjustment: Aim and adjust lighting fixtures for their intended purpose as specified or as required. Adjustments may include but not be limited to directional aiming, adjusting selectable lumen output, selectable correlative color temperature (CCT), selectable beam pattern, replacing/installing fixture manufacture's optional optical lens used for adjusting beam patterns or for softening beam edges, replacing/installing manufacture's optional theatrical/specialty color lens colors. Re-aim and re-adjust as required to the satisfaction of the Architect / Owner, including nighttime adjustment of exterior lighting in the presence of the Architect / Owner.

3.4 LAMP REPLACEMENT AND PROVISION OF SPARE LAMPS

- A. At time of substantial completion, replace lamps in luminaires that are observed to be not functioning properly after Contractor's use and testing. Provide spare replacement non-LED lamps amounting to 10 percent (but not less than ten lamps in each case) of each type and size lamp used in each type fixture.

END OF SECTION

SECTION 21 01 00

FIRE PROTECTION OPERATING AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Compilation product data and related information appropriate for Owner's operation and maintenance of products furnished under Contract. Prepare operating and maintenance data as specified.
- B. Instruct Owner's personnel in operation and maintenance of equipment and systems.
- C. Submit three copies of complete manual in final form.

1.2 SUBMITTALS

- A. Thirty (30) days after the Contractor has received the final scheduled identified submittals bearing the Architect / Engineer's stamp of acceptance (including resubmittals), submit for review one copy of the first draft of the Operating and Maintenance Manual. This copy shall contain as a minimum:
 - 1. Table of Contents for each element.
 - 2. Contractor information.
 - 3. All submittals, coordination drawings and product data, reviewed by the Architect / Engineer; bearing the Architect / Engineer's stamp of acceptance. (When submittals are returned from Engineer "Correct as Noted", corrected inserts shall be included.)
 - 4. All parts and maintenance manuals for items of equipment.
 - 5. Warranties (without starting dates).
 - 6. Certifications that have been completed. Submit forms and outlines of certifications that have not been completed.
 - 7. Operating and maintenance procedures.
 - 8. Form of Owner's Training Program Syllabus (including times and dates).
 - 9. Control operations/equipment wiring diagrams.
 - 10. Other required operating and maintenance information that are complete.
- B. Copy will be returned to the Contractor within 15 days with comments for corrections.
- C. Submit completed manuals in final electronic form to the Architect / Engineer one day after substantial completion, and prior to Owner's instructions. Include all specified data, test and balance reports, drawings, dated warranties, certificates, reports, along with other materials and information.
- D. The Architect / Engineer will review the manuals for completeness within fifteen (15) days.
- E. The Contractor shall be notified of any missing or omitted materials. The Manuals shall be reworked by the Contractor, as required, in the office of the Architect / Engineer. The manuals will not be retransmitted.
- F. Complete electronic manuals will be delivered to the Owner.

PART 2 - PRODUCTS

2.1 BINDERS

- A. Commercial quality black three-ring binders with clear overlay plastic covers.
- B. Minimum ring size: 1"; Maximum ring size: 3".
- C. When multiple binders are used, correlate the data into related groupings.
- D. Label contents on spine and face of binder with full size insert. Label under plastic cover.

PART 3 - EXECUTION

3.1 OPERATION AND MAINTENANCE MANUAL

- A. Form for Manuals:
 - 1. Prepare data in form of an instructional manual for use by Owner's personnel.
 - 2. Format:
 - a. Size: 8-1/2" x 11".
 - b. Text: Manufacturer's printed data or neatly typewritten.
 - 3. Drawings:
 - a. Provide reinforced punched binder tab and bind in text.
 - b. Fold larger drawings to size of text pages.
 - 4. Provide flyleaf indexed tabs for each separate product or each piece of operating equipment.
 - 5. Cover: Identify each volume with typed or printed title "Operating and Maintenance Instructions". List:
 - a. Title of Project.
 - b. Identity of separate structures as applicable.
 - c. Identity of general subject matter covered in the manual.
 - 6. Binder as specified.
- B. Content of Manual:
 - 1. Neatly typewritten Table of Contents for each volume arranged in systematic order as outlined in the specifications.
 - a. Contractor, name of responsible principal, address and telephone number.
 - b. A list of each product required to be included, indexed to content of the volume.
 - c. List with each product, name, address and telephone number of:
 - 1) Subcontractor or installer.
 - 2) Maintenance contractor as appropriate.
 - 3) Identify area of responsibility of each.
 - 4) Local source of supply for parts and replacement.
 - d. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
 - 2. Product Data:
 - a. Include those sheets pertinent to the specific product
 - b. Annotate each sheet to:
 - 1) Identify specific product or part installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information. (All options not supplied with equipment shall be marked out indicated in some manner.
 - 3. Drawings:

- a. Supplement product data with drawings as necessary to illustrate:
 - 1) Relations of component parts of equipment and systems.
 - 2) Control and flow diagrams.
 - b. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 - c. Do not use Project Record Documents as maintenance drawings.
 - 4. Written text, as required to supplement product data for the particular installation:
 - a. Organize in consistent format under separate headings for different procedures.
 - b. Provide logical sequence of instructions for each procedure.
 - 5. Copy of each warranty, bond and service contract issued.
 - a. Provide information sheet for Owner's personnel, giving:
 - 1) Proper procedures in event of failure
 - 2) Instances that might affect validity of warranties or bonds
 - 6. Shop drawings, coordination drawings and product data as specified.
- C. Sections for Equipment and Systems.
- 1. Content for each unit of equipment and system as appropriate:
 - a. Description of unit and component parts
 - 1) Function, normal operating characteristics, and limiting conditions
 - 2) Performance curves, engineering data and tests
 - 3) Complete nomenclature and commercial number of replaceable parts.
 - b. Operating procedures:
 - 1) Start up, break-in, routine and normal operating instructions.
 - 2) Regulation, control, stopping, shut down and emergency instructions.
 - 3) Summer and winter operating instructions.
 - 4) Special operating instructions.
 - c. Maintenance procedures:
 - 1) Routine operations
 - 2) Guide to trouble-shooting.
 - 3) Disassembly, repair and reassembly.
 - 4) Alignment, adjusting and checking.
 - 5) Routine service based on operating hours.
 - d. Servicing and lubrication schedule. List of lubricants required.
 - e. Manufacturer's printed operating and maintenance instructions.
 - f. Description of sequence of operation by control manufacturer.
 - g. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - 1) Predicted life of part subject to wear.
 - 2) Items recommended to be stocked as spare parts.
 - h. As installed control diagrams by controls manufacturer.
 - i. Complete equipment internal wiring diagrams.
 - j. Each Contractor's coordination drawings.
 - k. As installed color coded piping diagrams.
 - l. Charts of valve tag number, with location and function of each valve.
 - m. List of original manufacturer's spare parts and recommended quantities to be maintained in storage.
 - n. Other data as required under pertinent sections of the specifications.
 - 2. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.
 - 3. Additional requirements for operating and maintenance data as outlined in respective sections of specifications.
 - 4. Provide complete information for products specified in Division 21.

5. Provide certificates of compliance as specified in each related section.
6. Provide start up reports as specified in each related section.
7. Provide signed receipts for spare parts and material.
8. Provide training report and certificates.
9. Provide backflow preventer certified test reports.

END OF SECTION

SECTION 21 05 00

FIRE PROTECTION GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Except as modified in this Section, General Conditions and Supplementary Conditions, applicable provisions of the General Requirements, and other provisions and requirements of the contract documents apply to work of Division 21 Fire Sprinkler Systems.
- B. Applicable provisions of this section apply to all sections of Division 22, Plumbing.

1.2 CODE REQUIREMENTS AND FEES

- A. Perform work in accordance with applicable statutes, ordinances, codes and regulations of governmental authorities having jurisdiction.
- B. Plumbing work shall comply with applicable inspection services:
 - 1. Underwriters Laboratories.
 - 2. National Fire Protection Association.
 - 3. State Health Department.
 - 4. Local Municipal Building Inspection Department.
- C. Resolve any code violations discovered in contract documents with the Engineer prior to award of the contract. After Contract award, any correction or additions necessary for compliance with applicable codes shall be made at no additional cost to the Owner.
- D. This Contractor shall be responsible for being aware of and complying with asbestos NESHAP regulations, as well as all other applicable codes, laws and regulations.
- E. Obtain all permits required.

1.3 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this division shall be:
 - 1. A licensed specialist in this field and have the personnel, experience, training, skill, and organization to provide a practical working system
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that has served their Owners satisfactorily for not less than 3 years.

1.4 REFERENCE SPECIFICATIONS AND STANDARDS

- A. Materials which are specified by reference to Federal Specifications; ASTM, ASME, ANSI, or AWWA Specifications; Federal Standards; or other standard specifications must comply with latest editions, revisions, amendments or supplements in effect on date bids are received. Requirements in reference specifications and standards are minimum for all equipment, material, and work. In instances where specified capacities, size, or other features of equipment, devices, or materials exceed these minimums, meet specified capacities.

1.5 CONTRACT DRAWINGS

- A. Contract drawings are diagrammatic only and do not give fully dimensioned locations of various elements of work. Determine exact locations from field measurements.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain at the job site a separate set of white prints (blue line or black line) of the contract drawings for the sole purpose of recording the "as-built" changes and diagrams of those portions of work in which actual construction is at variance with the contract drawings. Mark the drawings with a colored pencil. Prepare, as the work progresses and upon completion of work, reproducible drawings clearly indicating locations of various lines, valves, ductwork, traps, equipment, and other pertinent items, as installed. Include flow-line elevation of sewer lines. Record existing and new underground and under slab piping with dimensioned locations and elevations of such piping.
- B. At the conclusion of project, obtain without cost to the Owner, original drawings and transfer as-built changes to these. Prior to transmittal of corrected drawings, obtain 3 sets of prints of each drawing, regardless of whether corrections were necessary and include in the transmittal (2 sets are for the Owner's use and one set is for the Architect/Engineer's records). Delivery of these as-built prints and reproducible is a condition of final acceptance. Provide record drawings on one set each and AutoCad 2012 / Revit CAD files.
- C. As-Built drawings should indicate the following information as a minimum:
 1. Indicate all addendum changes to documents.
 2. Remove Engineer's seal, name, address and logo from drawings.
 3. Mark documents RECORD DRAWINGS.
 4. Clearly indicate: DOCUMENT PRODUCED BY.
 5. Indicate all changes to construction during construction. Indicate actual routing of all piping, etc. that were deviated from construction drawings.
 6. Correct schedules to reflect (actual) equipment furnished and manufacturer.
 7. During the execution of work, maintain a complete set of drawings and specifications upon which all locations of equipment, ductwork, piping, devices, and all deviations and changes from the construction documents in the work shall be recorded.
 8. Location and size of all ductwork and mechanical piping above ceiling including exact location of isolation of domestic and plumbing valves.
 9. Exact location of all electrical equipment in and outside of the building.
 10. Fire Protection System documents revised to indicate exact location of all sprinkler heads and zone valves.
 11. Exact location of all roof mounted equipment, wall, roof and floor penetrations.
 12. Cloud all changes.

1.7 SPACE REQUIREMENTS

- A. Consider space limitations imposed by contiguous work in selection and location of equipment and material. Do not provide equipment or material that is not suitable in this respect.

1.8 RELATION WITH OTHER TRADES

- A. Carefully study all matters and conditions concerning the project. Submit notification of conflict in ample time to prevent unwarranted changes in any work. Review other Divisions of these specifications to determine their requirements.

- B. Because of the complicated relationship of this work to the total project, conscientiously study the relation and cooperate as necessary to accomplish the full intent of the documents.
- C. Provide sleeves and inserts in forms as required for the work. Stub up and protect open ends of pipe before any concrete is placed. Furnish sizes of required equipment pads. Furnish and locate bolts and fittings required to be cast in them.
- D. Locate and size openings required for installation of work specified in this Division in sufficient time to prevent delay in the work.
- E. Refer to other Divisions of the specifications for the scope of required connections to equipment furnished under that Division. Determine from the Contractor for the various trades, the Owner, and by direction from the Architect/Engineer, the exact location of all items.

1.9 CONCEALED AND EXPOSED WORK

- A. When the word "concealed" is used in connection with insulating, painting, piping, ducts and the like, the work is understood to mean hidden from sight as in chases, furred spaces or above ceilings. "Exposed" is understood to mean open to view.

1.10 GUARANTEE

- A. Guarantee work for 1 year from the date of substantial completion of the project. During that period make good any faults or imperfections that may arise due to defects or omissions in material, equipment or workmanship. At the Owner's option, replacement of failed parts or equipment shall be provided.

1.11 MATERIAL AND EQUIPMENT

- A. Furnish new and unused materials and equipment meeting the requirements of the paragraph specifying acceptable manufacturers. Where two or more units of the same type or class of equipment are required, provide units of a single manufacturer.

1.12 NOISE AND VIBRATION

- A. Select equipment to operate with minimum noise and vibration. If objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of work, rectify such conditions at no additional cost. If the item of equipment is judged to produce objectionable noise or vibration, demonstrate at no additional cost that equipment performs within designated limits on a vibration chart.

1.13 ACCEPTABLE MANUFACTURERS

- A. Manufacturers names and catalog number specified under sections of Division 21 are used to establish standards of design, performance, quality and serviceability and not to limit competition. Equipment of similar design, equal to that specified, manufactured by a named manufacturer will be acceptable on approval. A request for prior approval of equipment not listed must be submitted ten (10) days before bid due date. Submit complete design and performance data to the Engineer.

1.14 OPERATING TESTS

- A. After all plumbing systems have been completed and put into operation, subject each system to an operating test under design conditions to ensure proper sequencing and

operation throughout the range of operation. Tests shall be made in the presence of the Architect/Engineer. Make adjustments as required to ensure proper functioning of all systems. Special tests on individual systems are specified under individual sections. Submit 3 copies of all certifications and test reports adequately in advance of completion of the work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

1.15 WARRANTIES

- A. Submit 3 copies of all warranties and guarantees for systems, equipment, devices and materials. These shall be included in the Operating and Maintenance Manuals.

1.16 BUILDING CONSTRUCTION

- A. It shall be the responsibility of each sub-contractor to consult the Architectural and Engineering drawings, details, and specifications and thoroughly familiarize himself with the project and all job related requirements. Each sub-contractor shall cooperate with the General Contractor to verify that all piping and other items are placed in the walls, furred spaces, chases, etc., so there will be no delays in the job.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 OPENINGS

- A. Framed, cast or masonry openings for ductwork, equipment or piping are specified under other divisions. Drawings and layout work for exact size and location of all openings are included under this division.

3.2 HOUSEKEEPING PADS

- A. Provide equipment housekeeping pads under all floor mounted and ground mounted plumbing equipment, and as shown on the drawings.
- B. Concrete work as specified in Division 3.
- C. Concrete pads:
 - 1. 4" high, rounded edges, minimum 2500 psi unless otherwise indicated on the drawings
 - 2. Chamfer strips at edges and corner of forms.
 - 3. Smooth steel trowel finish.
 - 4. Doweled to existing slab
- D. Install concrete curbs around multiple pipe penetrations.

3.3 VANDAL RESISTANT DEVICES

- A. Where vandal resistant screws or bolts are employed on the project, deliver to the Owner 2 suitable tools for use with each type of fastener used.
- B. Proof of delivery of these items to the Owner shall be included in the Operating and Maintenance Manuals.

3.4 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection, conduct an on-site training program to instruct the Owner's operating personnel in the operation and maintenance of the fire protection systems.
 - 1. Provide the training during the Owner's regular working day.
 - 2. The instructors shall each be experienced in their phase of operation and maintenance of building plumbing systems and with the project.
- B. Time to be allocated for instructions.
 - 1. Minimum of 4 hours dedicated instructor time.
 - 2. 2 hours on each of 2 days.
- C. Before proceeding with the on-site training program, submit the program syllabus; proposed time and dates; and other pertinent information for review and approval.
 - 1. One copy to the Owner.
 - 2. One copy to the Architect/Engineer.
- D. The Owner will provide a list of personnel to receive instructions, and will coordinate their attendance at the agreed upon times.
- E. Use the operation and maintenance manuals as the basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shut down of each item of equipment.
- G. Demonstrate equipment functions (both individually and as part of the total integrated system).
- H. Prepare and insert additional data in the operating and maintenance manuals when the need for additional data becomes apparent during instructions.
- I. Submit a report within one week after completion of the training program that instructions have been satisfactorily completed. Give time and date of each demonstration and hours devoted to the demonstration, with a list of people present.
- J. At the conclusion of the on-site training program, have the person designated by the Owner sign a certificate to certify that he/she has a proper understanding of the system, that the demonstrations and instructions have been satisfactorily completed, and the scope and content of the operating and maintenance manuals used for the training program are satisfactory.
- K. Provide a copy of the report and the certificate in an appropriately tabbed section of each Operating and Maintenance Manual.

3.5 EQUIPMENT IDENTIFICATION

- A. Provide a laminated engraved plastic nameplate on each piece of equipment and starter.
 - 1. Designation approved by Architect/Engineer.
 - 2. Equipment includes, but is not limited to, pumps, and utility controllers.
 - 3. Submit schedule of equipment to be included and designations.
- B. Provide nameplates with 1/2" high letters and fastened with epoxy or screws.

3.6 OBSTRUCTIONS

- A. The drawings indicate certain information pertaining to surface and subsurface obstructions which has been taken from available drawings. Such information is not guaranteed, however, as to accuracy of location or complete information.
 - 1. Before any cutting or trenching operations are begun, verify with Owner's representative, utility companies, municipalities, and other interested parties that all available information has been provided.
 - 2. Should obstruction be encountered, whether shown or not, alter routing of new work, reroute existing lines, remove obstruction where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of the new work and leave existing services and structures in a satisfactory and serviceable condition.
- B. Assume total responsibility for and repair any damage to existing utilities or construction, whether or not such existing facilities are shown.

3.7 PROTECTION

- A. Protect work, equipment, fixtures, and materials. At work completion, work must be clean and in original manufacturer's condition.

END OF SECTION

SECTION 21 05 10

FIRE PROTECTION CONTRACT QUALITY CONTROL

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Contract quality control including workmanship, manufacturer's instructions and demonstrations.

1.2 QUALITY CONTROL PROGRAM

- A. Maintain quality control over supervision, subcontractors, suppliers, manufacturers, products, services, site conditions and workmanship to produce work in accordance with contract documents.

1.3 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking. Under no conditions shall material or equipment be suspended from structural bridging.
- D. Provide finishes to match approved samples. All exposed finishes shall be approved by the Architect. Submit color samples as required.

1.4 MANUFACTURER'S INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence.
- B. Should instruction conflict with Contract Documents, request clarification from Architect / Engineer before proceeding.

1.5 MANUFACTURER'S CERTIFICATES

- A. When required in individual Specification Sections, submit manufacturer's certificate in duplicate, certifying that products meet or exceed specified requirements.

1.6 MANUFACTURER'S FIELD SERVICES

- A. When required in individual Specification Sections, manufacturer shall provide qualified personnel to observe:
 - 1. Field conditions.
 - 2. Condition of installation.
 - 3. Quality of workmanship.
 - 4. Start-up of equipment.
 - 5. Testing, adjusting, and balancing of equipment.
- B. Representative shall make written report of observations and recommendations to Architect / Engineer.

PART 2 - PRODUCTS

2.1 REFERENCE APPLICABLE SPECIFICATION SECTIONS.

PART 3 - EXECUTION

3.1 PROTECTION OF EQUIPMENT

- A. Do not deliver equipment to the project site until progress of construction has reached the stage where equipment is actually needed or until building is closed in enough to protect the equipment from weather. Equipment allowed to stand in the weather will be rejected, and the Contractor is obligated to furnish new equipment of a like kind at no additional cost to the Owner.
- B. Adequately protect equipment from damage after delivery to the project. Cover with heavy tarpaulins, drop cloths or other protective coverings as required to protect from plaster, paint, mortar and/or dirt. Do not cover with plastic materials and trap condensate and cause corrosion.

END OF SECTION

SECTION 21 05 12

FIRE PROTECTION SHOP DRAWINGS, COORDINATION DRAWINGS & PRODUCT DATA

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Prepare submittals as required by Division 1.
- B. The term submittal, as used herein, refers to all:
 - 1. Shop Drawings.
 - 2. Coordination Drawings.
 - 3. Product data.
- C. Submittals shall be prepared and produced for:
 - 1. Distribution as specified.
 - 2. Inclusion in the Operating and Maintenance Manual, as specified, in the related section.

1.2 SHOP DRAWINGS

- A. Present drawings in a clear and thorough manner. Identify details by reference to sheet and detail, schedule, or room numbers shown on Contract Drawings.
- B. Show all dimensions of each item of equipment on a single composite Shop Drawing. Do not submit a series of drawings of components.
- C. Identify field dimensions; show relationship to adjacent features, critical features, work, or products.
- D. Submit shop drawings in plan, elevation and sections, showing equipment in mechanical equipment areas.

1.3 COORDINATION DRAWINGS

- A. Present in a clear and thorough manner. Title each drawing with project name. Identify each element of drawings by reference to sheet number and detail, or room number of contract documents. Minimum drawing scale: 1/8" = 1'-0".
- B. Prepare coordination drawings to coordinate installations for efficient use of available space, for proper sequence of installation, and to resolve conflicts. Coordinate with work specified in other sections and other divisions of the specifications.
- C. For each mechanical room and for each outside equipment pad where equipment is located, submit plan and elevation drawings. Show:
 - 1. Actual mechanical equipment and components to be furnished.
 - 2. Service clearance.
 - 3. Relationship to other equipment and components.
 - 4. Roof drains and leader piping.
 - 5. Fire protection piping and equipment.
- D. Identify field dimensions. Show relation to adjacent or critical features of work or products.
- E. Related requirements:
 - 1. Ductwork shop drawings.

2. Coordination drawing specified in Division 26.

F. Submit shop drawings in plan, elevation and sections, showing equipment in mechanical equipment areas.

1.4 PRODUCT DATA AND INSTALLATION INSTRUCTION

- A. Submit only pages which are pertinent to the project. All options which are indicated on the product data shall become part of the contract and shall be required whether specified are not.
- B. Mark each copy of standard printed data to identify pertinent products, referenced to specification section and article number.
- C. Show reference standards, performance characteristics and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions and required clearances.
- D. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.
- E. Mark up a copy of the specifications for the product. Indicate in the margin of each paragraph the following: "Comply, "Do Not Comply", or "Not Applicable". Explain all "Do Not Comply" statements.
- F. Provide a separate transmittal for each submittal item. Transmittals shall indicate product by specification section name and number. Separate all submittals into appropriate specification section number. Do not combine specification sections.

1.5 MANUFACTURERS INSTRUCTIONS

- A. Submit Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, calibrating, balancing and finishing.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Review submittals prior to transmittal.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Manufacturer's catalog numbers.
 - 4. Conformance with requirements of Contract Documents.
- C. Coordinate submittals with requirements of the work and of the Contract Documents.
- D. Notify the Architect / Engineer in writing at time of submission of any deviations in the submittals from requirements of the Contract Documents.
- E. Do not fabricate products, or begin work for which submittals are specified, until such submittals have been produced and bear contractor's stamp. Do not fabricate products or begin work scheduled to have submittals reviewed until return of reviewed submittals with Architect / Engineer's acceptance.

- F. Contractor's responsibility for errors and omissions in submittals is not relieved whether Architect / Engineer reviews submittals or not.
- G. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved whether Architect / Engineer reviews submittals or not, unless Architect / Engineer gives written acceptance of the specific deviations on reviewed documents.
- H. Submittals shall show sufficient data to indicate complete compliance with Contract Documents:
 - 1. Proper sizes and capacities.
 - 2. That the item will fit in the available space in a manner that will allow proper service.
 - 3. Construction methods, materials and finishes.
- I. Schedule submissions at least 15 days before date reviewed submittals will be needed.

1.7 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Project or in the work of any other Contractor.
- B. Number of submittals required:
 - 1. Shop Drawings and Coordination Drawings: Submit one reproducible transparency and three opaque reproductions.
 - 2. Product Data: Submit the number of copies which the contractor requires, plus those which will be retained by the Architect / Engineer.
- C. Accompany submittals with transmittal letter, in duplicate, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. The number of each Shop Drawing, Project Datum and Sample submitted.
 - 5. Other pertinent data.
- D. Submittals shall include:
 - 1. The date of submission.
 - 2. The project title and number.
 - 3. Contract Identification.
 - 4. The names of:
 - a. Contractor.
 - b. Subcontractor.
 - c. Supplier.
 - d. Manufacturer.
 - 5. Identification of the product.
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or federal specifications numbers.
 - 9. Identification of deviations from contract documents.
 - 10. Suitable blank space for General Contractor and Architect / Engineer stamps.
 - 11. Contractor's signed and dated Stamp of Approval.
- E. Coordinate submittals into logical groupings to facilitate interrelation of the several items:
 - 1. Finishes which involve Architect / Engineer selection of colors, textures or patterns.
 - 2. Associated items which require correlation for efficient function or for installation.

1.8 SUBMITTAL SPECIFICATION INFORMATION

- A. Every submittal document shall bear the following information as used in the project manual:
 - 1. The related specification section number.
 - 2. The exact specification section title.
- B. Submittals delivered to the Architect / Engineer without the specified information will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

1.9 RESUBMISSION REQUIREMENTS

- A. Make re-submittals under procedures specified for initial submittals.
 - 1. Indicate that the document or sample is a re-submittal.
 - 2. Identify changes made since previous submittals.
- B. Indicate any changes which have been made, other than those requested by the Architect / Engineer.

1.10 CONTRACTOR'S STAMP OF APPROVAL

- A. Contractor shall stamp and sign each document certifying to the review of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.
- B. Contractor's stamp of approval on any submittal shall constitute a representation to Owner and Architect / Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that Contractor has reviewed or coordinated each submittal with the requirements of the work and the Contract Documents.
- C. Do not deliver any submittals to the Architect / Engineer that do not bear the Contractor's stamp of approval and signature.
- D. Submittals delivered to the Architect / Engineer without Contractor's stamp of approval and signature will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

1.11 ARCHITECT / ENGINEER REVIEW OF IDENTIFIED SUBMITTALS

- A. The Architect / Engineer will:
 - 1. Review identified submittals with reasonable promptness and in accordance with schedule
 - 2. Affix stamp and initials or signature, and indicate requirements for re-submittal or approval of submittal
 - 3. Return submittals to Contractor for distribution or for resubmission
- B. Review and approval of submittals will not extend to design data reflected in submittals which is peculiarly within the special expertise of the Contractor or any party dealing directly with the Contractor.
- C. Architect / Engineer's review and approval is only for conformance with the design concept of the project and for compliance with the information given in the contract.

1. The review shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.
 2. The review shall not extend to review of quantities, dimensions, weights or gauges, fabrication processes or coordination with the work of other trades.
- D. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

1.12 SUBSTITUTIONS

- A. Do not make requests for substitution employing the procedures of this Section.
- B. The procedure for making a formal request for substitution is specified in Div. 1.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

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SECTION 21 10 00

FIRE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Design coordination of sprinkler work with the installations of other trades as shown on their drawings; all mechanical, electrical, plumbing and sprinkler work must fit the space requirements. The sprinkler work shall comply with other Sections of this specification; and fit the structure finishes. The Sprinkler Contractor will comply with all the codes and underwriter authorities, and the requirements for the installation of inside and outside piping; including sprinkler heads, valves, tamper switches, flow switches, hangers and supports, sleeves, fire department connections, inspector test connections, main drain and accessories, signs, and any other component parts reasonably incidental to providing a complete protection system. Provide 100 percent coverage for the areas indicated on the plans.
- B. A wet system shall be installed in heated areas and dry pipe systems in areas subject to freezing. When heated areas are not available and dry pipe system not used, provide heat tracing and / or insulation installed per NFPA and per local Fire Marshall Requirements, or as indicated on drawings.
- C. Furnish all articles of a completed sprinkler system including all materials, labor, tools, equipment, transportation services and supervision fees.
- D. The existing fire sprinkler riser assembly to remain. Connect new sprinkler mains to existing mains of sufficient size. Modify existing sprinkler head locations and add new heads as required for remodeled areas. These are a guide for subsequent preparation of the Contractor's detailed installation drawings of the complete fire protection sprinkler system which shall be submitted to the Architect / Engineer for review. Submit only drawings and calculations bearing the approval of the authority having jurisdiction.
- E. Do not exceed 52,000 square feet of building for each individual sprinkler system.
- F. Install fire protective system identification signs in accordance with NFPA-13.
- G. It shall be the fire protection installer's responsibility to verify pressure at the project site by performing a flow test. Determine if the available static pressure, residual pressure, and flow rate will adequately provide the fire extinguishing system with the necessary operating requirements or if a fire pump, storage tank and necessary appurtenances are required. Notify Architect and Engineer if low water flow / pressure condition exist and inform them of all options prior to proceeding.
 - 1. Fire hydrant flow test data: Static 56 PSI, Residual 54 PSI, Flow 1087 GPM.
 - 2. Projected available hydrant flow of 5177 GPM at 20 PSI residual.
- H. The installation of the entire Sprinkler Systems shall comply with all rules and regulations of the National Board of Fire Underwriters, the Local Building Code, Local Fire Marshall, and Requirements of NFPA Pamphlet 13, and other local authorities exercising jurisdiction.
- I. Study the general, structural, electrical, and mechanical drawings and specifications, in order to become familiar with the building and details as they apply to the work of this Section. Cooperate with all Trades so that there will be no conflict of space. Plumbing flow lines, large ductwork HVAC piping and electrical service feeders shall take

precedence over Fire Protection work, except where it is absolutely necessary to maintain coverage protection.

- J. Provide a water curtain sprinkler system along glazing to create a 1-hour rating, as outlined in NFPA 13. Refer to Architecture plans for locations. Water demand for water curtain shall be added to the ceiling sprinkler water demand at the point of connection, per NFPA 13. Sprinkler heads shall be spaced at 6'-0" o.c., minimum 6 inches and maximum 12 inches from glazing.

1.2 BASIS OF DESIGN

- A. National Fire Protection Association (NFPA), latest edition of NFPA 13, Standard for the Installation of Sprinkler Systems.
- B. Vertical zone valves installed in horizontal position are not acceptable. All zone valves are to be located at water entry into building and mounted in the vertical riser.

1.3 QUALITY ASSURANCE

- A. Sprinkler equipment and installation to be in accordance with recommendations of and approved by local, state, and federal fire authorities.
- B. Equipment and installation to meet requirements of NFPA No. 13, 14, 20, 24, 25, 70 and 72.
- C. Use materials and equipment that are new and of unused, approved by NFPA and as listed in the UL list of "Inspected Fire Protection Equipment and Materials."

1.4 SHOP DRAWINGS

- A. Make complete shop drawings and working drawings of equipment furnished, including detailed drawings of piping and sprinkler head locations. Drawings shall show construction details and dimensions of each piece of equipment and work to be installed. The location of all heads shall be as approved. Where additional heads are required to meet NFPA 13, provide at no additional cost.
- B. Before the shop drawings are submitted to Architect / Engineer, submit drawings to the jurisdictions for approval. All approvals shall be noted on the drawings or by letter from the departments.
- C. The Architect's approval of shop drawings shall not relieve the responsibility of correctly figured dimensions or any errors that may be contained in these drawings. The omission of any material shown on the contract drawings, or specified from the shop drawings, even though approved, shall not relieve the responsibility to furnish and erect them.
- D. Provide ¼ scale drawings to show the location of the water entry into building with all zone valves, and shut-off valves, with alarms and drains at this location. Prepare the sprinkler drawings under the work of this Section.
- E. Submit samples of all sprinkler types for approval.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Johnson Controls (Tyco Fire Products)
 - 1. Gem/Grinnell.

- 2. Central.
- 3. Star Sprinkler.
- B. Automatic Sprinkler Company of America.
- C. Potter Roemer, Inc.
- D. The Reliable Automatic Sprinkler Company.
- E. Viking Corporation.
- F. Victaulic Company of America.
- G. Globe Fire Sprinkler Corporation.

2.2 PIPING AND FITTINGS

- A. Above Slab Inside Building.
 - 1. Pipe 2" and Smaller: Schedule 40, black steel pipe conforming to ASTM A 795 or ASTM A135 joined with threaded fittings.
 - 2. Pipe 2-1/2" and larger, provide ASTM A795 or ASTM A135 UL and FM listed.
 - a. Light wall having a minimum corrosion resistance ratio (CRR) or 1.00 or greater.
 - a. Schedule. 40, black steel pipe joined with rolled grooved fittings.
- B. All piping shall be black carbon steel, except in dry systems where pipe shall be galvanized per ASTM A53.
- C. Fittings used to join pipe shall be listed fabricated fittings or manufactured in accordance with the material and dimension standards listed in table 6.4.1 NFPA 13 and 2.2.1 NFPA 14.

2.3 SPRINKLER HEAD

- A. All sprinklers shall comply with the latest requirements of NFPA 13 with respect to orifice size.
- B. All heads shall be UL listed and/or FM approved and comply with the latest requirements of NFPA 13 with respect to orifice size unless otherwise noted. Sprinkler heads with "O" ring design shall not be acceptable.
- C. Exposed areas:
 - 1. Standard upright type with brass finish and escutcheon. Provide temperature rating per NFPA 13 and UL/FM approvals.
- D. Sidewall applications:
 - 1. Horizontal sidewall type with brass finishes and chrome escutcheon.
 - 2. Unfinished areas and recessed with chrome plated escutcheon. Provide temperature rating per NFPA 13 and UL/FM approvals.
- E. Suspended ceilings:
 - 1. Semi-recessed pendant type with matching push on escutcheon plate with manufacturer painted white finish with glass bulb fusible link. Provide temperature rating per NFPA 13 and UL/FM approvals.
- F. Sprinklers subject to mechanical injury shall be protected with fusible solder type

sprinklers and listed heavy duty bolt on guards. Bulb type sprinklers shall have wire guards for these locations.

1. Storage rooms with exposed structure.
2. Mechanical and Electrical rooms.
3. Below exposed stairs.

2.4 FLOORS AND CEILING PLATES

- A. Provide chrome-plated floor and ceiling plates around pipes exposed to view when passing through walls, floors, partitions, or ceilings in finished areas; size plates to fit pipe or insulation and lock in place.

2.5 DOMESTIC MANUFACTURE

- A. All piping material, pipe and pipe fittings shall be manufactured in the United States of America.

2.6 COUPLINGS

- A. Use listed rolled grooved mechanical couplings to engage and lock grooved, or shouldered pipe ends and to allow for some angular deflection, contraction, and expansion. Coupling consists of ductile iron housing, c-shaped composition sealing gasket and steel bolts. Gasket Material for dry pipe systems shall be silicone and listed for dry pipe service.

2.7 VALVES

- A. Use valves suitable for 175 psig WOG.
- B. Valves to be UL listed and FM approved.
- C. Valve Connections:
 1. Provide valves suitable to connect adjoining piping as specified for pipe joints. Use full line size valves unless noted otherwise.
 2. Screwed ends for pipe sizes 2 inches and smaller.
 3. Flanged ends for pipe sizes 2-1/2 inches and larger.
 4. Solder or screw to solder adapters for copper tubing.
 5. Use grooved body valves with mechanical grooved jointed piping.
- D. Gate Valves:
 1. Up to 2 inches, bronze, outside screw and yoke, rising stem, solid wedge, screwed ends, manufactured by: Mueller, or approved equal.
 2. Over 2 inches, iron body, bronze trim, outside screw and yoke, rising stem, solid wedge, flanged ends; manufactured by Mueller, or approved equal.
- E. Ball Valves:
 1. Up to and including 2 inches, Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing stops, threaded ends with union. Watts or approved equal.
 2. Over 2 inches, cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle. Watts or approved equal.
- F. Check Valves:
 1. Up to 2-inch, bronze, regrind bronze swing disk, solder, or screwed ends; 200 WOG, manufactured by Mueller, or approved equal.
 2. Over 2-inch, iron body bronze trim, swing disk, regrind – renew bronze disk and

seat, flanged ends; 200 WOG, manufactured by Mueller, Globe Model RCV, or approved equal.

2.8 GAUGES

- A. Gauges shall be bourdon tube type with minimum 4-1/2-inch dial and die cast aluminum case with screwed ring and black enamel finish. The movement shall be all stainless steel with Grade A phosphor bronze bourdon tube, brazed at socket and tip. The accuracy of the gauge shall be within one-half of one percent of the scale range. The pointer shall be the micrometer adjustment type recalibrated from the front. Pressure and compound gauges shall have suitable scale ranges and graduations. Suitable for temperatures up to 120 degrees F.
- B. Gauges shall have ¼ inch connections and be mounted with combination stop / snubber needle valve with suitable pressure rating. Scale ranges: 0-200 psi.
- C. Gauge range shall be such that system normal operating pressure falls with 25 percent and 75 percent of the full-scale range.
- D. Pressure scale graduations shall read in psig. Figure intervals shall be in – 20 psig increments, with minor divisions in 2 psig increments.
- E. The accuracy of the gauge shall be at least 0.5 percent of the scale range. Gauge shall be made in accordance with ASME B40.1 accuracy grade 2A.
- F. Manufactured by:
 - 1. Trerice Model No. 4500 Series.
 - 2. Ashcroft.
 - 3. Marsh.
 - 4. Weksler.

2.9 SPARE SPRINKLER HEAD BOX

- A. Provide baked enamel steel box to store 36 sprinkler heads (Minimum of 3 of each type used) for emergency replacement. Provide sprinkler wrench.

PART 3 - EXECUTION

3.1 DESIGN

- A. Design, spacing of sprinkler heads and selection sizes shall conform to the requirements of NFPA 13 for the indicated occupancy.
- B. Uniform discharge density design shall be based on hydraulic calculations using the method outlined in NFPA 13. Density of discharge from sprinkler heads shall conform to NFPA 13.
- C. Friction losses in pipe will be based on a value of “C” = 120 in the Hazen and Williams formula.
- D. Design and install the system so that no part will interfere with doors, windows, heating, mechanical, lighting, or electrical equipment. Do not locate sprinkler heads closer than 3 feet to lighting fixtures or other obstructions.

3.2 LOCATION

- A. Heads shown, if indicated on reflected ceiling plans, are an integral part of the ceiling design. Where heads are not shown or indicated, locate them in the exact center of acoustical ceiling tile unless noted otherwise. In rooms with monolithic plaster or gypsum drywall ceilings, locate the sprinkler heads symmetrically arranged with respect to both axes of the room. Locate sprinkler heads in relation to specialty ceiling elements such as slats, ribs, panels, grids, etc., if not shown on the drawings. Generally, locate heads in the exact center of, or spaced between, such elements. Center heads in corridors.
- B. Locate heads as may be required for coordinated ceiling pattern, even though number of heads exceed minimum code requirements.
- C. Sprinkler heads located in utility or mechanical rooms, penthouses, service corridors, or other such spaces not subject to public view need not be centered in ceiling patterns and may use a straight drop from branch line.
- D. Install a water curtain sprinkler system along glazing to create a 1-hour rating, as outlined in NFPA 13. Refer to plans for locations. Water demand for water curtain shall be added to the ceiling sprinkler water demand at the point of connection, per NFPA 13. Sprinkler heads shall be spaced at 6'-0" on center, minimum 6 inches and maximum 12 inches from glazing.
- E. Where glazing shall be installed in 2-hour fire rated assemblies, the Tyco Window sprinkler shall be utilized as outlined in the ICC Legacy report equivalency requirements. Any glazing requiring fire exposure protection shall also utilize the Tyco window sprinklers.

3.3 PREPARATION

- A. Ream pipes and tubes, clean off scale, rust, oxide, and dirt, inside and outside, before assembly. Remove welding slag or other foreign material from piping.
- B. Pipe beveled each end, per approved procedures.
- C. Hammer clean and flush out piping after welding to remove scale, welding slag and other debris.

3.4 CONNECTION

- A. Make screwed joints with square, clean full cut standard taper pipe threads. Ream after cutting and threading. Red lead and linseed oil or other approved non-toxic joint compound applied to male threads only.
- B. Nipples: Shoulder type; extra heavy where less than 1-1/2 inch is unthreaded.
- C. Clamp cast iron water pipe at fittings with 3/4 inch rods and properly anchor and support.
- D. Use grooved mechanical couplings and mechanical fasteners only in accessible locations.

3.5 COORDINATION

- A. Coordinate the installation schedule for this work with the construction schedule for the Work to ensure orderly progress with minimum delay.

- B. Coordinate interface of fire sprinkler system with the work of other trades to ensure proper and adequate provision for the installation and connection of this system.

3.6 SURFACE CONDITIONS

- A. Before starting each stage of the fire sprinkler systems installation, inspect the installed work of other trades and determine that work is complete enough to allow installation to begin. Ensure that work of other trades has been installed in a manner to permit work of this Section in accordance with approved design.

3.7 INSTALLATION

- A. Run piping concealed above furred ceilings and in joists to minimize obstructions. Expose only heads.
- B. Protect sprinkler heads against mechanical injury with heavy duty bolt-on guards.
- C. Locate system drains and inspector's test connections in utility rooms, mechanical rooms or other readily accessible areas not requiring access through ceiling. Coordinate sprinkler system drain flow rates with plumbing system drainage capacities.
- D. Where low points or drains occur above ceilings or in otherwise finished spaces, furnish drain valve with brass cap and chain.
- E. Locate outside alarms on wall of building and coordinate with Architect.
- F. Provide on interior wall near sprinkler valve, cabinet containing extra sprinkler heads of each type and wrench suitable for each head type.
- G. Provide a minimum 18-inch radius swing joint for each drop to sprinkler heads located in ceilings.
- H. Provide Easy-Flex or Flexhead Industries sprinkler hose fittings for each sprinkler head installation for hydraulically designed wet, pre-action, deluge, or dry pipe sprinkler connections per NFPA 13. Allow a 3" minimum bend radius per UL.
- I. Install pipe markers to identify fire protection.
- J. Provide shield or deflector for sprinklers or equipment where electrical switchgear, switchboards and motor control centers are in sprinkler protected spaces.
- K. Install valves with stems upright or horizontal, not inverted.
- L. Sprinkler heads shall be installed above and below ductwork over 48 inches wide, in exposed areas, per NFPA 13.
- M. Install the complete fire sprinkler system in accordance with the approved shop drawings.
- N. Perform piping installation in accordance with the provisions of the specifications, including furnishing of required sleeves for fire sprinkler system pipes passing through rated walls, floors, and other parts of the building. Provide scheduled 40 galvanized pipe sleeve for concrete or CMU penetrations. Furnish size required for fireproofing and or insulation. Furnish and install split wall plates and chrome plated escutcheons for exposed fire sprinkler system pipes. Where pipes pass through concrete floors, furnish, and install wrought iron or steel pipe sleeves made flush with the ceiling below and extending 2" above the finished floor.

- O. Do not cut or make holes in any part of the building except where shown on the approved shop drawings.
- P. Furnish and install, next to the sprinkler riser main, a print sheet protected by glass or a transparent plastic cover, giving brief instructions regarding control, emergency procedure, and other data required by NFPA #13. For hydraulically designed sprinkler systems, a placard is to be permanently attached to the riser indicating the location, and the basis of design (discharge density and system demand).
- Q. Do not install exposed piping below structure in public area.
- R. Provide heat tracing and insulation on wet piping systems exposed to freezing when not installed in a heated space or installed by other acceptable methods of maintaining the piping from freezing. Installation of heat tracing and insulation shall be in accordance with the latest edition of NFPA 13 and the local code authorities. Coordinate electrical requirements with Division 26.

3.8 SECURING AND SUPPORTING

- A. Support piping to maintain line and grade, with provision for expansion and contraction. Use approved adjustable ring type or trapeze-type hangers connected to structural members of the building. Single pipe runs to be supported by approved adjustable ring type hangers. Multiple pipe runs to be supported by approved trapeze type hangers. Do not support piping from other piping or structural joist bridging.
- B. Provide supports both sides of elbows for pipe 6" and larger. Provide supports on smaller pipe at maximum of 12 inches from elbows and take-offs.
- C. Support vertical risers with steel strap pipe clamps of approved design and size, supported at each floor. Support piping assemblies in chases so they are rigid and self-supported before the chase is closed.
- D. Support spacing: As recommended by the project structural engineer and support manufacturer, but not more than listed below. Not to exceed spacing requirements of smallest pipe.

Pipe Size	Steel Max. Support Spacing, Feet	Minimum Rod Diameter, Inches
1" & smaller	6	3/8
1-1/4" & 1-1/2"	8	3/8
2"	10	3/8
3"	10	1/2
4" & 5"	10	5/8
6" and above	10	3/4

3.9 PIPE SUPPORTS

- A. Provide P1001 or P 5000 Unistrut metal framing members and appurtenances for pipe support. Hot-dip galvanize members and appurtenances when located outside. Sagging of pipes or supports is not acceptable.
- B. Adjustable ring type hangers shall be used for single pipe supports; Erico Model 115 NFPA UL/FM. When oversized clevis is used, a nipple shall be placed over the clevis bolt as a spacer to assure that the lower U-strap will not move in on the bolt. All parts shall be

zinc plated carbon steel, or galvanized.

3.10 PIPE SLEEVES

- A. Sleeves through masonry and concrete construction:
 - 1. Fabricate sleeves of Schedule 40 galvanized steel pipe.
 - 2. Size sleeve large enough to allow for movement due to expansion and to provide continuous insulation.
- B. Sleeves through gypsum wall construction.
 - 1. Fabricate sleeves of 16-gauge galvanized sheet metal.
- C. Sleeves through elevated slab construction.
 - 1. Fabricate sleeves of Schedule 40 galvanized steel pipe with welded center flange in floor.
- D. Extend each sleeve through the floor or wall. Cut the sleeve flush with each wall surface. Sleeves through floors shall extend 2" above floor lines for waterproofing purposes. Slab on grade floors shall not be sleeved except where penetrating waterproofing membrane or insect control is required.
- E. Caulk sleeves water and airtight. Seal annular space between pipes and sleeves with mastic compound to make the space water and airtight.
- F. Provide chrome plated escutcheon plates on pipes passing through walls, floors or ceilings exposed to view. At exterior walls, stainless steel sheet metal is to be used.
- G. For sleeves through fire and smoke rated walls, seal with a UL through-penetration firestop, rated to maintain the integrity of the time rated construction. Install in accordance with the manufacturer's installation instructions. Comply with UL and NFPA standards for the installation of firestops. Refer to Architectural drawings for all fire and smoke rated partitions, walls, floors, etc.

3.11 CLEANING OF PIPING SYSTEMS

- A. General cleaning of piping systems. Purge pipe of construction debris and contamination before placing the systems in service. Provide and install temporary connections as required to clean, purge, and circulate.

3.12 FLUSHING AND TESTING

- A. Testing and flushing of installation of sprinkler system shall be in accordance with NFPA 13, and NFPA 25.
- B. Flush sprinkler piping in accordance with NFPA 13. Additionally, flush all alarm valves, and all main piping up to valve.
- C. In addition to NFPA 13 required tests, provide flow switch test and tamper switch test for each device, and verify alarm valve operation.
- D. All tests shall be witnessed by Architect / Engineer. Contractor shall notify Architect / Engineer 7 working days in advance.

3.13 EXCAVATING, TRENCHING, AND BACKFILLING

- A. Perform excavation, trenching, and backfilling for this portion of the work in accordance

with the specifications.

3.14 PIPE MARKERS

- A. Identify interior exposed piping and piping in accessible chases or plenums with Opti-Code Brady Pressure Sensitive Adhesive Pipe Markers, consisting of pipe marker and direction of flow arrow tape. Clean pipe prior to installation. Background colors of markers, arrows, and tape for each type of system shall be the same. Meet ANSI/OSHA standards and clearly identify each system. Provide minimum 2-1/4-inch letters through 4-inch pipe and 4-inch letters for 5-inch pipe and larger.
- B. Identify exterior and mechanical room piping with Snap Around pipe markers through 4-inch pipe and Strap Around markers 5-inch pipe and larger. Pipe markers consisting of pipe marker and direction of flow arrow tape; background colors of markers, arrows, and type for each type of system shall be the same. Meet ANSI / OSHA standards and clearly identify each system. Provide minimum 2-1/4-inch letters through 4-inch pipe and 4-inch letters for 5-inch pipe and larger.
- C. Install identification in the following locations:
 - 1. Both sides of penetrations through walls, floors, and ceilings.
 - 2. Close to valves or flanges.
 - 3. Intervals on straight pipe runs not to exceed 50 feet.
 - 4. Apply marker where view is obstructed.
- D. Pipe markers shall meet or exceed the specifications of the ASME A13.1 "Scheme for Identification of Piping Systems".

3.15 TESTING AND ACCEPTANCE

- A. Prior to connecting to the overhead sprinkler piping, flush the underground main. Secure required approvals of the flushing operations.
- B. Upon completion of the fire sprinkler system installation, test and retest the complete installation and make corrections as necessary to obtain acceptance by the Fire Marshall and/or any other authority having jurisdiction. Furnish test equipment and personnel required.

3.16 TRAINING

- A. At a time mutually agreed upon, provide 4 hours of instruction to the Owner's designated personnel on the operation and maintenance of the automatic sprinkler system and associated equipment. Owner's Operation and Maintenance Manual prepared for this project shall be used during the instruction.

END OF SECTION

SECTION 23 05 00

MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Except as modified in this Section, General Conditions, Supplementary Conditions, applicable provisions of the General Requirements, and other provisions and requirements of the contract documents apply to work of Division 23 Mechanical.
- B. Applicable provisions of this section apply to all sections of Division 23, Mechanical.

1.2 CODE REQUIREMENTS AND FEES

- A. Perform work in accordance with applicable statutes, ordinances, codes and regulations of governmental authorities having jurisdiction.
- B. Mechanical work shall comply with applicable inspection services:
 - 1. Underwriters Laboratories.
 - 2. National Fire Protection Association.
 - 3. State Health Department.
 - 4. Local Municipal Building Inspection Department.
- C. Resolve any code violations discovered in contract documents with the Engineer prior to award of the contract. After Contract award, any correction or additions necessary for compliance with applicable codes shall be made at no additional cost to the Owner.
- D. This Contractor shall be responsible for being aware of and complying with asbestos NESHAP regulations, as well as all other applicable codes, laws and regulations.
- E. Obtain all permits required.

1.3 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, skill, and organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that has served their Owners satisfactorily for not less than 3 years.

1.4 REFERENCE SPECIFICATIONS AND STANDARDS

- A. Materials which are specified by reference to Federal Specifications; ASTM, ASME, ANSI, or AWWA Specifications; Federal Standards; or other standard specifications must comply with latest editions, revisions, amendments or supplements in effect on date bids are received. Requirements in reference specifications and standards are minimum for all equipment, material, and work. In instances where specified capacities, size, or other features of equipment, devices, or materials exceed these minimums, meet specified capacities.

1.5 CONTRACT DRAWINGS

- A. Contract drawings are diagrammatic only and do not give fully dimensioned locations of

various elements of work. Determine exact locations from field measurements.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain at the job site a separate set of white prints (black line) of the contract drawings for the sole purpose of recording the "as-built" changes and diagrams of those portions of work in which actual construction is at variance with the contract drawings. Mark the drawings with a colored pencil. Prepare, as the work progresses and upon completion of work, reproducible drawings clearly indicating locations of various lines, valves, ductwork, traps, equipment, and other pertinent items, as installed. Include flow-line elevation of sewer lines. Record existing and new underground and under slab piping with dimensioned locations and elevations of such piping.
- B. At the conclusion of project, obtain without cost to the Owner, erasable mylars of the original drawings and transfer as-built changes to these. Prior to transmittal of corrected drawings, obtain 3 sets of blue-line prints of each drawing, regardless of whether corrections were necessary and include in the transmittal (2 sets are for the Owner's use and one set is for the Architect/Engineer's records). Delivery of these as-built prints and reproducible is a condition of final acceptance. Provide record drawings on one set each (reproducible Dayrex mylar film positives) and AutoCad 2014 files on disk (CD Rom).
- C. As-Built drawings should indicate the following information as a minimum:
 - 1. Indicate all addendum changes to documents.
 - 2. Remove Engineer's seal, name, address and logo from drawings.
 - 3. Mark documents RECORD DRAWINGS.
 - 4. Clearly indicate: DOCUMENT PRODUCED BY.
 - 5. Indicate all changes to construction during construction. Indicate actual routing of all piping, ductwork, etc. that were deviated from construction drawings.
 - 6. Indicate exact location of all underground mechanical piping and elevation.
 - 7. Indicate exact location of all underground electrical raceways and elevations.
 - 8. Correct schedules to reflect (actual) equipment furnished and manufacturer.
 - 9. Location and size of all ductwork and mechanical piping above ceiling including exact location of isolation of domestic and mechanical valves.
 - 10. Exact location of all electrical equipment in and outside of the building.
 - 11. Exact location of all roof mounted equipment, wall, roof and floor penetrations.
 - 12. Cloud all changes.

1.7 SPACE REQUIREMENTS

- A. Consider space limitations imposed by contiguous work in selection and location of equipment and material. Do not provide equipment or material that is not suitable in this respect.

1.8 RELATION WITH OTHER TRADES

- A. Carefully study all matters and conditions concerning the project. Submit notification of conflict in ample time to prevent unwarranted changes in any work. Review other Divisions of these specifications to determine their requirements.
- B. Because of the complicated relationship of this work to the total project, conscientiously study the relation and cooperate as necessary to accomplish the full intent of the documents.
- C. Provide sleeves and inserts in forms as required for the work. Stub up and protect open ends of pipe before any concrete is placed. Furnish sizes of required equipment pads. Furnish and locate bolts and fittings required to be cast in them.

- D. Locate and size openings required for installation of work specified in this Division in sufficient time to prevent delay in the work.
- E. Refer to other Divisions of the specifications for the scope of required connections to equipment furnished under that Division. Determine from the Contractor for the various trades, the Owner, and by direction from the Architect/Engineer, the exact location of all items.

1.9 CONCEALED AND EXPOSED WORK

- A. When the word "concealed" is used in connection with insulating, painting, piping, ducts and the like, the work is understood to mean hidden from sight as in chases, furred spaces or above ceilings. "Exposed" is understood to mean open to view.

1.10 GUARANTEE

- A. Guarantee work for 1 year from the date of substantial completion of the project. During that period make good any faults or imperfections that may arise due to defects or omissions in material, equipment or workmanship. At the Owner's option, replacement of failed parts or equipment shall be provided.

1.11 MATERIAL AND EQUIPMENT

- A. Furnish new and unused materials and equipment meeting the requirements of the paragraph specifying acceptable manufacturers. Where two or more units of the same type or class of equipment are required, provide units of a single manufacturer.

1.12 NOISE AND VIBRATION

- A. Select equipment to operate with minimum noise and vibration. If objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of work, rectify such conditions at no additional cost. If the item of equipment is judged to produce objectionable noise or vibration, demonstrate at no additional cost that equipment performs within designated limits on a vibration chart.

1.13 ACCEPTABLE MANUFACTURERS

- A. Manufacturers names and catalog number specified under sections of Division 23 are used to establish standards of design, performance, quality and serviceability and not to limit competition. Equipment of similar design, equal to that specified, manufactured by a named manufacturer will be acceptable on approval. A request for prior approval of equipment not listed must be submitted ten (10) days before bid due date. Submit complete design and performance data to the Engineer.

1.14 OPERATING TESTS

- A. After all mechanical systems have been completed and put into operation, subject each system to an operating test under design conditions to ensure proper sequencing and operation throughout the range of operation. Tests shall be made in the presence of the Architect/Engineer. Make adjustments as required to ensure proper functioning of all systems. Special tests on individual systems are specified under individual sections. Submit 3 copies of all certifications and test reports adequately in advance of completion of the work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

1.15 WARRANTIES

- A. Submit 3 copies of all warranties and guarantees for systems, equipment, devices and materials. These shall be included in the Operating and Maintenance Manuals.

1.16 BUILDING CONSTRUCTION

- A. It shall be the responsibility of each sub-contractor to consult the Architectural and Engineering drawings, details, and specifications and thoroughly familiarize himself with the project and all job related requirements. Each sub-contractor shall cooperate with the General Contractor to verify that all piping and other items are placed in the walls, furred spaces, chases, etc., so there will be no delays in the job.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 OPENINGS

- A. Framed, cast or masonry openings for ductwork, equipment or piping are specified under other divisions. Drawings and layout work for exact size and location of all openings are included under this division.

3.2 AIR FILTERS AND PIPE STRAINERS

- A. Immediately prior to substantial completion of the project, inspect, clean and service air filters and strainers. Replace air filters.

3.3 LUBRICATION, REFRIGERANT AND OIL

- A. Provide a complete charge of correct lubricant for each item of equipment requiring lubrication.
- B. Provide a complete and working charge of proper refrigerant, free of contaminants, into each refrigerant system. After each system has been in operation long enough to ensure completely balanced conditions, check the charge and modify for proper operation as required.
- C. Provide a complete charge of special oil for refrigeration use, suitable for operation with refrigerant, in each system.

3.4 HOUSEKEEPING PADS

- A. Provide equipment housekeeping pads under all floor mounted and ground mounted HVAC equipment, and as shown on the drawings.
- B. Concrete work as specified in Division 3.
- C. Concrete pads:
 - 1. 4" high, rounded edges, minimum 2500 psi unless otherwise indicated on the drawings
 - 2. Chamfer strips at edges and corner of forms.
 - 3. Smooth steel trowel finish.
 - 4. Doweled to existing slab.

- D. Install concrete curbs around duct penetrations or multiple pipe penetrations.

3.5 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection, conduct an on-site training program to instruct the Owner's operating personnel in the operation and maintenance of the mechanical systems.
 - 1. Provide the training during the Owner's regular working day.
 - 2. The Instructors shall each be experienced in their phase of operation and maintenance of building mechanical systems and with the project.
- B. Time to be allocated for instructions.
 - 1. Minimum of 2 hours dedicated instructor time.
- C. Before proceeding with the on-site training program, submit the program syllabus; proposed time and dates; and other pertinent information for review and approval.
 - 1. One copy to the Owner.
 - 2. One copy to the Architect/Engineer.
- D. The Owner will provide a list of personnel to receive instructions, and will coordinate their attendance at the agreed upon times.
- E. Use the operation and maintenance manuals as the basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shut down of each item of equipment.
- G. Demonstrate equipment functions (both individually and as part of the total integrated system).
- H. Prepare and insert additional data in the operating and maintenance manuals when the need for additional data becomes apparent during instructions.
- I. Submit a report within one week after completion of the training program that instructions have been satisfactorily completed. Give time and date of each demonstration and hours devoted to the demonstration, with a list of people present.
- J. At the conclusion of the on-site training program, have the person designated by the Owner sign a certificate to certify that he/she has a proper understanding of the system, that the demonstrations and instructions have been satisfactorily completed, and the scope and content of the operating and maintenance manuals used for the training program are satisfactory.
- K. Provide a copy of the report and the certificate in an appropriately tabbed section of each Operating and Maintenance Manual.

3.6 EQUIPMENT IDENTIFICATION

- A. Provide a laminated engraved plastic nameplate on each piece of equipment and starter.
 - 1. Designation approved by Architect/Engineer.
 - 2. Equipment includes, but is not limited to, air handling units, fan coil units, variable volume boxes, fans, pumps, boilers and chillers.
 - 3. Submit schedule of equipment to be included and designations.
- B. Provide nameplates with 1/2" high letters and fastened with epoxy or screws.

3.7 OBSTRUCTIONS

- A. The drawings indicate certain information pertaining to surface and subsurface obstructions which has been taken from available drawings. Such information is not guaranteed, however, as to accuracy of location or complete information.
 - 1. Before any cutting or trenching operations are begun, verify with Owner's representative, utility companies, municipalities, and other interested parties that all available information has been provided.
 - 2. Should obstruction be encountered, whether shown or not, alter routing of new work, reroute existing lines, remove obstruction where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of the new work and leave existing services and structures in a satisfactory and serviceable condition.
- B. Assume total responsibility for and repair any damage to existing utilities or construction, whether or not such existing facilities are shown.

3.8 PROTECTION

- A. Protect work, equipment, fixtures, and materials. At work completion, work must be clean and in original manufacturer's condition.

3.9 INDOOR AIR QUALITY

- A. All equipment and ductwork shall be installed to allow sufficient space for testing, maintenance, and commissioning functions. Access doors or panels shall be installed in ventilation equipment, ductwork, and plenum enclosures for inspection and cleaning of outdoor air intakes, mixing plenums, up and downstream of coils, filters, drain pans and fans.
- B. Practice source control and eliminate potential contaminants in material selection, installation, and maintenance.
- C. Provide installation and disposal instructions for all materials and chemicals that are potential contaminants.
- D. Obtain and conform to the requirements of the Material Safety Data Sheets (MSDSs) in the use of materials.
- E. Utilize manufacturer's recommendations and provide installation instructions for all chemicals, compounds, and potential contaminants including pre-installation degassing if required.
- F. Ventilate completed building prior to final completion using no less than design outside air for at least 48 hours before occupancy.
- G. Make provisions for controls to prevent the entry of air contaminants into the HVAC air distribution system.
- H. Steps shall be taken to ensure that the HVAC system continues to function effectively and are not damaged or contaminated during construction activities.

END OF SECTION

SECTION 23 05 12

HVAC SHOP DRAWINGS, COORDINATION DRAWINGS & PRODUCT DATA

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Prepare submittals as required by these specifications as outlined below.
- B. The term submittal, as used herein, refers to all:
 - 1. Shop Drawings.
 - 2. Coordination Drawings.
 - 3. Product data.
- C. Submittals shall be prepared and produced for:
 - 1. Distribution as specified.
 - 2. Inclusion in the Operating and Maintenance Manual, as specified, in the related section.

1.2 SHOP DRAWINGS

- A. Present drawings in a clear and thorough manner. Identify details by reference to sheet and detail, schedule, or room numbers shown on Contract Drawings.
- B. Show all dimensions of each item of equipment on a single composite Shop Drawing. Do not submit a series of drawings of components.
- C. Identify field dimensions; show relationship to adjacent features, critical features, work, or products.
- D. Submit shop drawings in plan, elevation and sections, showing equipment in mechanical equipment areas.

1.3 COORDINATION DRAWINGS

- A. Present in a clear and thorough manner. Title each drawing with project name. Identify each element of drawings by reference to sheet number and detail, or room number of contract documents. Minimum drawing scale: $\frac{1}{4}'' = 1'-0''$.
- B. Prepare coordination drawings to coordinate installations for efficient use of available space, for proper sequence of installation, and to resolve conflicts. Coordinate with work specified in other sections and other divisions of the specifications.
- C. For each mechanical room and for each outside equipment pad where equipment is located, submit plan and elevation drawings. Show:
 - 1. Actual mechanical equipment and components to be furnished.
 - 2. Service clearance.
 - 3. Relationship to other equipment and components.
 - 4. Roof drains and leader piping.
 - 5. Fire protection piping and equipment.
- D. Identify field dimensions. Show relation to adjacent or critical features of work or products.

- E. Related requirements:
 - 1. Ductwork shop drawings.
 - 2. Coordination drawing specified in Division 26.
- F. Submit shop drawings in plan, elevation and sections, showing equipment in mechanical equipment areas.
- G. Gas piping sketch indicating proposed location of piping prior to proceeding with the installation.

1.4 PRODUCT DATA AND INSTALLATION INSTRUCTION

- A. Submit only pages which are pertinent to the project. All options which are indicated on the product data shall become part of the contract and shall be required whether specified are not.
- B. Mark each copy of standard printed data to identify pertinent products, referenced to specification section and article number.
- C. Show reference standards, performance characteristics and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions and required clearances.
- D. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.
- E. Mark up a copy of the specifications for the product. Indicate in the margin of each paragraph the following: COMPLY, DO NOT COMPLY, or NOT APPLICABLE. Explain all DO NOT COMPLY statements.
- F. Provide a separate transmittal for each submittal item. Transmittals shall indicate product by specification section name and number. Separate all submittals into appropriate specification section number. Do not combine specification sections.

1.5 MANUFACTURERS INSTRUCTIONS

- A. Submit Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, calibrating, balancing and finishing.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Review submittals prior to transmittal.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Manufacturer's catalog numbers.
 - 4. Conformance with requirements of Contract Documents.
- C. Coordinate submittals with requirements of the work and of the Contract Documents.
- D. Notify the Architect/Engineer in writing at time of submission of any deviations in the submittals from requirements of the Contract Documents.
- E. Do not fabricate products, or begin work for which submittals are specified, until such submittals have been produced and bear contractor's stamp. Do not fabricate products or

begin work scheduled to have submittals reviewed until return of reviewed submittals with Architect / Engineer's acceptance.

- F. Contractor's responsibility for errors and omissions in submittals is not relieved whether Architect / Engineer reviews submittals or not.
- G. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved whether Architect/Engineer reviews submittals or not, unless Architect / Engineer gives written acceptance of the specific deviations on reviewed documents.
- H. Submittals shall show sufficient data to indicate complete compliance with Contract Documents:
 - 1. Proper sizes and capacities.
 - 2. That the item will fit in the available space in a manner that will allow proper service.
 - 3. Construction methods, materials and finishes.
- I. Schedule submissions at least 15 days before date reviewed submittals will be needed.

1.7 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Project or in the work of any other Contractor.
- B. Number of submittals required:
 - 1. Shop Drawings and Coordination Drawings: Submit one reproducible transparency and three opaque reproductions.
 - 2. Product Data: Submit the number of copies which the contractor requires, plus those which will be retained by the Architect/Engineer.
- C. Accompany submittals with transmittal letter, in duplicate, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name, address and contact number.
 - 4. The number of each Shop Drawing, Project Datum and Sample submitted.
 - 5. Other pertinent data.
- D. Submittals shall include:
 - 1. The date of submission.
 - 2. The project title and number.
 - 3. Contract Identification.
 - 4. The names of:
 - a. Contractor.
 - b. Subcontractor.
 - c. Supplier.
 - d. Manufacturer.
 - 5. Identification of the product.
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or federal specifications numbers.
 - 9. Identification of deviations from contract documents.
 - 10. Suitable blank space for General Contractor and Architect/Engineer stamps.
 - 11. Contractor's signed and dated Stamp of Approval.

- E. Coordinate submittals into logical groupings to facilitate interrelation of the several items:
 - 1. Finishes which involve Architect/Engineer selection of colors, textures or patterns.
 - 2. Associated items which require correlation for efficient function or for installation.

1.8 SUBMITTAL SPECIFICATION INFORMATION

- A. Every submittal document shall bear the following information as used in the project manual:
 - 1. The related specification section number.
 - 2. The exact specification section title.
- B. Submittals delivered to the Architect/Engineer without the specified information will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

1.9 RESUBMISSION REQUIREMENTS

- A. Make re-submittals under procedures specified for initial submittals.
 - 1. Indicate that the document or sample is a re-submittal.
 - 2. Identify changes made since previous submittals.
- B. Indicate any changes which have been made, other than those requested by the Architect / Engineer.

1.10 CONTRACTOR'S STAMP OF APPROVAL

- A. Contractor shall stamp and sign each document certifying to the review of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.
- B. Contractor's stamp of approval on any submittal shall constitute a representation to Owner and Architect/Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that Contractor has reviewed or coordinated each submittal with the requirements of the work and the Contract Documents.
- C. Do not deliver any submittals to the Architect/Engineer that do not bear the Contractor's stamp of approval and signature.
- D. Submittals delivered to the Architect/Engineer without Contractor's stamp of approval and signature will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

1.11 ARCHITECT / ENGINEER REVIEW OF IDENTIFIED SUBMITTALS

- A. The Architect / Engineer will:
 - 1. Review identified submittals with reasonable promptness and in accordance with schedule.
 - 2. Affix stamp and initials or signature, and indicate requirements for re-submittal or approval of submittal.
 - 3. Return submittals to Contractor for distribution or for resubmission.

- B. Review and approval of submittals will not extend to design data reflected in submittals which is peculiarly within the special expertise of the Contractor or any party dealing directly with the Contractor.
- C. Architect / Engineer's review and approval is only for conformance with the design concept of the project and for compliance with the information given in the contract.
 - 1. The review shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.
 - 2. The review shall not extend to review of quantities, dimensions, weights or gauges, fabrication processes or coordination with the work of other trades.
- D. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

1.12 SUBSTITUTIONS

- A. Do not make requests for substitution employing the procedures of this Section.
- B. The procedure for making a formal request for substitution is specified in Div. 1.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

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SECTION 23 05 13

ELECTRICAL PROVISIONS OF HVAC WORK

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Electrical provisions to be provided as mechanical work are indicated in other Division 23 sections, on drawings, and as specified.
- B. Types of work, normally recognized as electrical but provided as mechanical, specified or partially specified in this Section, include but are not necessarily limited to the following:
 - 1. Motors for mechanical equipment.
 - 2. Starters for motors of mechanical equipment, but only where specifically indicated to be furnished integrally with equipment.
 - 3. Wiring from motors to disconnect switches or junction boxes for motors of mechanical equipment, but only where specifically indicated to be furnished integrally with equipment.
 - 4. Wiring of field-mounted float control switches, flow control switches, and similar mechanical-electrical devices provided for mechanical systems, to equipment control panels.
 - 5. Wiring of smoke detectors for shutdown of air handling equipment when a fire alarm system is not included in the project.
 - 6. Wiring of oil pump, vibration and oil level limit switches for cooling towers.
 - 7. Refrigerant monitor/sensor/alarming and field installed visual/audible display alarms.
 - 8. Pipe heat tracing.
 - 9. Cooling tower vibration switch/interlock/reset.
 - 10. Field interlock wiring from chiller: flow switches, pump aux. Contacts, pump start/stop.
 - 11. Power supply 120 VAC and control signal from chiller control panel to condenser water flow control valve installed in piping leaving chiller.
 - 12. Wiring of all related circulating water system chemical treatment devices.
 - a. Low voltage electric contacting water meter.
 - b. Solenoid valve/blow-down assembly.
 - 13. Radiant heater timer switches and/or thermostats.
 - 14. Low Voltage thermostat wiring.
- C. Refer to Division 23 Controls Sections for related control system wiring.
- D. Refer to Division 23 sections for specific individual mechanical equipment electrical requirements.
- E. Refer to Division 26 sections for motor starters and controls not furnished integrally with mechanical equipment.
- F. Refer to Division 26 sections for junction boxes and disconnect switches required for motors and other electrical units of mechanical equipment.

1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to work of this Section.

1.3 QUALITY ASSURANCE

- A. Wherever possible, match elements of electrical provisions of mechanical work with similar elements of electrical work specified in Division 26 sections for electrical work not otherwise specified.
- B. For electrical equipment and products, comply with applicable NEMA standards, and refer to NEMA standards for definitions of terminology. Comply with National Electrical Code (NFPA 70) for workmanship and installation requirements.

1.4 SUBMITTALS

- A. Include in listing of motors, voltage, notation of whether motor starter is furnished or installed integrally with motor or equipment containing motors.

PART 2 - PRODUCTS

2.1 MOTORS

- A. Provide motors for mechanical equipment manufactured by one of the following:
 - 1. Baldor Electric Company.
 - 2. Century Electric Div., Inc.
 - 3. General Electric Co.
 - 4. Louis Allis Div.; Litton Industrial Products, Inc.
 - 5. Lincoln Electric
 - 6. Marathon Electric Mfg. Corp.
 - 7. Reliance Electric Co.
 - 8. Westinghouse Electric Corp.
 - 9. WEG.
- B. Motor Characteristics. Except where more stringent requirements are indicated, and except where required items of mechanical equipment cannot be obtained with fully complying motors, comply with the following requirements for motors of mechanical work:
- C. Temperature Rating. Rated for 40 Degrees C environment with maximum 50 Degrees C temperature rise for continuous duty at full load (Class A Insulation).
- D. Provide each motor capable of making starts as frequently as indicated by automatic control system, and not less than 5 starts per hour for manually controlled motors.
- E. Phases and Current Characteristics. Provide squirrel-cage induction polyphase motors for 3/4hp and larger, and provide capacitor-start single-phase motors for 1/2hp and smaller, except 1/6hp and smaller may, at equipment manufacturer's option, be split-phase type. Coordinate current characteristics with power specified in Division 26 sections, and with individual equipment requirements specified in other Division 23 requirements. For 2-speed motors provide 2 separate windings on polyphase motors. Do not purchase motors until power characteristics available at locations of motors have been confirmed, and until rotation directions have been confirmed.
- F. Service Factor. 1.15 for polyphase motors and 1.35 for single-phase motors.
- G. Motor Construction. Provide general purpose, continuous duty motors, Design "B" except "C" where required for high starting torque.
 - 1. Frames. NEMA #56.

2. Bearings are to be ball or roller bearings with inner and outer shaft seals, regreasable except permanently sealed where motor is inaccessible for regular maintenance. Where belt drives and other drives produce lateral or axial thrust in motor, provide bearings designed to resist thrust loading. Refer to individual section of Division 23 for fractional-hp light-duty motors where sleeve-type bearings are permitted.
 3. Except as indicated, provide open drip-proof motors for indoor use where satisfactorily housed or remotely located during operation, and provide guarded drip-proof motors where exposed to contact by employees or building occupants. Provide weather-protected Type I for outdoor use, Type II where not housed. Refer to individual sections of Division 23 for other enclosure requirements.
 4. Provide built-in thermal overload protection and, where indicated, provide internal sensing device suitable for signaling and stopping motor at starter.
 5. Noise Rating: Provide "Quiet" rating on motors.
- H. All motors shall be premium efficiency.
- I. Provide an inverter duty motor on all equipment that utilizes a variable frequency drive.

2.2 EQUIPMENT FABRICATION

- A. Fabricate mechanical equipment for secure mounting of motors and other electrical items included in work. Provide either permanent alignment of motors with equipment, or adjustable mountings as applicable for belt drives, gear drives, special couplings and similar indirect coupling of equipment. Provide safe, secure, durable, and removable guards for motor drives. Arrange for lubrication and similar running-maintenance without removal of guards.

2.3 GENERAL REQUIREMENTS – SHAFT GROUNDING RINGS

- A. All motors operated on variable frequency drives shall be equipped with a maintenance-free, conductive microfiber shaft grounding ring to meet NEMA MG-1, 3.4.4.4.3 requirements, with a minimum of two rows of circumferential microfibers to discharge damaging shaft voltages away from the bearings to ground. SGR's Service Life: Designed to last for service life of motor. Provide AEGIS SGR Conductive MicroFiber Shaft Grounding Ring, or approved equal.
- B. Application Note: Motors up to 100 HP shall be provided with one shaft ground ring installed on either the drive end or non-drive end. Motors over 100 HP shall be provided with an insulated bearing on the non-drive end and a shaft grounding ring on the drive end of the motor with the exception of line contact bearings in the drive end of the machine. In this instance the line contact bearing must be electrically insulated and the AEGIS Bearing Protection Ring installed on the opposite drive end of the motor. Grounding rings shall be provided and installed by the motor manufacturer's recommendations.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install motors on motor mounting systems in accordance with motor manufacturer's instructions, anchored to resist torque, drive thrusts, and other external forces inherent in mechanical work. Secure sheaves and other drive units to motor shafts with keys and Allen set screws on flat surface of shaft. Unless otherwise indicated, set motor shafts parallel with machine shafts.

B. Verify voltage with Electrical Plans.

END OF SECTION

SECTION 23 05 14

HVAC CONDENSATE DRAIN PIPING SYSTEM

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide and install air conditioning condensate drains.

1.2 RELATED WORK

- A. Division 23 - Mechanical
 - 1. Insulation.

PART 2 - PRODUCTS

2.1 PIPE MATERIAL

- A. Type "L" copper with drainage pattern fittings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the system to facilitate easy removal.
 - 1. Use threaded plugged tee at each change of direction to permit cleaning.
 - 2. Install a cleanout every 50 feet of straight run piping.
 - 3. Maintain a positive slope on all piping.
- B. Install a water seal trap leg based on the fan pressure.
 - 1. Size the length of the trap leg 1 inch larger than the actual system pressure.
- C. Install traps and cleanout as shown in the drawing details.
 - 1. Confirm requirements with manufacturer's installation instructions.

3.2 SIZE PIPE AS SHOWN ON DRAWINGS.

- A. Do not install piping sized smaller than the unit drain connection size.

3.3 SECONDARY DRAINS

- A. Provide secondary drains where required by code, shown on the drawings, or where equipment has secondary drain connections.

END OF SECTION

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SECTION 23 05 93

TESTING, BALANCING AND ADJUSTING (TAB) OF ENVIRONMENTAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Balance, adjust and test the air distribution system including the exhaust system.
- B. Balance, adjust and test the hydronic system.
- C. Verify and record the duct test results performed by the mechanical contractor.

1.2 RELATED SECTIONS

- A. COORDINATION OF TESTING AND BALANCING

1.3 SUBMITTALS

- A. History of the TAB organization.
- B. Agency certification.
- C. Personnel qualifications.
- D. TAB data forms.
- E. Instrumentation list.
- F. Name of the project supervising engineer.
- G. Name and address and contact person of five successfully completed projects of similar size and scope.
- H. To perform required professional services, the balancing agency shall have a minimum of one test and balance engineer certified by National Environmental Balancing Bureau.

1.4 TAB FIRM QUALIFICATIONS

- A. The organization performing the work shall be a Certified member in good standing of the (NEBB) National Environmental Balancing Bureau.
- B. Able to furnish evidence of having contracted for and completed not less than five systems of comparable size and type that have served their Owners satisfactorily for not less than five years.
- C. A specialist in this field and have the personnel, experience, training, skill, and the organization to perform the work.
- D. The balancing agency shall furnish all necessary calibrated instrumentation to adequately perform the specified services. An inventory of all instruments and devices in possession of the balancing agency may be required by the engineer to determine the balancing agency's performance capability.

- E. The balancing agency shall have operated for a minimum of five years under its current name.
- F. Personnel:
 - 1. The project supervisor shall be a Professional Engineer registered in Texas.
 - a. Extensive knowledge of the work involved.
 - b. At least five years experience conducting tests of the type specified.
 - c. This test and balance engineer shall be responsible for the supervision and certification of the total work herein specified.
 - 2. All work shall be conducted under the direct supervision of the supervising engineer.
 - 3. Technicians shall be trained and experienced in the work they conduct.

1.5 WARRANTY

- A. Provide (NEBB) guarantee in writing.
- B. Extended warranty.
 - 1. Include an extended warranty of 2 years after completion of test and balance work, during which time the Architect/Engineer may request a retest or resetting of any outlet or other items as listed in the test report.
 - 2. Provide technicians and instruments to assist the Architect/Engineer in making any tests he may require during this period.
 - 3. The balancing agency shall perform an inspection of the HVAC system during the opposite season from that which the initial adjustments were made. The balancing agency shall make any necessary modifications to the initial adjustments to produce optimum system operation.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 TAB TOLERANCES

- A. The water, outside air, supply air, return air, and exhaust air for each system shall be adjusted to within +/- 5% of the value scheduled on the drawings.

3.2 SITE VISITS

- A. During construction, the balancing agency shall inspect the installation of the piping systems, sheetmetal work, temperature controls, energy management system, and other component parts of the heating, ventilating, and air conditioning systems. One inspection shall take place when 60% of the ductwork is installed and another inspection shall take place when 90% of the equipment is installed. The balancing agency shall submit a brief written report of each inspection to the architect and engineer.
- B. Upon completion of the installation and start-up of the mechanical equipment by the mechanical contractor, the balancing agency shall test and balance the system components to obtain optimum conditions in each conditioned space of the building. If construction deficiencies are encountered that preclude obtaining optimum conditions, and the deficiencies cannot be corrected by the mechanical contractor within a reasonable period of time, the balancing agency shall cease testing and balancing services and advise the architect, engineer, general contractor and owner, in writing, of the deficiencies.
- C. Note proper piping installation, location of valves, and flow measuring instruments.

- D. Make one series of visits, phased as required by construction progress, prior to installation of the ceiling. Note proper installation of balancing dampers.
- E. Continue the site visits up to completion of project. In each succeeding report, list corrections made from previous reports.

3.3 TESTING INSTRUMENTS

- A. Submit a list of all instruments to be used for the test and balance procedures.
 - 1. Catalog sheets.
 - 2. Certificate of last calibration.
 - 3. Calibration within a period of six months prior to balancing.
- B. Testing equipment shall be in good working order and tested for accuracy prior to start of work.

3.4 COORDINATION WITH OTHER SPECIFICATION SECTIONS

- A. Review the related ductwork shop drawings and piping shop drawings. Make recommendations concerning suitability with respect to the testing, balancing and adjusting work.
- B. Make tests to verify proper placement of the static pressure sensors for the variable air volume fan system control.
- C. In cooperation with the work specified in Building Management and Control System section, a systematic listing of the testing and verification shall be included in the final TAB report. The TAB firm shall provide a laptop computer to operate with the Building Management and Control System. Building Management and Control System shall provide all necessary software and special interface cables, as required, to communicate with the DDC system:
 - 1. Work with the temperature control contractor to ensure the most effective total system operation within the design limitations, and to obtain mutual understanding of the intended control performance.
 - 2. Verify that all control devices are properly connected.
 - 3. Verify that all dampers, valves, and other controlled devices, are operated by the intended controller.
 - 4. Verify that all dampers and valves are in the position indicated by the controller (open, closed or modulating).
 - 5. Verify the integrity of valves and dampers in terms of tightness of close-off and full open positions. This includes dampers in multizone units, terminal boxes and fire/smoke dampers.
 - 6. Observe that all valves are properly installed in piping system in relation to direction of flow and location.
 - 7. Observe the calibration of all controllers.
 - 8. Verify the proper application of all normally opened and normally closed valves.
 - 9. Observe the locations of all thermostats and humidistats for potential erratic operation from outside influences such as sunlight, drafts or cold walls.
 - 10. Observe the location of all sensors to determine whether their position will allow them to sense only the intended temperatures or pressures of the media. Control contractor will relocate as deemed necessary by the Engineer.
 - 11. Verify that the sequence of operation for any control mode is in accordance with the approved shop drawings and specifications. Verify that no simultaneous heating and cooling occurs.
 - 12. Verify the correct operation of all interlock systems and installation is per the

- 13. manufacturer recommendations.
 - 14. Check all dampers for free operation.
 - 15. Verify that all controller setpoints meet the design intent.
 - 15. Perform variable volume system verification to assure the system and its components track with changes from full flow to minimum flow.
- D. Upon completion of the testing and balancing, submit three days prior notice that the systems are ready for a running test. A qualified representative of the test and balance organization shall be present, with a representative from the engineers office, to field verify TAB report readings. Specific and random selections of data recorded in the certified test and balance report will be reviewed.

3.5 INSTRUMENT TEST HOLES

- A. When it is required to make holes in the field to measure temperature, static pressure or velocity in the ducts:
- 1. Drill holes, plug and tape external duct insulation.
 - 2. Repair damaged insulation to Engineer's approval.

3.6 TESTING THE AIR DISTRIBUTION SYSTEM

- A. The TAB agency shall verify that all ductwork, dampers, grilles, registers, and diffusers have been installed per design and set full open. The TAB agency shall perform the following TAB procedures in accordance with National Environmental Balancing Bureau and all results shall be recorded in the TAB report:
- 1. Supply Fans:
 - a. Fan speeds: Test and adjust fan RPM to achieve design CFM requirements.
 - b. Current and Voltage: Test and record motor voltage and amperage, and compare data with the nameplate limits to ensure fan motor is not in or above the service factor.
 - c. Pitot-Tube Traverse: Perform a Pitot-Tube traverse of the main supply and return ducts, as applicable, to obtain total CFM. If a Pitot-Tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet. Measurements must be recorded with an Inclined Manometer or an Inclined/Vertical Manometer.
 - d. Outside Air: Test and adjust the outside air on applicable equipment using a Pitot-Tube traverse. If a Pitot-Tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet. If a traverse is not practical, use the mixed air temperature method, if the inside and outside temperature difference is at least 20°F, or use the difference between Pitot-tube traverse of the supply and return ducts.
 - e. Static Pressure: Test and record system static pressure, including the static pressure profile of each supply fan.
 - 2. All Other Fans:
 - a. Fan speeds: Test and adjust fan RPM to achieve design CFM requirements.
 - b. Current and Voltage: Test and record motor voltage and amperage, and compare data with the nameplate limits to ensure fan motor is not in or above the service factor.
 - c. Pitot-Tube Traverse: Perform a Pitot-Tube traverse of the main return ducts, as applicable, to obtain total CFM. If a Pitot-Tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet. Measurements must be recorded with an Inclined Manometer or an Inclined/Vertical Manometer.

- d. Static Pressure: Test and record system static pressure, including the static pressure profile of each return fan.
 - 3. Diffusers, Registers and Grilles:
 - a. Tolerances: Test, adjust, and balance each diffuser, grille, and register to within 5% of design requirements. Minimize drafts. Observe throws are in direction as indicated on drawings.
 - 4. Coils (including electric coils):
 - a. Air Temperature: Once air flows are set to acceptable limits, take wet bulb (cooling coil only) and dry bulb air temperatures on the entering and leaving side of each coil. Calculate the sensible and latent (cooling coil only) capacity of the coil. Provide information in TAB report.
- B. Record preliminary air handler data, including fan RPM and static pressures across filter, fans and coils.
- C. Perform a velocity traverse of the main supply ducts using a pitot-tube and inclined manometer to establish initial air delivery. Perform a Pitot-tube traverse of main supply and return ducts, as applicable, to obtain total CFM. If a pitot-tube traverse is not practical, a detailed explanation of why a traverse was not made must appear on the appropriate data sheet.
- D. Where air measuring stations are installed, use pitot tube traverse readings to verify and record the correct calibration of the stations output.
- E. Make adjustments in fan RPM and damper settings, as required, to obtain design supply air, return air, and outside air.
- F. Measure and adjust all supply and return branches to design air delivery.
- G. Measure and adjust all diffusers to design air delivery to +/- 5% of design requirements.
- H. Make a set of recordings showing final system conditions.

3.7 EQUIPMENT POWER READINGS

- A. Record the following information for each motor:
 - 1. Equipment designation.
 - 2. Manufacturer.
 - 3. Unit model number and serial number and frame.
 - 4. Motor nameplate horsepower; nameplate voltage; phase and full load amperes.
 - 5. Heater coil in starter.
 - a. Rating in amperes.
 - b. Manufacturer's recommendation.
 - 6. Motor RPM/driven equipment RPM.
 - 7. Power reading (voltage, amperes of all legs at motor terminals).

3.8 DUCT TEST

- A. Test and Balancing Contractor shall verify and record the duct test results. A copy of the duct test results, as completed, shall be submitted to the engineer for review within five days. Provide a complete report of all the duct test results in the final TAB report.

3.9 DIRECT EXPANSION EQUIPMENT

- A. With each unit operating at near design conditions, measure and record the following:
 - 1. Manufacturer, model number, serial number and all nameplate data.
 - 2. Ambient temperature, condenser discharge temperature.
 - 3. Amperage and voltage for each phase.
 - 4. Leaving and entering air temperatures.
 - 5. Suction and discharge pressures and temperatures.
 - 6. Tons of cooling.
 - 7. Verification that moisture indicator shows dry refrigerant.

3.10 TAB REPORT

- A. The activities described in this specification shall be recorded in a report form; and four individually bound copies shall be provided to the Architect and Engineer. Neatly type and arrange data. Include with the data the date tested, personnel present, weather conditions, nameplate record of the test instruments used and list all measurements taken after all corrections are made to the system. Record all failures and corrective action taken to remedy any incorrect situation. The intent of the final report is to provide a reference of actual operating conditions for the Owner's operations personnel. Provide a "Preface" which shall include a general discussion of the system and any abnormalities or problems encountered.
- B. All measurements and recorded readings (of air, water, electricity, etc.) that appear in the report must have been recorded on site by the permanently employed technicians or engineers of the TAB firm.
- C. Submit reports on forms approved by the engineer that will include the following data as a minimum:
 - 1. Title Page
 - a. Company Name.
 - b. Company Address.
 - c. Company telephone number.
 - d. Project name.
 - e. Project location.
 - f. Project Manager.
 - g. Project Engineer.
 - h. Project Contractor.
 - i. Project Identification Number.
 - 2. Summary of the TAB report data.
 - 3. Index.
 - 4. Instrument List
 - a. Instrument.
 - b. Manufacturer.
 - c. Model.
 - d. Serial Number.
 - e. Range.
 - f. Calibration Date.
 - g. What test instrument is to be used for:.
 - 5. Fan Data
 - a. Location.
 - b. Manufacturer.
 - c. Model.
 - d. Air flow, specified and actual.
 - e. Total static pressure (total external) specified and actual.
 - f. Inlet pressure.

- g. Discharge pressure.
- h. Fan RPM.
- 6. Return Air/Outside Air Data
 - a. Identification/location.
 - b. Design return air flow.
 - c. Actual return air flow.
 - d. Design outside air flow.
 - e. Actual outside air flow.
 - f. Return air temperature.
 - g. Outside air temperature.
 - h. Required mixed air temperature.
 - i. Actual mixed air temperature.
- 7. Electric Motors
 - a. Manufacturer.
 - b. HP/BHP.
 - c. Phase, voltage, amperage, nameplate, actual.
 - d. PM.
 - e. Service Factor.
 - f. Starter size, heater elements, rating.
- 8. V-Belt Drive
 - a. Identification/location.
 - b. Required driven RPM.
 - c. Drive sheave, diameter and RPM.
 - d. Belt, size and quantity.
 - e. Motor sheave, diameter and RPM.
 - f. Center-to-center distance, maximum, minimum and actual.
- 9. Duct Traverse
 - a. System zone/branch.
 - b. Duct size.
 - c. Area.
 - d. Design velocity.
 - e. Design air flow.
 - f. Test velocity.
 - g. Test air flow.
 - h. Duct static pressure.
 - i. Air correction factor.
- 10. Air Monitoring Station Data
 - a. Identification/location.
 - b. System.
 - c. Size.
 - d. Area.
 - e. Design velocity.
 - f. Design air flow.
 - g. Test velocity.
 - h. Test air flow.
- 11. Air Distribution Test Sheet
 - a. Air terminal number.
 - b. Room number/location.
 - c. Terminal type.
 - d. Terminal size.
 - e. Correction factor.
 - f. Design velocity.
 - g. Design air flow.
 - h. Test (final) velocity.
 - i. Test (final) air flow.
- 12. Cooling Coil Data

- a. Identification/number.
 - b. Location.
 - c. Service.
 - d. Manufacturer.
 - e. Entering air DB temperature, design and actual.
 - f. Entering air WB temperature, design and actual.
 - g. Leaving air DB temperature, design and actual.
 - h. Leaving air WB temperature, design and actual.
 - i. Water pressure flow, design and actual.
 - j. Water pressure drop, design and actual.
 - k. Entering water temperature, design and actual.
 - l. Leaving water temperature, design and actual.
 - m. Air pressure drop, design and actual.
 - n. Capacity - sensible and latent.
13. Heating Coil Data
- a. Identification/number.
 - b. Location.
 - c. Service.
 - d. Manufacturer.
 - e. Entering air DB temperature, design and actual.
 - f. Leaving air DB temperature, design and actual.
 - g. Water pressure flow, design and actual.
 - h. Water pressure drop, design and actual.
 - i. Entering water temperature, design and actual.
 - j. Leaving water temperature, design and actual.
 - k. Air pressure drop, design and actual.
 - l. Capacity.
14. Sound Level Report
- a. Location (Location established by the design engineer).
 - b. N C curve for eight (8) bands-equipment off.
 - c. N C curve for eight (8) bands-equipment on.
15. Vibration Test on equipment having 10 HP motors or greater in size.
- a. Location of points:
 - 1) Fan bearing, drive end.
 - 2) Fan bearing, opposite end.
 - 3) Motor bearing, center (if applicable).
 - 4) Motor bearing, drive end.
 - 5) Motor bearing, opposite end.
 - 6) Casing (bottom or top).
 - 7) Casing (side).
 - 8) Duct after flexible connection (discharge).
 - 9) Duct after flexible connection (suction).
 - b. Test readings:
 - 1) Horizontal, velocity and displacement.
 - 2) Vertical, velocity and displacement.
 - 3) Axial, velocity and displacement.
 - c. Normally acceptable readings, velocity and acceleration.
 - d. Unusual conditions at time of test.
 - e. Vibration source (if non-complying).
16. Control verification indicating date performed and any abnormalities identified.
- a. Point Location/Description.
 - b. EMS Readout (Setpoint and Actual).
 - c. Actual Readout of all points.
 - d. Interlocks.
 - e. Safeties.
 - f. Variable speed drive tracking with EMS input.

- g. Variable speed drive Bypass operation.
- h. Sequence of operation.

END OF SECTION

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SECTION 23 07 19

HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install piping insulation, jackets, accessories and covering of specified materials. The insulation shall be used for high and low temperature piping applications including condensate piping.

1.2 QUALITY ASSURANCE

- A. The intent of insulation specifications is to obtain superior quality workmanship resulting in an installation that is absolutely satisfactory in both function and appearance. Provide insulation in accordance with the specifications for each type of service and apply as recommended by the manufacturer and as specified.
- B. An approved contractor for this work under this Division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their owners satisfactorily for not less than 3 years.
- C. All piping insulation used on the project inside the building must have a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 50, as determined by test procedures ASTM E 84, NFPA 255 and UL 723. These ratings must be as tested on the composite of insulation, jacket or facing, and adhesive. Components such as adhesives, mastics and cements must meet the same individual ratings as the minimum requirements and bear the UL label.
- D. Condensation on any insulated piping system is not acceptable.
- E. Replace insulation damaged by either moisture or other means. Insulation that has been wet, whether dried or not, is considered damaged. Make repairs where condensation is caused by improper installation of insulation. Also repair any damage caused by the condensation.
- F. Where existing insulated piping, or other surfaces are tapped, remove existing insulation back to undamaged sections for hot surfaces or to nearest insulation stop for cold surfaces, and replace with new insulation of the same type and thickness as existing insulation. Apply as specified for insulation of the same service.

1.3 SUBMITTALS

- A. Submit product data on each insulation type, adhesive, and finish to be used in the work. Make the submittal as specified in General Requirements and obtain approval before beginning installation. Include product description, list of materials and thickness for each service and location and the manufacturer's installation instructions for each product.
- B. Make a field application of each type of insulation to display the material, quality and application method. Obtain approval of the sample application before proceeding with installation of the work.

1.4 RELATED WORK

- A. Finishes. Painting and color-coding.
- B. Pipe Heat Tracing.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Elastomeric Insulation
 - 1. Armacell.
- B. Weather Resistant Coating
 - 1. WB Armaflex Finish.
 - 2. Foster 30-64.
- C. Glass fiber blanket insulation
 - 1. Manville R-series Microlite FSKL.
 - 2. Owens-Corning eD75 or ED100 RKF.
 - 3. Knauf 0.75 PCF FSK.

2.2 ELASTOMERIC INSULATION

- A. Insulation material shall be flexible, closed-cell elastomeric insulation in tubular or sheet form. Material shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84, latest revision. Sheet material with a thickness greater than $\frac{3}{4}$ " shall have a flame spread rating of 25 or less and a smoke developed rating of 100 or less when tested in accordance with ASTM E84, latest revision. In addition, the product, when tested, shall not melt or drip flaming particles, and the flame shall not be progressive. In addition, all materials shall pass simulated end-use fire test.
 - 1. Thermal conductivity 0.27 at 75°F mean (ASTM C177 or C518).

2.3 SEALANT, ADHESIVE AND FINISH

- A. Lap Adhesive. Provide Childers CP-82 or Foster 85-20 adhesive.
- B. Vapor Barrier Finish:
 - 1. Indoors: Provide as insulation coating Childers CP-38 or Foster 30-80, white. Coating must meet MIL Spec C-19565C, Type II and be QPL Listed. Permeance shall be 0.013 perms or less at 43 mils dry. Tested at 100°F and 90% RH per ASTM E96.
 - 2. Outdoors: Provide as insulation coating Childers Encacel X or Foster 60-90. Permeance shall be 0.03 perms or less at 30 mils dry. Tested at 100°F and 90% RH per ASTM F 1249 and must be Hypalon rubber based.
 - 3. Underground: Provide Childers CP-22/24 or Foster 60-25/26 for fittings and areas. Pittwrap cannot be used.
- C. Insulation Joint Sealant. Provide Childers CP-76 or Foster 95-50 vapor barrier sealant.
- D. Metal Jacketing Sealant. Provide Childers CP-76 or Foster 95-44 metal jacketing sealant for all outdoor metal jacketing laps.
- E. Lagging Adhesive. Provide Childers CP-50AMV1 or Foster 30-36.

- F. Other products of equal quality will be acceptable only upon approval.

2.4 ALUMINUM JACKETING

- A. Finish insulated piping outdoors with a smooth prefabricated Z-lock aluminum jacket 0.016" thick with factory applied 1 mil polyethylene/40 lb and Fab strap. Kraft moisture barrier.
- B. Valves, Fittings and Flanges. For finishing valves, fittings, flanges and similar installations, provide formed aluminum covers, 0.024" thick.
- C. Straps and Seals. Provide 1/2" x 0.020 stainless steel strapping and seals for jackets and covers according to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 REFRIGERANT AND CONDENSATE PIPING

- A. Cover all pipe with elastomeric insulation by slitting tubular sections or sliding unslit sections over the open ends of piping or tubing. Seams and butt joints shall be adhered and sealed using Foster 85-75, Childers CP-82 or Armstrong 520 Adhesive.
- B. All fittings shall be insulated with the same insulation thickness as the adjacent piping. All seams and mitered joints shall be adhered with Foster 85-75, Childers CP-82 or 520 Adhesive.
- C. Pipe Saddles: Formed galvanized sheets at each support point for insulated pipe, shaped to fit pipe, and covering bottom half of pipe. Length at saddle shall be not less than twice the insulation outside diameter.
- D. Outdoor exposed piping shall be painted with two coats of either WB or SB Armaflex finish or Foster 30-64 elastomer foam coating. All seams shall be located on the lower half of the pipe.
- E. Outdoor exposed piping after being sealed as noted above apply aluminum jacketing to protect piping insulation exposed to weather, from damage from sunlight, moisture, equipment maintenance, wind, and shall provide shielding from solar radiation. Adhesive Tape shall not be permitted.

3.2 INSULATION THICKNESS

INSULATED UNIT
Condensate Drains

THICKNESS
(Inches)
1

END OF SECTION

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SECTION 23 20 00

HVAC PIPE AND PIPE FITTINGS - GENERAL

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install pipe and pipe fittings for piping systems specified in Division 23 - Mechanical.

1.2 RELATED WORK

- A. Division 23 Mechanical:
 - 1. Earthwork.
 - 2. Valves, Strainers and Vents.
 - 3. Vibration Isolation.
 - 4. Insulation.
 - 5. Other Piping Sections.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. The particular type of pipe and fittings for each system is specified in the individual sections.

2.2 JOINTS

- A. Make screwed joints using machine cut USASI taper pipe threads. Apply a suitable joint compound to the male threads only. Ream the pipe to full inside diameter after cutting. All-thread nipples are not permitted.
- B. Dissimilar Metals. Make joints between copper and steel pipe and equipment using insulating unions or couplings such as Crane Company #1259; EPCO as manufactured by EPCO Sales, Inc.; or an approved equal.
- C. Solder joints.
 - 1. Prior to making joints, cut pipe square and ream to full inside diameter. Clean exterior of pipe and socket. Apply a thin coat of suitable fluxing compound to both pipe and socket, and fit parts together immediately.
 - 2. Heat assembled joint only as required to cause the solder to flow. Run the joint full, slightly beaded on the outside, and wipe to remove excess solder.
 - 3. Use silver brazing alloy or Sil-Fos on refrigerant piping and on underground piping. Use lead free solder on all other copper piping.
- D. Make welded joints as recommended by the standards of the American Welding Society. Ensure complete penetration of deposited metal with base metal. Provide filler metal suitable for use with base metal. Keep inside of fittings free from globules of weld metal. The use of mitered joints is not approved.
- E. Flanged.
 - 1. Prior to installation of bolts, center and align flanged joints to prevent mechanical pre-stressing of flanges, pipe or equipment. Align bolt holes to straddle the vertical, horizontal or north-south centerline. Do not exceed 3/64" per foot inclination of the flange face from true alignment.

2. Use flat-face companion flanges only with flat-faced fittings, valves or equipment. Otherwise, use raised-face flanges.
 3. Install gaskets suitable for the intended service and factory cut to proper dimensions. Secure with manufacturers recommended gasket cement.
 4. Use ANSI nuts and bolts, galvanized or black to match flange material. Use ANSI 316 stainless steel nuts and bolts underground. Tighten bolts progressively to prevent unbalanced stress. Draw bolts tight to ensure proper seating of gaskets.
 5. Use carbon steel flanges conforming to ANSI B16.5 with pipe materials conforming to ASTM A 105 Grade II or ASTM A 108, Grade II, ASTM A 53, Grade B. Use slip-on type flanges on pipe only. Use welding neck type flanges on all fittings. Weld slip-on flanges inside and outside.
 6. Keep flange covers on equipment while fabricating piping. Remove when ready to install in system.
- F. Mechanical Joints: Provide a stuffing box type mechanical joint adapted to use gasket, cast iron gland and bolts. Coat bolts with bitumastic enamel. Use joint parts similar in design to one of the following:
1. Doublex Simplex Joint manufactured by the American Cast Iron Pipe Company, Birmingham, Alabama.
 2. U.S. joints manufactured by the United States Pipe and Foundry Company, Burlington, New Jersey.
 3. Boltite Joint manufactured by the McWane Cast Iron Pipe Company, Birmingham, Alabama.
 4. Flexlamp manufactured by the National Cast Iron Pipe Company, Birmingham, Alabama.

2.3 UNIONS

- A. Use 150 lb. standard (300 lb. WOG) malleable iron, ground joint unions with bronze seat. Provide flanged joints on piping 2-1/2" and larger.
1. Where pipe material of different types join, use a dielectric union. Union shall be threaded, solder or as required for its intended use.

2.4 BRANCH CONNECTIONS

- A. Pipe 2" and Smaller: For threaded piping, use straight size reducing tee. When branch is smaller than header, a nipple and reducing coupling or swagged nipple may be used.
- B. 2-1/2" through 36": For welding piping, when branch size is the same as header size, use welding tee. For threaded branch connections, use 3000 lb. full coupling or Thread-o-let welded to header.

2.5 GASKETS

- A. High Temperature Piping: Provide 1/16" thick ring gaskets of aramid reinforced SBR such as Garlock #3200 or 3400 or equal by Advanced Products and Systems.
- B. Other Piping: Provide ring rubber gaskets, Garlock #7992 or equal by Advanced Products and Systems. Use 1/8" thick cloth reinforced neoprene gaskets. For smaller than 6", use 1/16" thick gasket.

2.6 FLOORS AND CEILING PLATES

- A. Provide chrome-plated floor and ceiling plates around pipes exposed to view when passing through walls, floors, partitions, or ceilings in finished areas; size plates to fit pipe or insulation and lock in place.

2.7 DOMESTIC MANUFACTURE

- A. All piping material, pipe and pipe fittings shall be manufactured in the United States of America.

PART 3 - EXECUTION

3.1 PIPE FABRICATION AND INSTALLATION

- A. Make piping layout and installation in the most advantageous manner possible with respect to headroom, valve access, opening and equipment clearance, and clearance for other work. Give particular attention to piping in the vicinity of equipment. Preserve the required minimum access clearances to various equipment parts, as recommended by the equipment manufacturer, for maintenance.
- B. Cut all pipes to measurement determined at the site. After cutting pipe, remove burrs by reaming. Bevel plain ends of ferrous pipe.
- C. Install piping neatly, free from unnecessary traps and pockets. Work into place without springing or forcing. Use fittings to make changes in direction. Field bending and mitering is prohibited. Make connections to equipment using flanged joints, unions or couplings. Make reducing connections with reducing fittings only.
- D. Install piping without tapping out of the bottom of pipe.

3.2 WELD

- A. Weld and fabricate piping in accordance with ANSI Standard B31.1, latest edition, Code for Pressure Piping.
- B. Align piping and equipment so that no part is offset more than 1/16". Set fittings and joints square and true, and preserve alignment during welding operation. Use of alignment rods inside pipe is prohibited.
- C. Do not permit any weld to project within the pipe so as to restrict flows. Tack welds, if used, must be of the same material and made by the same procedure as the completed weld. Otherwise, remove tack welds during welding operation.
- D. Do not split, bend, flatten or otherwise damage piping before, during or after installation.
- E. Remove dirt, scale and other foreign matter from inside piping before tying into existing piping sections, fittings, valves or equipment.
- F. Bevel ends of ferrous pipe.

3.3 OFFSETS AND FITTINGS

- A. Due to the small scale of drawings, the indication of offsets and fittings is not possible. Investigate the structural and finish conditions affecting the work and take steps required to meet these conditions.
- B. Install pipe close to walls, ceilings and columns so pipe will occupy minimum space. Provide proper spacing for insulation coverings, removal of pipe, special clearances, and offsets and fittings.

3.4 SECURING AND SUPPORTING

- A. Support piping to maintain line and grade, with provision for expansion and contraction. Use approved clevis-type or trapeze-type hangers connected to structural members of the building. Single pipe runs to be supported by approved clevis type hangers. Multiple pipe runs to be supported by approved trapeze type hangers. Do not support piping from other piping or structural joist bridging. Review structural drawings for additional information.
- B. Provide supports both sides and within 12" of each horizontal elbow for pipe 6" and larger.
- C. Support vertical risers with steel strap pipe clamps of approved design and size, supported at each floor. Support piping assemblies in chases so they are rigid and self-supported before the chase is closed. Provide structural support for piping penetrating chase walls to fixtures. On chilled water pipe supports shall be outside the insulation.
- D. Where insulation occurs, design hangers to protect insulation from damage. Pipe saddles and insulation shields, where required, are specified in the appropriate insulation section and are sized in accordance with the schedule on the drawings.
- E. Install trapeze hangers, properly sized, to support the intended load without distortion. Use hangers with 1-1/2" minimum vertical adjustment.
- F. Use electro-galvanized or zinc plated beam clamps if acceptable to the structural engineer, threaded rods, nuts, washers and hangers. All hanger rods shall be trimmed neatly so that no more than 1 inch of excess hanger rod protrudes beyond the hanger nut. Use only on beams as directed by the Structural Engineer.
- G. At outdoor locations, all supports, brackets and structural members shall be hot-dipped galvanized.
- H. Provide hangers within 3' of pipe length from all coil connections.
- I. Support spacing: As recommended by the project structural engineer and support manufacturer, but not more than listed below. Not to exceed spacing requirements of smallest pipe.

Pipe Size	Copper & Steel Max. Support Spacing, Ft.	Cast Iron Max. Support Spacing, Ft.	Minimum Rod Diameter, Inches
1" & smaller	6		3/8
1-1/4" & 1-1/2"	8	5	3/8
2"	10	5	3/8
3"	10	5	1/2
4" & 5"	10	5	5/8
6" and above	10	5	3/4

3.5 PIPE SUPPORTS

- A. Provide P1001 or P 5000 Unistrut metal framing members and appurtenances for pipe support. Hot-dip galvanized members and appurtenances when located outside. Sagging of pipes or supports is not acceptable.
- B. Adjustable clevis hangers shall be used for single pipe supports; Anvil Fig. 260. When oversized clevis is used, a nipple shall be placed over the clevis bolt as a spacer to

assure that the lower U-strap will not move in on the bolt. Provide adjustable clevis with a nut / washer above and below the hanger on the support rod. Ring type clevis hangers are not acceptable.

- C. Provide Anvil Figure 45 galvanized or primed and painted channel assembly for trapeze hangers.

3.6 PIPE SUPPORTS ON ROOF

- A. Support condensate drain pipe on roof with Portable Pipe Hanger Model PP-10 with roller and fully adjustable height throughout pipe run. Base material shall be high density / high impact polypropylene with UV inhibitors and anti-oxidants. Provide with hot dip galvanized rod finish and framing. Nuts and washers shall be hot dip galvanized.

3.7 ANCHORS

- A. Provide anchors as required. Use pipe anchors consisting of heavy steel collars with lugs and bolts for clamping to pipe and attaching anchor braces. Install anchor braces in the most effective manner to secure desired results. Do not install supports, anchors or similar devices where they will damage construction during installation or because of the weight or the expansion of the pipe. When possible, install sleeves in structural concrete prior to pouring of concrete.

3.8 FLOOR PENETRATIONS

- A. At locations where pipe passes through floors, provide watertight concrete curb around penetration.

3.9 PIPE SLEEVES

- A. Sleeves through masonry and concrete construction:
 - 1. Fabricate sleeves of Schedule 40 galvanized steel pipe.
 - 2. Size sleeve large enough to allow for movement due to expansion and to provide continuous insulation.
- B. Sleeves through gypsum wall construction.
 - 1. Fabricate sleeves of 16 gauge galvanized sheet metal.
- C. Sleeves through elevated slab construction.
 - 1. Fabricate sleeves of Schedule 40 galvanized steel pipe with welded center flange in floor.
- D. Extend each sleeve through the floor or wall. Cut the sleeve flush with each wall surface. Sleeves through floors shall extend 2" above floor lines for waterproofing purposes. Slab on grade floors shall not be sleeved except where penetrating waterproofing membrane or insect control is required.
- E. Caulk sleeves water and air tight. Seal annular space between pipes and sleeves with mastic compound to make the space water and air tight.
- F. For sleeves below grades in outside walls, provide Thunderline Link-Seal or Advance Product and System Interlynx, with 316 stainless steel nuts and bolts, with cast iron pressure plate.
- G. Provide chrome plated escutcheon plates on pipes passing through walls, floors or ceilings exposed to view. At exterior walls, stainless steel sheet metal is to be used.

- H. For sleeves through fire and smoke rated walls, seal with a UL through-penetration firestop, rated to maintain the integrity of the time rated construction. Install in accordance with the manufacturer's installation instructions. Comply with UL and NFPA standards for the installation of firestops. Refer to Architectural drawings for all fire and smoke rated partitions, walls, floors, etc.

3.10 ISOLATION VALVES

- A. Provide piping systems with line size shutoff valves located at the risers, at main branch connections to mains for equipment, to isolate central plant, and at other locations.

3.11 DRAIN VALVES

- A. Install drain valves at low points of water piping systems so that these systems can be entirely drained. Install a line size drain valve for pipes smaller than 2" unless indicated otherwise. For pipes 2-1/2" and larger, provide 2" drain valves unless indicated otherwise. Drain valves shall be plugged when not in use and at completion.

3.12 CLEANING OF PIPING SYSTEMS

- A. General cleaning of piping systems. Purge pipe of construction debris and contamination before placing the systems in service. Provide and install temporary connections as required to clean, purge and circulate. Flush the chilled and hot water systems utilizing the filter feeders.
- B. Install temporary strainers at the inlet of pumps and other equipment as necessary where permanent strainers are not indicated. Keep strainers in service until the equipment has been tested, then remove either entire strainer or straining element only. Fit strainers with a line size blow down ball valve and pipe to nearest drain. Blow down strainers, remove and clean as frequently as necessary.
- C. Phase One: Initial flushing of system. Remove loose dirt, mill scale, weld beads, rust and other deleterious substances without damage to system components. Open valves, drains, vents and strainers at all system levels during flushing procedures. Flush until "potable water clear" and particles larger than 5 microns are removed.
- D. Connect dead-end supply and return headers, even if not shown on the drawings, and provide terminal drains in bottom of pipe end caps or blind flanges.
- E. Dispose of water in approved manner.
- F. Phase Two: Cleaning of Piping Systems. Remove, without chemical or mechanical damage to any system component, adherent dirt (organic soil), oil, grease, (hydrocarbons), welding and soldering flux, mill varnish, piping compounds, rust (iron oxide) and other deleterious substances not removed by initial flushing. Chemical shall be equal to Nalco 2578 prepping compound. Insert anti-foam compound as necessary. Circulate for 48 hours or as recommended by the manufacture. Dispose of water in approved manner. Flush system and replace with clean water. Verify compatibility of chemicals used with existing chemical treatment program on remodel projects.
- G. Phase Three: Final flushing and rinsing: Flush and rinse until "potable water clear" and particles larger than 5 microns are removed. Operate valves to dislodge any debris in valve body. Dispose of water in approved manner.
- H. Submit status reports upon completion of each phase of work on each system.

- I. Special requirements, if any, are specified in the sections on each type of piping or in the section on Water Treatment Systems.

3.13 TESTING

- A. Test piping after installation with water hydrostatic pressure of 1-1/2 times operating pressure (150 psig minimum) and carefully check for leaks. Repair leaks and retest system until proven watertight.
- B. Do not insulate or conceal piping systems until tests are satisfactorily complete.
- C. If any leaks or other defects are observed, suspend the test and correct the condition at once. Repeat testing until leaks are eliminated and the full test period is achieved.
- D. The satisfactory completion of testing does not relieve the Contractor of responsibility for ultimate proper and satisfactory operation of piping systems and their accessories.

3.14 PIPE MARKERS

- A. Identify interior exposed piping and piping in accessible chases or plenums with Opti-Code Brady Pressure Sensitive Adhesive Pipe Markers, consisting of pipe marker and direction of flow arrow tape. Clean pipe prior to installation. Background colors of markers, arrows and tape for each type of system shall be the same. Meet ANSI/OSHA standards and clearly identify each system. Provide minimum 2-1/4-inch letters through 4-inch pipe and 4-inch letters for 5-inch pipe and larger.
- B. Identify exterior and mechanical room piping with Snap Around pipe markers through 4-inch pipe and Strap Around markers 5-inch pipe and larger. Pipe markers consisting of pipe marker and direction of flow arrow tape; background colors of markers, arrows and type for each type of system shall be the same. Meet ANSI / OSHA standards and clearly identify each system. Provide minimum 2-1/4-inch letters through 4-inch pipe and 4-inch letters for 5-inch pipe and larger.
- C. Install identification in the following locations:
 - 1. both sides of penetrations through walls, floors and ceilings.
 - 2. Close to valves or flanges.
 - 3. Intervals on straight pipe runs not to exceed 50 feet
 - 4. Apply marker where view is obstructed.
- D. Pipe markers shall meet or exceed the specifications of the ASME A13.1 "Scheme for Identification of Piping Systems".

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SECTION 23 31 13

DUCTWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Duct construction, support and accessories. Dimensions shown on the drawings are free area dimensions.

1.2 RELATED WORK

- A. Division 23 Mechanical
 - 1. Air Devices.
 - 2. Insulation.
 - 3. Fans
 - 4. Packaged Rooftop Air Conditioners.
 - 5. Testing, Balancing and Adjusting (TAB) of Environmental Systems.
- B. Division 9 – Finishes, Painting and Color Coding.

1.3 QUALITY ASSURANCE

- A. The intent of ductwork specifications is to obtain superior quality workmanship resulting in an installation that is absolutely satisfactory in both function and appearance. Provide ductwork in accordance with the specifications for each type of service.
- B. An approved contractor for this work under this division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 5 systems of comparable size and type that have served their owners satisfactorily for not less than 5 years.

1.4 GUARANTEE

- A. Guarantee ductwork for 1 year from the date of substantial completion. The guarantee covers workmanship, noise, chatter, whistling, or vibration. Ductwork shall be free from pulsation under conditions of operation.

1.5 CONTRACTOR COORDINATION

- A. Erect ducts in the general locations shown, but conform to structural and finish conditions of the building. Before fabricating any ductwork, check the physical conditions at the job site and make necessary changes in cross sections, offsets, and similar items, whether they are specifically indicated or not.
- B. Coordinate location of ductwork with structural members and Architectural drawings and requirements.

1.6 SHOP DRAWINGS AND SAMPLES

- A. Submit shop drawings of all ductwork layouts, including enlarged plans and elevations of all air handling equipment, and submit details of duct fittings, including particulars such as gauge sizes, welds, and configurations prior to starting work.

- B. Submit product data and sealing materials to be used.
- C. Submit sound attenuation data.
- D. Submit shop drawings in plan, elevation and sections, and three-dimensional view showing equipment in mechanical equipment areas.

PART 2 - PRODUCTS

2.1 STANDARDS AND CODES

- A. Except as otherwise indicated, sheet metal ductwork material and installation shall comply with the latest edition of SMACNA HVAC Duct Construction Standards. Air distribution devices (such as dampers) included in this specification shall comply with the latest applicable SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and NFPA 90A.

2.2 DUCT MATERIAL AND CONSTRUCTION

- A. Except for the special ducts specified below use lock forming quality prime galvanized steel sheets or coils up to 60" wide. Stencil each sheet with gauge and manufacturer's name. Stencil coils of sheet steel throughout on 10' centers with gauge and manufacturer's name. Provide certification of duct gauge and manufacturer for each size duct.
- B. Rectangular low and medium pressure duct constructed of sheet metal in accordance with the latest edition of SMACNA HVAC Duct Construction Standards.
- C. Low pressure round ducts shall be shop fabricated with snap lock longitudinal seams. Ducts shall be constructed for a minimum of 2" w.g. static pressure.
- D. Kitchen exhaust duct: Welded Black steel, minimum 16 gauge

2.3 DUCT SEALING OF SEAMS AND JOINTS

- A. Follow seal classification as indicated in Table 1-2 of SMACNA "HVAC AIR DUCT LEAKAGE TEST MANUAL". Use seal class A for 4" w.g. static. All longitudinal and transverse joints and seams shall be sealed by use of a fireproof, non-hardening, and non-migrating elastomeric sealant. With the exception of continuously welded joints and machine made spiral lock seams, joints and seams made air tight with duct sealer.
 1. Indoor applications – Foster 32-14.
 2. Outdoor applications – Foster 32-17.

2.4 FLEXIBLE DUCT LOW PRESSURE

- A. Construction:
 1. Continuous galvanized spring steel wire helix, with reinforced metalized cover
 - a. The fabric shall be mechanically fastened to the steel helix without the use of adhesives.
 2. UL 181 Class I air duct label.
 3. Reinforced vapor barrier jacket.
 4. Rated for use at system pressure (6" wc minimum).
 5. Flexible duct connections from lateral taps to variable volume boxes or terminal boxes shall be rated at twice the maximum pressure rating of the medium pressure system.
- B. Fire hazard classification:
 1. Flame spread rating 25 maximum.

2. Smoke developed rating 50 maximum.
- C. Thermal characteristics:
1. R-6 BTU/hr/sq. ft./°F (when located in a conditioned plenum).
 2. R-8 BTU/HR/Sq.Ft./°F (when located in an unconditioned plenum).
 3. 2" minimum wall thickness insulation with 1" overlap.
- D. Acceptable manufacturers:
1. Flexmaster.
 2. Hart & Cooley.
 3. Omniair.
 4. Peppertree Air Solutions.

2.5 FIRE DAMPERS

- A. Fire dampers for required wall ratings that are 95% minimum free area. Provide Type B or Type C UL dampers for low, medium and high-pressure rectangular, square or round ducts. Dampers shall be activated by a fusible link designed to react at 165°F. Install per manufactures recommendations to provide a UL assembly. Provide sealed sleeve to meet desired leakage performance.
- B. Acceptable Manufacturers:
1. Ruskin
 2. Prefco Products
 3. Air Balance
 4. Greenheck, Inc.
 5. Nailor Industries
 6. Pottoroff

2.6 WALL LOUVERS

- A. Refer to schedule on drawings. Coordinate with Architectural Drawings.
- B. All louver frames shall be a minimum of 0.08" extruded aluminum. All blades shall be a minimum of 0.081" extruded aluminum. Beginning point of water penetration at 0.01 oz/sq.ft. Shall be a minimum of 800 ft/min.
- C. Provide all louvers with removable aluminum bird screen with 1/4" mesh.
- D. Louvers shall be AMCA-550 tested and approved.
- E. Acceptable manufacturers:
1. American Warming and Ventilation
 2. Arrow
 3. Greenheck
 4. NCA
 5. Pottorff
 6. Ruskin

2.7 STORM SHELTER WALL LOUVERS

- A. Refer to schedule on drawings. Coordinate with Architectural Drawings.
- B. All louver frames shall be a minimum of 0.08" extruded aluminum. All blades shall be a minimum of 0.081" extruded aluminum. Beginning point of water penetration at 0.01 oz/sq.ft. Shall be a minimum of 800 ft/min.
- C. Provide all louvers with removable aluminum bird screen with 1/4" mesh.

- D. Louver performance shall be certified in accordance with the AMCA 511 Certified Ratings Program for AMCA 500-L Air Performance and Water Penetration and shall be licensed to bear the AMCA seal.
- E. Louvers shall be UL Classified (Wind-storm Rated) and shall be tested in accordance with the ICC 500-2014 debris impact standard of a 15 lb. 2 x 4 traveling at 100 mph as per the requirements indicated within the FEMA 361 construction guidelines for a FEMA 361 or FEMA 320 compliant storm shelter or safe room.
- F. Louvers shall be capable of withstanding positive or negative wind pressure loads up to 250 psf when installed in accordance with the manufacturer's published installation instructions.
- G. Acceptable manufacturers:
 1. Ruskin (XP500)
 2. United Enertech (FEMA-5)
 3. Greenheck (AFL-501)
 4. Pottorff (XAV-505)
 5. Airolite (AFG501)

2.8 DUCT LINING

- A. Duct lining shall be 1" thick, 1-1/2 lb. density, flexible lining coated on the air stream side to reduce attrition. Liner shall be Schuler Lina-Coustic, Certain-Teed Ultralite, or equal meeting requirements of NFPA 90-A. Provide I.A.Q. rated liner.

2.9 CONTROL DAMPERS

- A. Opposed blade dampers for 2-position and modulating control. Construct frames of 13-gauge galvanized sheet metal with provisions for duct mounting. Damper blades not exceeding 8" in width, of corrugated-type construction, fabricated from two sheets of 22-gauge galvanized sheet metal spot-welded together or a single 16-gauge sheet. Make bearings of nylon or oil-impregnated, sintered bronze. Make shafts of 1/2" zinc-plated steel. Blades suitable for high velocity performance. Construct damper so that leakage does not exceed 1/2% based on 2000 fpm and 4" static pressure. Provide replaceable resilient seals along top, bottom and sides of frame and along blade edge. Submit leakage and flow characteristics data with shop drawings. Linkage shall be concealed out of the air stream within damper frame to reduce pressure drop and noise.

- B. Acceptable Model is Ruskin Model CD60.

2.10 VOLUME DAMPERS

- A. Manual balancing dampers that meet or exceed the following minimum construction standards:
 1. Frame 16-gauge.
 2. Blades 16-gauge.
 3. Bearings corrosion resistant.
 4. Concealed linkage.
 5. Opposed blade dampers.
- B. Acceptable manufacturer:
 1. Ruskin Model MD-35 or approved equal, by.
 2. Arrow.
 3. American Warming and Ventilating.
 4. Nailor Industries.
 5. Pottorff.

2.11 DIFFUSER FITTINGS LOW PRESSURE TAPS

- A. Fitting shall meet or exceed the following minimum construction standards:
 - 1. Conical with a base diameter two inches larger than the tap diameter.
 - 2. Construct fitting and damper of galvanized steel in accordance with ASTM A 527, G90 finish.
 - a. Fitting with a 3/16-inch high stop bead approximately 2-1/2-inches from the discharge end of the fitting.
 - b. Provide the fitting with a butterfly damper, damper rod, end bearings and heavy duty locking quadrant.
 - c. Size the length of the straight section of the fitting to match the damper blade diameter. Center the damper blade in the straight section.
 - 3. Match the fitting body gauge to the SMACNA duct gauge, but not less than:
 - a. Through 8 inches: 26 gauge; Damper blade 22 gauge.
 - b. 10 inches and 12 inches: 24 gauge; Damper blade 22 gauge.
 - c. 14 inches and 16 inches: 22 gauge; Damper blade 22 gauge.
 - d. 18 inches and 20 inches: 20 gauge; Damper blade 20 gauge.
 - 4. Fasten damper blade to a 3/8 X 3/8 continuous square rod with minimum (2) galvanized U-bolts.
 - 5. Support the damper rod to the fitting with airtight nylon end bushings / bearings.
 - 6. Provide the damper with a self-locking regulator and handle.
 - 7. Provide a 2" sheet metal stand-off to extend the regulator.
 - 8. Flex duct grip area – 2 inches behind retaining bead.
 - 9. Flex duct retaining bead – 1 inch from end.
 - 10. Conical length of at least 3 inches.
 - 11. Barrel length of at least 9 inches.

2.12 AUXILIARY DRAIN PANS

- A. Galvanized steel, same gauge and same bracing or cross breaks as a duct with same dimensions. Sides of pan turned up to 1-1/2", all joints soldered watertight. Pan is to be large enough to complete cover drip lines of unit.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use construction methods and requirements as outlined in SMACNA HVAC Duct Construction Standards as well as SMACNA Balancing and Adjusting publications, unless indicated otherwise in the specifications. Refer to details on the drawings for additional information.
- B. Reinforce ducts in accordance with recommended construction practice of SMACNA. Provide additional reinforcement of large plenums as required to prevent excessive flexing and or vibration.
- C. Cross break or bead sheet metal for rigidity, except ducts that are 12" or less in the longest dimension.
- D. Where ducts pass through walls in exposed areas, install suitable escutcheons made of sheet metal angles as closers.
- E. At locations where ductwork passes through floors, provide watertight concrete curb around penetration.
- F. Support ducts where passing through floors with galvanized steel structural angles of adequate bearing surface.

- G. Metal or lined ductwork exposed to view through grilles, registers, and other openings shall be painted flat black. Do not install grilles, registers, or similar items until painting is complete.
- H. Fire Dampers shall be installed per manufacturer's recommendations to create a UL rated assembly.
- I. Install end bearing at all location where damper shaft penetrates duct wall.
- J. Clean duct to remove accumulated dust. Ducts shall be closed on ends between phases of fabrication to assure that no foreign material enters the ducts.

3.2 DUCTWORK

- A. Construct rectangular ducts and round ducts in accordance with the latest SMACNA HVAC Duct Construction Standards. Use the static pressure specified on the air handling unit schedule or fan schedules as a minimum for duct construction. All ductwork between the variable volume air handling units and the terminal units shall be constructed to the medium pressure ductwork specification.
- B. Provide adjustable, galvanized splitter-dampers, pivoted at the downstream end with appropriate control device at each supply duct split.
- C. For branch ducts wider than 18", and when shown on drawings provide extractors with an appropriate control device at each rectangular zone or branch supply duct connection. Provide controllers for extractors. Branch ducts shall have a 45° angle in the direction of flow. Do not provide extractor at branch ducts to sidewall registers where the registers are within 10 feet of the main duct.
- D. Shop manufactured curved blade scoops may be used for branch duct takeoffs up to 18" wide. Taper scoop blade to the end, to prevent any sagging that may cut into, or damage duct liner if specified during operation.
 - 1. Construct shop manufactured scoops and splitter blades of galvanized sheet metal 2 full gauges heavier than equivalent sheet metal gauge of branch duct (up to 16 gauge).
 - 2. Check extractors, scoops and splitter blades thoroughly for freedom of operation. Oil bearing points before installing.
- E. Use pushrod operator with locking nut and butt hinges assembly.
- F. Provide opposed-blade volume dampers with an appropriate control device in each of the following locations:
 - 1. Return air ductwork
 - 2. Outside air branch duct
 - 3. Exhaust branch duct
 - 4. Exhaust connections to hoods except kitchen grease hoods or equipment
 - 5. In each zone at multi-zone unit discharge installed downstream of duct mounted re-heat coils
 - 6. At each outside air and return air duct connection to plenum of constant volume units
 - 7. At discharge side of constant volume boxes
 - 8. Where otherwise indicated or required for balancing coordinate location of additional dampers required by TAB Contractor.
 - 9. Provide multi-blade dampers when blade width exceeds 12". Provide end bearing where damper shaft penetrates duct wall.

- G. Elbows:
1. Rectangular: Where square elbows are shown, or are required for good airflow, provide and install single-wall or airfoil turning vanes. Job-fabricated turning vanes, if used, shall be single-thickness vanes of galvanized steel sheets of the same gauge metal as the duct in which they are installed. Furnish vanes fabricated for the same angle as the duct offset. The use of radius elbows with a centerline radius of not less than 1-1/2 times the duct width may be provided in lieu of vaned elbows where space and air flow requirements permit.
 2. Round Oval Duct. Provide elbows with a centerline radius of 1-1/2 times the duct diameter or duct width. For round ducts, furnish smooth elbows or 5 piece, 90° elbows and 3 piece, 45° elbows.
- H. For control devices concealed by ceilings, furring, or in other inaccessible locations, furnish extension rods and appropriate recessed-type Young regulators, mounted on the surface of the ceiling or the furring, unless specified, or shown otherwise. Provide with chrome plated cover plates. Use only one mitered gear set for each control device.
- I. Install streamline deflectors at any point where dividing a sheet metal duct around piping or where other such obstruction is permitted. Where such obstructions occur in insulated ducts, fill space inside streamliner and around obstructions with glass fiber insulation.
- J. Insulated Flexible Duct:
1. Install in accordance with manufacturer's instructions, and the terms of its UL listing. Duct shall not exceed 6' in length. Make connections by use of sheet metal collars and stainless steel circular screw clamps. Clamps shall encircle the duct completely and be tightened with a worm gear operator to the point that will provide an airtight connection without unnecessary deformation of the duct. Provide one clamp on flexible duct and one clamp on external insulation. Vapor barrier jacket shall be tucked inside to conceal insulation material.
 2. Construct bends over 45° with sheet metal elbows.
- K. Duct Supports:
1. Horizontal ducts up to 40". Support horizontal ducts up to and including 40" in their greater dimension by means of #18 U.S. gauge galvanized iron strap hangers attached to the ducts by a minimum of two locations per side by means of screws, rivets or clamps, and fastened to inserts with toggle bolts, beam clamps or other approved means. Place supports on at least 8' centers. Use clamps to fasten hangers to reinforcing on sealed ducts.
 2. Horizontal ducts larger than 40". Support horizontal ducts larger than 40" in their greatest dimension by means of hanger rods bolted to angle iron trapeze hangers. Place supports on at least 8' centers in accordance with SMACNA Standards.
 3. Support vertical ducts where they pass through the floor lines with 1-1/2" x 1-1/2" x 1/4" angles for ducts up to 60". Above 60", the angles shall be increased in strength and sized on an individual basis considering space requirements.
 4. Supports shall be suspended from structural or by independent support. Do not support from structural bridging. Upper attachments should be selected with a safety factor of 4 or 5 times actual load conditions and subject to Engineers approval. Double wrap straps over open web of joist.
- L. Branch connections for medium pressure ductwork shall be made with a conical lateral. Field installed conical branch ducts shall be minimum 20-gauge galvanized sheet metal, "Everdur" welded and coated with "Galvabar".

3.3 FLEXIBLE CONNECTIONS

- A. Where ducts connect to fans or air handling units that are not internally isolated, make flexible airtight connections using "Ventglas" fabric. The fabric shall be fire-resistant, waterproof and mildew resistant with a weight of approximately 30 ounces per square yard. Provide a minimum of 1/2" slack in the connections, and a minimum of 2-1/2" distance between the edges of the ducts. Also, provide a minimum of 1" slack for each inch of static pressure on the fan system. Fasten fabric to apparatus and to adjacent ductwork by means of galvanized flats or draw bands. Where connections are made in outdoor locations, seal fabric to metal with mastic.

3.4 DUCT LINING

- A. Install glass fiber acoustical lining where shown on drawings. Secure to duct surfaces with Foster 85-62 / 85-60 or Childers CP-125-1 / CP-127 adhesive and sheet metal fasteners on 12" centers. Coat exposed edges and leading edges of cross-joints with adhesive.
- B. Provide metal nosing that is either channeled or "Z" profiled or are integrally-formed from the duct wall securely installed over transversely oriented liner edges facing the air stream at fan discharge and at any interval of lined duct preceded by unlined duct.
- C. Refer to Insulation & Liner Detail on drawings for locations requiring liner to be installed.
- D. Do not install liner in multi-zone unit ductwork.

3.5 SEALING OF SEAMS AND JOINTS

- A. Seal supply, return, exhaust and outside air duct systems.

3.11 KITCHEN EXHAUST DUCT

- A. All material and fittings shall be minimum 16 gauge, coated black steel to prevent rusting. All seams and joints in the kitchen exhaust duct, and penetrations of the hood enclosure to its lower outermost perimeter that directs and captures grease-laden vapors and exhaust gases shall have a liquid tight continuous external weld. All ducts shall be installed without forming dips or traps that might collect residues. Provide 18" x 18" or equal area at each elbow and as required for cleaning access, in direction of air flow. UL Listed access panel shall be located on the vertical wall of the duct 1-1/2" from the bottom of duct and shall be fitted with two handles, grease and air tight fitting access door and latch. All interior surfaces of ducts shall be accessible for cleaning and inspection purposes. Duct shall maintain minimum 1/4" per lineal foot slope to the exhaust hood. Provide duct over lay at the roof curb for a complete seal. Install kitchen exhaust system per local authority. In the absence of a local authority, the requirements of the Uniform Mechanical Code and NFPA 96 shall govern.

3.6 CONNECTIONS TO LOUVERS

- A. Make watertight connections to all louvers. Ductwork behind louver shall have watertight soldered joints for a minimum of three feet and be sloped to bottom of louver. Lap duct to be over bottom louver blade where possible.
- B. Where plenums are installed on inside of louver, construct such that bottom of plenum will lap over bottom blade of louver to drain any water that may enter.

3.7 PLENUMS

- A. Construct plenums with galvanized steel framing members and galvanized sheet steel, cross braced and rigidly braced with galvanized angles. Gauges and bracing shall conform to SMACNA recommendations for ductwork of like sizes. Openings for fans,

access doors, etc., shall be framed with galvanized steel angles.

3.8 B. Provide access doors.
AUXILIARY DRAIN PANS

A. Where coils that have a condensate drain are located above ceiling.

3.9 TESTING OF LOW PRESSURE DUCTWORK

A. Test ductwork for leaks before concealing. Maximum allowable leakage is 5% of total airflow.

B. Provide equipment necessary for performing tests, including rotary blower large enough to provide required static pressure at allowed CFM quantity, certified orifice section with proper papers, traceable serial numbers and pressure vs CFM leakage rate scale, U-tube gauge board complete with cocks, tubing, and inclined manometer for leakage rates.

C. Mains: Test mains after risers and branches are tied in and all equipment set. Close runout connections and place fan in operation. Provide pressure in mains at 1-1/2 times design pressure. Visually inspect joints. Repair leaks detected by sound or touch. Release mains for completion after joints are tight.

D. Ductwork down stream of terminal boxes, return, exhaust, and outside air ducts are to be visually inspected.

END OF SECTION

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SECTION 23 34 16

FANS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install fans, including centrifugal, axial and propeller types, with supplemental equipment.

1.2 RELATED WORK

- A. Division 23 Mechanical:
 - 1. Ductwork.
 - 2. Vibration Isolation.
 - 3. Air Balance.
 - 4. Electrical Provisions of Mechanical Work.

1.3 PERFORMANCE

- A. Provide fan type, arrangement, rotation, capacity, size, motor horsepower, and motor voltage as shown. Fan capacities and characteristics are scheduled on the drawings. Provide fans capable of accommodating static pressure variations of +10% of scheduled design at the design air flow.
- B. Rate fans according to appropriate Air Moving and Conditioning Association, Inc. (AMCA), approved test codes and procedures. Supply fans with sound ratings below the maximums permitted by AMCA Standards. All fans provided must be licensed to bear the Certified Ratings Seal.
- C. Statically and dynamically balance all fans.
- D. Motors shall be sized so that they do not operate within the motor service factor.
- E. Fans shall be capable of 120% of the scheduled air capacities.
- F. All static pressures shown on schedules are external to fans. Manufacturer shall add damper and accessory losses to scheduled value before selecting fan.

1.4 SUBMITTALS

- A. Submit fan performance curves with system operating point plotted on curves.
- B. Submit manufacturer's printed installation instructions.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Cook.
- B. Greenheck.
- C. Penn Barry Ventilator.

D. Twin City Fans

2.2 PROTECTIVE COATINGS

- A. Manufacturer's Standard. Apply to fans, motors and accessories, the manufacturer's standard prime coat and finish, except on aluminum surfaces or where special coatings are required.
- B. Galvanizing. After fabrication of the parts, hot-dip coat surfaces that require galvanizing. Where galvanizing is specified, a zinc coating may be used. After fabrication, apply the zinc coating and air-dry the coating to 95% pure zinc. Acceptable zinc coatings include Zincilate, Sealube, Amercoat, Diametcoat, or an approved equal.

2.3 SUPPLEMENTAL EQUIPMENT

- A. Motor Covers. Provide weatherproof motor covers for installations out of doors. Apply the same finish as used on the fan.
- B. Belt Drives:
 - 1. Unless otherwise specified for belt-driven fans, equip the fan motors with variable pitch sheaves. Select the sheave size for the approximate midpoint of adjustment and to provide not less than 20% speed variation from full open to full closed. Size drives for 150% of rated horsepower. Key the fan sheave to the fan shaft.
 - 2. Nonadjustable motor sheaves may be used for motor sizes over 15 horsepower, at the Contractor's option. However, if changing a nonadjustable sheave becomes necessary to produce the specified capacity, the change must be made at no additional cost.
 - 3. Provide belt guards and apply the same finish as used on the fan.
 - 4. Oil and heat resistant, nonstatic type belts.
 - 5. Bearings shall be designed and individually tested specifically for use in air handling applications. Construction shall be heavy duty, regreasable, ball type, in a pillow block, cast iron housing, selected for a minimum L50 life in excess of 200,000 hours at maximum catalog operating speed.
- C. Safety Disconnect Switch: Provide a factory-wired to motor, safety disconnect switch on each unit.
- D. Relief Vents and Air Inlets: Provide vents and inlets with aluminum frames and 1/2" mesh, galvanized bird screens. Include dampers where shown.
- E. Prefabricated Roof Curbs: Furnish prefabricated roof curbs as detailed. The minimum height is 14". Include a resilient pad on each roof curb so the equipment can be mounted on the top flange for proper seal. Coordinate roof slope and curb to ensure equipment is installed in level position. Provide double shell to protect insulation from damage.
- H. All fans are to be provided with a durable, deep etched, .025" thick, factory installed aluminum identification plate with the following information. Plates are to be furnished with four mounting holes.
 - 1. Fan mark as indicated on the Contract Drawings.
 - 2. Serial number.
 - 3. Model number.
 - 4. Capacity (CFM) and static pressure.
 - 5. Motor HP.
 - 6. Motor Amps.
 - 7. Manufacturer.

8. Motor phase.
 9. Number of Belts/Make/Size.
 10. Motor volts.
- I. Utility Vent Set Fans, provide minimum ¾ inch threaded coupling drain connection at lowest point of housing.

2.4 VENTILATION AND EXHAUST FANS

- A. Provide the ventilation and exhaust fans shown on the drawings.
- B. Provide each motor with internal overload protection.
- C. Provide each belt driven fan with approved, totally enclosed belt guard.
- D. Provide approved safety screen where inlet or outlet is exposed.
- E. Provide duct flanges where required for connections.
- F. Furnish kitchen hood exhaust fans with vented curb extension that meets NFPA 96, cleanout port, grease tap, curb seal, drain connection and hinge kit.
- G. Furnish supply fans with 1" aluminum, washable filter section.

2.5 ROOFTOP VENTILATION AND EXHAUST SYSTEMS

- A. Provide the rooftop ventilation and exhaust systems shown on the drawings.
- B. Provide each motor with internal overload protection.
- C. Components:
 1. Aluminum, stainless steel or plastic coated bird guard.
 2. Screws and fasteners of stainless steel or nonferrous material.
 3. All aluminum construction unless indicated otherwise on fan schedule.
- D. Welded construction, corrosion resistant fasteners, minimum 16 gauge marine alloy aluminum.
- E. Aluminum base shall be continuously welded curb cap corners.

2.6 GRAVITY ROOF-TOP INTAKE AND RELIEF VENTS

- A. Provide the rooftop intake and relief vent systems shown on the drawings.
- B. Provide with aluminum, stainless steel or plastic coated bird guard.
 1. Screws and fasteners of stainless steel or nonferrous material
 2. All aluminum construction
- C. Welded construction, corrosion resistant fasteners, minimum 16-gauge marine alloy aluminum.
- D. Aluminum base shall be continuously welded curb cap corners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fans according to the manufacturer's instructions and in the locations shown on the drawings. Ensure fan location is installed at minimum distance from roof edge to meet code requirements.
- B. Do not operate fans or fan powered devices for any purpose until ductwork is clean, filters in place, bearings lubricated and the fan has been run under observation.
- C. Roof mounted fans and gravity roof-top intake and relief vents shall be secured to the curb with stainless steel lag screws at a minimum of 6-inches on center. Follow manufacturer's installation instructions if they are more stringent. Install roof mounted equipment in a level position. Units shall be seated on properly sized curb. Gap between base of the fan and top of the curb shall be sealed with neoprene 1" x ¼" gasket. Gasket shall be glued or attached with pressure sensitive adhesive.
- D. Install curbs and equipment in level position.
- E. Ceiling mounted in-line centrifugal blowers
 - 1. Shall be suspended from structure with 1/2-inch zinc plated all-thread rods secured to structure.
 - 2. Provide sub-structure where required.
 - 3. Mount bottom of fan no more than 18-inches above the finished ceiling height.

3.2 EXTRA MATERIALS

- A. Provide two sets of belts for each fan, not including the set installed on the fans. Tag set to identify fan.

END OF SECTION

SECTION 23 37 13

AIR DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install air distribution devices, including grilles, diffusers, registers, dampers, and extractors.

1.2 RELATED WORK

- A. Division 23 Mechanical.
 - 1. Ductwork.
 - 2. Air Balance.
 - 3. Electrical Requirements for Mechanical Work.

1.3 COOPERATION WITH OTHER TRADES

- A. Coordinate this work with work under Division 26 Electrical, to ensure that intended functions of lighting and air systems are achieved.

1.4 SUBMITTALS

- A. Submit product data for outlets, grilles, registers, control devices, and similar equipment for review prior to placement of purchase order.
- B. Submittal shall include performance sheet for each air device type. Performance sheet shall include NC levels, throw, and total pressure loss at various air flows.

1.5 FINISHES

- A. Paint exposed devices with factory standard prime coat, or factory finish coat, as specified.

PART 2 - PRODUCTS

2.1 DIFFUSERS, GRILLES AND REGISTERS - Refer to Drawing Schedule.

2.2 ACCEPTABLE MANUFACTURERS

- A. Titus.
- B. Krueger.
- C. Nailor Industries.
- D. Price.
- E. Metal-Aire.

2.3 ACCESSORIES

- A. Supply Grille Extractors. Provide supply grilles with an air control device capable of positively regulating the volume of air extracted from the supply duct.

Select extractors similar to Titus Model AG25, tight-closing in the minimum position. Include a key-operated or worm-gear adjusting mechanism to facilitate positioning from the grille opening. Where adjustment is not accessible at the grille opening, provide a square control rod equipped with a locking quadrant.

- B. Mounting Frames. Provide each grille or register not equipped with a removable core with a companion, all-purpose mounting frame constructed like grille frame to facilitate installation and removal of the grille or register without marring adjacent mounting surfaces.
 - 1. Furnish frames with 1/2" thick sponge rubber gasket to prevent air leakage.
 - 2. Provide a frame that neatly fits the grille. Mounting frames will not be required for grilles or registers mounted directly on exposed ductwork.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Do not install ceilings adjacent to fixtures until installation of fixtures, air supply assemblies, return-air blank-off strips and flexible duct have been approved. Remove and reinstall any part of the installation found incorrect.

3.2 INSTALLATION

- A. Louvered diffuser outlets mount tight against the ceiling. Fasten outlets to ductwork with sheet metal screws. For perforated diffusers, attach the frame assembly by a concealed hinge assembly to an outer frame compatible with the type of ceiling on which the diffuser is installed.

END OF SECTION

SECTION 23 74 16

PACKAGED MAKEUP AIR DIRECT GAS FIRED FURNACE WITH COOLING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide and install a integral Direct Gas-Fired heating with cooling. Integral cooling source shall be Packaged DX cooling Airflow arrangement shall be Outdoor Air only. Each unit shall be constructed in a horizontal configuration.

1.2 RELATED WORK

- A. Division 23 Mechanical
 - 1. Ductwork.
 - 2. Air Balance.
 - 3. Electrical provisions for mechanical work.
 - 4. Air Filtration.
 - 5. Vibration Isolation.

1.3 PERFORMANCE

- A. As scheduled on drawings.

1.4 SUBMITTALS

- A. Manufacturer's certified supply air, cooling and heating capacity data with system operating conditions
- B. Submit manufacturer's installation, start-up and service instructions.
- C. Submit recommended clearance dimensions for air flow and service.
- D. Submit coordination drawings as specified. Consideration shall be given to adjacent structures and their effect on air flow patterns.
- E. Submit internal wiring diagram of Control Center
- F. Estimated gross weight of each installed unit.
- F. Submit sequence of operation in narrative form.
- G. Mark-up a copy of the specifications indicating in the margin of each paragraph the following: COMPLY, DO NOT COMPLY, NOT APPLICABLE.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Accurex.
- B. CaptiveAire.
- C. Halton.

2.2 CABINET

- A. Materials: Formed, double wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
1. Outside casing: 18 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish. Pre-painted components as supplied by the factory shall have polyester urethane paint on 18 gauge G60 galvanized steel. Base rail is 12 gauge, galvanized (G90) steel.
 2. Internal Assemblies: 24 gauge galvanized (G90) steel except for motor supports which shall be minimum 14 gauge galvanized (G90) steel.
- B. Cabinet Insulation: Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181.
1. Materials: Fiberglass insulation. If insulation other than fiberglass is used, it must also meet the Fire Hazard Classification shown below.
 - a. Thickness: 1 inch (25 mm)
 - b. Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411.
 - c. Location and application: Floor of each unit shall be insulated with fiberglass insulation. Full interior coverage from "Cooling on".
 - d. Access panels: Unit shall be equipped with insulated hinged access panels to provide easy access to all major components. Access panels shall be fabricated of 18 gauge galvanized G90 steel.
 - e. Blower assembly consists of an electric motor and a belt driven, double width, and double inlet forward curve blower. Assembly shall be mounted on heavy gauge galvanized rails and further mounted on minimum 1.125 inch thick neoprene vibration isolators.
- C. Control center / connections:
1. Unit shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections.
- D. Direct Gas-Fired Furnace:
1. Unit shall be factory assembled, piped, and wired. Direct gas-fired system will be 92% efficient while supplying a burner that is capable of providing 25:1 turndown. Unit will utilize a draw through design and incorporate adjustable burner baffles plates for field adjustments. Unit will have a EconomyPilot ignition system.
 2. Burner construction shall consist of a cast aluminum burner manifold and 400 series stainless steel mixing plates. No air from inside the space shall be allowed to pass across the burner at any time. Flame sensing shall be provided by a flame rod. Burner control shall have a digital coded fault indicator capable of storing the last five faults.
 3. Shall be equipped for operation on Natural gas with a maximum rated inlet gas pressure of 1/2 PSI.
 4. Burner control option to include the following: Discharge temperature.
 5. Shall include the following safety controls:

- a. Manual Reset, High Limit Switch: Main gas valve closes if high-limit temperature is exceeded.
 - b. Dual safety shutoff valves shall be provided that do not exceed 120 VAC control signals.
 - c. FM Global Requirements: Includes high and low gas pressure switches and visual indication gas valves.
- E. Condensate drain pan: Drain Pan shall be an integral part of the unit whenever a cooling option is included. Pan shall be formed of welded austenitic stainless steel sheet material and provided with a welded stainless steel drain connection at the front for connection to a P trap. Drain pan shall be double-pitched, sloped in opposite directions to provide positive draining. Drain connector shall be sealed at penetration through cabinet wall.
- F. P trap: If the unit is equipped with a condensate drain pan, contractor shall provide, or fabricate, and install an appropriate P trap, in accordance with all local and area codes and Best Practices.
- G. Packaged DX: Unit shall be equipped with a Packaged DX system to include compressor(s), evaporator and condenser coil(s), condenser fans, and all appurtenant controls as specified elsewhere in this section. The Packaged DX system is to be an integral module, incorporated into the unit. Stand-alone Packaged DX systems that are connected to the unit, or systems that require hardware or equipment that is not integral to the unit are not acceptable.
- H. Motorized Inlet Air Dampers: to be of low leakage type and shall be factory installed.
- I. Sensors are considered to be part of various optional operational modes or device controllers and are to be factory supplied and installed as specified by the A/E.
- J. Curb Assembly: A curb assembly shall be made of galvanized steel provided by the factory for field assembly and installation as part of this division. The curb shall include a duct adapter for supply air. The installing contractor shall be responsible for coordinating with roofing contractor to ensure curb unit is properly flashed to provide protection against weather/moisture penetration. Contractor shall provide and install appropriate insulation for the curb assembly.

2.4. BLOWER

- A. Blower section construction, Supply Air: Belt drive motor and blower shall be assembled onto a minimum 14 gauge galvanized steel platform and must have neoprene vibration isolation devices, minimum of 1-1/8 inches thick.
- B. Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
- C. Centrifugal blower housing: Formed and reinforced steel panels to make curved scroll housing with shaped cutoff.
- D. Forward curved blower (fan) wheels: Galvanized or aluminum construction with inlet flange and shallow blades curved forward in direction of airflow. Mechanically attached to shaft with set screws.

- E. Blower section motor source quality control: Blower performance shall be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".

2.5. MOTORS

- A. General: Blower motors greater than 3/4 horsepower shall be "NEMA Premium" unless otherwise indicated. Compliance with EPA's minimum energy-efficiency standards for single speed ODP and TE enclosures is not acceptable. Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase, and enclosure.

2.6. UNIT CONTROLS

- A. The unit shall be constructed so that it can function as a stand-alone heating and cooling system controlled by a factory-supplied remote panel, thermostats and sensors or it can be operated as a heating and cooling system controlled by a Building Management System (BMS).
- B. Variable Frequency Drive (VFD): Unit shall have factory installed variable frequency drives for modulation of the blower motors. The VFDs shall be factory-programmed for unit-specific requirements and shall not require additional field programming to operate.
- C. Sensors to be provided with the unit:
 - 1. Heating Inlet Air Sensor.
 - 2. Cooling Inlet Air Sensor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install according to manufacturer's recommendations and as shown on drawings.
- B. Unit is to be provided with a through-the-bottom service connection accessory package and must be used for electrical connections to unit. Use bulkhead connectors to make a waterproof connection.
- C. Seal all duct connections to roof curb for air tight connection. Install a 90 degree flanged ductwork connection to the roof curb. Provide and install gasketing around duct flanges. Provide and install gasketing around outer edge of roof curb.

3.2 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory authorized service representative to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to A/E in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM.

3.3 STARTUP

- A. Provide the services of a factory trained service technician employed full time by the unit manufacturer to start-up the system, or manufacturer's factory authorized representative under the supervision of the factory trained service technician. Upon completion of the installation, the system shall be started and commissioned by the manufacturer's factory authorized representative who will verify a complete fully functional system. The factory authorized representative will verify that accessories are installed and performing the specified functions. (Contractor startup is unacceptable.)
- B. The written startup report shall be provided to the owner and engineer upon completion.

3.4 DEMONSTRATION AND TRAINING

- A. Engage a factory authorized service representative to train owner's maintenance personnel to adjust, operate and maintain the entire Make-Up Air unit. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.

END OF SECTION

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SECTION 23 81 18

SINGLE PACKAGE ROOFTOP AIR CONDITIONERS (100% Outside Air)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide and install a single-package, single-zone, electric air conditioner with gas-fired heat for rooftop application.

1.2 RELATED WORK

- A. Division 23 Mechanical
 1. Ductwork.
 2. Air Balance.
 3. Electrical provisions for mechanical work.
 4. Air Filtration.
 5. Vibration Isolation.

1.3 PERFORMANCE

- A. As scheduled on drawings.

1.4 SUBMITTALS

- A. Manufacturer's certified capacity data.
- B. Submit manufacturer's installation, start-up and service instructions.
- C. Submit recommended clearance dimensions for air flow and service.
- D. Submit coordination drawings as specified. Consideration shall be given to adjacent structures and their effect on air flow patterns.
- E. Submit internal wiring diagram of Control Center.
- F. Submit sequence of operation in narrative form.
- G. Mark-up a copy of the specifications indicating in the margin of each paragraph the following:
COMPLY, DO NOT COMPLY, NOT APPLICABLE.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Mammoth.
- B. Addison.
- C. Reznor.
- D. Accurex.

2.2 COMPRESSOR

- A. Provide a thermally protected, serviceable semi-hermetic compressor with service valves, vibration isolation, crankcase heaters, sight glass and filter drier. Provide with a 5-year parts and labor warranty.
- B. Provide a minimum of three stages of cooling with hot gas reheat.

2.3 EVAPORATOR AND CONDENSER COILS

- A. Provide copper tubes with mechanically bonded aluminum fins for evaporator and condenser coils. Provide hot gas bypass for evaporator coil.
- B. Provide louvered condenser coil.
- C. Provide factory installed hail / vandalism guards for condenser coils.
- D. Provide coils with stainless steel casings, end plates, tube supports and top and bottom plates.

2.4 EVAPORATOR FANS

- A. Provide a belt-driven, forward-curved, centrifugal evaporator fan, with adjustable motor sheaves. Motor shall contain permanently lubricated bearings. Provide motor HP as indicated on the drawings.

2.5 GAS HEATING SECTION

- A. Unit shall be equipped with stainless steel burners and heat exchangers.
- B. Gas Controls.
 - 1. Automatic gas valve and pressure regulator.
 - 2. A manual shutoff valve.
 - 3. Pilot valve.
 - 4. Two flame rollout limit switches.
 - 5. An adjustable fan control.
 - 6. Fixed high limit controls.
- C. Unit shall be equipped with an electric spark pilot ignition system.
 - 1. Electronic flame detection.
 - 2. 100% safety shutoff.
- D. Combustion air shall be induced by a positive pressure power venting fan.
 - 1. Pre-purge of combustion chamber.

2.6 CASING FILTERS AND DUCT CONNECTION

- A. Provide a cabinet constructed of galvanized or zinc-coated steel, primed and coated with baked enamel and suitable for outdoor installation.
- B. Provide duct connections on the bottom of each unit, as indicated on drawings.
- C. Provide manually operated outdoor air balancing dampers and motorized shut-off damper.
- D. Furnish 2" thick filters as specified.

- E. Provide stainless steel or polymer fully IAQ condensate drain pan with positive slope in all directions to outlet.
 1. Externally line the condensate drain pan with 1-1/2" waterproof insulation.
 2. Provide a hinged access door with quick release handle adjacent to condensate drain pan for inspection. Install access door on drain connection side of unit.
- F. Double wall casing construction
 1. Construct interior casing panels with 1-1/2 lb. insulation for acoustic and condensate control.
- G. Furnish through-the-bottom electrical service connection.

2.7 ROOF CURB

- A. Install a roof curb of the same manufacture as the air conditioning unit.
 1. Curb to support the unit and provide a watertight enclosure to protect ductwork and utility services.
 2. Use a design complying with National Roofing Contractors Association requirements.
 3. Level curb according to manufacturer's recommendations.
 4. Curb height shall be minimum 14".

2.9 OUTDOOR FANS

- A. Provide propeller type with direct-driven permanently lubricated motor. Fan shall discharge upward.

2.10 SHORT CYCLE CIRCUIT

- A. Provide circuit to prevent compressor from short cycling as a result of a rapid change in thermostat setting. Circuit also prevents compressor restart at least 5 minutes after shutdown.

2.11 CONVENIENCE OUTLET

- A. Provide 120V GFI outlet in unit cabinet.

2.12 SERVICE DISCONNECT SWITCH

- A. Non-fused disconnect switch with external locking handle.

2.13 TEMPERATURE CONTROL

- A. Unit shall be controlled by maintaining a constant suction pressure with a leaving air temperature as scheduled on the drawings. When the outside air drops below the scheduled leaving air temperature, a duct mounted temperature sensor shall stage the heating to maintain the set point. Open outside air damper prior to starting fan.

2.14 MOTORIZED OUTSIDE AIR DAMPER

- A. Low leakage 14-gauge galvanized steel
 1. Airfoil blades.
 2. Ruskin CD60.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install according to manufacturer's recommendations and as shown on drawings.
- B. Unit is to be provided with a through-the-bottom service connection accessory package and must be used for electrical connections to unit. Use bulkhead connectors to make a waterproof connection.
- C. Seal all duct connections to roof curb for air tight connection. Install a 90 degree flanged ductwork connection to the roof curb. Provide and install gasketing around duct flanges. Provide and install gasketing around outer edge of roof curb.

3.2 STARTUP

- A. Provide the services of a factory trained service technician employed full time by the unit manufacturer to start-up the system, or manufacturer's factory authorized representative under the supervision of the factory trained service technician. Upon completion of the installation, the system shall be started and commissioned by the manufacturer's factory authorized representative who will verify a complete fully functional system. The factory authorized representative will verify that accessories are installed and performing the specified functions. (Contractor startup is unacceptable.)
- B. The written startup report shall be provided to the owner and engineer upon completion.

END OF SECTION

SECTION 23 81 21

SINGLE PACKAGE ROOFTOP AIR CONDITIONERS (w/gas-fired heat)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide and install a single-package, single-zone, electric air conditioner with gas-fired heat for rooftop application.

1.2 RELATED WORK

- A. Division 23 Mechanical.
 - 1. Ductwork.
 - 2. Air Balance.
 - 3. Electrical provisions for mechanical work.
 - 4. Air Filtration.

1.3 PERFORMANCE

- A. As scheduled on drawings, with head pressure control to enable unit start and operate down to 20 degrees F ambient.

1.4 SUBMITTALS

- A. Manufacturer's certified capacity data
- B. Submit manufacturer's installation, start-up and service instructions.
- C. Submit recommended clearance dimensions for air flow and service.
- D. Submit coordination drawings as specified. Consideration shall be given to adjacent structures and their effect on air flow patterns.
- E. Submit internal wiring diagram of Control Center
- F. Submit sequence of operation in narrative form.
- G. Mark-up a copy of the specifications indicating in the margin of each paragraph the following:
COMPLY, DO NOT COMPLY, NOT APPLICABLE.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Carrier.
- B. York.
- C. Lennox.

2.2 COMPRESSOR

- A. Provide a thermally protected, serviceable semi-hermetic compressor or hermetic compressor with service valves, vibration isolation, crankcase heaters, sight glass and filter drier. Provide with a 5 year warranty.

2.3 EVAPORATOR AND CONDENSER COILS

- A. Provide copper tubes with mechanically bonded aluminum fins for evaporator and condenser coils.
- B. Provide hail guards for condenser coils.

2.4 EVAPORATOR FANS

- A. Provide a belt-driven, forward-curved, centrifugal evaporator fan, with adjustable motor sheaves. Motor shall contain permanently lubricated bearings. Provide motor HP as indicated on the drawings.

2.5 GAS HEATING SECTION

- A. Unit shall be equipped with corrosion resistant burners and heat exchangers.
- B. Gas Controls.
 - 1. Automatic gas valve and pressure regulator.
 - 2. A manual shutoff valve.
 - 3. Pilot valve.
 - 4. Two flame rollout limit switches.
 - 5. An adjustable fan control.
 - 6. Fixed high limit controls.
- C. Unit shall be equipped with an electric spark pilot ignition system.
 - 1. Electronic flame detection.
 - 2. 100% safety shutoff.
- D. Combustion air shall be induced by a positive pressure power venting fan.
 - 1. Prepurge of combustion chamber.
- E. Furnish through-the-bottom electrical service connection.

2.6 CASING FILTERS AND DUCT CONNECTION

- A. Provide a cabinet constructed of galvanized or zinc-coated steel, primed and coated with baked enamel and suitable for outdoor installation.
- B. Provide duct connections on the bottom of each unit, as indicated on drawings.
- C. Provide manually operated outdoor air dampers.
- D. Furnish 2" thick filters as specified.
- E. Furnish through-the-bottom electrical service connection.

2.7 ROOF CURB

- A. Install a roof curb of the same manufacture as the air conditioning unit.
 - 1. Curb to support the unit and provide a watertight enclosure to protect ductwork and utility services.
 - 2. Use a design complying with National Roofing Contractors Association requirements.
 - 3. Level curb according to manufacturer's recommendations.
 - 4. Curb height shall be minimum 14".

2.8 OUTDOOR FANS

- A. Provide propeller type with direct-driven permanently lubricated motor. Fan shall discharge upward.

2.9 THERMOSTAT ASSEMBLY

- A. Provide staged heating and cooling as required, automatic changeover and fan control.

2.10 HEAD PRESSURE CONTROL

- A. Provide solid state outdoor air fan speed control to permit unit to operate down to -20°F.

2.11 SHORT CYCLE CIRCUIT

- A. Provide circuit to prevent compressor from short cycling as a result of a rapid change in thermostat setting. Circuit also prevents compressor restart at least 5 minutes after shutdown.

2.12 CONVENIENCE OUTLET

- A. Provide 115 volt outlet in unit cabinet.

2.13 MOTORIZED OUTSIDE AIR DAMPER

- A. Low leakage 14-gauge galvanized steel
 - 1. Airfoil Blades.
 - 2. Ruskin CD60.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install according to manufacturer's recommendations and as shown on drawings.
- B. Unit is to be provided with a through-the-bottom service connection accessory package and must be used for electrical connections to unit. Use bulkhead connectors to make a waterproof connection.
- C. Seal all duct connections to roof curb for air tight connection. Install a 90 degree flanged ductwork connection to the roof curb. Provide and install gasketing around duct flanges. Provide and install gasketing around outer edge of roof curb.

3.2 STARTUP

- A. Provide the services of a factory trained service technician employed full time by the unit manufacturer to start-up the system, or manufacturer's factory authorized representative under the supervision of the factory trained service technician. Upon completion of the installation, the system shall be started and commissioned by the manufacturer's factory authorized representative who will verify a complete fully functional system. The factory authorized representative will verify that accessories are installed and performing the specified functions. (Contractor startup is unacceptable.)

- B. The written startup report shall be provided to the owner and engineer upon completion.

END OF SECTION

SECTION 23 82 39

ELECTRIC UNIT HEATERS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide and install electric unit heaters complete with heating element, propeller mounting brackets and other options as specified.

1.2 RELATED WORK

- A. Division 23 - Mechanical.
 - 1. Electrical Provisions of Mechanical Work.
 - 2. Ductwork.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Modine.
- B. Reznor.
- C. Chromalox.
- D. Trane.
- E. Berko.

2.2 COMPONENTS

- A. Casing:
 - 1. Construct casing of sheetmetal with a structural frame.
 - 2. Enamel or lacquer finish to manufacturers standard.
- B. Electric Heating Elements:
 - 1. Shall bear the UL label.
 - 2. Corrosion resistant materials.
 - 3. Heating coil of 80-20 nickel-chrome wire.
- C. Components:
 - 1. Fused control circuits.
 - 2. Contactors in accordance with the staging requirements.
 - 3. Control power transformer.
 - 4. Control voltage 120.
- D. Louvers:
 - 1. Adjustable vertical and horizontal louvers for air discharge.
- E. Mounting brackets:
 - 1. As indicated.

2.3 CONTROLS

- A. Automatic controls:
 - 1. Factory mounted.
 - 2. Prewired to the junction box.
 - 3. Unit mounted thermostats 24-volt low voltage.
- B. Safety Controls:
 - 1. A primary and secondary thermal cut-off to de-energize each circuit.
 - 2. Manual reset high limit.
 - 3. Automatic reset thermal protection.

2.4 FAN

- A. Propeller blade fan:
 - 1. Construct the fan of aluminum or other corrosion-resistant material.
 - 2. Statically and dynamically balanced.
 - 3. Substantial fan guard.

2.5 MOTOR

- A. Totally enclosed ball bearing motor:
 - 1. Permanently lubricated bearings.
 - 2. 120 volt, single phase, 60 cycle motor .
 - 3. Sized to operate the fan at the required capacity.

2.6 ELECTRICAL

- A. Single point connection:
 - 1. Factory wiring.
 - 2. Only direct line supply and thermostat field connections.
 - 3. Terminal blocks for line voltage wiring.
 - 4. Wiring diagram permanently attached.
 - 5. Balance phases.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Furnish units with suitable connections for mounting as shown or as otherwise approved.
- B. Provide start-up to ensure correct operation of unit.
- C. Adjust discharge louvers to control direction of air flow.

END OF SECTION

SECTION 22 01 00

PLUMBING OPERATING AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Compilation product data and related information appropriate for Owner's operation and maintenance of products furnished under Contract. Prepare operating and maintenance data as specified.
- B. Instruct Owner's personnel in operation and maintenance of equipment and systems.
- C. Submit three copies of complete manual in final form.

1.2 SUBMITTALS

- A. Thirty (30) days after the Contractor has received the final scheduled identified submittals bearing the Architect/Engineer's stamp of acceptance (including resubmittals), submit for review one copy of the first draft of the Operating and Maintenance Manual. This copy shall contain as a minimum:
 - 1. Table of Contents for each element.
 - 2. Contractor information.
 - 3. All submittals, coordination drawings and product data, reviewed by the Architect / Engineer; bearing the Architect / Engineer's stamp of acceptance. (When submittals are returned from Engineer "Correct as Noted", corrected inserts shall be included.)
 - 4. All parts and maintenance manuals for items of equipment.
 - 5. Warranties (without starting dates)
 - 6. Certifications that have been completed. Submit forms and outlines of certifications that have not been completed.
 - 7. Operating and maintenance procedures.
 - 8. Form of Owner's Training Program Syllabus (including times and dates).
 - 9. Control operations/equipment wiring diagrams.
 - 10. Other required operating and maintenance information that are complete.
- B. Copy will be returned to the Contractor within 15 days with comments for corrections.
- C. Submit completed manuals in final electronic form to the Architect / Engineer one day after substantial completion, and prior to Owner's instructions. Include all specified data, test and balance reports, drawings, dated warranties, certificates, reports, along with other materials and information.
- D. The Architect/Engineer will review the manuals for completeness within fifteen (15) days.
- E. The Contractor shall be notified of any missing or omitted materials. The Manuals shall be reworked by the Contractor, as required, in the office of the Architect / Engineer. The manuals will not be retransmitted.
- F. Complete electronic manuals will be delivered to the Owner.

PART 2 - PRODUCTS

2.1 BINDERS

- A. Commercial quality black three-ring binders with clear overlay plastic covers.

- B. Minimum ring size: 1 inch; Maximum ring size: 3 inches.
- C. When multiple binders are used, correlate the data into related groupings.
- D. Label contents on spine and face of binder with full size insert. Label under plastic cover.

PART 3 - EXECUTION

3.1 OPERATION AND MAINTENANCE MANUAL

- A. Form for Manuals:
 - 1. Prepare data in form of an instructional manual for use by Owner's personnel.
 - 2. Format:
 - a. Size: 8-1/2 inch x 11 inch.
 - b. Text: Manufacturer's printed data or neatly typewritten.
 - 3. Drawings:
 - a. Provide reinforced punched binder tab and bind in text.
 - b. Fold larger drawings to size of text pages.
 - 4. Provide flyleaf indexed tabs for each separate product or each piece of operating equipment.
 - 5. Cover: Identify each volume with typed or printed title "Operating and Maintenance Instructions". List:
 - a. Title of Project
 - b. Identity of separate structures as applicable.
 - c. Identity of general subject matter covered in the manual.
 - 6. Binder as specified.
- B. Content of Manual:
 - 1. Neatly typewritten Table of Contents for each volume arranged in systematic order as outlined in the specifications.
 - a. Contractor, name of responsible principal, address and telephone number.
 - b. A list of each product required to be included, indexed to content of the volume.
 - c. List with each product, name, address and telephone number of:
 - 1) Subcontractor or installer.
 - 2) Maintenance contractor as appropriate.
 - 3) Identify area of responsibility of each.
 - 4) Local source of supply for parts and replacement.
 - d. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
 - 2. Product Data:
 - a. Include those sheets pertinent to the specific product.
 - b. Annotate each sheet to:
 - 1) Identify specific product or part installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information. (All options not supplied with equipment shall be marked out indicated in some manner.
 - 3. Drawings:
 - a. Supplement product data with drawings as necessary to illustrate:
 - 1) Relations of component parts of equipment and systems.
 - 2) Control and flow diagrams.
 - b. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 - c. Do not use Project Record Documents as maintenance drawings.

4. Written text, as required to supplement product data for the particular installation:
 - a. Organize in consistent format under separate headings for different procedures.
 - b. Provide logical sequence of instructions for each procedure.
5. Copy of each warranty, bond and service contract issued.
 - a. Provide information sheet for Owner's personnel, giving:
 - 1) Proper procedures in event of failure.
 - 2) Instances that might affect validity of warranties or bonds.
6. Shop drawings, coordination drawings and product data as specified.

C. Sections for Equipment and Systems.

1. Content for each unit of equipment and system as appropriate:
 - a. Description of unit and component parts.
 - 1) Function, normal operating characteristics, and limiting conditions.
 - 2) Performance curves, engineering data and tests.
 - 3) Complete nomenclature and commercial number of replaceable parts.
 - b. Operating procedures:
 - 1) Start up, break-in, routine and normal operating instructions.
 - 2) Regulation, control, stopping, shut down and emergency instructions.
 - 3) Summer and winter operating instructions.
 - 4) Special operating instructions.
 - c. Maintenance procedures:
 - 1) Routine operations
 - 2) Guide to trouble-shooting.
 - 3) Disassembly, repair and reassembly.
 - 4) Alignment, adjusting and checking.
 - 5) Routine service based on operating hours.
 - d. Servicing and lubrication schedule. List of lubricants required.
 - e. Manufacturer's printed operating and maintenance instructions.
 - f. Description of sequence of operation by control manufacturer.
 - g. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - 1) Predicted life of part subject to wear.
 - 2) Items recommended to be stocked as spare parts.
 - h. As installed control diagrams by controls manufacturer.
 - i. Complete equipment internal wiring diagrams.
 - j. Each Contractor's coordination drawings.
 - k. As installed color coded piping diagrams.
 - l. Charts of valve tag number, with location and function of each valve.
 - m. List of original manufacturer's spare parts and recommended quantities to be maintained in storage.
 - n. Other data as required under pertinent sections of the specifications.
2. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.
3. Additional requirements for operating and maintenance data as outlined in respective sections of specifications.
4. Provide complete information for products specified in Division 22.
5. Provide certificates of compliance as specified in each related section.
6. Provide start up reports as specified in each related section.
7. Provide signed receipts for spare parts and material.
8. Provide training report and certificates.
9. Provide backflow preventer certified test reports.
10. Provide gas piping pressure test reports.

END OF SECTION

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SECTION 22 05 00

PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Except as modified in this Section, General Conditions, Supplementary Conditions, applicable provisions of the General Requirements, and other provisions and requirements of the contract documents apply to work of Division 22 Plumbing.
- B. Applicable provisions of this section apply to all sections of Division 22, Plumbing.

1.2 CODE REQUIREMENTS AND FEES

- A. Perform work in accordance with applicable statutes, ordinances, codes and regulations of governmental authorities having jurisdiction.
- B. Plumbing work shall comply with applicable inspection services:
 - 1. Underwriters Laboratories.
 - 2. National Fire Protection Association.
 - 3. State Health Department.
 - 4. Local Municipal Building Inspection Department.
- C. Resolve any code violations discovered in contract documents with the Engineer prior to award of the contract. After Contract award, any correction or additions necessary for compliance with applicable codes shall be made at no additional cost to the Owner.
- D. This Contractor shall be responsible for being aware of and complying with asbestos NESHAP regulations, as well as all other applicable codes, laws and regulations.
- E. Obtain all permits required.

1.3 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this division shall be:
 - 1. A licensed specialist in this field and have the personnel, experience, training, skill, and organization to provide a practical working system
 - 2. Able to furnish evidence of having contracted for and installed not less than three systems of comparable size and type that has served their Owners satisfactorily for not less than three years.

1.4 REFERENCE SPECIFICATIONS AND STANDARDS

- A. Materials which are specified by reference to Federal Specifications; ASTM, ASME, ANSI, or AWWA Specifications; Federal Standards; or other standard specifications must comply with latest editions, revisions, amendments or supplements in effect on date bids are received. Requirements in reference specifications and standards are minimum for all equipment, material, and work. In instances where specified capacities, size, or other features of equipment, devices, or materials exceed these minimums, meet specified capacities.

1.5 CONTRACT DRAWINGS

- A. Contract drawings are diagrammatic only and do not give fully dimensioned locations of various elements of work. Determine exact locations from field measurements.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain at the job site a separate set of white prints (blue line or black line) of the contract drawings for the sole purpose of recording the "as-built" changes and diagrams of those portions of work in which actual construction is at variance with the contract drawings. Mark the drawings with a colored pencil. Prepare, as the work progresses and upon completion of work, reproducible drawings clearly indicating locations of various lines, valves, ductwork, traps, equipment, and other pertinent items, as installed. Include flow-line elevation of sewer lines. Record existing and new underground and under slab piping with dimensioned locations and elevations of such piping.
- B. At the conclusion of project, obtain without cost to the Owner, the original drawings and transfer as-built changes to these. Prior to transmittal of corrected drawings, obtain three sets of blue-line prints of each drawing, regardless of whether corrections were necessary and include in the transmittal (two sets are for the Owner's use and one set is for the Architect / Engineer's records). Delivery of these as-built prints and reproducible is a condition of final acceptance. Provide record drawings prints and electronic drawings on AutoCad 2012 / Revit CAD files.
- C. As-Built drawings should indicate the following information as a minimum:
 - 1. Indicate all addendum changes to documents.
 - 2. Remove Engineer's seal, name, address and logo from drawings.
 - 3. Mark documents RECORD DRAWINGS.
 - 4. Clearly indicate: DOCUMENT PRODUCED BY
 - 5. Indicate all changes to construction during construction. Indicate actual routing of all piping, ductwork, etc. that were deviated from construction drawings.
 - 6. Indicate exact location of all underground plumbing and flow line elevation.
 - 7. Indicate exact location of all underground plumbing piping and elevation.
 - 8. Indicate exact location of all underground electrical raceways and elevations.
 - 9. Correct schedules to reflect (actual) equipment furnished and manufacturer.
 - 10. During the execution of work, maintain a complete set of drawings and specifications upon which all locations of equipment, ductwork, piping, devices, and all deviations and changes from the construction documents in the work shall be recorded.
 - 11. Location and size of all ductwork and mechanical piping above ceiling including exact location of isolation of domestic and plumbing valves.
 - 12. Exact location of all electrical equipment in and outside of the building.
 - 13. Fire Protection System documents revised to indicate exact location of all sprinkler heads and zone valves.
 - 14. Exact location of all roof mounted equipment, wall, roof and floor penetrations.
 - 15. Cloud all changes.

1.7 SPACE REQUIREMENTS

- A. Consider space limitations imposed by contiguous work in selection and location of equipment and material. Do not provide equipment or material that is not suitable in this respect.

1.8 RELATION WITH OTHER TRADES

- A. Carefully study all matters and conditions concerning the project. Submit notification of conflict in ample time to prevent unwarranted changes in any work. Review other Divisions of these specifications to determine their requirements.
- B. Because of the complicated relationship of this work to the total project, conscientiously

study the relation and cooperate as necessary to accomplish the full intent of the documents.

- C. Provide sleeves and inserts in forms as required for the work. Stub up and protect open ends of pipe before any concrete is placed. Furnish sizes of required equipment pads. Furnish and locate bolts and fittings required to be cast in them.
- D. Locate and size openings required for installation of work specified in this Division in sufficient time to prevent delay in the work.
- E. Refer to other Divisions of the specifications for the scope of required connections to equipment furnished under that Division. Determine from the Contractor for the various trades, the Owner, and by direction from the Architect / Engineer, the exact location of all items.

1.9 CONCEALED AND EXPOSED WORK

- A. When the word "concealed" is used in connection with insulating, painting, piping, ducts and the like, the work is understood to mean hidden from sight as in chases, furred spaces or above ceilings. "Exposed" is understood to mean open to view.

1.10 GUARANTEE

- A. Guarantee work for one year from the date of substantial completion of the project. During that period make good any faults or imperfections that may arise due to defects or omissions in material, equipment or workmanship. At the Owner's option, replacement of failed parts or equipment shall be provided.

1.11 MATERIAL AND EQUIPMENT

- A. Furnish new and unused materials and equipment meeting the requirements of the paragraph specifying acceptable manufacturers. Where two or more units of the same type or class of equipment are required, provide units of a single manufacturer.

1.12 NOISE AND VIBRATION

- A. Select equipment to operate with minimum noise and vibration. If objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of work, rectify such conditions at no additional cost. If the item of equipment is judged to produce objectionable noise or vibration, demonstrate at no additional cost that equipment performs within designated limits on a vibration chart.

1.13 ACCEPTABLE MANUFACTURERS

- A. Manufacturers names and catalog number specified under sections of Division 22 are used to establish standards of design, performance, quality and serviceability and not to limit competition. Equipment of similar design, equal to that specified, manufactured by a named manufacturer will be acceptable on approval. A request for prior approval of equipment not listed must be submitted ten (10) days before bid due date. Submit complete design and performance data to the Engineer.

1.14 OPERATING TESTS

- A. After all plumbing systems have been completed and put into operation, subject each system to an operating test under design conditions to ensure proper sequencing and operation throughout the range of operation. Tests shall be made in the presence of the Architect / Engineer. Make adjustments as required to ensure proper functioning of all systems. Special

tests on individual systems are specified under individual sections. Submit three copies of all certifications and test reports adequately in advance of completion of the work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

1.15 WARRANTIES

- A. Submit three copies of all warranties and guarantees for systems, equipment, devices and materials. These shall be included in the Operating and Maintenance Manuals.

1.16 BUILDING CONSTRUCTION

- A. It shall be the responsibility of each sub-contractor to consult the Architectural and Engineering drawings, details, and specifications and thoroughly familiarize himself with the project and all job related requirements. Each subcontractor shall cooperate with the General Contractor to verify that all piping and other items are placed in the walls, furred spaces, chases, etc., so there will be no delays in the job.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 OPENINGS

- A. Framed, cast or masonry openings for ductwork, equipment or piping are specified under other divisions. Drawings and layout work for exact size and location of all openings are included under this division.

3.2 HOUSEKEEPING PADS

- A. Provide equipment housekeeping pads under all floor mounted and ground mounted plumbing equipment, and as shown on the drawings.
- B. Concrete work as specified in Division 3.
- C. Concrete pads:
 - 1. 4 inch high, rounded edges, minimum 2500 psi unless otherwise indicated on the drawings
 - 2. Chamfer strips at edges and corner of forms.
 - 3. Smooth steel trowel finish.
 - 4. Doweled to existing slab
- D. Install concrete curbs around multiple pipe penetrations.

3.3 VANDAL RESISTANT DEVICES

- A. Provide a handle for each loose keyed operated valve and hose bibb on the project.
- B. Where vandal resistant screws or bolts are employed on the project, deliver to the Owner two suitable tools for use with each type of fastener used.
- C. Proof of delivery of these items to the Owner shall be included in the Operating and Maintenance Manuals.

3.4 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection, conduct an on-site training program to instruct the Owner's operating personnel in the operation and maintenance of the plumbing systems.
 - 1. Provide the training during the Owner's regular working day.

2. The Instructors shall each be experienced in their phase of operation and maintenance of building plumbing systems and with the project.
- B. Time to be allocated for instructions.
 1. Minimum of 8 hours dedicated instructor time.
 2. 4 hours on each of 2 days.
 - C. Before proceeding with the on-site training program, submit the program syllabus; proposed time and dates; and other pertinent information for review and approval.
 1. One copy to the Owner.
 2. One copy to the Architect / Engineer.
 - D. The Owner will provide a list of personnel to receive instructions, and will coordinate their attendance at the agreed upon times.
 - E. Use the operation and maintenance manuals as the basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
 - F. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shut down of each item of equipment.
 - G. Demonstrate equipment functions (both individually and as part of the total integrated system).
 - H. Prepare and insert additional data in the operating and maintenance manuals when the need for additional data becomes apparent during instructions.
 - I. Submit a report within one week after completion of the training program that instructions have been satisfactorily completed. Give time and date of each demonstration and hours devoted to the demonstration, with a list of people present.
 - J. At the conclusion of the on-site training program, have the person designated by the Owner sign a certificate to certify that he/she has a proper understanding of the system, that the demonstrations and instructions have been satisfactorily completed, and the scope and content of the operating and maintenance manuals used for the training program are satisfactory.
 - K. Provide a copy of the report and the certificate in an appropriately tabbed section of each Operating and Maintenance Manual.

3.5 EQUIPMENT IDENTIFICATION

- A. Provide a laminated engraved plastic nameplate on each piece of equipment and starter.
 1. Designation approved by Architect / Engineer.
 2. Equipment includes, but is not limited to, water heaters, pumps, boilers and utility controllers.
 3. Submit schedule of equipment to be included and designations.
- B. Provide nameplates with ½ inch high letters and fastened with epoxy or screws.

3.6 OBSTRUCTIONS

- A. The drawings indicate certain information pertaining to surface and subsurface obstructions which has been taken from available drawings. Such information is not guaranteed, however, as to accuracy of location or complete information.
 1. Before any cutting or trenching operations are begun, verify with Owner's

representative, utility companies, municipalities, and other interested parties that all available information has been provided.

2. Should obstruction be encountered, whether shown or not, alter routing of new work, reroute existing lines, remove obstruction where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of the new work and leave existing services and structures in a satisfactory and serviceable condition.

- B. Assume total responsibility for and repair any damage to existing utilities or construction, whether or not such existing facilities are shown.

3.7 PROTECTION

- A. Protect work, equipment, fixtures, and materials. At work completion, work must be clean and in original manufacturer's condition.

END OF SECTION

SECTION 22 05 10

PLUMBING CONTRACT QUALITY CONTROL

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Contract quality control including workmanship, manufacturer's instructions and demonstrations.

1.2 QUALITY CONTROL PROGRAM

- A. Maintain quality control over supervision, subcontractors, suppliers, manufacturers, products, services, site conditions and workmanship to produce work in accordance with contract documents.

1.3 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking. Under no conditions shall material or equipment be suspended from structural bridging.
- D. Provide finishes to match approved samples. All exposed finishes shall be approved by the Architect. Submit color samples as required.

1.4 MANUFACTURER'S INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence.
- B. Should instruction conflict with Contract Documents, request clarification from Architect / Engineer before proceeding.

1.5 MANUFACTURER'S CERTIFICATES

- A. When required in individual Specification Sections, submit manufacturer's certificate in duplicate, certifying that products meet or exceed specified requirements.

1.6 MANUFACTURER'S FIELD SERVICES

- A. When required in individual Specification Sections, manufacturer shall provide qualified personnel to observe:
 - 1. Field conditions.
 - 2. Condition of installation.
 - 3. Quality of workmanship.
 - 4. Start-up of equipment.
 - 5. Testing, adjusting, and balancing of equipment.
- B. Representative shall make written report of observations and recommendations to Architect / Engineer.

PART 2 - PRODUCTS

2.1 REFERENCE APPLICABLE SPECIFICATION SECTIONS

PART 3 - EXECUTION

3.1 PROTECTION OF EQUIPMENT

- A. Do not deliver equipment to the project site until progress of construction has reached the stage where equipment is actually needed or until building is closed in enough to protect the equipment from weather. Equipment allowed to stand in the weather will be rejected, and the Contractor is obligated to furnish new equipment of a like kind at no additional cost to the Owner.
- B. Adequately protect equipment from damage after delivery to the project. Cover with heavy tarpaulins, drop cloths or other protective coverings as required to protect from plaster, paint, mortar and/or dirt. Do not cover with plastic materials and trap condensate and cause corrosion.

END OF SECTION

SECTION 22 05 12

PLUMBING SHOP DRAWINGS, COORDINATION DRAWINGS & PRODUCT DATA

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Prepare submittals as required by Division 1.
- B. The term submittal, as used herein, refers to all:
 - 1. Shop Drawings.
 - 2. Coordination Drawings.
 - 3. Product data.
- C. Submittals shall be prepared and produced for:
 - 1. Distribution as specified.
 - 2. Inclusion in the Operating and Maintenance Manual, as specified, in the related section.

1.2 SHOP DRAWINGS

- A. Present drawings in a clear and thorough manner. Identify details by reference to sheet and detail, schedule, or room numbers shown on Contract Drawings.
- B. Show all dimensions of each item of equipment on a single composite Shop Drawing. Do not submit a series of drawings of components.
- C. Identify field dimensions; show relationship to adjacent features, critical features, work, or products.
- D. Submit shop drawings in plan, elevation and sections, showing equipment in mechanical equipment areas.

1.3 COORDINATION DRAWINGS

- A. Present in a clear and thorough manner. Title each drawing with project name. Identify each element of drawings by reference to sheet number and detail, or room number of contract documents. Minimum drawing scale: $\frac{1}{4}$ inch = 1 foot - 0 inch.
- B. Prepare coordination drawings to coordinate installations for efficient use of available space, for proper sequence of installation, and to resolve conflicts. Coordinate with work specified in other sections and other divisions of the specifications.
- C. For each mechanical room and for each outside equipment pad where equipment is located, submit plan and elevation drawings. Show:
 - 1. Actual mechanical equipment and components to be furnished.
 - 2. Service clearance.
 - 3. Relationship to other equipment and components.
 - 4. Roof drains and leader piping.
 - 5. Fire protection piping and equipment.
- D. Identify field dimensions. Show relation to adjacent or critical features of work or products.
- E. Related requirements:
 - 1. Ductwork shop drawings.

2. Coordination drawing specified in Division 26.

- F. Submit shop drawings in plan, elevation and sections, showing equipment in mechanical equipment areas.
- G. Gas piping sketch indicating proposed location of piping prior to proceeding with the installation.

1.4 PRODUCT DATA AND INSTALLATION INSTRUCTION

- A. Submit only pages which are pertinent to the project. All options which are indicated on the product data shall become part of the contract and shall be required whether specified are not.
- B. Mark each copy of standard printed data to identify pertinent products, referenced to specification section and article number.
- C. Show reference standards, performance characteristics and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions and required clearances.
- D. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.
- E. Mark up a copy of the specifications for the product. Indicate in the margin of each paragraph the following: "Comply, "Do Not Comply", or "Not Applicable". Explain all "Do Not Comply" statements.
- F. Provide a separate transmittal for each submittal item. Transmittals shall indicate product by specification section name and number. Separate all submittals into appropriate specification section number. Do not combine specification sections.

1.5 MANUFACTURERS INSTRUCTIONS

- A. Submit Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, calibrating, balancing and finishing.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Review submittals prior to transmittal.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Manufacturer's catalog numbers.
 - 4. Conformance with requirements of Contract Documents.
- C. Coordinate submittals with requirements of the work and of the Contract Documents.
- D. Notify the Architect/Engineer in writing at time of submission of any deviations in the submittals from requirements of the Contract Documents.
- E. Do not fabricate products, or begin work for which submittals are specified, until such submittals have been produced and bear contractor's stamp. Do not fabricate products or begin work scheduled to have submittals reviewed until return of reviewed submittals with Architect/Engineer's acceptance.

- F. Contractor's responsibility for errors and omissions in submittals is not relieved whether Architect/Engineer reviews submittals or not.
- G. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved whether Architect/Engineer reviews submittals or not, unless Architect/engineer gives written acceptance of the specific deviations on reviewed documents.
- H. Submittals shall show sufficient data to indicate complete compliance with Contract Documents:
 - 1. Proper sizes and capacities.
 - 2. That the item will fit in the available space in a manner that will allow proper service.
 - 3. Construction methods, materials and finishes.
- I. Schedule submissions at least 15 days before date reviewed submittals will be needed.

1.7 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Project or in the work of any other Contractor.
- B. Shop drawing submittals required:
 - 1. Shop drawing submittals shall be individually submitted by specification section number in PDF format. Combined submittals will be returned for contractor to divide.
 - 2. Product Data: Submit the number of copies which the contractor requires, plus those which will be retained by the Architect/Engineer.
- C. Accompany submittals with transmittal letter, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. The number of each Shop Drawing, Project Datum and Sample submitted.
 - 5. Other pertinent data.
- D. Submittals shall include:
 - 1. The date of submission
 - 2. The project title and number
 - 3. Contract Identification
 - 4. The names of:
 - a. Contractor.
 - b. Subcontractor.
 - c. Supplier.
 - d. Manufacturer.
 - 5. Identification of the product.
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or federal specifications numbers.
 - 9. Identification of deviations from contract documents.
 - 10. Suitable blank space for General Contractor and Architect/Engineer stamps.
 - 11. Contractor's signed and dated Stamp of Approval.
- E. Coordinate submittals into logical groupings to facilitate interrelation of the several items:
 - 1. Finishes which involve Architect/Engineer selection of colors, textures or patterns
 - 2. Associated items which require correlation for efficient function or for installation

1.8 SUBMITTAL SPECIFICATION INFORMATION

- A. Every submittal document shall bear the following information as used in the project manual:
 - 1. The related specification section number.
 - 2. The exact specification section title.
- B. Submittals delivered to the Architect/Engineer without the specified information will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

1.9 RESUBMISSION REQUIREMENTS

- A. Make re-submittals under procedures specified for initial submittals.
 - 1. Indicate that the document or sample is a re-submittal.
 - 2. Identify changes made since previous submittals.
- B. Indicate any changes which have been made, other than those requested by the Architect / Engineer.

1.10 CONTRACTOR'S STAMP OF APPROVAL

- A. Contractor shall stamp and sign each document certifying to the review of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.
- B. Contractor's stamp of approval on any submittal shall constitute a representation to Owner and Architect/Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that Contractor has reviewed or coordinated each submittal with the requirements of the work and the Contract Documents.
- C. Do not deliver any submittals to the Architect/Engineer that do not bear the Contractor's stamp of approval and signature.
- D. Submittals delivered to the Architect/Engineer without Contractor's stamp of approval and signature will not be processed. The Contractor shall bear the risk of all delays, as if no submittal had been delivered.

1.11 ARCHITECT/ENGINEER REVIEW OF IDENTIFIED SUBMITTALS

- A. The Architect/Engineer will:
 - 1. Review identified submittals with reasonable promptness and in accordance with schedule.
 - 2. Affix stamp and initials or signature, and indicate requirements for re-submittal or approval of submittal.
 - 3. Return submittals to Contractor for distribution or for resubmission.
- B. Review and approval of submittals will not extend to design data reflected in submittals which is peculiarly within the special expertise of the Contractor or any party dealing directly with the Contractor.
- C. Architect/Engineer's review and approval is only for conformance with the design concept of the project and for compliance with the information given in the contract.
 - 1. The review shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.

2. The review shall not extend to review of quantities, dimensions, weights or gauges, fabrication processes or coordination with the work of other trades.
- D. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

1.12 SUBSTITUTIONS

- A. Do not make requests for substitution employing the procedures of this Section.
- B. The procedure for making a formal request for substitution is specified in Div. 1.

PART 2 - PRODUCTS - NOT USED.

PART 3 - EXECUTION - NOT USED

END OF SECTION

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SECTION 22 05 15

PLUMBING EARTHWORK

PART 1 - GENERAL

- A. Excavate and backfill for pipe trenches for underground piping, and excavate for structures installed as part of plumbing work.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Excavate trenches for underground piping to the required depth to ensure 2 foot minimum coverage over piping.
- B. Cut the bottom of the trench or excavation to uniform grade.
- C. Should rock be encountered, excavate 6 inches below grade, fill with bedding material and tamp well.
- D. Lay out alignment of pipe trenches to avoid obstructions. Assure that proposed route of pipe will not interfere with building foundation before any cutting is begun. Should interference be found, contact the Architect/Engineer before proceeding.

3.2 BACKFILL

- A. Backfill shall not be placed until the work has been inspected, tested and approved. Complete backfill to the surface of natural ground or to the lines and grades shown on drawings. Except where special materials are requested, use suitable friable soils from other excavation as backfill material. Do not use peat, silt, muck, debris or other organic materials. Deposit backfill in uniform layers and compact each layer as specified in Division 2.
- B. Compacting Backfill. Place material in uniform layers of prescribed maximum thickness and wet or dry the material to optimum moisture content. Compact with power-driven tampers to the prescribed density. Place regular backfill in 8 inch maximum layers, loose measure. Compact to not less than 95 percent of maximum soil density as determined by ASTM D-698 Standard Proctor.
- C. Restoration. Compact backfill, where trenching or excavation is required in improved areas such as pavements, walks, and similar areas, to a condition equal to the adjacent undisturbed earth, and restore surface of the area to the condition existing prior to trenching or excavating operation.
- D. Provide 6 inch stabilized sand bed with 4 inch stabilized sand cover around each pipe.

3.3 DISPOSAL OF EXCESS MATERIAL

- A. Remove excess excavation material or material unsuitable for backfill. Excess material can be spread on grade, or shall be removed from site as directed by the Owner/Architect.

END OF SECTION

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SECTION 22 05 17

PLUMBING ACCESS DOORS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install access doors in wall or ceiling locations as required or shown for access to valves, controls, regulating devices, water arresters and other equipment requiring maintenance, adjustment or operation.

PART 2 - PRODUCTS

2.1 NON-FIRE RATED ACCESS DOORS

- A. 16-Gauge frames.
- B. 14-gauge steel panels.
- C. Continuous fully concealed hinges.
- D. Cylinder lock with key.
- E. Prime coat finish.
- F. Brushed satin stainless steel finish for restroom, kitchen or cafeteria installation.
- G. Material suitable for wall and/or ceiling mounting.

2.2 FIRE RATED ACCESS DOORS

- A. UL listed, 1-1/2 hour Label "B", access doors.
- B. 16-Gauge stainless steel.
- C. 20-Gauge insulated sandwich-type door panel.
- D. Two inch thick with fire rated insulation.
- E. Continuous fully concealed hinge.
- F. Automatic closing and latching mechanism.
- G. Knurled knob and recessed key operation for Owner selection.
- H. Interior latch release slide for opening from inside.
- I. Prime coat finish.
- J. Material suitable for wall and/or ceiling mounting.

2.3 ACCEPTABLE MANUFACTURERS

- A. Milcor.
- B. MIFAB.

- C. Acudor.
- D. Elmdor.
- E. Or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Access doors specified in Division 22 will be installed by other crafts. Not all required access doors are shown. Coordinate with the Contractor to locate access doors for ease of operation and maintenance of concealed equipment.
- B. Installation shall be in accordance with the manufacturer's printed instructions.
- C. Minimum size required:
 - 1. 24 inch x 24 inch for plumbing multiple isolation valves and electrical related items in ceilings.
 - 2. 12 inch x 12 inch for plumbing for single isolation valve, hub drain or shock arrestor.

END OF SECTION

SECTION 22 05 19

PRESSURE AND TEMPERATURE INSTRUMENTS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. This section specifies gauges, thermometers, wells and/or pressure and temperature test stations to be installed as specified.

1.2 RELATED WORK

- A. Division 22, Plumbing
 1. Plumbing General Provisions.
 2. Pipe and Pipe Fittings, General.
 3. Valves, Strainers and Vents.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - GAUGES AND THERMOMETERS

- A. Trerice.
- B. Taylor.
- C. Marsh.
- D. Weksler.
- E. Weiss.
- F. or approved equal.

2.2 PRESSURE GAUGES

- A. Case and Ring: 4 inch type 304 stainless steel; liquid filled case with stainless steel bayonet ring.
- B. Dial: White aluminum with black markings.
- C. Window: Clear acrylic.
- D. Tube: Phosphor bronze and forged brass socket.
- E. Gauge accuracy: +/- 1 percent over operating range.
- F. For pulsating service, provide impulse dampers.
- G. Without flange for pipe mounting.
- H. With flange for wall mounting.
- I. Weiss Model: Domestic Water 4CTS LF (Lead Free) 0-100 PSI.

2.3 THERMOMETER WELLS

- A. Brass or type 300 stainless steel. Machined bar stock, 1-piece construction (Lead Free).
- B. Where installed in insulated piping or vessels, provide with extension neck to match insulation thickness.

- C. Provide metal-to-metal contact with bulb chamber for maximum sensitivity.
- D. Wells shall be sized to extend a minimum of 50 percent into pipe.

2.4 THERMOMETERS IN PIPING SYSTEMS OR VESSELS

- A. Die cast aluminum case with baked epoxy finish.
- B. Adjustable angle 9 inch scale length.
- C. Clear acrylic window.
- D. Brass stem, length to match well.
- E. Red or blue reading organic spirit filled-in magnifying glass column.
- F. White background with black figures and markings.
- G. Brass stems and union connections (Lead Free).
- H. Accuracy: +/- 1 percent of scale range.
- I. Range:
 - 1. Hot water lines: 30 deg. F to 240 deg. F.

2.5 PRESSURE AND TEMPERATURE TEST STATIONS

- A. "Test Station" fitting to receive either a temperature or pressure probe. Fitting shall be solid brass with two valve cores of Nordel (Lead Free).
 - 1. Fitted with a color coded cap strap with gasket.
 - 2. Acceptable Manufacturer: Peterson Equipment Company.
 - 3. Provide with extension neck to match insulation thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with drawing details and manufacturer's recommendations.
- B. Provide a ball valve at each gauge (Lead Free).
- C. Locate gauges and thermometers to be easily readable from the floor at a 5 foot-6 inch eye level. Use adjustable angle or rigid stem as required. Install gauges in upright position.
- D. Install pressure gauges in the following locations: across pumps, domestic water service entrance. Pressure scale range 0 to 160 PSI.
- E. Install thermometer in the following locations: At hot water supply at water heater, and hot water return line at circulation pump.
 - 1. Hot water lines: 30 deg. F to 240 deg. F.

END OF SECTION

SECTION 22 05 23

VALVES, STRAINERS AND VENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Plumbing Valves
- B. Pipe strainer and suction diffusers.

PART 2 - PRODUCTS

2.1 VALVES

- A. Pressure Ratings:
 - 1. Unless otherwise indicated, use valves suitable for 125 minimum psig working steam pressure (WSP) and 450 deg. F.
 - 2. The pressure temperature rating of valves shall be not less than the design criteria applicable to components of the system.
- B. Balancing Valves (Manual)
 - 1. Provide balancing valves with:
 - a. Corrosion resistant plug with resilient seal when required.
 - b. O-ring stem seal.
 - c. Permanently lubricated, corrosion resistant bearings.
 - 2. Connections
 - a. Through 2-inch pipe size use threaded connections.
 - b. For valves 2-1/2-inch pipe size and larger shall be provided with 150 psig flange connections.
 - 3. Provide each valve with:
 - a. Memory stop.
 - b. Plastic drip cap.
 - c. 1/8-inch gauge tap.
 - 4. All valves for domestic use must be lead free.
- C. Thermal Balancing Valves (adjustable Temperature)
 - 1. Adjustable thermal balancing valve used for automatic balancing of circulation circuits in domestic hot water systems. Modulates flow rate in each circuit so hot water temperature at fixtures remains constant.
 - 2. Standards:
 - a. NSF/ANSI/CAN 372 low-lead laws, as certified by ICC-ES.
 - b. NSF/ANSI/CAN 61, commercial hot water 180 deg. F. as certified by ICC-ES.
 - c. Meets codes IPC and UPC.
 - 3. Maximum Working Pressure: 230 psig.
 - 4. Body Material: DZR low-lead brass.
 - 5. Connections: NPT female threaded.
 - 6. Hydraulic Seals: Peroxide-cured EPDM.
 - 7. Adjustable Balancing Cartridge: Stainless steel and copper.
 - 8. ABS Adjustable Knob: Temperature adjustment scale for manual setting and tamper-proof adjustment locking screw.
 - 9. Factory Setting: 130 deg. F.
 - 10. Outlet Temperature gauge: 2-inch diameter with optional dual-scale outlet, 30 to 180 deg. F.

11. Check Valve.
12. Isolation Ball Valves: Inlet and outlet low-lead brass.
13. Manufacturers:
 - a. Caleffi.
 - b. Acorn.
 - c. Cimberio Valve.
 - d. Or approved equal.

D. Ball Valves

1. Provide ball valves with:
 - a. Blowout proof stem.
 - b. Full size port, 316 stainless steel ball and stem.
 - c. Cast bronze body.
 - d. Threaded ends.
2. Seat, seals, thrust washers and packing shall be suitable for the intended service.
3. Service rating:
 - a. 150 psi saturated steam.
 - b. 600 psi WOG.
4. Provide with memory stop for balancing valves.
5. Where Viega ProPress fittings are used, Viega ProPress ball valves may be used.
6. All valves for domestic use must be lead free.

E. Thermostatic Mixing Valves

1. Manufacturers:
 - a. Watts.
 - b. Caleffi.
 - c. Lawler.
 - d. Or approved equal.
2. Valve: Lead free brass body, stainless steel or copper alloy, integral temperature adjustment, check valves. At fixture ASSE 1070.

F. Valve Connections

1. Provide valves suitable to connect to adjoining piping as specified for pipe joints. Use pipe size valves. Sweated joints are not allowed.
2. Thread pipe sizes 2 inches and smaller.
3. Flange pipe sizes 2-1/2 inches and larger.
4. Use screw to solder adapters for copper tubing.
5. Use grooved body valves with mechanical grooved jointed piping.
6. Use press valves when using copper press systems.

G. Check Valves

1. Bronze body, 2 inches and smaller, bronze disc (Teflon disc for steam service), regrinding swing check, screw-in cap, threaded connection (Lead Free).
2. Iron body, 2-1/2 inches and larger, bronze trim, non-slam: stainless steel pins and springs, and bronze plate or bronze mounted, regrind-renew check, bronze seat ring and disc. Provide either wafer or threaded lug (Lead Free).
3. Acceptable Manufacturers (All listed must be lead free):
 - a. Apollo.
 - b. Milwaukee.
 - c. Nibco.
 - d. Or approved equal.

H. Backflow Preventer (All valves for domestic use must be lead free):

1. Intermediate Atmospheric Vented Backflow Preventers: Lead-free, ASSE 1012,

same size as pipe, with intermediate atmospheric vent between independent check valves, bronze body with union ends, stainless steel springs, rated for 175 psig and 210°F. Watts LF9D or equal.

2. Acceptable Manufacturers (All listed must be lead free):
 - a. Watts.
 - b. Wilkins.
 - c. Or approved equal.
- I. Provide valves of same manufacturer throughout where possible.
- J. Provide valves with manufacturer's name and manufacturing location, duty and pressure rating clearly marked on outside of body.
- K. Where valves are installed in insulated piping, provide with extended neck so valve operator and stop plate clears the full thickness insulation.
- L. Provide valve, seat and trim materials suitable for the intended service.
- M. Provide memory stops for all valves used for throttling service. Valves for throttling service shall be butterfly, plug, globe or ball type.

2.2 PIPE SYSTEMS STRAINERS

- A. Body:
 1. Bronze "Y" pattern or basket as shown on the drawings.
 2. Line size.
 3. Threaded strainer blow down port.
 4. ASTM A #126 Class B Cast Iron Body.
- B. Construction:
 1. 2 inch size and smaller with screw connections rated 400 psi WOG.
 2. Over 2 inch size with flanged connections, rated 125 psi WOG.
- C. Fabricate screens of Monel or type 304 stainless steel:
 1. With 20 mesh woven wire in piping systems through 2 inches.
 2. With 0.045 perforations in piping systems 2-1/2 inches and 3 inches.
 3. With 0.125 perforations in piping systems 4 inches and larger.
- D. Start-up:
 1. Provide an additional fine mesh disposable screen for use during start-up operations.
 2. Remove after 30 days.
 3. Attach to piping for Owner's review.
- E. Acceptable Manufacturers (All listed must be lead free):
 1. Apollo.
 2. Crane.
 3. Mueller.
 4. Nibco.
 5. Zurn.
 6. Or approved equal.

2.4 VALVE SCHEDULE

- A. Domestic Service
 - 1. Gas shut-off service: UL approved for natural gas service.
 - a. Nibco Ball Valve, full port through 1 inch: T-585-70-UL.
 - b. Nibco Ball Valve conventional port 1-1/4 inch through 3 inch: T-580-70-UL.
Mueller 1-1/4 inch through 4 inch: Lub-O-seal.
 - c. Milwaukee Full Port ¼ inch-2 inch.
 - d. Or approved equal.
 - 2. Cold and Hot water service (all listed must be Lead Free):
 - a. Nibco Ball Valve full port through 2 inch: T-585-66-LF.
 - b. Nibco Ball Valve 2-1/2 inch and 3 inch conventional port: T-580-66-LF.
 - c. Viega ProPress Bronze Ball Valves (where Viega ProPress fittings are used).
 - d. Milwaukee Full Port ¼ inch-2 inch.
 - e. Milwaukee Standard Port 2-1/2 inch & 3 inch.
 - f. Apollo Press Bronze Ball valves – 77 WLF.
 - g. Or approved equal.
 - 3. Check Valve (All listed must be Lead Free):
 - a. Nibco Check Valve: T - 413 - Y -LF (Teflon Seats).
 - b. Milwaukee Valve – 509T.
 - c. Apollo Check Valve: 163TLF.
 - d. Apollo Press Check Valve: 163TPR-LF.
 - e. Apollo Check Valve 2 inch and larger 910WE-LF (Wafer).
 - f. Or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install valves for shut-off and isolating service at each piece of equipment, at vertical risers, and where shown on the drawings.
- C. Use ball valves in domestic hot water and domestic cold water systems.
- D. Use ball valves in circulating water systems, for balancing duty.
- E. Provide drain valves at main shut-off valves and low points of piping and apparatus so the systems can be entirely drained.
 - 1. 1 inch valve for pipes 6 inch and larger.
 - 2. 3/4 inch valve for pipes smaller than 6 inch.
 - 3. Terminate with pipe plug.
 - 4. Drain valves shall be ball valves.
- F. Provide isolation valves in domestic water lines to isolate all equipment, restrooms, hose bibbs, and where shown on the drawings.
- G. Where valves are installed in insulated pipe, valve operator shall have an insert so the lever or handle will not damage the insulation. Install handles so the lever or handles will not damage the insulation.
- H. Provide clearance for installation of insulation and access to valves.

- I. Provide access where valves are not exposed.
- J. Install backflow preventers in accordance with Oklahoma requirements maintaining minimum clearance distances for servicing and testing. Provide indirect waste piping with air gap installation from relief opening to above hub drain or floor drain.

3.2 VALVE TAGS

- A. Furnish valves with 1-1/2 inch diameter brass valve tags with stamped, black or red-filled numbers. Service designations shall be 1/4 inch letters, and valve numbers shall be 2 inch letters. Engineer shall approve Service designations. Secure tags to valves by use of brass "S" hooks or brass chain. Secure chain to valve by use of copper or Monel meter seals. Valve tags are not required if the valve is located within 3 feet of the equipment being served and the service is obvious.
- B. Mount charts and drawings listing functions of each valve and its location in a metal and glass frame. Place charts and drawings as directed; in addition, on the record drawings mark the symbols and furnish a valve schedule properly identifying the valve number, service, exact location, the material being piped, and the room number of area that the valve services. This schedule shall be furnished on reproducible drafting paper or film suitable for reproduction on an Ozalid machine. The Owner shall approve the size of drafting paper. Provide a copy of the valve chart in the Operating and Maintenance Manuals.

3.3 PIPE SYSTEMS STRAINERS

- A. Provide strainers in supply piping to circulating pumps, thermostatic mixing valves, before solenoid valves and trap primer valves.

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SECTION 22 07 19

PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install piping insulation, jackets, accessories and covering of specified materials. The insulation shall be used for high and low temperature piping applications including domestic hot and cold water, roof and overflow drain sump bodies and rain leaders, horizontal sanitary and drain piping which receives condensate.

1.2 QUALITY ASSURANCE

- A. The intent of insulation specifications is to obtain superior quality workmanship resulting in an installation that is absolutely satisfactory in both function and appearance. Provide insulation in accordance with the specifications for each type of service and apply as recommended by the manufacturer and as specified.
- B. An approved contractor for this work under this Division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their owners satisfactorily for not less than 3 years.
- C. All piping insulation used on the project inside the building must have a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 50, as determined by test procedures ASTM E 84, NFPA 255 and UL 723. These ratings must be as tested on the composite of insulation, jacket or facing, and adhesive. Components such as adhesives, mastics and cements must meet the same individual ratings as the minimum requirements and bear the UL label.
- D. Condensation on any insulated piping system is not acceptable.
- E. Replace insulation damaged by either moisture or other means. Insulation that has been wet, whether dried or not, is considered damaged. Make repairs where condensation is caused by improper installation of insulation. Also repair any damage caused by the condensation.

1.3 APPROVALS

- A. Submit product data on each insulation type, adhesive, and finish to be used in the work. Make the submittal as specified in Division 1 General Requirements and obtain approval before beginning installation. Include product description, list of materials and thickness for each service and location and the manufacturer's installation instructions for each product.
- B. Make a field application of each type of insulation to display the material, quality and application method. Obtain approval of the sample application before proceeding with installation of the work.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Glass fiber pipe insulation:
 - 1. Johns-Manville Micro-Lok AP-T.

2. Owens-Corning ASJ/SSL.
 3. Knauf ASJ/SSL.
- B. Cellular Glass Insulation (Foamglass):
1. Pittsburg Corning.
 2. Cell-U-Foam.
- C. Aluminum Jacketing:
1. Childers.
 2. Pabco.
 3. RPR.
- D. Fiberglass reinforcing cloth mesh:
1. Perma Glass Mesh.
 2. Alpha Glass Mesh.
 3. Childers Chil-Glas.
 4. Vimasco.
- E. Mastics and Adhesives
1. Childers.
 2. Foster.
 3. Vimasco.
 4. Armstrong 520 Adhesive.
- F. Elastomeric Insulation
1. Armacell.

2.2 FIBERGLASS PIPE INSULATION

- A. Heavy density, dual temperature fiberglass insulation with factory applied, all service, reinforced vapor barrier jacket having integral laminated vapor barrier. Provide with a factory applied pressure sensitive tape closure system and matching butt strips. Supply in thickness as shown.
1. Thermal conductivity 0.23 @ 75°F mean (ASTM 335).

2.3 ELASTOMERIC INSULATION

- A. Insulation material shall be flexible, closed-cell elastomeric insulation in tubular or sheet form. Material shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84, latest revision. Sheet material with a thickness greater than 3/4" shall have a flame spread rating of 25 or less and a smoke developed rating of 100 or less when tested in accordance with ASTM E84, latest revision. In addition, the product, when tested, shall not melt or drip flaming particles, and the flame shall not be progressive. In addition, all materials shall pass simulated end-use fire test. Minimum 3/4" thick.
1. Thermal conductivity 0.27 at 75°F mean (ASTM C177 or C518).

2.4 CELLULAR GLASS INSULATION

- A. ASTM C552:
1. "k" value of 0.35 @ 75°F ("ksi" value of 0.047 @ 24°C);
 2. 8.0 lb./cu.ft. (128 kg/cu.m.) density.

2.5 INSULATION/SHIELD AT HANGERS

- A. Field fabricated: Use 360° sections of rigid foamglass insulation that will support the bearing

area at hangers and supports. Further support insulation at hangers and supports with a shield of galvanized metal covering at least half of the pipe circumference, and conforming to the schedule. Insulation shall extend at least 1" beyond metal shield on each end. When pipe is guided at top and bottom, metal shields shall cover the whole pipe circumference. Adhere metal shield to insulation so that metal will not slide with respect to insulation with 1/2" aluminum bands (2) per shield.

1. Sections of foam glass insulation may be used of the same outside diameter of the adjoining pipe insulation.
 2. Minimum thickness of foam glass insulation shall not be less than 1" thick.
- B. Pipe saddles: Formed galvanized sheets at each support point for insulated pipe, shaped to fit pipe, and covering bottom half of pipe. Length at saddle shall be not less than twice the insulation outside diameter or more than 22". Provide 18 gauge through 4" pipe and 16-gauge 5" pipe and above.

2.6 SEALANT, ADHESIVE AND FINISH

- A. Lap Adhesive. Provide Childers CP-82 adhesive.
- B. Vapor Barrier Finish:
1. Indoors: Provide as insulation coating Childers CP-35, white.
 2. Outdoors: Provide as insulation coating Childers Encacel X.
 3. Underground: Provide Childers CP-22/24 for fittings and areas. Pittwrap cannot be used.
- C. Sealant. Provide Childers CP-76 vapor barrier sealant.
- D. Lagging Adhesive. Provide Childers CP-50.
- E. Other products of equal quality will be acceptable only upon approval.

2.7 GLASS FIBER BLANKET INSULATION

- A. Minimum density of 1.0 PCF, 2" thick, installed R value to be 6.0 or better at 75°F mean, facing of 0.35 mil foil reinforced with glass yarn mesh and laminated to 40 lbs fire resistant kraft.

PART 3 - EXECUTION

3.1 INTERIOR PIPING

- A. Cover all piping with glass fiber, heavy density, dual temperature pipe insulation with a vapor barrier jacket. Apply insulation to clean, dry pipes. Longitudinal seams shall be joined firmly together and sealed with self-sealing lap joints. Butt insulation joints firmly together and seal with a 3" wide ASJ butt strip seal. Longitudinal seams and butt strip laps shall be coated and sealed with CP-35 vapor barrier coating for chilled water piping applications.
- B. Install hanger with protective shield, on the outside of all insulation.
- C. Where domestic water pipes (1/2" & 3/4" pipe sizes) are installed on trapeze type hangers, provide galvanized sheet metal protection shields at these locations. Place insulation jacket directly on hanger. Incompressible, load bearing insulation segments are not required.
- D. Pipe Saddles: Formed galvanized sheets at each support point for insulated pipe, shaped to fit pipe, and covering bottom half of pipe. Length at saddle shall be not less than twice the insulation outside diameter. Provide 18-gauge through 4" pipe and 16-gauge for 5" pipe and

above.

- E. Seal ends of pipe for drinking chilled water insulation with vapor barrier mastic at valves, flanges, fittings and every 21' on straight runs of piping. Mastic should extend on top of ASJ jacket, across the glass, down onto the pipe making a complete seal.
- F. Apply a smooth flood coat of white lagging Foster 8142W over all exposed insulation.
- G. Piping to be insulated as specified above:
 - 1. All hot and cold water.
 - 2. Make-up water
 - 3. Horizontal sanitary drain piping that receives condensate
 - 4. Exposed to view storm drainage system including roof and overflow drain bodies, vertical piping from drain body and all horizontal rain leaders to first elbow turning down

3.2 FLANGE, VALVE AND FITTING INSULATION

- A. Cover valves and flanges with fabricated segments, fittings with two-piece factory molded fittings, and both of matching pipe insulation type and thickness equal to that of the adjoining pipe. Fittings and fabricated segments shall be securely held in place.
 - 1. Apply a tack coat of insulating mastic to the insulated fitting to produce a smooth surface.
 - 2. After mastic is dry, apply a second coat of vapor barrier mastic. Neatly embed with 10 x 10 fiberglass cloth into the tack coat.
 - 3. Overlap mastic and fiberglass cloth by 2" on adjoining sections of pipe insulation.
 - 4. Apply a second coat of mastic over the fiberglass cloth to present a smooth surface.
 - 5. Apply mastic to a wet film thickness of 3/64".
 - 6. Fabric shall not be visible after completion.
 - 7. Vapor seal flanges, valves and fittings with Childers CP-35.
- B. PVC fitting covers are not acceptable.

3.3 CONCEALED STORM DRAIN PIPING

- A. Provide flexible glass fiber insulation with factory-applied, reinforced UL labeled Foil-Skrim-Kraft (FSK) facing. Install insulation on clean, dry piping.
- B. Insulation shall be wrapped tightly on the piping with all circumferential joints and longitudinal joints overlapped a minimum of 2" with facing to the outside to obtain specified R-value using a maximum of 25% compression.
- C. Provide vapor retarder at penetrations, joints, seams and damage to the facing with staples and FSK foil tape. The facing shall be taped with a minimum 3" wide strip of reinforced foil tape. Pressure-sensitive tape shall be a minimum 3" (76mm) wide and shall be applied with moving pressure using an appropriate sealing tool. Staples shall be outward cinch and placed 6" (152mm) on center.
- D. Mechanical / Electrical rooms and above ceilings are considered concealed spaces.

3.4 MISCELLANEOUS

- A. Install materials after piping has been tested and approved.
- B. Apply insulation on clean, dry surfaces only.

- C. Apply weather protective finish on elastomeric insulation installed in non-conditioned spaces. Provide a minimum of three coats.

3.5 INSULATION THICKNESS

<u>INSULATED UNIT</u>	<u>THICKNESS (Inches)</u>
Roof Drain Bodies and Horizontal Roof Drain Leaders	1
Roof Overflow Drain Bodies and Horizontal Drain Leaders	1
Domestic Cold Water.	1
Horizontal Sanitary Drain Piping Which Receives Condensate	1
Domestic Hot Water Piping, 1-1/2" Pipe and Smaller	1
Domestic Hot Water Piping, 2" Pipe and Larger	1-1/2

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SECTION 22 08 00

PLUMBING COMMISSIONING COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section outlines commissioning requirements and activities of Contractor, Owner, CxA and Design Professionals as related to the Division 22 Plumbing.
- B. Related Sections:
 - 1. Division 01 – General Requirements and Specification Section 01 91 13, General Commissioning.
 - 2. Division 22 – Plumbing.
 - 3. Division 23 – Mechanical.
 - 4. Division 26 – Electrical .

1.2 DEFINITIONS

- A. Refer to Specification Section 01 91 13, General Commissioning for definitions.

1.3 CONTACT INFORMATION

- A. The Owner will contract directly for commissioning services.
 - 1. Commissioning Agent fee will be paid for directly by the owner.
 - 2. Cost of contractor coordination with the CxA is specified in this section.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Contractor shall provide all standard and specialized testing equipment required to perform Start-up and Functional Performance Testing. Test equipment required for Functional Performance Testing is listed below. Data logging equipment and software required to test equipment shall be provided by the Contractor.
- B. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to an accuracy of 1.0°F and a resolution of + or - 0.2°F). Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year. All equipment shall be calibrated according to the manufacturer's recommended intervals and following any repairs to the equipment. Calibration tags shall be affixed or certificates readily available.

2.2 OTHER CONTRACTOR PROVIDED EQUIPMENT:

- A. Ladders and/or lifts and appropriate fall protection as required by Contractor site requirements.

PART 3 - EXECUTION

3.1 COORDINATION - GENERAL

- A. Except for the activities to be performed by the CxA called for herein, all component and

system installation work required by the Division 22, 23 and 26 specifications including specific contractor furnished items indicated by this Section shall be provided by the Contractor.

3.2 SUBMITTALS

- A. Plumbing
 - 1. Plumbing Equipment.

3.3 EQUIPMENT START-UP

- A. Notification
 - 1. Contractor shall provide ten Owner business days' notice to CxA, Owner and Design Team of start-up dates.
- B. Prior to start-up, contractor shall:
 - 1. Verify that equipment and systems are complete, accessible, correctly connected to utilities and ready for operation. Perform all pre-start inspections and tests as called for in Division 22.
 - 2. Comply with pre-start requirements of manufacturer and complete applicable documentation.
 - 3. Complete applicable sections of Pre-functional Checklists.
 - 4. Coordinate start-up attendance by manufacturer or authorized representative as required by specifications or manufacturer.
- C. At start-up, contractor shall:
 - 1. Supervise the activities of the authorized start-up technician or manufacturer's representative.
 - 2. Verify proper voltage, phase, drive rotation and any other conditions that may cause damage if not correct.
 - 3. Execute start-up under supervision of qualified contractor and equipment manufacturer personnel and in accordance with the manufacturer's instruction.
 - 4. Complete manufacturer start-up requirements and documentation. Provide a copy of documentation to the CxA for inclusion in the Cx Manual.
 - 5. Complete PFC's and provide documentation to CxA.
 - 6. Provide documentation of any issues noted during start-up to CxA, Owner and Design Team. Outline recommendations for corrective action.

3.4 PRE-FUNCTIONAL CHECKLISTS

- A. Contractor shall forward completed copies of PFC's to the CxA for inclusion into the Cx documentation. PFC's will be provided by the CxA. As an alternate, contractor shall submit their versions of the PFC's to the CxA for review and comment.
- B. Contractor shall complete PFC for each of the following equipment:
 - 1. Plumbing:
 - a. Domestic Hot Water Heater/Converter.
 - b. Recirculation Pump.
 - c. Mixing Valve.

3.5 FUNCTIONAL TESTING

- A. General.
 - 1. Contractor shall organize and schedule Construction Team members to execute the functional testing, which will be directed by CxA.

- B. Recirculation Pump
 - 1. Graphics.
 - 2. Start/Stop/Schedule.
 - 3. Pump Operation (On/Off/Hand/Auto).
 - 4. Temperature Sensor Calibration.

- C. Domestic Water Heater
 - 1. Graphics.
 - 2. Start/Stop Schedule.
 - 3. Discharge Temperature.

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SECTION 22 11 16

DOMESTIC WATER PIPING AND APPURTENANCES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install domestic hot and cold water piping.

1.2 RELATED WORK

- A. Division 22 Plumbing
 1. Valves, Strainers and Vents.
 2. Pipe and Pipe Fittings – General.
 3. Plumbing Piping Insulation.
 4. Plumbing Fixtures and Fixture Carriers.

PART 2 - PRODUCTS

2.1 PIPING AND FITTINGS

- A. Below Slab on Grade Piping for Water Entries:
 1. 2-inch and smaller, provide ASTM B88 Type K (heavy wall) annealed tempered (soft) seamless copper water tube. No joints below slab entries.
 2. 2-1/2-inch and 3-inch, provide ASTM B88 Type K (heavy wall) annealed tempered (soft) seamless copper water tube, 20 ft. straight lengths. One joint allowed below slab entry using wrought copper, solder-joint pressure fittings: ASME B16.22 with an approved brazing filler metal or pipe can be shop bent for no joint installation by using a "bending" temper tubing.
 3. 4-inch and larger, provide ductile iron pipe with mechanical joints, ANSI A21.6.
 4. 3 inch and larger, provide one-piece stainless steel IBR (in building riser), Watts or Ames.
- B. Below Slab on Grade Piping. Furnish ASTM B 88 and ANSI/NSF Standard 61 annealed tempered (soft), Type K copper water tube. Run continuous with no joints under the floor slab. Provide copper pipe corrosion protection as specified in this Section.
- C. Below Slab on Grade Piping: PEX tubing. Refer to section 22 11 21.
- D. Above Slab Piping. Provide seamless ASTM B 88 and ANSI/NSF Standard 61 drawn tempered (hard) Type L copper water tube with wrought copper or bronze fittings with solder-joints, ANSI B16.22. Solder material shall be 95-5 (lead free) (Tin-Antimony-Grade 95TA) ASTM B 32.
- E. Above Slab Piping: PEX tubing. Refer to section 22 11 21.
- F. Unions. Provide 150 lb. standard unions with ground joint and bronze seat. Flange joints larger than 2 inches. Provide dielectric isolating unions at junctions or connection between metallic piping of dissimilar metal. Provide pipe threads with standard taper pipe threads ANSI B2.1.
- G. Alternate Method of Joining Copper Pipe and Tubing: Press Fittings: Copper press fitting shall conform to the material and sizing requirements of ASME B16.51. O-rings for copper press fittings shall be EPDM. VIEGA. The system intended for use shall be approved by submittal. Systems from various manufacturers may vary in technology. The field personnel

shall carry training credentials from the approved manufacturer for the project. Mixing of fittings from different manufacturers is strictly prohibited.

2.2 WATER HAMMER ARRESTORS

- A. Provide piston type hydraulic engineered/manufactured water hammer arrestors in cold and hot water supply lines in chases or walls to each fixture branch or battery of fixtures serving quick closing valves of electrical, pneumatic, spring loaded type, or quick hand closure valves on fixture trim. Provide water hammer arrestors at the end of the branch line between the last two fixtures served. Provide Precision Plumbing Products, Inc., or equal. Size units according to water hammer arrestor's Standard PDI WH-201; refer to schedule on drawings.
- B. Install all water hammer arrestors so as to attain 100% effectiveness according to Plumbing and Drainage Institute PDI-WH201 Table 5, 6 and 6-A for water hammer arrestors.
- C. All water hammer arrestors shall be installed in a vertical position.
- D. All water hammer arrestors shall be accessible and shall have access panels where required. Arrestors located above ceilings in fixture drops will not be acceptable. Refer to sizing and placement data as indicated in PDI Standard PDI-WH-201.

PART 3 - EXECUTION

3.1 DRAINAGE

- A. Install water piping systems with uniform horizontal grade of 1/8 inch per 10 foot, minimum, to low points to provide complete system drainage. Where constant pitch cannot be maintained for long runs, establish intermediate low points and rise to new level. Grade branches to drain to mains or risers. Unless otherwise indicated, terminate low points of risers with drain valve piped to nearest hub or floor drain.

3.2 STERILIZATION

- A. Prior to starting work, verify system is complete, flushed and clean.
- B. Disinfect water distribution system as required per state and local codes.
- C. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651, AWWA C652 or local authority having jurisdiction
 - 1. Obtain a minimum of one water sample flushing from at least 10% of the outlets and from the water entry.
 - 2. Take samples from faucets located at highest point in the building, and farthest point from the main water supply.
- D. After final flushing, remove aerators, clean and replace.

3.3 TESTING

- A. Test under a cold water hydrostatic pressure not less than operating pressure of system and carefully check for leaks. Test shall conform to requirements of IPC and local codes.
 - a. Repair leaks and retest system until proven watertight.
- B. Test the domestic water piping system at pressure, maintained for minimum of 15 minutes.

- C. Use only potable water for the test.
- D. Perform the test before fixtures, faucets, trim or final connections are made to equipment.
- E. If the system is tested in sections, the entire domestic water piping system shall be submitted to a final test, employing the specified procedure.
- F. Do not insulate or conceal piping systems until tests are satisfactorily complete.
- G. If any leaks or other defects are observed, suspend the test and correct the condition at once. Repeat testing until leaks are eliminated and the full test period is achieved.
- H. The satisfactory completion of testing does not relieve the Contractor of responsibility for ultimate proper and satisfactory operation of piping systems and their accessories.

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SECTION 22 11 21

PEX PIPE AND FITTINGS

Uponor (Pipe Sizes ½" Through 3" Copper Tube Sizes)

PART 1 – GENERAL

1.1 PIPE

- A. All hot and cold water PEX piping shall be manufactured by Uponor North America as AquaPEX and manufactured in a Standard Dimensional Ratio of 9 (SDR 9) and satisfy ASTM F876. As recognized in IAPMO Research and Testing File No. 3558, the tubing is produced from a cross-linked polyethylene compound complying with ASTM F877, has a 100 PSI pressure rating at 180 degrees.

1.2 TECHNICAL DATA

A. APPLICABLE STANDARDS

- 1. AquaPEX is available in nominal sizes of ¼" through 3" diameter.
- 2. Uncoated (natural) AquaPEX has a material designation of PEX 5106.
- 3. Coated (blue and Red) AquaPEX has a material designation of PEX 5206.
- 4. AquaPEX is recognized as conforming to ASTM F 877 by IAPMO R&T #3558, as well as conforming to NSF 61, NSF (J-00103652).

B. APPLICABLE CODES

- 1. 2018 International Plumbing Code (IPC).

1.3 FITTINGS

A. Uponor ProPEX®

- 1. Third-party certified to NSF 14 and ASTM F1960 cold expansion with PEX reinforcing ring and shall comply with ASTM F876 and ASTM F877, ½ inch through 3 inch nominal pipe size fittings manufactured from the following material types:
 - a. Reinforcing cold expansion rings shall be manufactured from the same source as PEX-a piping manufacturer and marked "F1960".
- 2. Uponor multiport tees and elbows: Multiple-outlet fitting complying with ASTM F877 (CAN/CSA B137.5); with ASTM F1960 inlets and outlets.
- 3. Uponor manifolds Multiple outlet assembly with ASTM F1960 outlets.
 - a. Type L copper branch manifold with lead-free brass valve outlets.
 - b. Type L copper branch manifold without valves, with lead-free brass outlets.

B. PEX-to-metal transition fittings:

- 1. Manufacturers: Provide fittings from the same manufacturer of the piping.
- 2. Third-party certified to NSF 14 and ASTM F1960 cold expansion with PEX reinforcing ring and shall comply with ASTM F876 and ASTM F877, 1/2 inch through 3 inch nominal pipe size fittings manufactured from the following material types:
 - a. PEX-a to thread transition: One-piece lead free (LF) brass fitting with male or female threaded adapter and ASTM F1960 cold expansion end, with PEX-a reinforcing cold-expansion ring.
 - b. PEX-a to copper sweat transition: One-piece lead free (LF) brass fitting with sweat adapter and ASTM F1960 cold expansion end, with PEX-a reinforcing cold expansion ring.

- c. PEX-a to copper press transition: One-piece lead free (LF) brass fitting with one ASME B16.51 copper press end and one ASTM F1960 cold expansion end, with PEX-a reinforcing cold expansion ring.
- d. PEX-a to flange transition: Two-piece fitting with one steel flange conforming to ASME B16.5 and one lead free (LF) brass adapter conforming to ASTM F1960.
- e. PEX-a to groove transition: One-piece lead free (LF) brass fitting with one CSA B242-05 groove end in either iron pipe size (IPS) or copper tube size (CTS) and one ASTM F1960 cold expansion end with PEX-a reinforcing cold expansion ring.
- f. PEX-a to water meter transition: Two-piece fitting with one NPSM union thread and one ASTM F1960 cold expansion end, with PEX-a reinforcing cold expansion ring.

C. PEX-to-thermoplastic transition fittings:

- 1. PEX-a to CPVC transition: Thermoplastic fitting with one spigot or socket end and one ASTM F1960 cold expansion end, with PEX-a reinforcing cold expansion ring.

1.4 BASIC USE

- A. Uponor's AquaPEX cross-linked polyethylene (PEX) tubing and fittings for use in potable hot and cold water distribution, water service in buildings of any type of construction allowed under the applicable code.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. The piping systems shall be constructed from a cross-linked polyethylene (PEX) tubing and fittings compounds.

2.2 MANUFACTURERS

- A. PIPE AND/OR FITTINGS
 - 1. Uponor North America.

2.3 SYSTEM DESIGN

- A. System design shall be in accordance with standard industry practice for water distribution systems and the manufacturer's instructions. The design shall take into consideration such factors as pressure and flow requirements, friction loss, operating temperatures, support spacing, joining methods, and thermal expansion and contraction.
- B. A Hazen-Williams C Factor of 150 shall be used in all hydraulic calculations.
- C. AquaPEX:
 - 1. PEX-a (Engel-method crosslinked polyethylene), ASTM F876 and F877 (CAN/CSA-B137.5), SDR 9, CTS, ½ inch through 3 inch nominal pipe size.
 - 2. Tubing is certified to NSF Standards 14 and 61 and listed by the Hydrostatic Stress Board of PPI at 200 degrees F. at 80 PSI, 180 degrees F. at 100PSI and 73.4 degrees F. at 160 PSI.
 - 3. Tubing sizes 2-inch, 2-1/2-inch and 3-inch reach out to manufacturer's representative for proper design flow and velocity sizing of pipe.

PART 3 – EXECUTION

3.1 INSTALLATION PROCEDURES

- A. Installation practices such as pipe support spacing, bracing, allowance for thermal expansion/contraction, handling and storage shall be in accordance with the manufacturer's instructions and this specification.
- B. Special requirements for PEX pressure pipe and fittings:
 - 1. Installing contractor shall have successfully completed the Uponor Commercial Piping Systems Training Course (previously AquaPEX Certification) as given by an Uponor employee or Uponor Manufacturer's Representative.
 - 2. Special installation requirements as indicated above for all PEX pipe systems.
- C. Installers must be factory trained. The manufacturer's published installation instructions must be available on the job site if requested by Code officials.
- D. Reference the use of Table 6-6 by manufacturer for sizing PEX-a F 1960 domestic water systems.
 - 1. Reference the use of Uponor Pressure Loss charts for sizing PEX-a domestic water systems that fall outside of Table 6-6 parameters.
 - 2. Refer to Uponor Plumbing Installation Manual for PEX pipe installation instructions with and without PEX pipe support to ensure proper support and clamping requirements.

3.2 WATER SERVICE AND WATER DISTRIBUTION

- A. When installing pipe horizontally it must be laid or supported in a manner that assures the temperature expansion and contraction joints are securely accommodated for. The installation must comply with applicable codes and the manufacturer's published installation instructions.

3.3 LIMITATIONS

- A. Pipe and fittings are intended for use at a maximum working pressure of 130 psi at 120°F
- B. When installation is in fire resistive assemblies, evidence of compliance with IBC Section 713 (penetrations), UBC Section 709 (walls and partitions), and UBC Section 710 (floor / ceiling or roof / ceiling) and, as applicable, must be provided to the Code official for approval.
- C. The tubing and fittings must be protected from exposure to direct sunlight as noted in the manufacturer's installation instructions.
- D. Clearances from heat producing equipment must be in accordance with Section 802.10-5 of the IAPMO UMC, Section 503.10.5 of the 2009 International Fuel Gas Code®, Section M1306 of the IRC, and Section 304.6 of the 1997 UMC or, as applicable. In areas enforcing the Uniform codes PEX shall not be installed within 18 inches of a water heater.
- E. The tubing must be maintained at the proposed operating pressure during placement of concrete, or prior to backfilling when used in buried applications.
- F. Minimum bending radius is six times the outside tube diameter of the PEX tube. The outside diameter is the nominal diameter plus 1/8 inch (3.2 mm) or copper tube size (CTS).

- G. Installation of tubing must be pressure-tested in the presence of the building official for any possible leaks.
- H. The tubing must not be utilized as a source of electrical ground.
- I. The products are produced under a quality control program in Apple Valley, Minnesota with inspection by IAPMO Uniform ES.

3.4 TESTING

- A. Test under a cold water hydrostatic pressure of 1-1/2 times operating pressure (150 psig minimum) and carefully check for leaks. Repair leaks and retest system until proven watertight.
- B. Test the domestic water piping system at 150psig hydrostatic pressure, maintained for 6 hours.
- C. Use only potable water for the test. Do not use compressed air.
- D. Perform the test before fixtures, faucets, trim or final connections are made to equipment.
- E. If the system is tested in sections, the entire domestic water piping system shall be submitted to a final test, employing the specified procedure.
- F. Do not insulate or conceal piping systems until tests are satisfactorily complete.
- G. If any leaks or other defects are observed, suspend the test and correct the condition at once. Repeat testing until leaks are eliminated and the full test period is achieved.
- H. The satisfactory completion of testing does not relieve the Contractor of responsibility for ultimate proper and satisfactory operation of piping systems and their accessories.

3.5 WARRANTY

- A. Consult the manufacturer for specific 25 Year System Warranty information.

END OF SECTION

SECTION 22 11 23

DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. General characteristics for pumps specified in Division 22 - Plumbing.

1.2 RELATED WORK

Requirements for pumps are specified in other sections of Division 22 - Plumbing, including the following:

- A. Division 22 Plumbing - Electrical Provisions of Plumbing Work.

1.3 PUMP SELECTION

- A. Select pumps conservatively for scheduled conditions. Furnish pumps that have reasonably high efficiencies, with peak efficiency at or near rated conditions. Select pumps that will operate stably at 15' suction lift despite substantial reduction in head or substantial increase in delivery.
- B. If the pumps proposed are not considered suitable, submit manufacturer's data on other pumps, for review.
- C. Scheduled design flow, design head, pump efficiency, and motor horsepower are the minimum acceptable.
- D. The pump curve shall rise continuously from maximum flow to cut-off.
- E. Shut-off head approximately 10 percent greater than design head, unless otherwise indicated in pump schedules.
- F. Pump brake horsepower shall not exceed the motor horsepower rating over the entire operating range from shut-off to run-out.
- G. Select the pump for operation at or near peak efficiency.
- H. Cavitation-free at all points on the curve.
- I. Impeller diameter shall not exceed 90 percent of the maximum published diameter.

1.4 PUMP SIZE AND TYPE

- A. Provide motor-driven pumps of the type and speed scheduled. Select pumps that are not overloaded throughout the entire range of pump operation. Provide pump connection sizes as indicated.
- B. Submit copies of manufacturer's performance curves, as shop drawings on each pump. Clearly mark the curves for each pump to indicate the diameter of the impeller and the selection point.

1.5 CERTIFIED DATA

- A. Submit factory certified pump curves showing pump performance characteristics with

pump and system operating points plotted. Curves shall include as a minimum, flow (gallons per minute), head (feet of water), all available impeller diameters (inches), efficiency (percent), net positive suction head required (feet of water), brake horsepower, pump size and pump model. Show pump curves with system curve plotted.

PART 2 - PRODUCTS

2.1 DOMESTIC HOT WATER CIRCULATING PUMPS (SMALL) FRACTIONAL HORSEPOWER

- A. Pump Construction:
 - 1. Wet-rotor, in-line, single stage.
 - 2. Bronze housings with 1/2" and 3/4" sweat connections.
 - 3. Stainless steel housing with union threaded connections.
 - 4. Variable speed ECM.
 - 5. Integrated check valve inside union fitting on a sweat pump housing.
 - 6. Built-in 5-foot, 115 volt AC line cord with NEMA 3 Prong male plug or line cord.
 - 7. Timer control.
 - 8. Aquastat thermostatic control.

- B. Acceptable manufacturers:
 - 1. Bell & Gossett.
 - 2. Grundfos.
 - 3. Armstrong.
 - 4. Taco.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the pumps in accordance with Manufacturer's "Installation, Start-up and Service Instructions".
 - 1. Provide access space around pumps for service.
 - 2. Lubricate pumps prior to start-up.
 - 3. Install hot water circulator horizontally, properly supported to wall, in an accessible location for testing and maintenance at a height not to exceed 60" above finished floor. Install line size Ernst bronze rotating wheel, flow indicator with double window, downstream of circulator.

- B. Provide a line size isolation valve and strainer on the pump suction and a line size silent check valve and balancing valve on the pump discharge.

- C. Support piping adjacent to the pump such that no weight is carried on the pump casing. Decrease from pipe size with eccentric reducer on suction side and concentric increaser on discharge side.

- D. Ensure pumps:
 - 1. Operate at specified system fluid temperatures without vapor binding and cavitation.
 - 2. Are non-overloading in parallel and individual operation.
 - 3. Operate within 25 percent of midpoint of published maximum efficiency curve.

- E. Refer to pump detail on the Contract Drawings for piping accessories to be provided.

3.2 MANUFACTURER START-UP SERVICE ALIGNMENT

- A. After installation, the pumps and motors are to be aligned by the manufacturer or their

representative utilizing a dial indicator. After completion, a formal report must be submitted by the Manufacturer to the Engineer prior to final acceptance. This report must include pump serial number, location, beginning and final alignment at a minimum.

1. Technicians, as required, shall be trained and experienced in the work they perform (Contractor start-up / alignment is unacceptable).
- B. Before starting pumps, but after connecting piping:
1. Align shafts and coupling with a precision dial indicator alignment instrument to the minimum tolerances .004 (TIR) per inch of coupling radius or as recommended by the manufacturer, whichever is the greater.
 2. Tabulate the actual pump alignment reading with manufacturer's minimum tolerances.
 3. Submit readings for approval.
 4. Include the approved readings in the Owner's Maintenance Manual.

3.3 FINAL PUMP FLOW CALIBRATION

- A. Based on the results of the final phases of the test and balance sequences, if the flow of the unthrottled pump is more than 10% above the scheduled values:
1. Request detailed instructions from the pump manufacturer for the correct impeller diameter.
 2. Trim the impeller to the diameter recommended by the manufacturer, employing precision machinery.
- B. Enter the information on the final configuration of the pump in the Owner's Manual.
1. Modify the pump nameplate to reflect the correct head and flow data and the impeller diameter.

3.4 SPARE PARTS

- A. Provide the following spare parts and material to the Owner for his use after the warranty period.
1. A mechanical seal for each pump.
 2. A set of bearings for each pump.

END OF SECTION

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SECTION 22 13 16

SOIL, WASTE AND SANITARY DRAIN PIPING, VENT PIPING AND APPURTENANCES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install piping in buildings and underground laterals to 5 foot outside of building.

1.2 RELATED WORK

- A. Site Work:
 - 1. Sanitary Sewers.
 - 2. Excavation, Trenching and Backfilling for Utilities.
- B. Division 22 Plumbing:
 - 1. Pipe and Pipe Fittings.
 - 2. Plumbing Fixtures and Fixture Carriers.
 - 3. Drains, Cleanouts and Hydrants.
 - 4. Earthwork.

1.3 REFERENCES

- A. CISPI - Cast Iron Soil Pipe Institute.
- B. ASTM - American Society for Testing and Materials

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. All No-Hub clamps must have 4 bands minimum.
 - 1. No-Hub Clamps – Sanitary Waste:
 - a. Husky SD 4000.
 - 2. No-Hub Clamps – Vents
 - a. Husky SD – 2000.
 - b. Mission Rubber Co., LLC Heavy Weight Couplings.
 - 3. Clamp-All Hi-TorQ 80 or approved equal.
- B. Provide Fernco “Pro-flex” shielded couplings Series 3000 with one piece neoprene gasket for all cast iron pipe transitions to Schedule 40 DWV pipe penetrations through slabs. Sizes 1-1/2” through 8” Series 3000.
- C. Cast Iron Soil Pipe and Fittings:
 - 1. AB&I.
 - 2. Charlotte Pipe and Foundry Co.
 - 3. Tyler Pipe / Soil Division.
- D. PVC Soil Pipe and Fittings
 - 1. Charlotte Pipe.
 - 2. Westlake Pipe and Fittings.
 - 3. JM Eagle.

2.2 DRAIN PIPE AND FITTINGS

- A. Above Slab Piping:
 - 1. Schedule 40 PVC plastic pipe and DWV fittings with solvent welded joints.
 - 2. Pipe and fittings shall conform to ASTM D 1784-82.
- B. Above Slab Piping – Commercial Kitchen Fixture Drain Piping.
 - 1. Copper Tube: ASTM B 306, DWV.
 - 2. Fittings: ASME B16.29, wrought copper, or ASME B16.32, solvent.
 - 3. Joints: ASTM B 32, alloy Sn50 solder.
- C. Below Slab on Grade Pipe:
 - 1. Schedule 40 PVC plastic pipe and DWV fittings.
 - 2. Solvent welded DWV joints shall conform to IAPMO Installation Standard IS-9.
 - 3. Pipe and fittings shall conform to ASTM D 1784, ASTM D 1785, ASTM D 2665, ASTM D 3311 and NPS Standard 14 & 61.
- D. Below Slab on Grade Piping for Grease Waste:
 - 1. Schedule 40 CPVC pipe and fittings
 - 2. Solvent welded DWV joints shall conform to ASTM D3311 and be produced to dimensions specified in ASTM F 2618, NSF International, UPC, IAPMO IGS 210 and International Plumbing Code.
 - 3. Solvent Cement, Heavy Body; mustard yellow color, as tested by ASTM F 2618 / ASTM F493.
 - 4. Manufacturer: Spears or equal.
- E. Below Slab on Grade Piping for grease waste:
 - 1. Service weight/cast iron hub and spigot pipe and fittings
 - 2. Compression type, with neoprene gaskets shall conform to ASTM C-564.
 - 3. Pipe shall conform to requirements of ASTM A74.
 - 4. All Cast Iron Soil Pipe and Fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.

2.3 VENT PIPE AND FITTINGS

- A. Above Slab Piping. Provide Schedule 40 PVC plastic pipe and DWV fittings with solvent welded joints. Pipe and fittings shall conform to ASTM D 1784-82.
- B. Below Slab on Grade Piping:
 - 1. Provide Schedule 40 PVC with DWV fittings with solvent welded joints. Pipe and fittings shall conform to ASTM D1784-82.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All above and below slab soil, waste, sanitary drain and vent piping installation methods shall be in accordance with Cast Iron Soil Pipe Institute Standards.
- B. Above ground installation in the horizontal position shall be supported at every hub (hub & spigot or hubless type). Hangers are to be placed within 12" of hub or coupling. For large diameter fittings, 5 inches and larger shall be braced to prevent horizontal movement. Every branch opening or change of direction, braces, blocks, rodding or other suitable method shall be used to prevent movement. Riser clamps to be used for vertical piping, not to exceed 15'-0" between clamps..

- C. All above and below slab PVC sanitary waste and vent piping installation methods shall be in accordance with IAPMO Installation Standard 18-9 for Schedule 40 PVC-DWV, per manufacturer's recommendations and applicable standards.
- D. Tracer wires shall be installed on all underground PVC sanitary sewer lines installed outside the building slab.
- E. All PVC underground shall be installed in accordance with ASTM D2321.

3.2 GRADE

- A. Give horizontal pipe grade of ¼-inch per foot where possible, but not less than 1/8 inch per foot unless otherwise shown.
- B. Horizontal below grade 2" waste piping sloped at 1/4 inch per foot.
- C. Grease waste piping below grade sloped at 1/4 inch per foot.

3.3 DRAIN PIPE AND FITTINGS

- A. Offsets and Fittings.
 1. Use reduction fittings to connect two pipes of different diameter.
 2. Change directions by appropriate use of 45-degree wyes, long-sweep quarter-bends, and sixth-, eighth-, and sixteenth-bends. Sanitary tees can be used on vertical stacks. Use long sweeps at the base of risers.
 3. Provide a separate trap at each fixture, unless a trap is built into the fixture. Provide a deep seal trap at each floor drain and hub drain. Place traps so that the discharge from any fixture will pass through only one trap before reaching a building drain.
 4. Refer to Sanitary Drainage Code section for acceptable fittings to be used for changes in direction of drainage flow. Double combo sanitary fittings or double wye and 1/8th bend fittings are not allowed for horizontal to horizontal piping systems per Code.
- B. Hub Drains. Install hub drains where indicated, with the top of the hub 1/2 above the finished floor, unless otherwise indicated on the drawings.
- C. Cleanouts. Install cleanouts the same size as the soil waste lines in which the cleanouts are placed; however, no cleanout should be larger than 4 inches in diameter. Provide cover with vandal-resistant securing screw.
 1. Where cleanouts occur in pipe chases, bring the cleanouts through the walls and install covers. Where cleanouts occur in floor slabs, set flush. Reference drawing schedule.
 2. Provide cleanouts where soil lines change direction, every 75 foot on long runs, or as shown on the drawings, at the end of each horizontal waste line, and at the base of each riser (and at each increase in pipe size).
 3. Cleanouts shall occur at the end of each battery of water closets, urinals, lavatories, sinks, and single water closets. Cleanouts shall be installed so as to access the main sanitary or soil line. Extend and offset above flood rim of water closet.
 4. Double sanitary tees and double quarter bends do not allow for easy access to main lines, therefore these types of fittings are not allowed.

3.4 VENT PIPING

- A. Make vent connections to vent stacks with inverted wye fittings. Extend full-size vents through the roof to at least 12 inches above the roof.

- B. Coordinate with roof contractor for installation of vents thru roof. Flashing at vent penetration shall comply with the roofing manufacturer's requirements. Reference the Architectural Drawings for exact requirements.
- C. Locate vent piping through roof a minimum horizontal distance of not less than 10 feet from any air intake opening or supply fan.

3.5 TESTING

- A. Below Slab on Grade and All Floors in Multi-Story Buildings:
 1. Test pipe below slab on grade before backfilling and connecting to city sewers.
 2. Maintain not less than 10 foot of hydrostatic head for 1 hour without a leak.
 3. Before acceptance of the work the contractor must ensure the piping is in working order before and after the slab is poured. To ensure this the contractor must test completed systems in the presence of the Architect, Engineer and authorities having jurisdiction after installation is complete.
 4. Maintain the test on the system till after the slab is poured. Provide an accessible connection that may be reviewed by Architect, Engineer and authorities having jurisdiction prior to and after the slab is poured.
 5. Test drainage piping systems in accordance with governing codes and the requirements specified. Provide equipment and materials and make test connections required to execute tests.
 6. Test drainage and waste piping hydraulically by filling system to its highest point or, whichever is greater, at a static head of 10 feet. Leaks at any joint shall be sufficient cause for rejection.
 7. Air tests may be substituted for hydraulic tests by forcing air into the closed system at a uniform pressure sufficient to balance a column of 10 inch hg in height.
 8. Under any of the previously described tests, the water height shall remain constant, after stabilization, for not less than 15 minutes without any further addition of water.
- B. System Test. After the various sections of soil, waste and vent piping are installed, but before fixtures are connected, test the system by:
 1. Plugging outlets.
 2. Filling vertical sections of multiple story buildings of not less than three floors at a time with water. Provide wyes as required to facilitate plugging.
 3. Test for 6 hours without any drop in the water level.

3.6 RODDING SEWERS

- A. All sanitary soil and waste lines, both in the building and out, shall be rodded out and flushed out after completion of construction and prior to finish floor being installed. All work must be completed prior to substantial completion. All floor drains and cleanout locations must be included in this work.
- B. All sanitary soil and waste lines below building 3" and larger shall be internally videotaped at time of substantial completion. All videotaping shall include on-screen date and time, and include audio narration. All videotaping shall be provided by experienced individual in videotaping piping systems. An Owner's Representative shall be present during videotaping. Three copies of the videotape shall be delivered to the Owner for future records.
- C. This work shall be done in the presence of the Owner's Representative, as part of the Contract, to ensure all lines are clear, and any obstruction that may be discovered shall be removed immediately. Rodding shall be accomplished by utilizing the proper rotary head to clear sewer. Pipe sizes 8 inches and larger shall be hydro-flushed.

3.7 SMOKE TESTING

- A. Interior Plumbing Piping:
1. Contractor shall perform smoke testing on all interior sanitary sewer piping and sanitary vent piping above and below floor prior to cover-up.
 2. Artificially created smoke used must be a persistent white tracer smoke and produced by thermogenic chemical reaction. All smoke candles or smoke pencils to be used must be non-toxic and EPA approved. Provided by Superior Signal Smoke Candles.
 3. All plumbing fixtures must be installed including floor drains with wetted trap seals.
 4. Smoke testing shall be performed after completion of any videotaping, rodding or flushing of the sanitary system. Test must be performed prior to ceiling installation in new construction projects. Smoke is usually injected into the building through the two-way cleanout in the main sewer line leaving the building or a plumbing roof vent or fixture. Smoke will travel through the sanitary sewer and vent system and through the air spaces in the sewer lines and emanate from any leaks in the system. The smoke must reach the last roof vent in the system to indicate the entire system has been completely filled with smoke. The smoke must travel the full length of the piping system. Contractor must provide manpower as necessary to visually trace the flow of smoke through the wall cavities, annular floor/ceiling spaces, inject the smoke, observe the roof vents and to identify the integrity problems.
 5. Contractor shall provide a detailed list of findings and a drawing indicating the location, fixture type, type and size of pipe, and or description of type of problems found.
 6. Typical findings from indoor smoke testing may include:
 - a. Dry traps in floor drains.
 - b. Improperly capped sewer lines or vents.
 - c. Broken sewer lines or vents.
 - d. Cross connected sewer vents and drains.
 - e. The drawing of air emanating from sewer vents into intakes of air exchange systems.
 - f. Poorly glued pipe joints.
 - g. Loose no-hub couplings.
 7. An Owner's Representative shall be present during smoke testing.

3.8 SMOKE TESTING – LIQUID SMOKE SYSTEM

- A. Interior Plumbing Piping:
1. Contractor shall perform smoke testing for finding leaks in all interior of building sanitary sewer piping and sanitary vent piping above and below building slab prior to cover up.
 2. Contractor must use a laboratory tested safe liquid smoke with a patented liquid smoke generating system. The liquid smoke must be contained in a pressure tank with inline filter and quick disconnect.
 3. Smoke generating system must generate up to 3 hours or more of continuous and constant smoke. Generating system must have a metering valve to precisely control smoke flow and density. Smoke generating system must have a 4" x 6" industrial flexible mining duct for connection to vent stack or cleanout.
 4. Smoke generating system must be power full enough to push smoke through the smallest leaks.
 5. The liquid smoke must not leave any stains or odors.
 6. The liquid smoke shall not contain Zinc Chloride, a listed toxic compound in OSHA 1915,1000 – Air contaminants.

7. Smoke generating system must have a means to atomize the liquid smoke and have an enclosed fan system capable of up to 700 cfm with adjustable inlet damper control to adjust cfm as necessary for the size of system.
8. Provide Hurco "Power smoker " with Hurco "LiquiSmoke" system or approved equal.
9. All plumbing fixtures must be installed including floor drains with wetted trap seals.
10. Smoke testing shall be performed after completion of any videotaping, rodding or flushing of the sanitary system. Test must be performed prior to ceiling installation in new construction projects. Smoke is usually injected into the building through the two-way cleanout in the main sewer line leaving the building or a plumbing roof vent or fixture. Smoke will travel through the sanitary sewer and vent system and through the air spaces in the sewer lines and emanate from any leaks in the system. The smoke must reach the last roof vent in the system to indicate the entire system has been completely filled with smoke. The smoke must travel the full length of the piping system. Contractor must provide manpower as necessary to visually trace the flow of smoke through the wall cavities, annular floor/ceiling spaces, inject the smoke, observe the roof vents and to identify the integrity problems.
11. Contractor shall provide a detailed list of findings and a drawing indicating the location, fixture type, type and size of pipe, and or description of type of problems found.
12. Typical findings from indoor smoke testing may include:
 - a. Dry traps in floor drains.
 - b. Improperly capped sewer lines or vents.
 - c. Broken sewer lines or vents.
 - d. Cross connected sewer vents and drains.
 - e. The drawing of air emanating from sewer vents into intakes of air exchange systems.
 - f. Poorly glued pipe joints.
 - g. Loose no-hub couplings.
13. An Owner's Representative shall be present during smoke testing.

END OF SECTION

SECTION 22 20 00

PLUMBING PIPE AND PIPE FITTINGS - GENERAL

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install pipe and pipe fittings for piping systems specified in Division 22 - Plumbing.

1.2 RELATED WORK

- A. Division 22 Plumbing
 1. Earthwork.
 2. Valves, Strainers and Vents.
 3. Insulation.
 4. Other Piping Sections.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. The particular type of pipe and fittings for each system is specified in the individual sections.

2.2 JOINTS

- A. Make screwed joints using machine cut USASI taper pipe threads. Apply a suitable joint compound to the male threads only. Ream the pipe to full inside diameter after cutting. All-thread nipples are not permitted.
- B. Dissimilar Metals. Make joints between copper and steel pipe and equipment using insulating unions or couplings such as Crane Company #1259; EPCO as manufactured by EPCO Sales, Inc.; or an approved equal.
- C. Solder joints.
 1. Prior to making joints, cut pipe square and ream to full inside diameter. Clean exterior of pipe and socket. Apply a thin coat of suitable fluxing compound to both pipe and socket, and fit parts together immediately.
 2. Heat assembled joint only as required to cause the solder to flow. Run the joint full, slightly beaded on the outside, and wipe to remove excess solder.
 3. Use silver brazing alloy or Sil-Fos on underground water entry piping. Use lead free solder on all other copper piping.
- D. Make welded joints as recommended by the standards of the American Welding Society. Ensure complete penetration of deposited metal with base metal. Provide filler metal suitable for use with base metal. Keep inside of fittings free from globules of weld metal. The use of mitered joints is not approved.
- E. Flanged.
 1. Prior to installation of bolts, center and align flanged joints to prevent mechanical pre-stressing of flanges, pipe or equipment. Align bolt holes to straddle the vertical, horizontal or north-south centerline. Do not exceed 3/64" per foot inclination of the flange face from true alignment.
 2. Use flat-face companion flanges only with flat-faced fittings, valves or equipment.

- Otherwise, use raised-face flanges.
3. Install gaskets suitable for the intended service and factory cut to proper dimensions. Secure with manufacturers recommended gasket cement.
 4. Use ANSI nuts and bolts, galvanized or black to match flange material. Use ANSI 316 stainless steel nuts and bolts underground. Tighten bolts progressively to prevent unbalanced stress. Draw bolts tight to ensure proper seating of gaskets.
 5. Use carbon steel flanges conforming to ANSI B16.5 with pipe materials conforming to ASTM A 105 Grade II or ASTM A 108, Grade II, ASTM A 53, Grade B. Use slip-on type flanges on pipe only. Use welding neck type flanges on all fittings. Weld slip-on flanges inside and outside.
 6. Keep flange covers on equipment while fabricating piping. Remove when ready to install in system.
- F. No Hub. Hubless joints shall be made with wide body, neoprene sealing sleeve with stainless steel sleeve, coupling joints conforming to ASTM C 1277.
1. 4" pipe size and smaller coupling housing minimum of 3" width; 24 gauge Series 300 stainless steel with hi-torque clamps; neoprene coupling gasket.
 2. 6" through 10" pipe size coupling housing minimum of 4" width.
 3. Tighten clamps to within manufacturer's tolerances using preset torque wrench.
- G. Mechanical Joints. Provide a stuffing box type mechanical joint adapted to use gasket, cast iron gland and bolts. Coat bolts with bitumastic enamel. Use joint parts similar in design to one of the following:
1. Duplex Simplex Joint manufactured by the American Cast Iron Pipe Company, Birmingham, Alabama.
 2. U.S. joints manufactured by the United States Pipe and Foundry Company, Burlington, New Jersey.
 3. Boltite Joint manufactured by the McWane Cast Iron Pipe Company, Birmingham, Alabama.
 4. Flexlamp manufactured by the National Cast Iron Pipe Company, Birmingham, Alabama.
- H. Compression Joints for Cast Iron Water Pipe. Use Beltite, Tyton or Grip-Tite compression joints. Install in accordance with the manufacturer's recommendations for compression joints. Provide adequate concrete thrust blocks at changes of direction, as recommended by the manufacturer.
- I. Compression Gasket System. Bell and spigot cast iron pipe 4" and smaller, use flax-base lubricant, Tyler Ty-Seal Lubricant or Charlotte Regular Lubricant. 6" and larger use a neoprene base lubricant, Charlotte Adhesive Lubricant.
- J. Ring-Tite Joints: Ring-Tite gasketed sewer fittings for sanitary and storm. Furnish joints for installation manufactured per ASTM/CSA, IpeX, and J.M Eagle C900. Provide adequate concrete thrust blocks at changes in direction, as recommended by manufacturer. JM Eagle pressure rated PVC water pipe. ASTM D2241 pressure rating, ASTM D3219 joints, gaskets ASTM F477.
- K. Ball Joints. Where shown, provide flexible ball joints, made of carbon steel. Ball joints must have 15° of angular flexibility. Use welded or flanged ends, as required. Furnish with 11N gaskets.
- L. Mechanically Formed Tee Fitting. Mechanically extracted collars shall be formed in a continuous operation consisting of drilling a pilot hole and drawing out the tube surface to form a collar having a height not less than three (3) times the thickness of the branch wall. The branch tube shall be notched to conform with the inner curve of the run tube and shall have two (2) dimple / depth stops to insure that penetration of the branch tube

into the collar is of sufficient depth for brazing and that the branch tube does not obstruct the flow in the main line tube. Dimple depth stops shall be in line with the run tube. The second dimple shall be one quarter (1/4) inch above the first and shall serve as a visual point of observation. All joints shall be brazed with silver brazing alloy or Sil-Fos. Soft soldered joints shall not be allowed.

- M. Press fittings for copper pipe 1/2" to 4": Copper press fittings shall conform to the material and sizing requirements of ASTM B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM. Pro-Press System manufactured by VIEGA. The system intended for use shall be approved by submittal. Systems from various manufacturers may vary in technology. The field personnel shall carry training credentials from the approved manufacturer for the project. Mixing of fittings from different manufacturers is strictly prohibited.
- N. Press fittings for steel pipe 1/2" to 2": Where accepted by local code for specific applications, Cold Press Mechanical Joint Fittings shall conform to material requirements of ASTM A420 or ASME B16.3 and performance criteria of ANSI/CSA LC4. Sealing system shall be EPDM or HNBR as appropriate for a defined application. MegaPress system manufactured by VIEGA or approved equal and include "Smart Connect" assurance that unpressed fittings will not hold pressure. The system intended for use shall be approved by submittal. Systems from various manufacturers may vary in technology. The field personnel shall carry training credentials from the approved manufacturer for the project. Mixing of fittings from different manufacturers is strictly prohibited.

2.3 UNIONS

- A. Use 150 lb. standard (300 lb. WOG) malleable iron, ground joint unions with bronze seat. Provide flanged joints on piping 2-1/2" and larger.
 - 1. Where pipe materials of different types join, use a dielectric union. Union shall be threaded, solder or as required for its intended use.

2.4 BRANCH CONNECTIONS

- A. Pipe 2" and Smaller. For threaded piping, use straight size reducing tee. When branch is smaller than header, a nipple and reducing coupling or swagged nipple may be used.
- B. 2-1/2" through 36": For welding piping, when branch size is the same as header size, use welding tee. Use Weld-o-let when branch is smaller than header. For threaded branch connections, use 3000 lb. full coupling or Thread-o-let welded to header.

2.5 GASKETS

- A. High Temperature Piping. Provide 1/16" thick ring gaskets of aramid reinforced SBR such as Garlock #3200 or 3400 or equal by Advanced Products and Systems.
- B. Other Piping. Provide ring rubber gaskets, Garlock #7992 or equal by Advanced Products and Systems. Use 1/8" thick cloth reinforced neoprene gaskets. For smaller than 6", use 1/16" thick gasket.

2.6 FLOORS AND CEILING PLATES

- A. Provide chrome-plated floor and ceiling plates around pipes exposed to view when passing through walls, floors, partitions, or ceilings in finished areas; size plates to fit pipe or insulation and lock in place.

2.7 DOMESTIC MANUFACTURE

- A. All piping material, pipe and pipe fittings shall be manufactured in the United States of America unless specifically named in these specifications.

PART 3 - EXECUTION

3.1 PIPE FABRICATION AND INSTALLATION

- A. Make piping layout and installation in the most advantageous manner possible with respect to headroom, valve access, opening and equipment clearance, and clearance for other work. Give particular attention to piping in the vicinity of equipment. Preserve the required minimum access clearances to various equipment parts, as recommended by the equipment manufacturer, for maintenance.
- B. Cut all pipes to measurement determined at the site. After cutting pipe, remove burrs by reaming. Bevel plain ends of ferrous pipe.
- C. Install piping neatly, free from unnecessary traps and pockets. Work into place without springing or forcing. Use fittings to make changes in direction. Field bending and mitering is prohibited. Make connections to equipment using flanged joints, unions or couplings. Make reducing connections with reducing fittings only.
- D. Install piping without tapping out of the bottom of pipe.
- E. Press Connections: Copper and steel press fittings ½" through 4" shall be applied in accordance with the manufacturer's installation instructions. The tubing/pipe shall be fully inserted into the fitting and the tubing/pipe marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing/pipe to assure the tubing/pipe is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer. If soldering (thread adapters, etc.) near press fittings, take precautions to not damage the O-ring fittings. Maintain three pipe diameters or use a cooling agent. Viega-"Pro-Press".

3.2 WELD

- A. Weld and fabricate piping in accordance with ANSI Standard B31.1, latest edition, Code for Pressure Piping.
- B. Align piping and equipment so that no part is offset more than 1/16". Set fittings and joints square and true, and preserve alignment during welding operation. Use of alignment rods inside pipe is prohibited.
- C. Do not permit any weld to project within the pipe so as to restrict flows. Tack welds, if used, must be of the same material and made by the same procedure as the completed weld. Otherwise, remove tack welds during welding operation.
- D. Do not split, bend, flatten or otherwise damage piping before, during or after installation.
- E. Remove dirt, scale and other foreign matter from inside piping before tying into existing piping sections, fittings, valves or equipment.
- F. Bevel ends of ferrous pipe.

3.3 OFFSETS AND FITTINGS

- A. Due to the small scale of drawings, the indication of offsets and fittings is not possible. Investigate the structural and finish conditions affecting the work and take steps required to meet these conditions.
- B. Install pipe close to walls, ceilings and columns so pipe will occupy minimum space. Provide proper spacing for insulation coverings, removal of pipe, special clearances, and offsets and fittings.

3.4 SECURING AND SUPPORTING

- A. Support piping to maintain line and grade, with provision for expansion and contraction. Use approved clevis-type or trapeze-type hangers connected to structural members of the building. Single pipe runs to be supported by approved clevis type hangers. Multiple pipe runs to be supported by approved trapeze type hangers. Do not support piping from other piping or structural joist bridging.
- B. Provide supports both sides of elbows for pipe 6" and larger. For smaller pipe provide support within 12" of elbows and tees.
- C. Support vertical risers with steel strap pipe clamps of approved design and size, supported at each floor. Support piping assemblies in chases so they are rigid and self-supported before the chase is closed. Provide structural support for piping penetrating chase walls to fixtures. On cold water pipe, supports shall be outside the insulation.
- D. Where insulation occurs, design hangers to protect insulation from damage. Pipe saddles and insulation shields, where required, are specified in the appropriate insulation section and are sized in accordance with the schedule on the drawings.
- E. Install trapeze hangers, properly sized, to support the intended load without distortion.
- F. Use electro-galvanized or zinc plated threaded rods, nuts, washers and hangers.
- G. At outdoor locations, all supports, brackets and structural members shall be hot-dipped galvanized.
- H. Support spacing: As recommended by the project structural engineer and support manufacturer, but not more than listed below. Not to exceed spacing requirements of smallest pipe.

Pipe Size	Copper & Steel Max. Support Spacing, Feet	Cast Iron Max. Support Spacing, Ft.	Minimum Rod Diameter, Inches
1" & smaller	6		3/8
1-1/4" & 1-1/2"	8	5	3/8
2"	10	5	3/8
3"	10	5	1/2
4" & 5"	10	5	5/8
6" and above	10	5	3/4

- I. PEX Piping:
 - a. Maximum hanger spacing, 2'-8".
 - b. Hanger rod diameter, 3/8 inch.
 - c. Hanger spacing per piping manufacturer's instructions when using horizontal

rigid metal channel to support piping.

3.5 PIPE SUPPORTS

- A. Provide P1001 or P 5000 Unistrut metal framing members and appurtenances for pipe support. Hot-dip galvanize members and appurtenances when located outside. Sagging of pipes or supports is not acceptable.
- B. Adjustable clevis hangers shall be used for single pipe supports; Anvil Fig. 260. When oversized clevis is used, a nipple shall be placed over the clevis bolt as a spacer to assure that the lower U-strap will not move in on the bolt. Provide adjustable clevis with a nut / washer above and below the hanger on the support rod. Ring type clevis hangers are not acceptable.
- C. Provide Anvil Figure 45 galvanized or primed and painted channel assembly for trapeze hangers.

3.6 PIPE SUPPORTS ON ROOF

- A. Support gas pipe on roof with Miro Industries Model 3-RAH-8 or approved equal with roller and fully adjustable height throughout pipe run. Base material shall be high density / high impact polypropylene with UV inhibitors and anti-oxidants. Provide with hot dip galvanized rod finish and framing. Nuts and washers shall be hot dip galvanized.

3.7 ANCHORS

- A. Provide anchors as required. Use pipe anchors consisting of heavy steel collars with lugs and bolts for clamping to pipe and attaching anchor braces. Install anchor braces in the most effective manner to secure desired results. Do not install supports, anchors or similar devices where they will damage construction during installation or because of the weight or the expansion of the pipe. When possible, install sleeves in structural concrete prior to pouring of concrete.

3.8 FLOOR PENETRATIONS

- A. At locations where pipe passes through floors, provide watertight concrete curb around penetration.

3.9 PIPE SLEEVES

- A. Sleeves through masonry and concrete construction:
 - 1. Fabricate sleeves of Schedule 40 galvanized steel pipe.
 - 2. Size sleeve large enough to allow for movement due to expansion and to provide continuous insulation.
- B. Sleeves through gypsum wall construction.
 - 1. Fabricate sleeves of 16 gauge galvanized sheet metal.
- C. Sleeves through elevated slab construction.
 - 1. Fabricate sleeves of Schedule 40 galvanized steel pipe with welded center flange in floor.
- D. Extend each sleeve through the floor or wall. Cut the sleeve flush with each wall surface. Sleeves through floors shall extend 2" above floor lines for waterproofing purposes. Slab on grade floors shall not be sleeved except where penetrating waterproofing membrane or insect control is required.

- E. Caulk sleeves water and air tight. Seal annular space between pipes and sleeves with mastic compound to make the space water and air tight.
- F. For sleeves below grades in outside walls, provide Thunderline Link-Seal or Advance Product and System Interlynx, with 316 stainless steel nuts and bolts, with cast iron pressure plate.
- G. Provide chrome plated escutcheon plates on pipes passing through walls, floors or ceilings exposed to view. At exterior walls, stainless steel sheet metal is to be used.
- H. For sleeves through fire and smoke rated walls, seal with a UL through-penetration firestop, rated to maintain the integrity of the time rated construction. Install in accordance with the manufacturer's installation instructions. Comply with UL and NFPA standards for the installation of firestops. Refer to Architectural drawings for all fire and smoke rated partitions, walls, floors, etc.

3.10 ISOLATION VALVES

- A. Provide piping systems with line size shutoff valves located at the risers, at main branch connections to mains for equipment, to isolate central plant, and at other locations.

3.11 DRAIN VALVES

- A. Install drain valves at low points of water piping systems so that these systems can be entirely drained. Install a line size drain valve for pipes smaller than 2" unless indicated otherwise. For pipes 2-1/2" and larger, provide 2" drain valves unless indicated otherwise. Drain valves shall be plugged when not in use and at completion.

3.12 CLEANING OF PIPING SYSTEMS

- A. General cleaning of piping systems. Purge pipe of construction debris and contamination before placing the systems in service. Provide and install temporary connections as required to clean, purge and circulate.
- B. Install temporary strainers at the inlet of pumps and other equipment as necessary where permanent strainers are not indicated. Keep strainers in service until the equipment has been tested, then remove either entire strainer or straining element only. Fit strainers with a line size blow down ball valve and pipe to nearest drain. Blow down strainers, remove and clean as frequently as necessary.
- C. Phase One: Initial flushing of system. Remove loose dirt, mill scale, weld beads, rust and other deleterious substances without damage to system components. Open valves, drains, vents and strainers at all system levels during flushing procedures. Flush until "potable water clear" and particles larger than 5 microns are removed.
- D. Connect dead-end supply and return headers, even if not shown on the drawings, and provide terminal drains in bottom of pipe end caps or blind flanges.
- E. Dispose of water in approved manner.
- F. Phase Two: Cleaning of Piping Systems. Remove, without chemical or mechanical damage to any system component, adherent dirt (organic soil), oil, grease, (hydrocarbons), soldering flux, mill varnish, piping compounds, rust (iron oxide) and other deleterious substances not removed by initial flushing. Flush system and replace with clean water.

- G. Phase Three: Final flushing and rinsing: Flush and rinse until “potable water clear” and particles larger than 5 microns are removed. Operate valves to dislodge any debris in valve body. Dispose of water in approved manner.
- H. Submit status reports upon completion of each phase of work on each system.

3.13 TESTING

- A. Test piping after installation with water hydrostatic pressure of 1-1/2 times operating pressure (150 psig minimum) and carefully check for leaks. Repair leaks and retest system until proven watertight.
- B. Do not insulate or conceal piping systems until tests are satisfactorily complete.
- C. If any leaks or other defects are observed, suspend the test and correct the condition at once. Repeat testing until leaks are eliminated and the full test period is achieved.
- D. The satisfactory completion of testing does not relieve the Contractor of responsibility for ultimate proper and satisfactory operation of piping systems and their accessories.

3.14 PIPE MARKERS

- A. Identify interior exposed piping and piping in accessible chases or plenums with Opti-Code Brady Pressure Sensitive Adhesive Pipe Markers, consisting of pipe marker and direction of flow arrow tape. Clean pipe prior to installation. Background colors of markers, arrows and tape for each type of system shall be the same. Meet ANSI/OSHA standards and clearly identify each system. Provide minimum 2-1/4-inch letters through 4-inch pipe and 4-inch letters for 5-inch pipe and larger.
- B. Identify exterior and mechanical room piping with Snap Around pipe markers through 4-inch pipe and Strap Around markers 5-inch pipe and larger. Pipe markers consisting of pipe marker and direction of flow arrow tape; background colors of markers, arrows and type for each type of system shall be the same. Meet ANSI / OSHA standards and clearly identify each system. Provide minimum 2-1/4-inch letters through 4-inch pipe and 4-inch letters for 5-inch pipe and larger.
- C. Install identification in the following locations:
 - 1. Both sides of penetrations through walls, floors and ceilings.
 - 2. Close to valves or flanges.
 - 3. Intervals on straight pipe runs not to exceed 50 feet
 - 4. Apply marker where view is obstructed.
- D. Pipe markers shall meet or exceed the specifications of the ASME A13.1 “Scheme for Identification of Piping Systems”.

END OF SECTION

SECTION 22 33 34

ELECTRIC WATER HEATER (Commercial - Non-ASME)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Electric water heaters for domestic water systems.

1.2 RELATED WORK

- A. Division 22 Plumbing
 1. Domestic Water Piping.
 2. Plumbing Piping Insulation.
 3. Division 26 Electrical.

1.3 WARRANTY

- A. Provide standard manufacturer's 1 year commercial warranty for mechanical and electrical and 5 year warranty for leaks. Warranty shall start the date of the substantial completion certificate.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. A. O. Smith.
- B. Bradford White.
- C. Rheem/Ruud.

2.2 PRODUCTS

- A. Provide electric water heaters with kilowatt, recovery ratings, and storage capacities as scheduled on drawings.
- B. Provide a tank designed for 150 psig working pressure. Furnish glass-lined tank. Lining shall be corrosion-resistant.
- C. Furnish factory-assembled, integral units equipped as follows:
 1. Extruded high density anode rod.
 2. Individually mounted thermostat at each element with a high temperature cutoff.
 3. High temperature limit switch (energy cutout).
 4. UL rated.
 5. Temperature and pressure relief valve.
- D. Provide medium watt density elements having zinc-plated copper sheathing and prewired leads.
- E. The outer jacket shall be baked enamel finish and shall be provided with full size control compartment for performance of service and maintenance through hinged front panels and shall enclose the tank with foam insulation.

- F. Electrical junction box with heavy duty terminal block shall be provided.
- G. Heater shall have a three year limited warranty.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
- B. All installations shall be in accordance with the manufacturer's published recommendations.
- C. Furnish all supports required by the equipment included in this Contract.
- D. Provide a wall support platform beneath heaters with integral drain pan.
- E. Furnish and install all necessary valves, traps, gauges, strainers, unions, etc. to facilitate proper functioning and servicing of equipment.
 - 1. Install a line size shutoff valve in cold water inlet and hot water outlet close to each heater.
 - 2. Provide a temperature gauge in the domestic hot water piping within five feet of outlet to each heater, upstream of all shut-off valves. Size and locate gauges to be easily readable from a standing position.
- F. Provide dielectric isolation device where copper lines connect to ferrous lines or equipment, such as dielectric coupling or dielectric flange fitting.
- G. Pipe relief valve discharge and all equipment drains indirectly to appropriate floor drain.
- H. Connect hot water return from circulation pump to cold water supply to heater.
- I. Set thermostats on domestic water heaters to delivery maximum water temperature as indicated on Contract Drawings. Set the operating and safety controls.
- J. Furnish and install an expansion tank on cold water supply to heater. Locate tank as close to water heater as possible between water heater and all check valves or backflow preventers. Expansion tank capacity shall be as scheduled on Contract Drawings. Install expansion tank in accordance with manufacturer's recommendations.

3.2 STARTUP

- A. Startup shall be performed by factory trained and authorized personnel. The factory representative shall also provide a technical and practical operation and maintenance training seminar including a hands-on operation and maintenance demonstration, and classroom presentation with handouts and visual aids, for no less than three physical plant personnel.

END OF SECTION

SECTION 22 35 16

INSTANTANEOUS GAS-FIRED TANKLESS WATER HEATERS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Tankless gas-fired water heaters for domestic water systems.

1.2 RELATED ITEMS

- A. Division 22 Plumbing:
 - 1. Domestic Water Piping.
 - 2. Gas Piping.
 - 3. Flue Piping.
 - 4. Plumbing Piping Insulation.

PART 2 - PRODUCTS

2.0 ACCEPTABLE MANUFACTURERS

- A. Navien
- B. Rinnai Corp.
- C. A. O. Smith.

2.1 PRODUCT SPECIFICATIONS

- A. Commercial tankless, internally mounted, instantaneous, gas fired, direct vent water heater design certified to the ANSI Z21.10.3 / CSA 4.9 wall mounted for indoors.
 - a. Basis of design manufacturer: Navien.
- B. Adjustable hot water temperature range of 90°F to 140°F.
- C. Flow rates of 0.5 GPM up to 9.3 GPM (199 cfh).
- D. Heaters shall be microprocessor controlled (standard digital controller) and utilize a direct electronic ignition system (with no standing pilot) modulating gas valve, flow meter, flow control valve and temperature thermistors to maintain outlet water temperature between +/- 2°F of setpoint temperature.
- E. Safety Devices:
 - 1. Flame failure lockout.
 - 2. Boiling protection lockout.
 - 3. Thermal overheat protection.
 - 4. Lockout protection in the event of a blocked flue.
- F. Accessories:
 - 1. Temperature and Pressure Relief Valve: ASME labeled.
 - 2. Wall mounted support.
 - 3. Ball valves and unions at pipe connection points.
 - 4. Condensate drain neutralizer kit piped to floor sink.
 - 5. Provide a properly sized thermal expansion tank as scheduled on drawing.

2.2 FLUE

- A. This water heater(s) shall be suitable for sealed combustion direct-venting air intake pipe

and exhaust pipe per manufacturer's instructions. Provide roof concentric vent kit.

2.3 ELECTRONIC DESCALER

- A. Electronic descaler to prevent calcium build-up in piping. Install unit on wall next to water heaters, coil wiring installed on cold water supply pipe to water heater per manufacturer's instructions. Coordinate 120 volt outlet for power supply with electrical contractor.
- B. Manufacturer: Clear Water Enviro technologies; model Scaleblaster SB-250 or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install a line size valve in the cold water supply close to each heater and a line size plug cock in the gas supply close to each heater.
- B. Install all flue exhaust and air intake material and manifolds per manufacturer's instructions.
- C. Install according to manufacturer's specifications and pipes as shown. Provide accessories as required for a complete operating system.
- D. Coordinate with plumbing piping and related fuel piping, gas venting, ductwork and electrical work to achieve operating system. Locate equipment and arrange plumbing piping to provide access space for servicing all components.

3.2 WARRANTY

- A. Heat Exchanger: 304 stainless steel burner or copper heat exchanger warranted for 5 years from date of purchase in a commercial application. Three years from date of purchase when used as a circulating water heater with a hot water circulation loop.

END OF SECTION

SECTION 22 40 00

PLUMBING FIXTURES AND FIXTURE CARRIERS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install water closets, urinals, lavatories, electric drinking fountains, fixture carriers and plumbing appurtenances.

1.2 RELATED WORK

- A. Division 22 Plumbing
 1. Drains, Hydrants and Cleanouts.
 2. Domestic Water Piping.
 3. Soil, Waste and Sanitary Drain Piping and Vent Piping.

1.3 JOB REQUIREMENTS

- A. Furnish plumbing fixtures and trim as shown and specified. Provide faucets, fittings, supply stops and similar devices of a single manufacturer. Furnish faucets and supply stops with renewable seats. Porcelain to steel and enameled cast iron fixtures shall be acid resistant. Wall hung fixtures shall be installed with a fixture carrier.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Plumbing Fixtures (Vitreous China):
 1. American Standard.
 2. Kohler.
- B. Plumbing Faucets:
 1. American Standard.
 2. Chicago Faucets.
 3. Moen Commercial.
- C. Supports and Carriers:
 1. Wade.
 2. Zurn.
 3. J.R. Smith.
 4. Watts.
 5. MIFAB.
- D. Flush Valves:
 1. Sloan.
- E. Supplies, Stops and Chrome Plated Tubular Brass:
 1. McGuire.
 2. Brasscraft.
 3. ProFlo.
- F. Water Closet Seats:
 1. American Standard.
 2. Bemis.

- 3. Kohler.
- G. Floor Drains & Floor Sinks:
 - 1. Zurn.
 - 2. J.R. Smith.
 - 3. Sioux Chief.
 - 4. MIFAB.
- H. Cleanouts:
 - 1. J.R. Smith.
 - 2. Zurn.
 - 3. MIFAB.
 - 4. Sioux Chief.
 - 5. Wade.
- I. Shower Valves
 - 1. Bradley.
 - 2. Delta.
 - 3. Symmons.
- J. Stainless Steel Sinks:
 - 1. Elkay.
 - 2. Kohler.
 - 3. Just.
- K. Water Hammer Arrestors:
 - 1. Precision Plumbing Products.
 - 2. Sioux Chief.
 - 3. Watts.
- L. Thermostatic Mixing Valves
 - 1. Watts.
 - 2. Caleffi.
 - 3. Powers.
- O. Grease Interceptors
 - 1. Schier.
 - 2. Endura
- P. Sanitary Sampling Port
 - 1. Schier.
 - 2. Thermaco.
- Q. Water Box & Ice Machine box.
 - 1. Sioux Chief.
 - 2. Oatey.
- R. Trap Primer
 - 1. Precision Plumbing Products.
 - 2. Sioux Chief.
- S. Electric Water Cooler
 - 1. Elkay
 - 2. Oasis.
- T. Trench Drains

1. IMC – Teddy
 2. Advance Tabco.
 3. Eagle Group.
- U. Commercial Kitchen Fixtures
1. Kitchen fixtures furnished by others. Provide rough-in and final connections as required. Coordinate with Kitchen Equipment Contractor. Refer to Architectural drawings and Plumbing Fixture Schedule on plan.

2.2 REQUIREMENTS

- A. Refer to the drawings for equipment to be supplied.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation shall be in accordance with the manufacturer's instructions. Set level and plumb. Secure in place to counters, floors and walls providing solid bearing and secure mounting. Bolt fixture carriers to floor and wall. Secure rough-in fixture piping to prevent movement of exposed piping. Cover exposed water closet bolts with bolt covers.
- B. Make rough-in and final connection of service to each fixture provided under this Section and other Sections, Equipment furnished by others, Architectural and Plumbing Drawings.
- C. Provide necessary stops, valves, traps, unions, vents, cold water, hot water, sanitary, etc. for a complete installation. Provide chrome plated rigid or stainless steel flexible supplies to fixtures with commercial grade quarter-turn loose key or removable handle stops, reducers, and escutcheons. Install fixture stops in readily accessible location for servicing.
- D. Provide isolation valves in domestic water lines to isolate all equipment, restrooms, hose bibbs, and where shown on drawings. Piping stub outs for supply stops shall be type L copper.
- E. Remove piping and services roughed-in incorrectly and install correctly, without cost.
- F. Exposed piping, fittings and appurtenances shall be chrome-plated brass. Cover pipe penetrations with escutcheons. Exposed traps, stops, piping and escutcheons to be chrome plated brass and incased with ADA compliant covers.
- G. Coordinate with the Equipment suppliers for locations and service required for equipment furnished or provided by others.
- H. All floor drains and floor sinks shall have a trap primer connection for trap seal protection.
- I. All floor drains and floor sink locations are to be coordinated with all equipment. Locate drains in mechanical equipment spaces to conform to drain locations of equipment furnished. Coordinate drain location with equipment and Architectural Drawings.
- J. All floor drains and cleanout covers are to be provided with stainless steel vandal resistant screws.
- K. Coordinate installation of exterior below grade grease interceptor and sampling port with site contractor.
- L. Coordinate with Kitchen Equipment Contractor . Provide rough-in piping, traps, tailpieces,

indirect waste lines and make final and necessary connections for foodservice equipment. Install faucets, drains, vacuum breakers, check valves, water inlet fittings, filters, and strainers, furnished by foodservice equipment contractor. Provide condensate drain piping from cooler/ freezer evaporator or ice machines. Make all final and necessary plumbing connections. Provide suitable access panel as required in non-accessible ceilings and walls.

- M. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.
- N. Test fixtures to demonstrate proper operation. Replace malfunctioning units or components. Adjust valves for intended water flow rate to fixtures without splashing, noise or overflow.
- O. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
- P. Clean plumbing fixtures and equipment. Do not permit use of fixtures by construction personnel.
- Q. Protect installed products from damage due to subsequent construction operations.
- R. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 22 63 11

GAS PIPING AND APPURTENANCES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install steel gas pipe inside buildings and on roof, including the supply line from the meter, service lines to gas equipment and appliances, termination of the service line with a plug valve, drip leg, pressure regulator and final connection to equipment and appliances with unions.
- B. Coordinate with Gas Company for gas meter capacity to handle increase in gas load.
- C. Extend steel gas piping from meter to inside the building and on roof to all fixtures, appliances and equipment requiring gas.

1.2 RELATED WORK

- A. Division 22 Plumbing
 - 1. Plumbing Pipe and Fittings.
 - 2. Valves and Vents.

1.3 UTILITY CONNECTIONS

- A. Make arrangements for and pay all fees and connection charges for obtaining service to the building.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS - ABOVE GRADE

- A. Pipe 2 inch and Smaller:
 - 1. Schedule 40 ASTM A 53 black steel pipe.
 - 2. Factory fabricated socket weld fittings or threaded. NFPA 54, ASME B31.1.
 - 3. Where approved for a specific project and where accepted by local code, cold press mechanical joint fittings shall conform to material requirements of ASTM A420 or ASME B16.3 and performance criteria of ANSI/CSA LC4. Sealing elements shall be HNBR and the fittings shall bear the CSA stamp to confirm acceptability for fuel gas systems. MegaPress system manufactured by VIEGA including "Smart Connect" or approved equal to assure unpressed fittings will not hold pressure. Installers shall carry training credentials from the manufacturer to confirm they have been instructed in the correct installation procedures.
- B. Pipe Larger than 2 inch:
 - 1. Schedule 40 ASTM A 53 black steel pipe.
 - 2. Factory fabricated butt weld fittings for welded steel pipes shall conform to ASTM A-234 WPB (seamless weld fittings).
- C. Unions:
 - 1. Standard 150 lb. (300 lb. water, oil or gas) malleable iron.
 - 2. Ground joint unions, with bronze seat.
 - 3. Flange joints for pipe larger than 2 inch in diameter.
- D. Flanges:
 - 1. Steel flanges. ANSI B16.5 and ASTM A-105.

2.2 VALVES

- A. See Section 22 05 23.

2.3 GAS PRESSURE REGULATOR

- A. Size the gas pressure regulator in accordance with the manufacturer's recommendations for flow quantities and reduced pressure as required for all equipment. Coordinate final equipment gas pressure requirements prior to ordering regulators. Provide Maxitrol or American Meter Company regulators or approved equal, suitable for indoor or outdoor installation. Regulators outside exposed to weather shall be installed with vent in vertical down position.
- B. All line pressure regulators shall be listed in accordance with ANSI (American National Standard) Z21.80 and CSA (Canadian Standards Association Standard) 6.22.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation Standards: Install gas piping in accordance with recommendations of the National Fire Protection Association.
- B. Drip Legs: Install a capped drip leg 6 inches long at the base of each vertical rise.
- C. Coating and Wrapping. Coat and wrap underground piping in accordance with the service utility company standards.
- D. Sleeves.
 - 1. Encase gas piping running in or through solid partitions with thin wall metal conduit. Sleeve piping and fittings shall be two pipe sizes, but not less than 1 inch larger than encased gas piping.
- E. Do not install gas piping exposed to view inside public area, or occupied spaces, without prior written approval.
- F. Provide test ports and isolation valves to enable proper testing of system in the future.
- G. Provide isolation valve and unions across regulators for proper removal.
- H. Provide anodeless transition risers where below grade polyethylene pipe changes to steel pipe above grade.
- I. Gas Pressure Regulators / Vents:
 - 1. Piping shall be sized in accordance with the regulator manufacturer's instructions. Never use pipe sizes smaller than the vent size; smaller pipe sizes restrict the gas flow. Where there is more than one regulator at a location, each regulator shall have a separate vent to the roof / outdoors or provide vent limiter.
 - 2. Support the vent pipe to eliminate strain on the regulator diaphragm case.
 - 3. Install vent piping from regulators to location to prevent gas smells from entering building. Do not locate the vent line terminus near windows, fans, or other ventilation equipment. See the installation instructions furnished with the regulator.
 - 4. Install double elbows and insect screen at end of piping to prevent moisture and insects from entering. Always point outdoor vent pipes in the downward position

- to reduce the possibility of rain, snow, sleet, and other moisture entering the pipe.
5. When installed inside building provide with vent limiter or route vents horizontally and terminate through building sidewall. The vent must be piped to the outside atmosphere using the shortest length of pipe, the fewest possible pipe elbows, and a pipe diameter as large as the vent size or larger. If a long gas run must be used, increase the pipe one nominal size every ten feet to keep the flow restriction as low as possible. Vents terminating through roof must have prior approval from Architect before installation. Through roof penetrations shall be minimized.
 6. Regulators installed outside or on roof top: Install regulator vent turned downward with insect screen over vent opening. The vent shall be designed to prevent the entry of water, insects, or other foreign materials that could cause blockage.
 7. Ensure the end of the vent line is away from ANY potential ignition sources. It is the installer's responsibility to ensure the vent line is exhausting to a safe environment
 8. Adhere to all applicable codes and regulations.

3.2 TESTING GAS PIPING

- A. Preliminary gas test as required by Code, but minimum test pressure of 3 PSI held for not less than eight hours without noticeable drop.
- B. Test joints with a soap solution while lines are under pressure.
- C. Repair leaks.
- D. Final gas test shall be with a 24 inch column of mercury or a diaphragm gauge with a minimum dial size of 3-1/2 inches with a set hand and a pressure range not to exceed twenty (20) psig with 2/10-pound increments. The minimum test pressure shall not be less than 3 PSI and the maximum test pressure shall be 1.5 times system operating pressure. This test will be observed for no less than (30) thirty minutes with no drop in pressure.
- E. Provide copy of gas pressure test reports in Operations & Maintenance Manual.

3.3 IDENTIFICATION CONDUCTOR

- A. Spiral A #12 AWG insulated copper conductor the full length of the thermoplastic piping system. Fasten to the pipe at 3 foot intervals with plastic tie wraps.
- B. Terminate at each end in a 12 inch x 12 inch x 4 inch FRP junction box.
 1. Bolted gasketed cover with stainless steel screws.
 2. Screw type terminal strip.
 3. Legend on cover "gas pipe identification conductor."
- C. Set in concrete pad.

3.4 PAINT EXPOSED OUTSIDE GAS PIPE

- A. Interior and Exterior Gas piping shall be protected from rust.
- B. Paint pipe with a flat alkyd coating, clean pipe prior to painting by preparing surface by hand tool cleaning per SSPC-SP2-82, applying one coat of Glidden Y-590 Rustmaster Metal Primer White and top coat of Yellow Alkyd Flat Enamel.

END OF SECTION

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MOORE PUBLIC SCHOOLS CHILD CARE FACILITY

INDEPENDENT DISTRICT NO. 2
CLEVELAND COUNTY, MOORE, OKLAHOMA

201 NORTH EASTERN AVENUE
MOORE, OKLAHOMA 73160

PROJECT MANUAL
OCTOBER 2024

AGP | the Abla Griffin
Partnership



PROJECT MANUAL
OCTOBER 2024

**MOORE PUBLIC SCHOOLS
CHILD CARE CENTER**

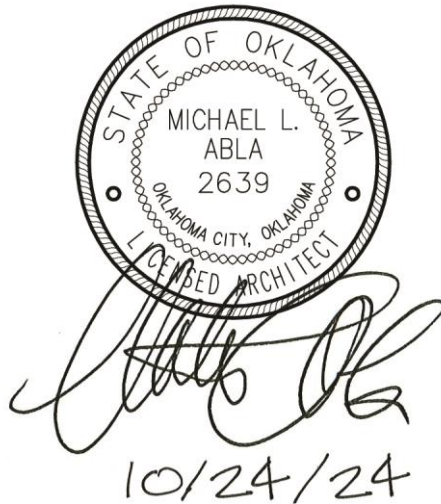
**INDEPENDENT DISTRICT NO. 2
CLEVELAND COUNTY, MOORE, OKLAHOMA**

**201 NORTH EASTERN AVENUE
MOORE, OKLAHOMA 73160**

ARCHITECT:

AGP | the Abla Griffin
Partnership

the Abla Griffin Partnership LLC
201 North Broadway, Suite 210
Moore, Oklahoma 73160
t: 405.735.3477
AGP@theAGP.net



10/24/24

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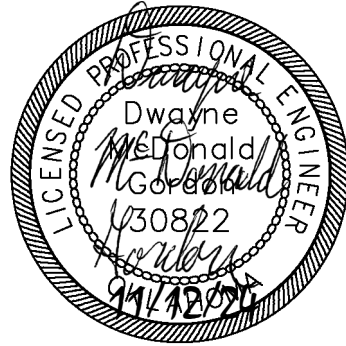
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Divisions 21, 22, 23
Dwayne McDonald Gordon
Mechanical Engineer
Salas O'Brien, LLC
OK 30822 / EXP 02.28.2026
CA 7058/ EXP 06.30.2025



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Engineer of Record
Division 26
Timothy Van Ostran
Electrical Engineer
Salas O'Brien, LLC
OK 32650 / EXP 03.31.2025
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END OF SECTION

SPECIAL CONDITIONS

TIME FOR COMPLETION AND LIQUIDATED DAMAGES:

- A. Upon execution of the contract agreement between the Owner and the Contractor, it shall become an obligation of the contractor to complete all work to be performed under this agreement for the Construction of the Moore Public Schools - Child Care Center renovation located at 201 North Eastern Ave., Moore, OK - **within 210 Calendar Days.**
- B. Penalty for noncompliance by the above date shall be cessation of all further periodical payments until the work is completed and can be fully used for the purpose intended.

PAYMENTS:

- A. The Owner's payment schedule indicating the payment dates established by Moore Public Schools shall be provided to the contractor to establish a monthly payment schedule.
- B. **Certificates of payment shall be submitted to the Architect on or before 7 days prior to Owner's cut-off date.**
- C. Until the Work is 50 percent complete, the Owner will pay 95 percent of the amount due the Contractor on account of progress payments. At the time the Work is 50 percent complete, any **remaining** partial payments shall be paid at 97.5 percent of amount due. The retainage shall be retained until the project is completed.

INSURANCE AND BONDS:

- A. Insurance provided shall be with a company or companies licensed to do business in the state of Oklahoma.
- B. Policies shall be provided in the following types and amounts:
 - 1. a. Workmen's Compensation-Statutory
 - b. Employer's Liability-\$500,000 each accident.
 - 2. Comprehensive General Liability:
 - a. Bodily Injury - \$1,000,000 each occurrence.
 - b. Personal Injury - \$1,000,000
 - c. Property Damage - \$1,000,000 each occurrence.
 - 3. Automobile Liability:
 - a. Bodily Injury - \$500,000 each person/\$1,000,000 each occurrence.

- b. Such Comprehensive Automobile Liability Insurance shall include all owned and non-owned hired motor vehicles.
- 4. Owner's Protective Liability - Same limits as above.
- 5. Products and Completed Operations - Same limits as above.
- 6. Contractual Liability - Same limits as above.
- C. Furnish one copy of Certificates herein required for each copy of the Agreement; specifically set forth evidence of all coverage required by Subparagraphs 11.1 and 11.2. Furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits.
- D. **The Contractor shall provide property insurance in the amount of the initial contract sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. This insurance coverage shall be the "all-risk" form for completed value.**

TEMPORARY SERVICES:

- A. Sanitary Facilities: The Contractor shall provide and maintain necessary sanitary conveniences for the use of those employed on/or about the work. The sanitary facilities shall be properly secluded from public observation and shall be such locations as shall be approved by the Owner, and their use shall be strictly enforced.

SHOP DRAWINGS and SUBMITTALS:

- A. Unless otherwise specified, the shop drawings and product data shall be submitted **electronically**. Physical samples of materials shall be submitted to the Architect as required.
- B. Construction Manager is responsible for obtaining and distributing required prints of shop drawings to his subcontractors and material suppliers after as well as before final approval.
- C. Prior to forwarding all submittals - including shop drawings and samples - to the Architect, the Construction Manager is responsible for reviewing submitted materials in their entirety

and making necessary revisions/comments/corrections, etc. to the submittals.

- D. Shop drawings and samples shall be dated and marked to show the names of the Project, Architect, CM, originating Sub-Contractor, manufacturer or supplier, and separate detailer if pertinent. Shop drawings shall completely identify Specifications section and locations at which materials or equipment are to be installed. Reproduction of Contract Drawings are acceptable as Shop Drawings only when specifically authorized in writing by the Architect.
- E. If materials or specified items other than those specified in these Contract Documents are supplied - and approved by the Architect - it shall be the Construction Manager's responsibility to provide ALL additional materials, accessories, substrates, utility connection, etc. for a complete and operational installation at NO additional cost to the Owner.

CHANGES IN THE WORK:

- A. Cost shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits under collective bargaining agreements; workmen's compensation insurance; bond premiums; and rental value of power tools and equipment. Overhead shall include the following; supervision, superintendence, wages of timekeepers, watchmen and clerks, hand tools, incidentals, general office expense, and all other expenses not included in "cost".
- B. Change Order markups shall be limited to 10% overhead and 10% profit. No other markups shall be allowed.

AS BUILT DRAWINGS:

- A. Provide and maintain in proper order and in good, clean condition in the field office at the project site, one complete full-size set of all working drawings. On this set of drawing prints, in red ink, neatly and accurately inscribe any and all changes in the work.
- B. Upon completion of work, the Contractor shall furnish one set of "as built" drawings. These drawings shall be contract drawings corrected in **red ink** to show any differences between contract

drawings and actual construction. All changes made during construction shall be noted. Each drawing showing changes in dimensions, details, or containing supplemental information shall be plainly marked "**As Built**" and shall contain the signature of both the Architect and the Contractor.

CLOSEOUT SUBMITTALS:

Prepare project data in the form of an instructional manual supplied electronically on media as requested by Owner (CD or flash drive). The following information shall be included and arranged under a Table of Contents:

1. Directory listing names, addresses, and telephone numbers of the Architect/Engineer(s), General Contractor, Subcontractors, and major material/equipment suppliers.
2. Operation and Maintenance Instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and Suppliers. Include equipment, parts list for each, operating instructions, maintenance instructions for equipment, special finishes, etc.
3. Project documents and certificates, including shop drawings and product data, air and water balance reports, photocopies of warranties.
4. Record As-Built Drawings as described above.
5. Completed Non-Asbestos Affidavit.

DEBRIS DISPOSAL:

Waste disposal shall be the responsibility of the Contractor. The Contractor shall make arrangements with the local authorities having jurisdiction for accommodation of all waste disposal. If local facilities are not available, the contractor shall be responsible for all other arrangements for waste disposal.

SUPPLEMENTARY CONDITIONS AND SPECIAL CONDITIONS:

In the following sections where the term "General Conditions" is used, it shall include the "Supplementary Conditions" and/or "Special Conditions" bound in this project manual.

MISCELLANEOUS PROVISIONS:

A. TESTS AND INSPECTIONS

Add the following clarification: **Regardless of how it is**

described elsewhere in the drawings and specifications, the CM shall engage all testing laboratories / subcontractors as approved by the Architect; and, pay for ALL testing as required by the drawings and specifications. The CM shall pay for any additional testing due to defective work. The Owner shall pay for any additional testing requested and found to be non-defective.

B. EQUAL OPPORTUNITY

The Contractor shall maintain policies of employment as follows:

The Construction Manager and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated fairly during employment without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment advertising; layoff or termination; rates of pay or any other forms of compensation; and selection for training, including apprenticeship. The CM agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

C. COOPERATION WITH BUILDING OFFICIALS

Cooperate with applicable Federal, State, City or other governmental officials and inspectors at all times. If such officials or inspectors deem special inspections are necessary, provide assistance and facilities that will expedite their inspection.

Construction Manager shall be responsible for obtaining and paying for ALL building permits required for this project. This cost shall be included in the Construction Manager's General Conditions.

D. MEASUREMENTS

Before doing any work or ordering any materials, the Contractor shall verify all measurements of existing and new work and shall be responsible for their correctness.

Any differences which may be found shall be submitted to

the Architect for consideration before proceeding with the work. No extra compensation will be allowed because of differences between actual dimensions and measurements indicated on the working drawings.

E. MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS

Install all manufactured items of materials or equipment in strict accordance with manufacturer's recommended specifications, except that the specifications herein, where more stringent, shall be complied with.

At the completion of the project and prior to final acceptance by the Owner, provide the Owner with three complete sets of operating and maintenance instructions, and demonstrate to him the procedures for proper operation and maintenance of all equipment.

F. JOB MAINTENANCE

During the course of their work, all crafts and trades shall protect all work which preceded theirs from damage, and they shall make repairs or replacements to any damage caused either directly or indirectly by them.

G. COMPLIANCE WITH STATE AND FEDERAL LAWS

Construction Manager assumes full responsibility for the payment of all contributions and payroll taxes (state and federal) as to all subcontractors and employees engaged in the performance of work pursuant hereto and further agrees to check and meet all requirements that might be specified under regulations of the administrative officials or board charged with the enforcement of any state or federal act on the subject referred. CM agrees to furnish Owner, upon request, a certificate or other evidence of compliance therewith.

H. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (OSHA)

The Construction Manager shall comply with the latest edition and revision of The Federal Occupational Safety and Health Act of 1970 for construction.

I. GUARANTY BONDS

1. Prior to the Owner signing the contract agreement, he

will require the Construction Manager to furnish performance and payment bonds covering the faithful performance of the entire construction contract agreement. The performance bond and the payment bond shall each be made out in one hundred percent (100%) of the contract sum and shall be in a company or companies against which the Owner has no reasonable objection.

2. Bonds shall be signed by an official of the bonding company and shall be accompanied by the bonding agent's written power-of-attorney in order that one copy may be attached to each copy of the contract agreement.
3. The Construction Manager shall include in his proposal amount the total premiums for all required bonds.
4. The Contractor does hereby warrant and/or guarantee against defects in all workmanship and materials performed or furnished by him directly or by his subcontractors for a period of one (1) year from the date of completion, as evidenced by the date of the Final Certificate or final acceptance of the project. Said warranty and/or guarantee shall be in the form of a good and sufficient bond in a sum equal to one hundred percent (100%) of the contract price.

End of Special Conditions

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

Part 1 - General

1.01 Work Included:

- A. The General Conditions, Bidding Requirements, and Division I are hereby made a part of each of the technical sections that follow, and shall be understood to apply and shall apply in full to all individuals or corporations who contract or subcontract to perform any part or all of the project work.
- B. Indications on the working drawings or in any section of the specifications of an article or material, operation, or method, requires that the Contractor shall provide each item or service or quality or is subject to qualifications noted; and, the Contractor shall perform each operation prescribed according to the conditions stated providing, therefore, all necessary labor, equipment and incidentals to complete the project work.
- C. The project:
 1. Name: Moore Public Schools - Child Care Center.
 2. Location: 201 North Eastern Ave. - Moore, Oklahoma.

1.02 Summary of Work:

- A. **Base Bid:** Provide and pay for all materials, labor, services, equipment, licenses, taxes, permits, and other items necessary for the complete construction of an (approximately) 33,750 s.f. child care center interior and exterior renovation including new outdoor play area, sidewalks, paving, and site utilities. Contractor shall maintain all barriers, guards and other environmental items required at the site during construction.
- B. Owner: Moore Public Schools
 1. Owner's Representative:
Jeff Horn, Bond Issue Consultant
Moore Public Schools
1500 SE 4th Street
Moore, OK 73160
405-735-4221
- C. Design Team:
 1. Architect:
Mike Abla, Principal Architect
AGP
313 SE 5th Street
Moore, OK 73160
405-735-3477
 2. Structural Engineer:
Brandon Birch, Structural Engineer
KFC Engineering, Inc.
205 NW 63rd, Suite 390
Oklahoma City, OK 73116
 3. Mechanical, Electrical and Plumbing Engineers:
Dwayne Gordon, Mechanical Engineer
Salas O'Brien LLC
2900 S. Telephone Rd., Suite 120
Moore, OK 73160
405-364-9926

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

4. Civil Engineer:
Derek Harris, Engineering Intern
Cedar Creek
P.O. Box 14534
Oklahoma City, OK 73113
405-863-8984
4. Construction Manager:
Joe Sherga, Project Manager
Omni Construction LLC
1909 S. Eastern Ave.
Moore, OK 73160
405-735-3992
- 1.04 Work to be Provided and Installed By Others:
Not applicable.
- 1.05 Use of the Site:
 - A. Confine operations at the site to the areas permitted under the contract. Portions of the site beyond areas on which work is indicated are not to be disturbed.
 - B. Keep facility free from accumulation of waste material, rubbish or construction debris.
- 1.06 Safety of Persons and property:
 - A. Contractor is responsible for ALL means and methods required for the protection of the existing building being added on to and shall replace/repair any damage to said building that occurs during construction of the new addition.
 - B. Contractor shall at all times protect the building from damage from rainwater.
 - C. Contractor shall provide barricades and clearly mark work zone areas.
 - D. Refer to Special Conditions "Temporary Services" for additional information.
 - E. During the period of construction, the OSHA Standards shall be followed as applicable by law.
 - F. The Contractor shall post emergency telephone numbers.
- 1.07 Preconstruction Conference:
 - A. A preconstruction meeting will be held at a time and place designated by the Architect or Owner's Representative, for the purpose of identifying responsibilities of the Owner's and the Architect's personnel and explanation of administrative procedures.
 - B. The Contractor shall use this meeting for the following minimum agenda:
 1. Construction Schedule/Project Phasing.
 2. Use of areas of the site.
 3. Delivery and storage.
 4. Safety.
 5. Security.
 6. Cleaning up.
 7. Subcontractor procedures relating to:
 - a. Submittals.
 - b. Change orders.
 - c. Applications for payment.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

- d. Record documents.
 - C. The attendees shall include:
 - 1. The Owner's Representatives.
 - 2. The Architect.
 - 3. The Contractor and its superintendent.
- 1.08 Project Scheduling:
 - A. The Contractor is responsible for the scheduling of construction and must prepare a schedule and charting system described below. This schedule is to ensure adequate planning and execution of the work by the contractor and to assist the Architect in appraising the schedule and evaluating the progress of the work.
 - B. The project schedule shall be presented within ten (10) days after receipt of the Notice to Proceed. Electronic copies of the schedule shall be submitted to the Architect for review and approval.
 - C. The schedule logic must be in the form of a "fenced" bar chart or Critical Path Method network indicating the planned start and completion dates of the activity, logical constraints between activities, and total float of each activity.
 - D. An updated project schedule shall be provided when requested by the Architect.
- 1.09 Environmental Controls:
 - A. Water Resources:
 - 1. Oily substances: prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water.
 - 2. Mosquito abatement: prevent ponding of stagnant water conducive to mosquito breeding habitat.
 - B. Land Resources:
 - 1. Erodible soils: plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use the areas developed. Immediately protect side slopes and back slopes upon completion of rough grading.
 - C. Air resources:
 - 1. Prevent creation of dust, air pollution, and odors.
 - 2. Use water sprinkling, temporary enclosures, and other appropriate methods to limit dust and dirt rising and scattering in air to locate practical level.
 - 3. Store volatile liquids, including fuels and solvents, in closed containers.
 - 4. Properly maintain equipment to reduce gaseous pollutant emissions.
 - D. Comply with all applicable environmental control guidelines as required by the City of Oklahoma City.
- 1.10 Temporary Utilities:
 - A. The Contractor shall provide and pay for all temporary utilities required for the complete construction of the project including, but not limited to, electricity, lighting, heating, cooling, ventilating, telephone, water, sanitary facilities, exterior and interior enclosures, access roads and parking

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

areas, cleaning and waste removal, project identification and signs, etc.

1.11 Cleaning:

- A. Use cleaning materials and agents recommended by manufacturer or fabricator of surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.
- B. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of work to condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's published instructions.
- C. Complete cleaning operations prior to requesting a Final / Substantial Completion Inspection.

1.12 Project Sign:

- A. Provide and install painted plywood project sign on wooden posts securely erected at the project site in a location approved by the Owner.
- B. No other project signs or advertisement shall be allowed at the project site unless approved by the Owner.
- C. Graphics and form of letter of the project sign shall be as indicated in the attached detail.

End of Section

8'-0"

YOUR BOND FUNDS AT WORK



MOORE
PUBLIC SCHOOLS

CHILD CARE CENTER RENOVATION

ARCHITECT: AGP - ABLA GRIFFIN PARTNERSHIP L.L.C.
MOORE, OKLAHOMA

CONTRACTOR: OMNI CONSTRUCTION, L.L.C.
MOORE, OKLAHOMA

4'-0"

NOTES:

1. WHITE LETTERS ON DARK BLUE BACKGROUND
2. 3/4" EXTERIOR PLYWOOD - PAINTED ALL SIDES
3. MOUNT ON 4" X 4" WOOD POST
4. CONTRACTOR TO HAVE LAYOUT APPROVED PRIOR TO INSTALLATION

DIVISION 2 - SITE WORK

SECTION 02050 - DEMOLITION

Part 1 - General

1.01 Work Included:

- A. The General Conditions and applicable sections of Division 1 shall apply to this entire section.
- B. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- C. Complete demolition of the existing paving and curbs as indicated on the drawings; and all other site materials as shown on the Drawings.
- D. Removal of all materials, debris and rubbish from site. Refer to Part 3 for ownership of materials.

1.02 Submittals:

- A. Scheduling of Alteration and Demolition Work:
 1. Before commencing any alteration removal or demolition work the contractor shall prepare and submit for approval by the Architect, a schedule showing the commencement, the order, and the completion dates of the various parts of this work.
 2. Before starting any work relating to existing utilities (electrical, heat, gas, etc.) that will temporarily discontinue or disrupt services to any existing building, the Contractor shall be required to give notice to the Architect and obtain his approval in writing before proceeding with this phase of work.

Part 2 - Materials (not applicable)

Part 3 - Execution

3.01 General Requirements:

- A. Permits, Licenses, Ordinances and Regulations:

All work shall comply with local and other governing ordinance, codes and regulations, but this requirement does not relieve the Contractor of responsibility of complying with these specifications. Complying with requirements of state, county or local laws, ordinances and regulations regarding demolition work is the responsibility of the Contractor, who shall pay any and all fees, and give any notices necessary in connection therewith.

3.02 Demolition of Work To Be Modified:

- A. Alterations and demolition shall be as indicated on the Drawings and in accordance with applicable technical sections of the specifications. The Contractor shall do all necessary demolition or removal of existing work as required in connection with this project, including shoring, bracing, etc. and removal of unwanted material and debris from the site. Demolish existing items only as necessary to tie on new construction as detailed. This work shall be done in a most careful manner, as the Contractor will be held responsible for any damage which may be caused thereby to any part or parts of existing streets,

DIVISION 2 - SITE WORK

SECTION 02050 - DEMOLITION

- neighboring buildings, and grounds.
- B. When alterations occur, or new and old work join, the immediate adjacent surfaces or so much thereof as required by the involved conditions, shall be cut, removed, patched, repaired or refinished and left in as good a condition as existed prior to the commencing of the work, and matching the remainder of the existing paving, etc.
 - C. Conduit and piping found underground on the site, or other areas involved in demolition or alteration shall be removed, re-rerouted or protected as required by the Drawings. Where these items are found; but not covered in the drawings, the Contractor shall notify the Architect for disposition instructions.
 - D. Maintain existing utility services to remain and protect from damage during demolition operations.
 - E. The Contractor shall furnish and install adequate guards, barricades and other temporary protection to prevent injury to persons.
 - F. The Contractor shall make every effort to control the amount of dust and the noise level generated by demolition operations.
- 3.03 Ownership and Disposition of Materials:
- A. Classification of removed materials (re: Drawings for applicable items):
 - 1. **Reinstalled:** Items are those items which, after removal, are to be used, reinserted, remounted or otherwise built back into the work under this contract.
 - 2. **Salvaged:** Items are those items which, after removal, are to be retained by the Owner and delivered for storage on the Owner=s premises.
 - 3. **Scrapped:** Items are all other removed materials or equipment. This includes all items which are not noted or specified for reinstallation or salvage.
 - B. Disposition by Classification:
 - 1. **Reinstalled:** Items of material or equipment shown on the work shall be jointly inspected by the Contractor and the Architect prior to dismantling or removal. An agreement shall be reached briefly setting forth the apparent condition of the material, or equipment, and approved by the Architect. Simple operating test of operative equipment will be included with this joint inspection if feasible. Such items shall be reinstalled as specified in the applicable sections of the specifications covering new items of similar categories.
 - 2. **Salvaged:** Materials and equipment noted on the Drawings or listed to be salvaged shall be carefully handled and protected and shall be delivered to storage areas, as designated by the Architect, on the Owner=s premises.
 - 3. **Scrapped:** All removed materials and equipment not noted on the drawings specified to be reinstalled, shall be considered as scrap and shall be disposed of by the Contractor off the Owner=s premises and credit for the

DIVISION 2 - SITE WORK

SECTION 02050 - DEMOLITION

value thereof, if any, shall have been reflected in the Contractor's bid price.

3.04 Clean-Up:

- A. Disposition of all material, debris and rubbish shall be the responsibility of the Contractor. Leave site clean. Completely remove all materials, debris, and rubbish from site. Absolutely no burning of debris on the site will be allowed.
- B. **The Contractor shall submit proposed refuse dumping sites to the Architect and shall receive written approval from the Architect concerning acceptable dumping sites prior to the disposition of any material, debris or rubbish generated by this project.**

End of Section

DIVISION 2 - SITE WORK

SECTION 02100 - SITE PREPARATION

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.
- B. Erection and maintenance of a temporary construction fence, as noted on the Drawings, shall be provided by the Contractor.

1.02 Protection of Trees and Shrubs:

- A. All existing trees and shrubs in or near the construction area that are not indicated to be removed shall be protected. Should damage occur, the Contractor shall replace the tree or shrub with a similar size and species.
- B. Periodically water as required to limit dust and dirt during construction.
- C. Protect any adjacent property and improvements from damage, and replace any portions damaged through this operation.

Part 2 - Products

2.01 Materials:

- A. Temporary Fencing: **Refer to Section 02110.**

Part 3 - Execution

3.01 Clearing and Grubbing:

- A. Limits of clearing shall be all areas within contract limit lines.
- B. Remove all organic or undesirable materials from areas where concrete is to be placed.
- C. Within building lines and exterior concrete slabs remove roots, debris, rubbish, etc., and cut roots of adjacent trees and shrubs to remain, not less than 12" from concrete work.
- D. From building lines and exterior concrete walks and slabs out to the limits of earth cut and fill, remove all exposed stumps and roots, brush, rubbish, etc.
- E. Remove completely all existing trees designated on Drawings.
- F. Remove topsoil to depth of organic matter and stockpile on site for use in grading.

3.02 Removal of Improvements:

- A. Remove all above-grade and below-grade improvements indicated on the Drawings or as necessary for the installation of new work.

DIVISION 2 - SITE WORK

SECTION 02100 - SITE PREPARATION

3.03 Disposal of Debris:

- A. Burning of combustible materials on the site will not be permitted. Completely remove from site and legally dispose of all materials and debris.

End of Section

DIVISION 2 - SITE WORK

SECTION 02110 - TEMPORARY CONSTRUCTION FENCING

Part 1 - General

1.01 Summary

- A. Section includes: Erection, maintenance and dismantling of temporary fencing around construction site and materials storage areas. This section does not apply where security fencing is required.
- B. Refer to Drawings for temporary fencing layout and location of gates.

1.02 Submittals

- A. Submit the following:
 - 1. Shop drawing indicating layout of temporary fencing, location and size of gates, existing pavement and roads, access to fire hydrants and hose connections, and other site specific conditions. Prepare drawing after site observation and verification of existing conditions.

Part 2 - Products

2.01 Temporary Chain Link fencing:

- A. Unless otherwise indicated, type of temporary chain link fencing shall be Contractor's option. Following types are acceptable:
 - 1. New materials or previously used salvaged chain link fencing in good condition.
 - 2. Posts: Galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings, driving into ground, anchoring with base plates, or inserting in precast concrete blocks.
 - 3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.
 - 4. Height: Minimum Height shall be 8'-0".
- B. Gates: Provide personnel and vehicle gates of the quantity and size indicated on the Drawings or required for functional access to site.
 - 1. Fabricate of same material as used for fencing.
 - 2. Vehicle gates:
 - a. Minimum width: 20 feet to allow access for emergency vehicles.
 - b. Capable of manual operation by one person.

Part 3 - Execution:

3.01 Layout:

- A. Installation of temporary fencing shall not deter or hinder

DIVISION 2 - SITE WORK

SECTION 02110 - TEMPORARY CONSTRUCTION FENCING

access to existing and new hose connections and fire hydrants.

1. Maintain 3 feet diameter clear space around fire hydrants.
 2. Where fire hydrant or hose connection is blocked by fencing, provide access gate.
- B. Access: Provide gates for personnel, delivery of materials, and access by emergency vehicles.

3.02 Installation:

- A. Chain link posts:
1. Space at 10'-0" maximum.
 2. Drive posts, set in holes and backfill, or anchor in precast concrete blocks.
 3. For soft and unstable ground conditions, cast concrete plug around post.
 4. Posts over pavement: Use steel post plates or precast concrete blocks.
 5. Gate posts: Use bracing or concrete footings to provide rigidity for accommodating size of gate.
- B. Fabric: Securely attach to posts.
- C. Gates: Install with required hardware.
- D. Plastic mesh fencing: Space steel support posts to ensure mesh remains vertical and at proper height. Securely tie mesh to posts.

3.03 Maintenance and Removal:

- A. Maintain fencing in good condition. If damaged, immediately repair.
- B. Remove temporary fencing upon completion of Work or when no longer required for security or control. Backfill holes and compact. Holes in pavement shall be surfaced to match existing paving. Repair damage caused by installation of temporary fencing.

End of Section

DIVISION 2 - SITE WORK

SECTION 02110 - TEMPORARY CONSTRUCTION FENCING

DIVISION 2 - SITE WORK

SECTION 02200 - EARTHWORK

Part 1 - General

- 1.01 Work Included:
- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- 1.02 Related Work Specified Elsewhere:
- A. Site Preparation - Section 02100
 - B. Paving and Surfacing - Section 02500
 - C. Cast-In-Place Concrete - Section 03300
- 1.03 Quality Assurance:
- A. Standards:
 - 1. American Society for Testing and Materials
 - a. ASTM D-1556, Density of soil in place
 - B. **Testing: All required tests, and their fees, shall be the responsibility of the Contractor. The Contractor shall engage and pay for the services of an independent testing laboratory approved by the Architect.**
 - 1. Qualified according to ASTM E-329 and ASTM D-3740 for testing.
 - C. Comply with 29 CFR 1926, Subpart P - Excavations (OSHA Regulations).
- 1.04 Submittals:
- A. Product data for each type of manufactured products required.
 - B. Qualification data for testing agency.
 - C. Material Test Reports for each borrow soil material proposed for engineered fill and backfill as follows:
 - 1. Classification according to ASTM D-2487.
 - 2. Laboratory compaction curve according to ASTM D-698.
- 1.05 Project Conditions:
- A. Traffic: minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and Authority Having Jurisdiction. Provide alternate routes around obstructions as required by authorities.

Part 2 - Products

- 2.01 Materials:
- A. Backfill Material: Approved low volume change material. If additional material required, it shall be low plasticity cohesive material (plasticity index between 5 and 18 and a maximum liquid limit of 35 percent). The moisture content of the low volume change soil should be adjusted to its optimum value, or above, before compaction. The suitability of materials, including off-site soils, shall be approved by the Geotechnical Engineer hired by the Contractor. Frozen material shall not be acceptable for backfilling.
 - B. Top Soil: Material shall be native, fertile, neutral top soil of loamy character, free from heavy clay, coarse sand, stones,

DIVISION 2 - SITE WORK

SECTION 02200 - EARTHWORK

- lumps, plants, roots, or other foreign matter.
- C. Gravel: Course gravel - 100% passing a 2" screen, 90% retained on a 1/4" screen.
- D. Aggregate Base Course: Aggregate base - meet ASTM D448 size 57, 100 percent passing the 12" sieve, less than 5 percent passing the #8 sieve, plasticity index less than or equal to 6.
- E. Hydrated Lime: meet requirements of ASTM C977.

Part 3 - Execution

3.01 Excavations:

- A. General:
 - 1. Excavations shall be made to the elevations and dimensions shown on Drawings.
 - 2. If excavations are made deeper than called for on plans, no backfilling is permitted. Any additional depth or size shall be made up by additional concrete at no increase in contract price.
 - 3. Foundations shall be plumb, bottoms level and of type indicated on Drawings with allowance for erection of any required forms or shoring, and inspection of footings, etc.
 - 4. Shore and brace excavations where necessary to prevent cave-ins, and in accordance with all safety laws and codes, including all OSHA requirements.
 - 5. If an excavation must remain empty through a shutdown period, cover hole with suitable protection materials and clean out immediately prior to placing concrete.
 - 6. Keep excavations free of water by use of pumps.
 - 7. Keep area around excavations and concrete work clean for a distance of 3 feet all directions until concrete is placed and has set.
- B. Footings / Grade Beams:
 - 1. Footing bottoms shall be level, clean, clear of loose and objectionable material, and true to size.
 - 2. Concrete for footings shall be poured as soon as possible after excavation has been completed. Excavations shall be protected until concrete has been poured.
- C. Exterior and Pavement Sections:
 - 1. Excavate to underside of walks, curb, gutter, and miscellaneous items.
 - 2. Excavation shall be away from sides of grade beams and retaining walls below grade to a sufficient distance for erecting and removing forms with assured safety for workmen.
 - 3. Bottoms of excavated areas shall be level and kept clean of loose and objectionable materials at all times.
- D. All excavations for concrete footings, foundations or slabs shall be kept dry at all times and shall be completely dry at

DIVISION 2 - SITE WORK

SECTION 02200 - EARTHWORK

the time of any concrete pour. The Geotechnical Engineer, **hired by the Contractor**, shall make final approval of all excavations prior to the start of any concrete placement.

3.02 Classification of Excavation:

- A. All excavation shall be unclassified and the term "unclassified excavation" shall be understood to mean all and any materials encountered during excavation - including old floors, pavement, foundations, rock, earth, piping and debris. No adjustment in the contract price will be made on account of the presence or absence of rock, hard or soft sandstone, shale, masonry, or other materials.

3.03 Unknown Utilities:

A. Unknown Utilities:

1. If any unknown and uncharted utilities are encountered during excavation, promptly notify the Architect and wait for his instructions before proceeding.
2. If it is ascertained by the Architect that such utility line has been abandoned, the Contractor shall properly cap the line at depth of 12" or more below finish grade.
3. If such unknown utilities are encountered and work is continued without contacting the Architect for instruction, and damage is caused to said utilities, the Contractor shall repair, at his own expense, such damage to the satisfaction of the utility company concerned.

B. Unknown Obstacles:

1. If any unknown obstacles such as house or small building foundations or such as residential size basements, cisterns, etc., are encountered, the Contractor at his own expense shall remove the foundations, fill basements or cisterns or perform any work necessary to complete the work of this contract.
2. Should the Contractor encounter any unforeseen major obstacle in excavation, such as an abandoned water-well, subsurface streams, or "cave-ins" etc., which prove to be unduly expensive to overcome, it is the intention to cause a survey to be made to determine a course of action that will relieve the Contractor of undue expense.

3.04 Fill and Backfill:

A. Preparation for Concrete slab item on Fill:

1. Site preparation shall include removing existing vegetation, and any other unsuitable materials encountered. Refer to Soils Report and Structural Drawings concerning additional preparation procedures. The prepared area shall extend beyond the building footprint a minimum of 5 feet laterally. After performing the required cuts, proofroll existing site with a loaded, tandem-axle dump truck weighing at least 25 tons. Proofrolling shall involve overlapping passes in mutually perpendicular directions. After proofrolling, unstable soil should be overexcavated and replaced with a low volume change soil. Scarify existing soil at base of fill to

DIVISION 2 - SITE WORK

SECTION 02200 - EARTHWORK

- a minimum depth of 8"; moisture content of scarified soil shall be adjusted to a minimum of 2% above the material's optimum content, as determined by the standard Proctor method ASTM D-698, and be compacted to at least 95 percent of its maximum dry density.
2. Provide fill material to bring site to required grade. Refer to 2.01A.
 3. **Compaction:** Compact fill in lifts not exceeding 8" in loose thickness. Compact soil according to table below. Tests shall be required and paid for by the Contractor. Any additional moisture required to achieve compaction in a layer should be added and the entire lift mixed to obtain the uniform moisture content.
 4. Compaction shall not be attempted using water settling.
 5. **Care shall be taken to maintain the minimum recommended moisture content in the subgrade until floor slabs are constructed. Positive drainage shall also be developed away from building to prevent water from ponding along the perimeter and affecting future floor slab performance.**
- B. Preparation for Paving items on fill:
1. Before compaction, the top 8" of the stabilized soil zone shall be modified with a minimum of 7% hydrated lime. The lime shall be thoroughly blended into the subgrade and allowed to cure for 48 to 72 hours before being remixed and compacted. Before compaction, the treated soil zone shall be adjusted to within 2 percentage points of optimum moisture as determined by the standard Proctor method (ASTM D-698); then compacted to at least 98 percent of the material's maximum standard Proctor dry density.
- C. Backfill at Walls (including footing and foundation walls):
1. Fill material shall be approved backfill material except as noted on Drawings.
 2. Backfill around footing and foundation walls must be compacted.
- 3.05 Exterior Fill and Grading:
- A. Fill:
1. Subgrade fill as shown on plot plan, placed in 4" to 8" layers, to within 6" of finish. Compact according to table below.
 2. Top 6" of graded surface shall be approved top soil.
- B. Lines and Grades:
1. Work shall conform to lines and grades shown on the Drawings. Ruts holes and depressions shall be filled with approved material.
 2. The slopes between contours or between spot elevations shall be smooth, uniform slopes and the surface shall be finished to a tolerance of 2" in 10' under a straight edge.

DIVISION 2 - SITE WORK

SECTION 02200 - EARTHWORK

3.06 Compaction (fills less than 8'-0" thick):

Soil Compaction Criteria

Minimum Compaction (%) per ASTM D698

Use	Exposed in-situ subgrade soil	Fill	Base Course
Beneath foundation components	95	95	95
Beneath pavements, curbs and sidewalks (Stabilized on-site soil)	98	98	95
Aggregate base (at slab) Aggregate base (at pavements)			98
Beneath exterior slabs and utility trench backfill (stabilized on-site soil)	95	95	95
Miscellaneous backfill (non-load bearing)		90	

3.08 Testing:

- A. Make at least one density test of subgrade for every 2500 square feet of paved area or building slab, but in no case less than 5 tests.
- B. In each compacted fill layer, make one density test for every 2500 square feet of overlaying building slab or paved area, but in no case less than 8 tests.

3.09 Trenching and Backfilling of Utilities:

- A. The Contractor shall do all excavation and backfilling necessary for the installation of all utilities, including shoring, bailing, and pumping required to maintain the excavations in a safe and dry condition.
- B. All excavations shall be backfilled in 4" to 6" layers and thoroughly compacted one layer at a time with a mechanical tamper. Backfill material under areas where walks, drives, slab, parking areas, etc., are to be constructed shall be fill sand (free of all dirt). Backfill material in other areas shall be excavated material. Where excavation is not to be built over, replace the top 12" with existing top soil. Remove superfluous materials from job site.

End of Section

DIVISION 2 - SITE WORK

SECTION 02202 - EARTHWORK FOR UTILITIES

Part 1 - General

1.01 Applicable Publications: The publications of the organizations listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Society for Testing and Materials (ASTM) Publications:

1. Sieve or Screen Analysis of Fine and Coarse Aggregates.
2. Liquid Limit of Soils.
3. Plastic Limit and Plasticity Index of Soils.
4. Moisture Density Relations of Soils and Soils Aggregate Mixtures Using 5.5 lb. (2.49 KG.) Rammer and 12 in. (305.mm) Drop.
5. Amount of Material in Soils Finer than the No. 200 (75 micrometer) Sieve.
6. Density of Soil in Place by the Sand Cone Method.
7. Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb. (4.54KG) Rammer and 18 in. (457 mm) Drop.
8. Breaking Load and Elongation of Textile Fabrics.
9. Underground Installation of Flexible Thermoplastic Sewer Pipe.
10. Classification of Soils for Engineering Purposes.
11. Underground Installation of Thermoplastic Pressure Piping.
12. Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).

B. American Water Works Association (AWWA) Publications:

1. The Selection of Asbestos Cement Distribution Pipe, 4 in. Through 16 in., for Water and Other Liquids.
 2. Installation of Gray and Ductile Cast Iron Water Mains and Appurtenances.
 3. Installation of Asbestos Cement Pressure Pipe.
 4. Steel Pipe Design and Installation, 1964 Edition.
- 1.02 Description: This section covers all earthwork requirements for piping systems specified in Section 02550 - Sanitary Sewer Gravity and Section 02551 - Water Lines. This section covers requirements for excavation and for compaction of succeeding layers after backfill has been placed around pipe as specified in the respective sections for these systems.

1.03 Quality Assurance:

A. Standards:

1. American Society for Testing and Materials
 - a. ASTM D-1556, Density of soil in place
- B. Comply with 29 CFR 1926, Subpart P - Excavations (OSHA Regulations).

DIVISION 2 - SITE WORK

SECTION 02202 - EARTHWORK FOR UTILITIES

- C. **Testing:** All required tests, and their fees, shall be the responsibility of the Contractor. The Contractor shall engage and pay for the services of an independent testing laboratory approved by the Architect.
- 1.04 Submittals:
- A. Certified Test Reports: Submit certified test reports for the following:
 - 1. Sand tested in accordance with ASTM C136 and ASTM D2487.
 - 2. Porous fill tested in accordance with ASTM C136.
 - B. Shoring and Sheeting Plan: Before starting work submit a shoring and sheeting plan as required to meet O.S.H.A. regulations.
 - C. Manufacturer's Data: Submit manufacturer's descriptive literature, detailed specifications, available performance test data, instructions, and recommendations for buried warning and identification tape.
- 1.05 Delivery and Storage: Deliver and store materials in a manner to prevent deterioration, contamination or segregation.
- 1.06 Criteria For Bidding: Base bids on the criteria listed below. Hard material is defined as solid rock, firmly cemented unstratified masses, or conglomerate deposits possessing the characteristics of solid rock which can not ordinarily be removed without systematic drilling and blasting, and any boulder, masonry, or concrete except pavement, exceeding 2 cubic yard in volume.
- A. That the surface elevations are as indicated.
 - B. That no pipes or other artificial obstruction, except those indicated will be encountered.
 - C. That the character of the material to be removed is as indicated.
- 1.07 Protection:
- A. Shoring and Sheeting: Provide shoring and bracing where required for compliance with O.S.H.A. regulations.
 - B. In addition to any other requirements set forth in this Contract, meet the following requirements:
 - 1. Prevent undermining of pavements and slabs.
 - 2. Banks may be sloped where space permits and as directed.
 - 3. Where shoring and sheeting materials must be left in place in the completed work to prevent settlements or damage to adjacent structures or as directed, backfill the excavation to 3 feet below the finished grade and remove the remaining exposed portion of the shoring before completing the backfill.
 - C. Shoring and Sheeting Plan: Shall include detailed drawings

DIVISION 2 - SITE WORK

SECTION 02202 - EARTHWORK FOR UTILITIES

and the following:

1. Design calculations by a Registered Professional Engineer.
2. The sequence and methods of installation and removal.
3. The materials, sizes, and arrangement of members proposed for use as shoring and bracing.

1.08 Minimum Burial Depths:

- A. Water Lines: refer to Plumbing Drawings.**
- B. Sewer Lines: refer to Plumbing Drawings.**

Part 2 - Products

- 2.01 Soil Materials: In general, shall be free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, frozen, deleterious, or objectionable materials.
- A. Backfill: Shall conform to the general requirements for soil materials above and shall be material excavated on the site of this project. This material is unclassified and no testing will be required before use as backfill.
 - B. Sand: Shall conform to the general requirements for soil materials above and shall be clean, coarse grained material classified as SW by ASTM D2487 of which no more than 10 percent by weight shall be finer than the No. 200 sieve.
 - C. Gravel: Shall conform to the general requirements for soil materials above and shall be clean, coarse grained material classified as GP by ASTM D2487 of which no more than 10 percent by weight shall be finer than the No. 200 sieve.
 - D. Crushed Stone: Shall conform to the general requirements for gravel above and a minimum of 10 percent of the particles shall have at least one fractured face and the maximum particle size shall be 3/4 inches.
 - E. Porous Fill: Shall conform to the general requirements for gravel above and shall pass a 2 inch sieve and be retained on a 1/2 inch sieve.
 - F. Bedding:
 - a. Shall Be SW sand for water lines.
 - b. Bedding shall be ASTM type 57 crushed stone for sanitary sewer lines.
 - G. Materials For Use in Pipe Installations: Bedding and backfill materials shall conform to requirements specified herein, except as modified herein by the respective specifications and requirements listed following:

PIPE MATERIALS

MATERIAL REFERENCE

- | | |
|---------------------------|--------------------------|
| 1. Ductile Iron Soil Pipe | AWWA C600, except refill |
|---------------------------|--------------------------|

DIVISION 2 - SITE WORK

SECTION 02202 - EARTHWORK FOR UTILITIES

- of overcut shall be crushed stone. Bedding shall be GW.
- 2. Metallic Water Service Line Pipe (Steel, Copper Tube). AWWA C600
 - 3. Polyethylene (PE) Pressure pipe ASTM D2774, except bedding shall be SW and all material surrounding the pipe shall have maximum particle size of 1/2 inch.
 - 4. Polyvinyl Chloride (PVC) ASTM D2321, except bedding shall be SW and all material surrounding the pipe shall have maximum particle size of 1/2 inch.
 - 5. Polyvinyl Chloride (PVC) Pressure Pipe ASTM D2774, except bedding shall be SW and all material surrounding pipe shall have maximum particle size of 1/2 inch..
- H. Topsoil: Shall be material free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material or substance detrimental to plant growth. Topsoil shall be a natural, friable soil representative of productive soils in the vicinity.
- I. Borrow: Shall be materials conforming to the requirements for backfill.
- J. Embankment: Embankment material shall be in accordance with Borrow material and shall be approved by the Architect.
- 2.02 Buried Warning And Identification Tape: Shall be polyethylene plastic tape manufactured specifically for warning and identification of buried utility lines. Tape shall be provided in rolls, 6 inches minimum width, color coded for intended service with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be "CAUTION BURIED (Intended Service) LINE BELOW" or similar wording. Code and letter

DIVISION 2 - SITE WORK

SECTION 02202 - EARTHWORK FOR UTILITIES

coloring shall be permanent, unaffected by moisture and other substances contained in trench backfill material.

Part 3 - Execution

3.01 Surface Preparation:

- A. Stockpiling Topsoil: Strip suitable soil from the site where excavation or grading is indicated and stockpile separate from other excavated material. Material unsuitable for use as topsoil shall be stockpiled and used for backfilling. Locate topsoil such that the material can be used readily for the finished grading. Where sufficient existing topsoil conforming to the material requirements is not available on site, provide borrow materials suitable for use as topsoil. Protect topsoil and maintain in segregated piles until needed.
- B. Cutting Pavement, Curbs, and Gutters: Make cuts with neat, parallel, straight lines one foot wider than trench width on each side of trenches and one foot beyond each edge of pits.

3.02 General Excavation: Shall be to the elevations and dimensions indicated or otherwise specified. Keep excavations free from water while construction is in progress. Notify the Architect immediately in writing if it becomes necessary to remove hard, soft, weak, or wet material to a depth greater than indicated. Make trench sides as nearly vertical as practicable except where sloping of sides is allowed. Sides of trenches shall not be sloped from the bottom of the trench up to the elevation of top of the pipe. Excavate ledge rock, boulders, or hard material to an overdepth at least 4 inches below the bottom of the pipe unless otherwise indicated or specified. Blasting will not be permitted. Stabilize soft, weak, or wet excavations as indicated. Use bedding material to refill overdepth to the proper grade and place in 6 inch maximum layers. At the option of the Contractor, the excavations may be cut to an overdepth of not less than 4 inches and refilled to required grade as specified. Grade bottom of trenches accurately to provide uniform bearing and support for each section of pipe on undisturbed soil, or bedding material as indicated or specified at every point along its entire length except for portions where it is necessary to excavate for bell holes and for making proper joints. Dig bell holes and depressions for joints after trench has been graded and dimension to ensure that the bell does not bear on the bottom of the excavation.

3.03 General Bedding: For utility lines and utility line structures shall be one of the materials and depths indicated. Place

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bedding in 6 inch maximum loose lifts. Provide uniform and continuous support for each section of structure except at bell holes or depressions necessary for making proper joints.

- A. Refill: Is defined as material placed in excavation to correct overcut in depth.
 - B. Concrete Cradles: Specified in lieu of other types of bedding for a particular type of pipe material, shall be as indicated.
- 3.04 General Backfilling: Surround pipes with backfill as indicated. Ensure that backfill is placed completely under pipe haunches. Place in 6 inch maximum loose lifts to one foot above pipe unless otherwise specified. Bring up evenly on each side, and for the full length, of the structure. Ensure that no damage is done to structures or protective coatings thereon. Place the remainder of the backfill in 12 inch maximum loose lifts unless otherwise specified. Compact each loose lift as specified in Paragraph "General Compaction" before placing the next lift. Do not backfill in freezing weather, where the material in the trench is already frozen or is muddy, except as authorized. Provide a minimum cover from final grade of 4 feet for water mains. Where unacceptable settlements occur in trenches and pit due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation. Coordinate backfilling with testing of utilities. Provide buried warning and identification tape.
- 3.05 General Compaction: Use hand operated plate type vibratory or other suitable hand tampers in areas not accessible to larger rollers or compactors. Be careful to avoid damaging pipes and protective pipe coatings. Compaction shall be in accordance with the following unless otherwise specified.
- A. **Compaction shall conform to Soil Compaction Criteria listed in Section 02200 - Earthwork for Buildings.**
- 3.06 **All trenches created for utility access under the building shall be effectively sealed to restrict water intrusion and flow along the trenches. Use a clay soil to construct an effective trench plug that extends at least 5 feet out from the face of the building. The clay should have a minimum plasticity index of 15 and be placed in controlled lifts not exceeding 9 inches in loose thickness so as to surround the utility line and fill the trench. Each lift of clay backfill should be compacted to at least 95 percent of the material's maximum dry density as determined by the standard Proctor test method (ASTM D-698). The moisture content of the clay backfill should be adjusted to its optimum value or above before compaction.**

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3.07 Finish Operations:

- A. Grading: Shall be to finished grades indicated within one tenth of a foot. Provide sod or topsoil in areas to be seeded as indicated. Grade areas to drain water away from structures. Existing grades which are to remain but are disturbed by the Contractor's operations shall be graded as directed.
- B. Spreading Topsoil: Areas indicated to receive topsoil for the finished surface shall be free of materials that would interfere with planting and maintenance operations. Spread topsoil uniformly grade and compact to the thicknesses, elevations, and slopes indicated. Do not place topsoil when the subgrade is frozen, extremely wet or dry, or in other conditions detrimental to seeding, planting, or grading.
- C. Borrow Areas: Shall be graded to drain properly.
- D. Disposition of Surplus Material: Surplus or other soil material not required or suitable for filling, backfilling or grading shall be disposed of as directed by the Architect.
- E. Protection of Surfaces: Protect newly graded areas from traffic, erosion, and settlements that may occur. Repair or re-establish damaged grades, elevations, or slopes.
- F. Pavement Repair: Repair pavement, curbs, and gutters as indicated. Do not repair pavement until trench or pit has been backfilled and compacted as herein specified. Provide a temporary road surface of crushed stone over the backfilled portion until permanent pavement is repaired. Remove and dispose of temporary road surface material when permanent pavement is placed. As a minimum one way traffic shall be maintained at all times on roads and streets crossed by trenches; roads and streets shall be fully opened to traffic as quickly as possible.

- 3.08 Field Sampling and Testing: Test sand, gravel, bedding, and backfill for conformance to gradation limits in accordance with ASTM C136. Test sand, gravel, backfill and material used as subgrade under roads and other paved areas for material finer than the No. 20 sieve in accordance with ASTM D1140. Test backfill material used as subgrade under roads and other paved areas for liquid limit in accordance with ASTM D423 and for plasticity index in accordance with ASTM D424. Test bedding and backfill materials for moisture density relations in accordance with ASTM D698 & D1557. Perform at least one of each of the required tests for each material used. Provide additional tests as specified above for each source change. Perform density tests in randomly selected locations and in accordance with ASTM

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D1556 or ASTM D2922 and ASTM D3017 as follows: one test per 100 lineal feet in each lift.

End of Section

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SECTION 02500 - PAVING AND SURFACING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary to complete all Paving Work as shown on the Drawings and specified herein.

1.02 Related Work Specified Elsewhere:

- A. Site Preparation - Section 02100
- B. Earthwork for Buildings - Section 02200
- C. Hot Mix Asphalt Paving - Section 02741
- C. Cast-In-Place Concrete - Section 03300

1.03 Quality Assurance:

- A. Standards:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. American Association of State Highway and Transportation Officials (AASHTO).
 - 3. Oklahoma Department of Transportation (ODOT) Standard Specifications for Highway Construction.
- B. **Testing: All required tests, and their fees, shall be the responsibility of the Contractor. The Contractor shall engage and pay for the services of an independent testing laboratory approved by the Architect.**

1.04 Paving Quality Requirements:

- A. General: In addition to other specified conditions, comply with the following minimum requirements:
 - 1. Test concrete as required under Section 03300 - Cast-In-Place Concrete.
 - 2. Test subgrade preparation as required under Section 02200 - Earthwork for Buildings.
- B. Provide final surfaces of uniform texture, conforming to required grades and cross-sections. Finished surface tolerance - 1/2" in 10'-0" under a straightedge.
- C. Thickness: In-place compacted thickness shall not be acceptable if not meeting the minimum thickness indicated on the Drawings.

1.05 Coordination:

- A. Coordinate work and cooperate with any other trades whose work relates to paving in any way.

1.06 Personnel:

- A. All work shall be directed by trained and experienced applicators, thoroughly adept at the procedures and equipment required by this section.

1.07 Weather Limitations:

- A. Do not install paving when the subgrade is frozen or show any evidence of excessive moisture.
- B. Do not install paving when the air temperature is less than

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40 degrees Farenheit nor when temperature of the surface on which mixture is to be placed is below 40 degrees Farenheit unless directed otherwise by Architect.

Part 2 - Products

2.01 Material Applications:

- A. Subgrade Preparation:
 - 1. Description: Refer to Section 02200 - Earthwork, Part 3, 3.01 and 3.04.
- B. Concrete Paving:
 - 1. Description: A minimum 4,000 p.s.i. 28 day concrete slab with a minimum cement content of six (6) sacks per cubic yard on prepared base and subgrade course. Provide steel dowels at all expansion and construction joints. The concrete shall be reinforced with #3 bars at 24" o.c. Provide expansion and saw joints as shown on the Drawings.
- C. Concrete Curbs:
 - 1. Description: Concrete curbs and/or gutters constructed of a minimum 4,000 p.s.i., 28 day concrete with a minimum cement content of six (6) sacks per cubic yard on prepared base and subgrade course. Provide steel dowels at all expansion and construction joints.
- D. Concrete Walks:
 - 1. Description: A 4,000 p.s.i. reinforced concrete slab on a sand base. Provide expansion and saw cuts as shown on the Drawings.
- E. Paint:
 - 1. Parking lot paint shall be Pittsburg Paints Speedhide High Performance Test Drying Safety Paint:
 - a. Colors:
 - 1. Parking stall striping, directional arrows, and miscellaneous markings - white.
 - 2. All handicapped markings shall be blue field with white symbol and border.
 - 3. Fire lane striping and curbs - red with white letters indicating "FIRE LANE - NO PARKING".
 - 4. Light Pole Base (where applicable) - yellow.
 - 5. Lane Striping Separation of Traffic in Opposite Directions - double line yellow.
- F. Asphalt Paving: refer to Section 02741 - Hot Mix Asphalt Paving.

2.02 Expansion Control:

- A. Construction Joint Form: Tongue and groove keyway, premolded asphaltic or wood form, designed to provide 1 1/2" keyway.
- B. Joint Filler: Resilient, non-extruding

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- bituminous-impregnated fiberboard expansion joint material by thickness shown on the Drawings, ASTM D-1751.
- C. Joint Sealers: Hot applied, non-tracking asphalt-rubber compound, ASTM D-1190.
 - D. Anchorage Inserts: Malleable cast iron adjustable wedge, or threaded, type with 3/4" bolt size unless indicated otherwise on the Drawings.
 - E. Embedded Items: Provide materials as sized and/or indicated on the Drawings, or as required.

Part 3 - Execution

3.01 General:

- A. Make careful inspection of excavated surface on which paving is to be placed, and check on bottom and top grades of paving throughout the area to be paved, prior to starting work under this section. Notify the Contractor of any unsatisfactory conditions. Do not begin paving work until such conditions have been corrected and area is ready to receive paving.

3.02 Workmanship:

- A. Apply paving in true planes to eliminate depressions or "fat" spots. Carefully warp changes in slope. Carefully hand compact and roll around building projections so that texture and compaction matches machine compaction. Mask building before placing concrete primer to prevent staining exposed building surfaces, and concrete curbs.
- B. All concrete curb and gutter shall be constructed to the alignment and grades shown on the plans.
- C. Backfill shall be placed behind the sidewalks in a manner that will not cause displacement of the section nor damage to the exposed edges. All damaged sidewalks shall be replaced at the direction of the Architect at the Contractor's expense.
- D. Adjoining Paving: where new work adjoins existing, warp carefully to flush surface, with seal over joint.
- E. Construction Joints: As noted on the Drawings or as directed by the Architect:
 - 1. At joints, thoroughly clean surfaces and remove all laitance.
 - 2. In addition, vertical surfaces shall be thoroughly wetted and coated with cement grout before placing new concrete.
- F. Expansion Joints: As noted on the Drawings, or as directed by the Architect:
 - 1. Provide 1/2" expansion joints where sidewalks join structural concrete.
 - 2. Hold filler material down 1/2", fill top with sealant.
- G. Control Joints: Provide scored lines and weak plane joints

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SECTION 02500 - PAVING AND SURFACING

on exterior and interior concrete slabs as indicated on the Drawings, and as approved by the Architect. Fill with sealant.

- H. Finishes:
 - 1. Concrete Walks and Pavement:
 - a. Provide trowel and medium broom finish. Refer to drawings.
 - b. Broom after concrete is hard enough to retain scoring, using a stiff fiber, or wire, broom. Broom perpendicular to direction of traffic.
- I. Repair any damage to finished pavement surfaces that may result from subsequent construction to a smooth, true, and uniform surface.
- J. Clean-up: After completion of paving operations, remove all excess materials, equipment and debris (dispose of away from the site). Leave all work in clean condition.
- K. Protection:
 - 1. Provide barricades and warning devices as required to protect pavement and the general public.
 - 2. Cover any openings of structures in area of paving until permanent coverings are installed.
 - 3. Prohibit all traffic on paving until it has reached atmospheric temperature.
- L. Pavement Markings:
 - 1. Surface shall be dry, free of oil, and grease, and cleaned of all loose dirt.
 - 2. Paint shall be spray applied to a wet film thickness of 12-15 mils.
 - 3. The paint shall be spray applied in accordance with manufacturer's recommendations.
 - 4. Do not apply paint markings on surfaces that are not dry or if rain is expected within 24 hours.
 - 5. Do not apply paint markings when surface temperature is below 50 degrees F.
 - 6. At sidewalks, and where applicable, use straightedge to provide uniform, clean, and straight stripe.

End of Section

DIVISION 2 - SITE WORK

SECTION 02550 - SANITARY SEWER GRAVITY

Part 1 - General

1.01 Work Included:

- A. All materials, equipment, labor, services and incidentals necessary for the completion of this section of work.
- B. Work specified herein will include installation of sewer service lines, sewer mains, joints, clean outs, and associated testing.
- C. Backfilling shall be accomplished after inspection by the Architect.
- D. Work covered by this section will not be accepted until backfilling connected with the work has been completed satisfactorily.

1.02 Related Work Specified Elsewhere:

- A. Excavation, trenching, and backfilling shall be in accordance with the applicable provisions of Section 02202 - Earthwork for Utilities (except as modified herein).

1.03 Submittals: Contractor shall submit 30 days after date of receipt of notice to proceed, a complete list of materials and equipment showing the types, sizes, catalog number, manufacturer=s name for each of the following items to ensure compliance with the specifications.

1.04 Wye and Service Line Record: The Contractor shall keep a wye record showing the distance in feet from the manhole to each wye or connection placed in the sewer main. A service line record shall be kept showing the length of pipe installed and the location in relationship to the house and wye connection point. The record shall also locate all clean outs and bends. No payment for sewer work will be made until the wye and service line record is furnished to the Architect.

1.05 **Minimum Burial Depth: refer to Plumbing Drawings.**

Part 2 - Products

2.01 Pipes:

- A. PSM Polyvinyl Chloride (PVC) Pipe and Fitting: ASTM D3034; SDR 35.
 - 1. Elastomeric Gaskets for Compression Joints ASTM F477.
- B. Ductile Iron Pipe (Class 52) and Cast Iron Fittings: ASTM A536 with physical properties of Grade 60-42-10.
 - 1. Rubber Gaskets for Compression Joints AWWA Designation C111 (ANSI A21.11).

2.02 Cleanouts: Cleanouts shall be iron ferrule with metal counter sunk screw plugs set in formed square concrete collar. Re: Mechanical.

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SECTION 02550 - SANITARY SEWER GRAVITY

Part 3 - Execution

3.01 Pipe Laying:

- A. Pipe shall be protected during handling against impact shocks and free fall and the pipe interior shall be free of extraneous material.
- B. Pipe laying shall proceed upgrade with bell ends upgrade. Each pipe shall be laid accurately to the line and grade shown on the Drawings. Pipe shall be laid and centered so that the sewer has a uniform invert. The alignment of the installed pipe shall appear straight to the naked eye and shall be such that a full circle of light can be seen between manholes, etc., when sighting along all points of the pipe circumference.
- C. Before making pipe joints all surfaces of the portions of the pipe to be joined shall be clean and dry. Lubricants, primers, and adhesives shall be used as recommended by the pipe manufacturer. The joints shall then be placed, fitted, joined, and adjusted to obtain the degree of water tightness required.
- D. Water and Sewer Line Separation: Where the location of the sewer line is not clearly defined in dimensions on the Drawings, the sewer line shall not be laid closer horizontally than 10 feet from a water line except where the bottom of the water pipe will be at least 12 inches above the top of the sewer pipe, in which case the sewer line shall not be laid closer horizontally than 6 feet from the water pipe. Where water lines cross under gravity flow sewer lines, the sewer pipe for a distance of at least 10 feet each side of the crossing shall be fully encased in concrete or shall be made of pressure pipe with no joint located within 3 feet horizontally of the crossing. Joints in the sewer main, closer horizontally than 3 feet to the crossing, shall be encased in concrete. Where a water main crosses over an existing sanitary sewer main, the sewer line shall be uncovered to its spring line and a concrete cradle constructed for a distance of 10 feet each side of the water main. The water line shall not pass through or come into contact with any part of a sewer manhole.
- E. Trenches shall be kept free of water and as dry as possible during bedding, laying, and jointing and for a long a period as required. When work is not in progress, open ends of pipe and fittings shall be satisfactorily closed so that no trench water or other material will enter the pipe or fittings.
- F. Bedding: Sanitary sewer shall be bedded in crushed stone (ASTM Type 57) from 4 inches below pipe to 4 inches above the pipe. Bedding shall be placed as soon as possible after the joint is made to prevent pipe

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SECTION 02550 - SANITARY SEWER GRAVITY

- movement off line or grade.
- G. Width of Trench: If the maximum width of the trench at the top of the pipe, as specified in Section 02202: Earthwork for Utilities is exceeded for any reason other than by direction, the Contractor shall install at no additional cost to the Government such concrete cradling, pipe encasement, or other bedding as may be required to satisfactorily support the added load of the backfill.
 - I. Joints between different pipe materials shall be made as herein before specified, using approved jointing materials.
 - J. Handling and Storage: Pipe, fittings and joints material shall be handled and stored in accordance with the manufacturer=s recommendations.
 - K. All pipe shall be bedded per Section 02202: Earthwork for Utilities, unless otherwise indicated on the plans or ordered by the Architect.
 - L. Where a project out falls into an existing sanitary sewer, construction of the physical connection to the existing line shall be delayed until all upstream underground construction, including exfiltration testing, is complete and accepted unless special permission is granted by the Architect. Care shall be exercised during construction, flushing and testing operations of this connecting link to assure that water is not diverted into any portion of a sanitary sewer line in service or a sanitary sewer line which is not a portion of the construction project for which the Contractor is responsible.
 - M. No pipe shall be laid when the bottom of the ditch or the sides to one foot above the pipe is frozen. No backfill containing frozen material shall be placed within 3 feet of the pipe, nor shall the trench be left open during freezing weather so that temperatures of the material near the pipe goes below freezing.
- 3.02 Wye Branches: Wye branches shall be installed where sewer connections are indicated or where directed. Cutting into piping, for connections shall not be done except in special approved cases. When conditions are such that the connecting pipe shall be encased in concrete backfill or supported on a concrete cradle as directed. Concrete required because of conditions resulting from faulty construction methods or negligence by the Contractor shall be installed at no cost to the Owner.
- 3.03 Testing:
- A. Alignment and Grade: As the pipe laying progresses, and after partial backfilling, the interior of the sewer shall be visually inspected for alignment and grade, by means of artificial or reflected light. Necessary corrections shall be made by the Contractor at no additional cost to the Owner.

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- B. Sewer and Manholes: Sewer and manholes shall be subject to test for leakage after the lines have been partially backfilled, in accordance with the following:
1. General:
 - a. The Contractor shall clean all sanitary sewer installed, and in addition to this all sanitary sewer pipe shall be flushed. All sand, debris, mortar and other foreign materials shall be removed from sanitary sewer pipe and manholes prior to testing or final inspection.
 - b. All sanitary sewer pipe installed will be subject to either an infiltration test or an exfiltration test. In those areas where, in the opinion of the Architect, the water table is high enough to subject the pipe to a satisfactory infiltration test, it is not anticipated that an exfiltration test will be required. In checking leakage there will be no allowance made for external hydrostatic head.
 - c. Where in the opinion of the Architect, the water table is not high enough to provide a satisfactory infiltration test, an exfiltration test will be required.
 - d. The type of test (either infiltration or exfiltration) shall be determined by the Architect.
 - e. All wyes, tees, or ends of side sewer stubs shall be plugged or capped and the plug or cap shall be securely fastened to withstand the internal test pressures. Such plugs and caps shall be readily removable and their removal shall provide a socket suitable for extending the lateral connection.
 2. Exfiltration Test (Using Water):
 - a. On completion of a section of sanitary sewer between manholes or otherwise, the Architect will require that the ends of all pipe be plugged, including service connections, and the pipe subjected to a hydrostatic pressure. Generally, all testing is to be conducted after backfilling prior to resurfacing and after service connections are made. The lengths of service connections shall be included in the computations to determine the allowable leakage for the test section.
 - b. A minimum head of 6 feet of water above the crown at the upper end of the test section shall be maintained for a period of 4 hours during which time it will be presumed that full absorption of the pipe

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SECTION 02550 - SANITARY SEWER GRAVITY

body has taken place and thereafter for a further period of 1 hour for the actual test leakage. During this 1 hour period the measured loss shall not exceed the rate given in the following formula:

$$E=0.004DL$$

E=Allowable leakage in gallons per hour.

D=Nominal inside diameter of pipe in inches.

L=Length of pipe being tested in feet.

3. Infiltration Test:
 - a. Infiltration testing may be allowed at the Architect's option when the natural ground water table is 6 feet or more above the crown of the higher end of the test section. The maximum allowable limit for infiltration shall be as determined by the Formula $E=0.004DL$.
 - b. The Contractor shall furnish all tools, equipment and labor necessary to complete the tests and shall know from his own observations, or preliminary tests, that each line conforms with this Specification before requesting the Architect to observe and record the actual leakage. The Contracting Officer may require the Contractor to repair obvious leaks even though the total length of the test section falls within the maximum allowable leakage for the test used.
4. Deflection Test: All sanitary sewer must pass deflection test by use of pulled mandrel. Contractor to supply the mandrel to be inspected and approved by engineer. Deflection shall not exceed 5% of pipe diameter. Deflection test to be performed not less than 30 days after final backfilling.
5. Air Testing: Air tests shall be conducted on each manhole-to-manhole section of sewer. The air test shall be performed in accordance with the following specifications:
 - a. **Equipment** - Cherne Air-Loc Equipment as manufactured by Cherne Industrial of Hopkins, Minnesota or approved equal. Equipment used shall meet the following requirements:
 - 1) Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.

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- 2) Pneumatic plugs shall resist internal test pressure without requiring external bracing or blocking.
 - 3) All air used shall pass through a single control panel.
 - 4) Three (3) individual hoses shall be used for the following connections: (a) from the control panel to pneumatic plugs for inflation; (b) from the control panel to sealed line for introducing the low pressure air; and (c) from sealed line to control panel for continually monitoring the air pressure rise in the sealed line.
- b. **Procedures** - All pneumatic plugs shall be seal-tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to twenty-five (25 psig) pounds per square inch gauge. The sealed pipe shall be pressurized to five (5 psig) pounds per square inch gauge. If a ground water level over the top of the pipe is present, the pressure in psig shall be increased by the height of ground water level above top of pipe at upstream manhole divided by two and one third (2.3). The plugs shall hold against this pressure without bracing and without movement of the plugs out of the pipe.

After a manhole reach of pipe has been backfilled and cleaned, and the pneumatic plugs are checked by the above procedures, the plugs shall be placed in the line at each manhole and inflated to twenty-five (25 psig) pounds per square inch gauge. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches four (4 psig) pounds per square inch gauge. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period (three and one half (3.5 psig) pounds per square inch gauge minimum pressure in the pipe), the air hose from the control panel to the air supply shall be disconnected. The portion of the line being tested shall be termed "acceptable" if the time required in minutes for the pressure to decrease from three and one half (3.5) to two and one half (2.5 psig)

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pounds per square inch gauge is not less than that shown in the following table:

Pipe Nominal Size (Inches)	Minimum Test Time (min:sec)	Length for Minimum Time (Feet)
6	2:50	751
8	3:47	564
10	4:43	450
12	5:40	376
15	7:05	302
18	8:30	250
21	9:55	215
24	11:20	188
27	12:45	167
30	14:10	150
33	15:35	138
36	17:00	125
42	19:50	107
48	22:40	94
54	25:30	83
60	28:20	75
66	31:10	68
72	34:00	63
78	36:50	58
84	39:40	54
90	42:35	51
96	45:20	47

For lengths in excess of "Length for Minimum Time" given in table above, additional testing time to be added to the "Minimum Test Time" is determined from the following equation:

$$t = 0.011 (d^2) (L)$$

where t = additional testing time, seconds
 d = nominal pipe diameter, inches
 L = additional length, feet.

If the air leakage in any reach exceeds the allowable, it shall be

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re-tested after the leaks are repaired.

4. The Contractor shall furnish and report on the test results prior to acceptable of the system including the following:
 - a. Date of test.
 - b. Name of person in responsible charge for the tests.
 - c. Segments of pipe tested.
 - d. Outline of test procedures used.
 - e. Elapsed time for container to empty.
 - f. Calculated minimum test duration times and calculated loss rate (exfiltration method).

End of Section

DIVISION 2 - SITE WORK

SECTION 02551 - WATER LINES

Part 1 - General

- 1.01 Work Included: This section covers water distribution lines, water service lines, and connections to buildings services at a point approximately 5 feet outside all buildings and structures to which service is required, complete as indicated on civil Drawings. Pipe and accessories shall be new and unused unless otherwise approved.
- 1.02 Piping for Water Service Lines Less Than 3 Inches in Diameter:
- A. Piping for water service lines less than 3 inches in diameter shall be poly vinyl chloride (PVC) plastic, polyethylene (PE) or copper tubing, unless otherwise shown or specified. Piping for water service lines for sizes 3 inches and larger shall be ductile iron, or poly vinyl chloride (PVC) plastic through 12-inch nominal diameter, unless otherwise shown or specified.
- 1.03 Piping for Water Distribution Lines 3 Inches or Larger: Piping for water distribution lines 3 inches or larger shall be ductile iron, or poly vinyl chloride (PVC) plastic through 12-inch nominal diameter, unless otherwise shown or specified.
- 1.04 Recommendations of the Manufacturer: The Contractor shall, as a part of the shop Drawings, submit to the Architect the manufacturer's recommendations for each material or procedure to be utilized which is required to be in accordance with such recommendations. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times.
- 1.05 Related Work Specified Elsewhere:
- A. Excavation, trenching, and backfilling shall be in accordance with the applicable provisions of Section 02202 -Earthwork For Utilities.
- 1.06 **All water distribution and service lines shall have a burial depth adequate for protection from freezing. The burial depth shall be as indicated on the drawings, and the actual depth shall be approved by the Architect prior to any installation of water lines.**

Part 2 - Products

- 2.01 Pipe:
- A. Copper Tubing: ASTM B88, Type K, annealed.
- B. Ductile-Iron Pipe: ANSI A21.51, working pressure not less than 150 pounds per square inch unless otherwise shown or specified. Pipe shall be cement-mortar lined.
1. Cement-Mortar Lining: ANSI A21.4. Linings shall be standard thickness.
- C. Poly Vinyl Chloride (PVC) Plastic Pipe: All pipe, couplings and fittings shall be manufactured of material conforming to ASTM D1784, Class 150 1245A or 1245B, designated as PVC 1120.

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SECTION 02551 - WATER LINES

- 1. Pipe Less Than 4-Inch Diameter:
 - a. Screw-Joint: Pipe, couplings, and fittings to dimensional requirements of ASTM D1785, with joints meeting requirements of 150 psi working pressure, 200 hydrostatic test pressure, unless otherwise shown or specified. Pipe couplings and fittings must be hydrostatically tested as required by AWWA C900. Screw joints for Schedule 80 pipe only.
 - b. Elastomeric-Gasket Joint: Pipe couplings, and fittings shall be dimensional requirements of ASTM D1785, Schedule 40, with joints meeting the requirements of 150 psi working pressure, 200 hydrostatic test pressure, unless otherwise shown or specified, or it may be pipe, couplings and fittings conforming to requirements of ASTM D2241, elastomeric joint, with the following applications:

Maximum Working <u>SDR</u>	Minimum Hydrostatic <u>Pressure</u>	<u>Pressure</u>
21	120	160
17	150	200
13.5	200	266

In addition to the above requirements the pipe, couplings and fittings must be hydrostatically tested as required by AWWA C900, and must be iron pipe size dimensions.

- 2. Pipe 4-Inch Through 12-Inch Diameter: Pipe, couplings and fittings 4-inch through 12-inch diameter shall conform to the requirements of AWWA C900, Class 150, C.I. pipe dimensions only, elastomeric gasket joint only, unless otherwise shown or specified.
- D. Polyethylene (PE) Pressure Pipe: PE pipe tubing and fittings shall conform to AWWA C901, Type III, Grade 34 Class C material, Dr=7.0 for 160 psi design pressure.

2.02 Joints:

- A. Copper Tubing: Joints shall be compression-pattern flared and shall be made with fittings hereinafter specified.
- B. Ductile-Iron Pipe:
 - 1. Mechanical Joints shall be of the stuffing box type and shall conform to ANSI A21.11 as modified by ANSI A21.51.
 - 2. Push-on joints shall conform to ANSI A21.51.
 - 3. Rubber gaskets and lubricant shall conform to applicable requirements of ANSI A21.11.
- C. Poly Vinyl Chloride Pipe and Polyethylene Pipe: Joints for

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pipe, fittings, and couplings for pipe less than 4-inches in diameter shall be as given in Paragraph 3.07.D.1, and pipe 4-inch through 12-inch diameter shall be as given in Paragraph 3.07.D.2. Joints connecting pipe of differing materials shall be made in accordance with the manufacturer's recommendation as approved by the Architect.

2.03 Fittings and Specials:

- A. For Copper Tubing: Fittings and specials shall be flared and shall conform to ANSI B16.26.
- B. For Ductile-Iron Pipe: Fittings and specials shall be suitable for 150 pounds per square inch pressure rating, unless otherwise specified. Fittings and specials for mechanical joint pipe shall conform to ANSI A21.10. Fittings and specials for use with push on joint pipe shall conform to ANSI A21.10 and ANSI A21.11. Fittings and specials shall be cement-mortar lined in accordance with ANSI A21.4. Linings shall be standard thickness.
- C. For Poly Vinyl Chloride (PVC) Pipe:
 1. For Pipe Less Than 4-Inch Diameter: Screw-joint conforming to the requirements of ASTM D1785, threaded to conform to the requirements of ASTM D2464 for use with Schedule 80 pipe and fittings only, all other pipe less than 4-inch diameter shall be elastomeric-gasket bell and socket fittings with built-in stops, pipe ends tapered to fit the socket or elastomeric-gasket couplings with built-in stops, pipe end tapered to fit the coupling. Gasket shall conform to the requirements of ASTM D1869.
 2. For Pipe 4-Inch Through 12-Inch Diameter: Fittings and specials shall be cast iron, bell end in accordance with ANSI A21.10, 150 pounds per square inch pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer; or may be fittings and specials of the same material as the pipe with elastomeric gaskets, all in conformance with the requirements of AWWA C900. Fittings and specials shall be cement-mortar lined (standard thickness) in accordance with ANSI A21.4. Fittings shall be for bell and spigot pipe or plain end pipe, as applicable.

2.04 Couplings:

- A. Dielectric fittings shall be installed between threaded ferrous and nonferrous metallic pipe, fittings and valves, except where corporation stops join mains. Dielectric fittings shall prevent metal-to-metal contact of dissimilar metallic piping elements and shall be suitable for the required working pressure.

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2.05 Valves:

- A. Gate valves shall conform to AWWA C500 and be designed for a working pressure of not less than 150 pounds per square inch. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. The operating nut or wheel shall have an arrow, cast in the metal, indicating the direction of opening.

- 2.06 Valve Boxes: Valve boxes shall be cast iron. Cast iron boxes shall be extension type with slide-type adjustment and with flared base. The minimum thickness of metal shall be 3/16 inch. The word "WATER" shall be cast in the cover. The boxes shall be of such lengths as will be adapted, without full extension, to the depth of cover required over the pipe at the valve location. Locking covers required.

2.07 Fire Hydrants:

- A. Fire Hydrants shall be 5 1/4" dry barrel, Traffic breakable - AWWA C502, refer to Drawings.

2.08 Miscellaneous Items:

- A. Corporation stops shall have standard corporation stop thread conforming to AWWA C800 on the inlet end, with flanged joints, compression pattern flared tube couplings, or wiped joints for connections to goosenecks.
- B. Goosenecks: Copper tubing for gooseneck connections shall conform to the applicable requirements of ASTM B88, K annealed. Length of cable requirements connections shall be in accordance with standard practice.
- C. Service stops shall be water-works inverted-ground-key type, oval or round flow way, tee handle, without drain. Pipe connections or compression-pattern flared tube couplings, and be designed for hydrostatic test pressure not less than 200 pounds per square inch.
- D. Service boxes shall be cast iron. Extension service boxes of the required length and having either screw or slide-type adjustment shall be installed at all service box locations. The boxes shall have housings of sufficient size to completely cover the service stop and shall be complete with identifying covers.
- E. Disinfection: Chlorinating materials shall conform to:
 - 1. Chlorine, Liquid: AWWA B301.
 - 2. Hypochlorite, Calcium and Sodium: AWWA B300.
- F. Polyethylene Encasement: AWWA C105.

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Part 3 - Execution:

3.01 **Pipe Burial Depth:** refer to Plumbing Drawings.

3.02 **Handling:** Pipe and accessories shall be handled so as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating. If the coating or lining of any pipe or fitting is damaged, the repair shall be made by the Contractor at his expense in a satisfactory manner. No other pipe or material of any kind shall be placed inside a pipe or fitting after the coating has been applied. Pipe shall be carried into position and not dragged. Use of pinch bars and tongs for alining or turning pipe will be permitted only on the bare ends of the pipe. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Government. Rubber gaskets that are not to be installed immediately shall be stored in a cool and dark place. Poly vinyl chloride pipe and fittings shall be handled and stored in accordance with the manufacturer's recommendations. Storage facilities shall be classified and marked in accordance with NFPA 704, with classification as indicated in NFPA 49 and NFPA 325M.

A. Polyethylene encasement shall be used on buried ductile iron piping valves and fittings.

3.03 **Cutting of Pipe:** Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the Architect, cutting shall be done with an approved type mechanical cutter. Wheel cutters shall be used when practicable. Copper tubing shall be cut square and all burrs shall be removed.

3.04 **Adjacent Facilities:**

A. **Sewer Lines:** Where the location of the water pipe is not clearly defined in dimensions on the Drawings, the water pipe shall not be laid closer horizontally than 10 feet from a sewer except where the bottom of the water pipe will be at least 12 inches above the top of the sewer pipe, in which case the water pipe shall not be laid closer horizontally than 6 feet from the sewer. Where water lines cross under gravity-flow sewer lines, the sewer pipe for a distance of at least 10 feet each side of the crossing shall be fully encased in concrete or shall be made of pressure pipe with no joint located within 3 feet horizontally of the crossing. Water lines shall in all cases cross above sewage force mains or inverted siphons and shall be not less than 2 feet above the sewer main. Joints in the

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- sewer main, closer horizontally than 3 feet to the crossing, shall be encased in concrete.
- B. Water lines shall not be laid in the same trench with sewer lines, gas lines, fuel lines, or electrical wiring.
- C. Copper tubing shall not be installed in the same trench with ferrous piping materials.
- D. Nonferrous Metallic Pipe: Where nonferrous metallic pipe, e.g., copper tubing, crosses any ferrous piping material, a minimum vertical separation of 12 inches must be maintained between pipes.

3.05 Joint Deflection:

- A. Ductile-Iron Pipe: The maximum allowable deflection will be as given in AWWA C600. Table 1 shows maximum deflection for 18 feet lengths of pipe. For other lengths the deflection will vary proportionately.

TABLE 1. DEFLECTION IN INCHES

<u>Diameter In Inches</u>	<u>Push-On Joint Pipe</u>	<u>Bell-and-Spigot Joint Pipe</u>	<u>Mechanical Joint Pipe</u>
3	19	22.2	31
4	19	16.7	31
6	19	16.7	27
8	19	14.6	20
10	19	14.0	20
12	19	11.9	20
14	11	10.1	13.5
16	11	8.8	13.5

- B. Poly Vinyl Chloride (PVC) Pipe: Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Architect, but in no case shall it exceed 5 degrees.

- 3.06 Placing and Laying:** Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Under no circumstances shall any of the waterline materials be dropped or dumped into the trench. Care shall be taken to avoid abrasion of the pipe coating. Except where necessary in making connections with other lines or as authorized by the Architect, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and relayed. Pipe that has the grade or shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joining is completed. When work is not in

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progress, open ends, of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by the Contractor at his expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged, or capped and anchored as shown.

- A. Connections: Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. Standards methods are available for making connections to various types of pipe, made under pressure, these connections shall be installed as approved by the Architect.
- B. Pipe passing through walls of valve pits and structures shall be provided with cast-iron wall sleeves. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

3.07 Jointing:

- A. Copper Tubing: Joints shall be made with flared fittings. The flared end tube shall be pulled tightly against the tapered part of the fitting by a nut which is part of the fitting, so there is metal-to-metal contact.
- B. Ductile-Iron Pipe: Mechanical and push-on type joints shall be installed in accordance with AWWA C600, modified as necessary by the recommendations of the manufacturer to provide for special requirements of ductile-iron pipe.
- C. Poly Vinyl Chloride (PVC) Plastic Pipe:
 - 1. Pipe Less Than 4-Inch Diameter: Threaded joints shall be made by wrapping the male threads with approved thread tape or applying an approved thread lubricant, then threading the joining members together. The joint shall be tightened using strap wrenches to prevent damage to the pipe and/or fitting. To avoid excessive torque, joints shall be tightened no more than two threads past hand-tight. Preformed rubber-ring gaskets for elastomeric-gasket joints shall be made in accordance with requirements of AWWA C600 and AWWA C603, as applicable, and as required herein. All pipe ends for push-on joints shall be beveled to facilitate assembly and marked to indicate when the pipe is fully seated. The gasket shall be pre-lubricated to prevent displacement. Care shall be exercised to assure the gasket and ring groove in the bell or coupling match. The manufacturer of the pipe or fitting must also supply the elastomeric gasket. Couplings shall be provided with stops or centering rings to assure that the coupling is centered on the joint.

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- 2. Pipe 4-Inch Through 12-Inch Diameter: Joints shall be elastomeric gasket as specified in AWWA C900. Joints utilizing or requiring solvent-cement will not be accepted. Jointing procedure shall be specified for pipe less than 4-inch diameter with configuration utilizing elastomeric ring gasket.
 - D. Polyethylene Pipe: Joints shall be made in accordance with the recommendations of the manufacturer.
 - E. Connections between different types of pipe and accessories shall be made with transition fittings approved by the Architect.
- 3.08 Service Lines: Service lines shall include the lines to and connections with the building service at a point approximately 5 feet outside the building where such building services are not installed, the Contractor shall terminate the service lines approximately 5 feet from the site of the proposed building at a point designated by the Architect. Such service lines shall be closed with plugs or caps. All services stops and valves shall be provided with extension service boxes of the lengths required by the depth of service line stops or valves. Service lines shall be constructed in accordance with the following requirements:
- A. Service lines 2 inches and smaller shall be connected to the main by a direct-tapped corporation stop or by a service clamp. A corporation stop and a copper gooseneck shall be provided with either type of connection. Maximum sizes for directly-tapped corporation stops and for outlets with service clamps shall be as in Table II.

TABLE II. SIZE OF CORPORATION STOPS AND OUTLETS

<u>Pipe Size Inches</u>	<u>Corporation Stops, Inches For Cast Iron InchesPipe</u>	<u>Outlets W/Service Clamps, Single & Double Straps</u>
3	---	1
4	1	1
6	1-1/4	1-1/2
8	1-1/2	2
10	1-1/2	2
12 & Larger	2	2

Where two or more gooseneck connections to the main are required for an individual service, such connections shall be made with standard branch connections. The total clear area of the branches shall be at least equal to the clear area of the service which they are to supply.

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1. Service lines 1 1/2 inches and smaller shall have a service stop.
 2. Service lines 2 inches in size shall have a gate valve.
 - B. Service lines larger than 2 inches shall be connected to the main by a rigid connection and shall have a gate valve.
- 3.09 Tapped Tees and Crosses: Tapped tees and crosses for future connections shall be installed where shown.
- 3.10 Thrust Blocks: Plugs, caps, tees and bends deflecting 22 1/4 degrees or more, either vertically or horizontally, on water-lines 4 inches in diameter or larger, and fire hydrants shall be provided with thrust blocking, as directed. Thrust blocking shall be concrete of a mix not leaner than 1 cement: 2 1/2 sand: 5 gravel and having a compressive strength of not less than 2,000 pounds per square inch after 28 days. Blocking shall be placed between solid ground and the hydrant or fitting to be anchored. Unless otherwise indicated or directed the base and thrust bearing sides of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair.
- 3.11 Hydrostatic Tests: Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the hydrostatic tests shall not be made until at least 5 days after installation of the concrete thrust blocking unless otherwise approved. The method proposed for disposal of waste water from hydrostatic tests and disinfection shall be submitted to the Architect for approval prior to performing hydrostatic tests.
- 3.12 Pressure Test: After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of water distribution or water service piping shall, unless otherwise specified, be subjected for 1 hour to a hydrostatic pressure test of 150 pounds per square inch. Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, valves, and hydrants shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory. The requirement for the joints to remain exposed for the hydrostatic tests may be waived by the Architect when one or more of the following conditions is encountered:
- A. Wet or unstable soil conditions in the trench.
 - B. Compliance would require maintaining barricades and walkways around and across an open trench in a heavily used area that

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would require continuous surveillance to assure safe conditions.

C. Maintaining the trench in an open condition would delay completion of the contract.

D. An unforeseeable cause which would result in excess cost. The Contractor may request the waiver, setting forth in writing the reasons for the request and stating the alternative procedure proposed to comply with the required hydrostatic tests. Backfill placed prior to the tests shall be placed in accordance with the requirements of Section 02202, Earthwork for Utilities. Piping and specials requiring replacement, as disclosed by the hydrostatic tests, and all work connected therewith, shall be at the Contractor's expense.

3.13 Leakage Test: Leakage test shall be conducted after the pressure test has been satisfactorily completed. The duration of each leakage test shall be at least 2 hours. Test pressure shall be at least 50 psi greater than maximum System pressure (minimum of 100 psi). Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. No piping installation will be accepted until the leakage is less than the number of gallons per hour as determined by the formula.

$$L = 0.00054 ND / P$$

In which L equals the allowable leakage in gallons per hour; N is the number of joints in the length of pipeline tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge. The allowable leakage in gallons per hour, per joint at 100 pounds per square inch average test pressure shall be as in Table III.

TABLE III. ALLOWABLE LEAKAGE, LIMITS

Pipe Diameter (Inches)	Gallons Per Hour
2	0.0108
3	0.0162
4	0.0216
6	0.0324
8	0.0432
10	0.0540

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Should any test of pipe disclose leakage greater than that specified in the foregoing table, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the Government.

- 3.14 Time for Making Test: Except for joint material setting or where concrete reaction backing necessitates a 5-day delay, pipelines jointed with rubber gaskets, mechanical or push-on joints, or couplings may be subjected to hydrostatic pressure, inspected, and tested for leakage at any time after partial completion of backfill.
- 3.15 Concurrent Hydrostatic Tests: The Contractor may elect to conduct the hydrostatic tests using either or both of the following procedures. Regardless of the sequence of tests employed, the results or pressure tests, leakage test, and disinfection shall be satisfactory as specified. All replacement, repair, or retesting required shall be accomplished by the Contractor at no additional cost to the Government.
- A. Pressure test and leakage test may be conducted concurrently.
 - B. Hydrostatic tests and disinfection may be conducted concurrently using the water treated for disinfection to accomplish the hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be reaccomplished.
- 3.16 Disinfection: Before acceptance for potable water operation, each unit of completed water distribution line and water service line shall be disinfected as specified herein. After pressure tests have been made, the unit to be disinfected shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. The chlorinating material shall be either liquid chlorine, calcium hypochlorite, or sodium hypochlorite, conforming to paragraph Products. The chlorinating material shall provide a dosage of not less than 50 parts per million and shall be introduced into the water lines in an approved manner. Poly vinyl chloride (PVC) pipe lines shall be chlorinated using only the above specified chlorinating material in solution. In no case will the agent be introduced into the line in a dry solid state.
- The treated water shall be retained in the pipe long enough to destroy all non-spore-forming bacteria. Except where a shorter period is approved, the retention time shall be at least 24 hours and shall produce not less than 10 p.p.m of chlorine throughout the line at the end of the retention period. All valves on the lines being disinfected shall be opened and closed several times during the contact period. The line shall then be flushed with clean water until the residual chlorine is reduced to less than 1.0 p.p.m. During the flushing period, each fire hydrant on the line shall be opened and closed several times. From several points in the unit,

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the Contractor will take samples of water in properly sterilized containers for bacterial examination. The disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained.

- 3.17 Clean-Up: Upon completion of the installation of the water distribution lines, water service lines, irrigation system, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

End of Section

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SECTION 02741 - HOT MIX ASPHALT PAVING and SEAL COAT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract and Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hot-mix asphalt paving.
 - 2. Hot-mix asphalt patching.
 - 3. Pavement-marking paint.
 - 4. Subgrade modification.
 - 5. Asphalt seal and FOG coat.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork".

1.3 QUALITY ASSURANCE

- A. STATE OF OKLAHOMA, DEPARTMENT OF TRANSPORTATION, Standard Specifications for Construction and Materials, Current standards, as amended to date.
- B. Current ODOT Standards are available at the following website address:
http://www.odot.org/c_manuals/specbook/oe_ss_2009.pdf
- C. 36 CFR 1191 American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines.
- D. American Society of Testing Materials
 - 1. ASTM D-2939 Standard Test Methods Emulsion Bitumen's Use as Protective Coatings
 - 2. ASTM D-3405 Joint Sealant Hot-Applied for Concrete and Asphalt Pavement
 - 3. ASTM D-3320 Emulsified Coal Tar Pitch (Mineral Colloid Type

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SECTION 02741 - HOT MIX ASPHALT PAVING and SEAL COAT

1.4 SYSTEM DESCRIPTION

- A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of standard specifications for patching/repair of existing paving.
- B. Cleaning and preparing the pavement surface, mixing the pavement sealer, and applying asphalt pavement sealer of existing bituminous pavement surfaces.
- C. Restriping parking lot markings for an existing parking lot for maintenance and repair application. Areas to receive parking lot markings are all areas within the property boundary.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties (all test results must be current - within the last 12 months).
- B. Job-Mix Designs: Certification of approval of job mix proposed for the Work (mix must be current - within the last 12 months).
- C. In place material testing procedures - refer to Section 3.11 for testing requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Manufacturer shall be Oklahoma Department of Transportation (ODOT) approved paving-mix manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing

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SECTION 02741 - HOT MIX ASPHALT PAVING and SEAL COAT

manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
 - 1. Prime and Tack Coats: Minimum surface temperature of 40 deg F.
 - 2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 - 3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse and Fine Aggregate: shall be in accordance with the requirements of ODOT Standards for Construction, as amended to date, for hot-mixed asphalt.

2.2 ASPHALT MATERIALS

- A. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-30 or MC-70.
- B. Tack Coat: AASHTO M 140, emulsified asphalt slow setting, diluted in water, of suitable grade and consistency for application - ASHTO MP1.
- C. Water: Potable.

2.3 STABILIZED SUBGRADE MATERIAL

- A. Hydrated Lime Material: Shall meet the requirements of ASTM C 977. Top 8" of substrate shall be amended at a rate of 5 - 7% hydrated lime.
- B. At the time of hydrated lime stabilization placement, the contractor shall coordinate with the testing agency to

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SECTION 02741 - HOT MIX ASPHALT PAVING and SEAL COAT

observe and provide on-site testing during application. This is required to ensure the proper amount of hydrated lime is mixed and the recommended subgrade modification is achieved.

- C. Compact to a minimum 95 percent optimum density in accordance with ASTM D 698, or 92 percent optimum density in accordance with ASTM D 1557, unless otherwise required by the Geotechnical Report which is a part of these Contract Documents.

2.4 AUXILIARY MATERIALS

- A. Joint Sealant: ASTM D 3405 or AASHTO M 301, hot-applied, single-component, polymer-modified bituminous sealant as manufactured by:
 - a. Crafcoc Inc
 - b. W.R. Meadows, Inc.
 - c. Or approved equal
- B. Color: Joint color shall match pavement color. Contractor shall submit color sample to Owner for approval
- C. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

2.5 MIX

- A. Hot-Mix - Hot Lay Asphalt:
 - 1. Oklahoma Department of Transportation (ODOT) Type "A" Asphalt Concrete:

Sieve Size (inch)	Passing (%)
1-1/2"	100
1	90-100
3/4	-
1/2	70-90
3/8	-
No. 4	40-65
No. 10	25-45

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SECTION 02741 - HOT MIX ASPHALT PAVING and SEAL COAT

No. 40 10-26
No. 200 -

Asphalt Cement

% of mix mass 3.8 - 6.5

2. Oklahoma Department of Transportation (ODOT) Type "B"
Asphalt Concrete:

Sieve Size (inch) Passing (%)

1-1/2"	-
1	-
3/4	100
1/2	90-100
3/8	70-90
No. 4	45-70
No. 10	25-50
No. 40	12-30
No. 200	7-20

Asphalt Cement

% of mix mass 4.7 - 7.5

2.6 ASPHALT SEAL AND FOG COAT

- A. SealMaster Polymer Modified Coal Tar Sealer (PMCTS).
- B. Oil Spot Treatment: SealMaster PetroSeal or prep seal oil spot primer as specified by the manufacturer for pavement sealer.
- C. Water.
- D. Aggregate or sand as required and specified by the manufacturer.
- E. Polymer Additive (optional).
- F. Fortifier: water based epoxy-latex additive, designed as a fortifier for refined coal tar emulsions to increase resistance to power steering marks, fuel and chemical effects to assist in fast drying of the coating is acceptable. Thickeners only are not permitted.
- G. Self-propelled squeegee equipment shall have at least 2 squeegee or brush devices to assure adequate distribution and penetration of sealer into the bituminous pavement. Equipment shall have continuous agitation or mixing capabilities to maintain homogenous consistency of pavement sealer mixture

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SECTION 02741 - HOT MIX ASPHALT PAVING and SEAL COAT

throughout the application process. Pressurized spray application equipment shall be capable of spraying pavement sealer with sand added. Equipment shall have continuous agitation or mixing capabilities to maintain homogenous consistency of pavement sealer mixture throughout the application process. Hand squeegee and brushes shall be acceptable only in areas where practicality prohibits the use of mechanized equipment.

- H. Mix Designs:
1. Sealer concentrate - 100 gallon
 2. Silica Sand 400 Meeting 40 to 60 fineness rating (AFS). Black Beauty Slag Sand with comparable sieve rating may be substituted when silica sand is not available.
 3. Water - specified material does not require onsite dilution.
 4. Fortifier 3%.
 5. Curing agents on high traffic areas (when applicable).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads. Contractor shall verify proper moisture.
- B. Proof-roll subbase using a loaded, tandem-axle dump truck weighing at least 25 tons to locate areas that are unstable or that require further compaction. Amend substrate below all paving with lime stabilization as per Geotechnical Report which is a part of this Project Manual, and as described above.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate

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surfaces. Ensure that prepared subgrade is ready to receive paving.

- B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.
 - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 - 2. Protect primed substrate from damage until ready to receive paving.

3.3 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place Type "A" hot-mix asphalt base course in number of lifts (maximum 3-inch lift) and thicknesses required for a total thickness of 5".
 - 2. Place Type "B" hot-mix asphalt surface course in single lift (maximum lift height: 3-inches) for a total thickness of 3".
 - 3. Spread mix at minimum temperature of 250 deg F.
 - 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
 - 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
 - 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap

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previous strips. Complete a section of asphalt base course before placing asphalt surface course.

- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
 1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
 1. Asphalt material behind the laydown machine shall be a minimum of 250°F and complete compaction before mix temperature cools to below 180° F.
 2. Minimum surface temperatures for compacted lift thickness:
 - a. Less than 1-1/2 inch - minimum 50°F
 - b. 1-1/2 inch to 3 inches - minimum 45°F
 3. Steel wheeled compactors shall weigh at least 10 tons (maximum speed 2.50mph)

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4. Pneumatic tired compactors (maximum speed 3mph) shall have at least seven pneumatic tires of equal size and diameter. They shall be constructed so that their total weights shall be varied to produce an operating weight of at least 3,500 pounds per tire.
 5. Use Pneumatic tired rollers on all lifts following the initial roller with a steel roller and before finishing with a steel wheel roller. A minimum of two coverages with the pneumatic tired roller is required on each lift.
 6. Compaction requirements shall be in accordance with the current ODOT standards.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent nor greater than 100 percent.
 2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

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- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

- A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Surface Course: 1/8 inch.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports. Testing agency shall be certified in all ASTM and AASHTO test required for this project.
 - 1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
 - 2. Testing frequency as listed below:

Asphalt Extraction and Gradation	1,000 tons Asphalt Pavement
Roadway Density of Asphalt Mix	4 Per 2,000 Tons Asphalt Pavement (not less than 1 per day of laydown)
Hveem Stability Test and Density of Molded Specimen	1 Per 2,000 Tons Asphalt Pavement
Maximum Theoretical Specific Gravity of Asphalt Mix	1 Per 2,000 Tons Asphalt Pavement

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- B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
 - 1. Tolerance: 1/8 inch in 10 feet
 - 2. All pavement will be subject to straightedge inspection during construction operations. The variation of the surface from the testing edge of the straightedge between any two contacts with the surface shall at no point exceed the tolerance listed above.
- E. In-Place Density: Testing agency will take samples of un-compacted paving mixtures and compacted pavement according to specifications.
 - 1. The target density of each lot shall be 94% of the Maximum Theoretical Specific Gravity at the job mix formula asphalt content determined by the most recent specific gravity of the bituminous paving mixture in accordance with AASHTO T209.
 - 2. The roadway density for each lot will be the average of tests of three separate specimens taken randomly within the limits of the area represented by the lot.
 - 3. Average lot density tolerance: 91% to 97% of Maximum Theoretical Density.
- F. Remove and replace hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.
- G. Coring of pavement: If core drilling is determined necessary, the following will be followed:
 - 1. Minimum of three cores for each section of questionable pavement.
 - 2. Obtain 3-1/2 inch diameter cores.
 - 3. Obtain a length of 1.50 times the diameter.

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4. Condition cores based on current version of ACI 318 and ASTM C 42.

3.7 EXECUTION - PAVEMENT SEALER

- A. Apply pavement sealer when ambient temperature is 50 degrees F and rising for a period of 24 hours after application. Do not apply when temperature is expected to drop below 50 degrees F in a 24-hour period. Do not apply if rain is imminent within 8 hours. Do not apply pavement sealer when ambient temperature is 90 degrees F and above without first cooling the surface with a fine mist of water (fogging). The fogging should only dampen the surface without causing puddling. Between September 15th and May 1st, check the specifications and requirements of the State Department of Transportation WEATHER LIMITATIONS on the permitted dates of applying the seal coats.

B. Surface Preparation:

1. Surface must be free from dirt, dust, and includes grass along the edges. Remove and dispose of any loose and unsuitable materials, dirt, and debris from pavement surface by power blower or mechanical sweeping equipment.
2. Surface hairline cracks up to 0.50" must be filled with crack filler; cracks larger than 0.5" must be cleaned and filled with elastomeric emulsion crack filler.
3. Potholes, alligator areas, and similar surface defects must be cut out and repairs made.
4. Treat all grease, oil, and gasoline spots with compatible primer of the manufactured coating. In hot weather, the surface shall be fogged with water prior to sealing.
5. Prior to spreading pavement sealer, paint all existing paint stripes with black paint.
6. Contractor to dispose of all cans, bags, and leftover materials off-site.

C. Application:

1. Mix pavement sealer in accordance with the manufacturer's procedure to a uniform consistency before using. First and second coat all parking areas at a

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- rate of 13 gallons per square yard per coat. At no time are total coats to exceed 0.51 gallons per square yard.
2. Allow a minimum of 24 hours of curing time before allowing traffic over treated surface or application of traffic marking paint. Use solvent borne paint shall not be permitted.
 3. Lines, stencils, and markings shall be painted as per the Drawings.
 4. It is the Construction Manager's responsibility to check local zoning codes and regulations.
 5. All seal coat and striping projects must be performed during available time periods that do not interfere with other construction operations.

3.8 DISPOSAL

- A. Except for material indicated to be recycled, excessive asphalt, etc. shall be removed from the Project site and legally disposed of.

END OF SECTION

DIVISION 2 - SITE WORK

SECTION 02900 - TURF ESTABLISHMENT

Part 1 - GENERAL

1.01 Summary:

- A. This section generally describes the work, equipment, and materials required to furnish and landscape the site. The Contractor shall provide all necessary labor, equipment and materials to construct and complete site work landscaping. All work shall be completed in conformance with the recommendations of plant material suppliers.
- B. As a minimum, the Contractor must be able to provide the following materials and services:
 - 1. Supply and grade of fill material
 - 2. Environmentally approved control/elimination of weeds/grasses.

1.02 References:

- A. Drawings and general provisions of the Project Manual and Contract, including General and Supplementary Conditions and Division I Specification sections, apply to Work of this Section.

1.03 Submittals:

- A. Architect approval is required. The following shall be provided:
 - 1. Pesticide and Herbicide Treatment Plan, giving proposed sequence of pesticide and herbicide treatment work, before work is started. The pesticide and herbicide trade name, chemical composition, formulation, concentration, application rate of active ingredients and methods of application for all materials furnished, and the name and state license number of the state certified applicator shall be included.
 - 2. Certificates of compliance certifying that materials meet the requirements specified, prior to the delivery of materials. Reports for the following materials shall be included:
 - a. Fertilizer: For chemical analysis and composition percent.
 - b. Pesticide and Herbicide Material: For EPA registration number and registered uses.

1.04 Quality Assurance:

- A. All plant materials shall be guaranteed for one (1) year, following Architect's acceptance of the project.
- B. The Contractor shall maintain the project by weeding, watering, and other tasks as required, through final acceptance of the project by the Owner. Weeds, trimmings, etc. shall be removed from the site on the day work is performed and the area cleaned. Contractor shall immediately replace any and all defective

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components or dead or dying plant materials.

- C. The Architect shall inspect all planting materials upon delivery to the site and reserves the right to reject any or all materials which do not conform to the intent of this specification.

1.05 Delivery, Storage and Handling:

- A. Pesticide and herbicide materials shall be delivered to the site in the original unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration numbers and the registered uses.
- B. Sod not installed on the day of arrival at the site shall be stored and protected in areas designated by the Architect. Sod shall be protected from exposure to wind and shall be shaded from the sun. Covering that will allow air to circulate and prevent internal heat from building up shall be provided. All sod shall be kept in a moist condition by watering with a fine mist spray until planted.
- C. Soil amendments shall be stored in dry locations away from contaminants. Pesticide and herbicide materials shall not be stored with other landscape materials. Storage of materials shall be in areas designated or as approved by the Architect.
- D. Care shall be taken to avoid injury to sod. Materials shall not be dropped from vehicles.

Part 2 - Products

2.01 Materials:

- A. Plants:
 - 1. Turf grass shall be Bermuda sod. Sod shall be freshly cut (no more than 5 days). Water all areas to receive sod 1/4" less than 24 hours prior to installation of new sod. Sod all disturbed and exposed soil within the project limits as indicated on the Drawings.
 - 2. Substitutions will not be permitted without written request from the Contractor for approval by the Architect.
 - 3. Sod shall be grown under climatic conditions similar to those in the locality of the project.

2.02 Topsoil:

- A. Acceptable topsoil includes selectively excavated material that is representative of soils in the vicinity that produces growth of grass typical of the project area. Topsoil should be reasonably free from underlying subsoil, clay lumps, objectionable weeds, litter, brush, matted roots, toxic substances or any material that might be harmful to plant growth or be a hindrance to grading, planting, or maintenance operations. Topsoil shall not contain more than five percent

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by volume of stones, stumps or other objects larger than 3/4 inch in any dimension.

2.03 Fertilizer:

- A. The commercial grade of fertilizer shall be suitable for the locations and season approved by the Architect. The P-N-K content shall be determined on the basis of soil conditions and the plants involved.
- B. Prepackaged fertilizer delivered to the site shall be packaged in new, sealed, clean containers which bear a label fully describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, and the brand name and address of the manufacturer. Bulk fertilizer delivered to the site shall be accompanied with certification describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, and the brand name and address of the manufacturer. No fertilizer which becomes caked or otherwise damaged will be accepted.

2.04 Water:

- A. Water shall not contain elements toxic to plant life.
- B. The Contractor is responsible for ensuring that new lawns are adequately watered at all times.
- C. During prolonged periods of drought, watering guidelines established by local water district shall apply.

Part 3 - Execution

3.01 Examination:

- A. The Architect shall verify the finished grades are as indicated on drawings, and the placing of topsoil and smooth grading has been completed.
- B. The location of underground utilities and facilities shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.02 Site Preparation:

- A. Prior to placing topsoil, the ground surface shall be cleared of all brush, snags, and rubbish.
- B. Previously constructed grades shall be repaired if necessary so that areas to be topsoiled conform to the final grades upon completion of topsoil placement.
- C. The topsoil shall be uniformly distributed on the designated areas and evenly spread to a minimum thickness of 6 inches. The spreading shall be performed in such a manner that planting can proceed with little additional soil preparation or tillage. The surface resulting from topsoiling shall meet the finish surface requirements as specified. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry,

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or in a condition otherwise detrimental to proper grading or the proposed planting.

- D. All topsoiled areas covered by the project shall be uniformly smooth graded. The finished surface shall be reasonably smooth and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations. The finished surface shall be free of depressed areas where water would pond.

3.03 Application of Pesticide Material:

- A. When pesticide becomes necessary to remove a disease or pest, a state-certified applicator shall apply required pesticide in accordance with State EPA label restrictions and recommendations. Hydraulic equipment shall be provided for the liquid application of pesticides with a leak-proof tank, positive agitation methods, controlled application pressure and metering gauges. A pesticide treatment plan shall be provided to the Architect as specified in paragraph SUBMITTALS.

3.04 Restoration and Clean Up:

- A. Planting areas, pavements and facilities that have been damaged from the planting operation shall be restored to original condition at the Contractor's expense.
- B. Excess and waste material from the planting operation shall be removed and disposed of off the site. Adjacent paved areas shall be cleared.

End of Section

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SECTION 02910 - TEMPORARY EROSION CONTROL

Part 1 - General

- 1.01 Work Included: The work under this section of the Specifications shall include all temporary erosion control measures including, but not necessarily limited to, rapid stabilization, rock entrance, silt fence, bale checks, bio rolls, and interim mulch as may be necessary to control soil erosion and sedimentation. The work shall include furnishing all materials, labor and equipment required for the construction and maintenance of erosion and sediment control devices as shown on the Drawings or as directed by the Architect. The work shall also include all inspections and reports as required by the storm water discharge permit for construction activities.
- 1.02 Reference Specifications:
- A. The erosion prevention requirements of the City of Moore shall be considered as a part of this Specification.
 - B. All testing required by the Jurisdiction Having Authority shall be performed by the independent testing laboratory retained by the Contractor. The costs of said testing shall be borne by the Contractor.
- 1.03 Stormwater Pollution Prevention - General Permit: if a Permit is required by the local Jurisdiction Having Authority, it shall be obtained from said authority and all fees and/or costs shall be paid by the Contractor.
- A. The Contractor will furnish a copy of the completed application package and General Permit to the Architect.
 - B. The back and side lot ditches shall be sodded immediately after they have been graded and top soil spread.

Part 2 - Products

- 2.01 Erosion Control Blankets: Erosion control blankets shall conform to applicable requirements.
- 2.02 Silt Fence: refer to the Drawings.
- A. The geotextile fabric shall be free of flaws such as tears or other defects. Any geotextile fabric which becomes damaged shall be replaced. The geotextile fabric shall meet or exceed the following requirements:

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- | | |
|--|---------------------|
| 1. Grab Strength (ASTM D 4632) | 100 lbs. |
| 2. Apparent Opening Size (ASTM D 4751) | 20 - 70 sieve range |
| 3. Width | 36 inches |

Part 3 - Execution

3.01 General:

- A. Temporary erosion control measures such as erosion control blankets, bio rolls, rock entrance, and silt fences shall be coordinated with the site work and turf establishment. No site work will be permitted until ALL necessary temporary erosion control measures are completed and in place in order to prevent excessive soil erosion and subsequent siltation from entering wetlands, streams or storm sewers. The construction of erosion control measures shall not relieve the Contractor of the responsibility for preventing or minimizing the potential for erosion or siltation. The Contractor shall be responsible for all damages and clean up and the costs therefore, resulting from erosion of the soils and any siltation which may occur, regardless of the temporary erosion control measures taken.
- B. The alignment and location of erosion control measures shall be as show on the Drawings or as directed by the Architect. Minimum measures are shown on the Drawings. The Contractor shall incorporate further measures into the work as the Contractor's progress may dictate. Inspections of the temporary erosion control measures and reports thereof, shall be made by the Contractor in accordance with the storm water discharge permit for construction activities.
- C. Structural practices:
 - 1. Perimeter Ditches - Perimeter ditches will be installed to collect runoff from the disturbed area and direct runoff to the sedimentation basin.
- D. Rapid stabilization shall be used in the following areas as well as the areas shown on the Plans.
 - 1. Disturbed areas around culvert inlets and streams.
 - 2. Ditches draining from the construction sites.
 - 3. Disturbed slopes near storm drain inlets.

3.02 Timing of Controls/Measures: Any ditches and stabilized construction entrances shall be constructed prior to grading of any other portions of the site. Areas where construction

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activity temporarily ceases for more than 21 days will be stabilized with a temporary seed and mulch within 14 days of the last disturbance. Once construction activity ceases permanently in an area, that area will be stabilized with permanent sod turf.

3.03 Removal of Temporary Erosion Control: Temporary erosion control devices shall remain in place until the permanent measures (turf establishment) have become established as determined by the Architect. All areas disturbed by the removal of temporary erosion control measures shall receive the same turf establishment as the areas adjacent thereto.

3.04 Installation Requirements:

- A. Bio Rolls shall be installed as required to reduce erosion.
- B. Silt Fence shall be constructed on 2 x 2 wood posts that are spaced no more than 6 feet and embedded no less than 2.0 feet. The geotextile fabric shall be secured to the upstream face of the posts. The geotextile fabric shall be embedded in an anchor trench along the upstream side of the silt fence. The anchor trench shall be 12 inches deep by 12 inches wide and shall extend the full length of the silt fence. The geotextile fabric shall line both sides and the bottom of the anchor trench. The anchor trench shall be backfilled with the excavated material, which shall be firmly compacted into place.
- C. Rate of slurry application shall be variable depending on surface roughness, slope configuration and degree of undulation but it is expected that 6 M gallons per acre. This rate is equivalent to applying Type 6 Hydraulic Soil Stabilizer at 2100 pounds per acre. Amount of material applied shall be such to obtain 100% soil surface coverage. In inaccessible areas, the mix may be pumped through a hose. To obtain coverage, two (2) passes may be necessary. In inaccessible areas, the mix may be pumped through a hose.

3.05 Maintenance:

- A. It shall be the Contractor's responsibility to maintain all erosion control measures and to inspect same after each rainfall event. All displaced bio rolls shall be replaced and silt fences shall be repaired where sagging or otherwise damaged. The Contractor shall review the temporary erosion control measures and make revisions as necessary in order to minimize damage due to future rainfalls. All costs of temporary erosion control shall be considered incidental and the responsibility of the Contractor.
- B. The rock entrances may need occasional maintenance to prevent the tracking of mud onto paved roads. This may

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require periodic top-dressing with additional rock or removal and reinstallation of the entrances. The cost of maintenance of rock entrances shall be the responsibility of the Contractor.

3.06 Waste Disposal:

A. Waste Materials: All waste materials will be disposed of as described in the "Construction Storm Water Pollution Prevention Plan".

3.07 Offset Vehicle Tracking: One (1) stabilized construction entrances shall be constructed to help reduce vehicle tracking of sediments. The paved parking lot adjacent to the site entrance shall be swept as needed to remove any excess mud, dirt or rock tracked from the site. Dump trucks hauling material from the construction site shall be covered with a tarp.

3.08 Maintenance/Inspection Procedures:

A. Erosion and Sediment Control Inspection and Maintenance Practices:

1. All control measures will be inspected at least once each week and following any storm event of 0.5 inches or greater.
2. All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of report.
3. Build up sediment will be removed from silt fence when it has reached one-third the height of the fence.
4. Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
5. Ditches will be inspected and any erosion promptly repaired.

B. Non-Storm Water Discharges: All non-storm water discharges will be directed to a location selected by the Contractor and approved by the Architect. It is expected that the following non-storm water discharges will occur from the site during the construction period:

1. Water from water line flushing.
2. Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
3. Uncontaminated groundwater (from dewatering excavation).

3.09 Spill Prevention:

A. Material Management Practices.

The following good housekeeping practices shall be followed onsite during the construction project.

1. Good Housekeeping:

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The following good housekeeping practices shall be followed onsite during the construction project:

- a. An effort shall be made to store only enough product required to do the job.
 - b. All materials stored onsite shall be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
 - c. Products shall be kept in their original containers with the original manufacture's label.
 - d. Substances shall not be mixed with one another unless recommended by the manufacturer.
 - e. Whenever possible, all of a product shall be used up before disposing of the container.
 - f. Manufacturers' recommendations for proper use and disposal shall be followed.
 - g. The site superintendent shall inspect daily to ensure proper use and disposal of materials onsite.
2. Hazardous Products: These practices are used to reduce the risks associated with hazardous materials.
- a. Products shall be kept in original containers unless they are not re-sealable.
 - b. Original labels and material safety data shall be retained; they contain important product information.
 - c. If surplus product must be disposed of, manufactures' or Local and State recommended methods for proper disposal shall be followed.
- B. Product Specific Practices: The following project specific practices shall be followed onsite:
1. Petroleum Products:
All onsite vehicles shall be monitored for leaks and receive regular preventative maintenance to reduce the change of leakage. Petroleum products shall be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite shall be applied according to the manufacturer's recommendations.
 2. Fertilizers:
Fertilizers used shall be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked into the soil to limit exposure to storm water. Storage shall be in a covered shed. The contents of any partially used

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bags of fertilizer shall be transferred to a sealable plastic bin to avoid spills.

3. Paints:

All containers shall be tightly sealed and stored when not required for use. Excess paint shall not be discharged to the storm sewer system but shall be properly disposed of according to manufactures' instructions or State and Local regulations.

4. Concrete Trucks:

Concrete trucks shall not be allowed to wash out or discharge surplus concrete or drum wash water on the site.

C. Spill Control Practices:

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices shall be followed for spill prevention and cleanup:

1. Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
2. Materials and equipment necessary for spill cleanup shall be kept in the material storage area onsite. Equipment and materials shall include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
3. All spills shall be cleaned up immediately after discovery.
4. The spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
5. Spills of toxic or hazardous material shall be reported to the appropriate State or Local government agency, regardless of the size.
6. The spill prevention plan shall be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures shall also be included.

End of Section

DIVISION 2 - SITE WORK

SECTION 02920 - LANDSCAPE GRADING

Part 1 -General

1.01 Summary:

- A. This section describes the labor, materials and installation requirements necessary to complete the fine grading, incidental grading, and related items as indicated or specified.

1.02 Site Conditions:

- A. Protect landscaping and other features remaining as final work.
- B. Protect any existing structures, roads, sidewalks, paving and curbs, or other features pertinent to the site in this project.

Part 2 - Products NOT USED

Part 3 - Execution

3.01 Examination:

- A. The areas to be graded will be free of waste or debris developed by other trades.
- B. Contractor shall field verify all dimensions and/or layout prior to starting work.

3.02 Preparation:

- A. Prepare site by applying Round Up, or approved equal, as per label directions to weed growth on site.
 - 1. Scarify planting areas to a minimum depth of six (6) inches and thoroughly water to settle all soil.

3.03 Grading:

- A. Contractor shall grade all planting areas, swales or other areas as noted on drawings.
 - 1. Contractor shall provide incidental grading of all areas adjacent to curbs and sidewalks. Provide a finish grade one (1") inch below curbs or sidewalks.
 - 2. Contractor shall fine grade turf areas, eliminating rough or low areas to ensure positive drainage.
 - 3. Any other areas not covered specifically above shall be graded to leave a generally smooth appearance conforming to standard landscape practices defined as: The final surface shall be raked; all objectionable materials, trash, brush, weeds, and stones larger than one inch shall be removed from the site and disposed of properly off base.
 - 4. When sod is being installed, the appropriate sub-grade shall be graded prior to the installation of such materials. See applicable specifications, in any, for additional requirements.

End of Section

DIVISION 3 - CONCRETE

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 Section Includes

- A. Concrete formwork.
- B. Slabs on grade.
- C. Concrete foundation walls and retaining walls.
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads and equipment pits.
- G. Concrete curing.

1.02 Related Requirements

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints, construction joints and isolation joints in slabs.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
- C. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- D. ACI 301 - Specifications for Structural Concrete.
- E. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
- F. ACI 302.2R - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
- G. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- H. ACI 305R - Guide to Hot Weather Concreting.
- I. ACI 305.1 - Specification for Hot Weather Concreting.
- J. ACI 306R - Guide to Cold Weather Concreting.
- K. ACI 308R - Guide to External Curing of Concrete.
- L. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
- M. ACI 347R - Guide to Formwork for Concrete.
- N. ACI SP-66 - ACI Detailing Manual.
- O. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- P. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

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- Q. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- R. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
- S. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- T. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- U. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- V. ASTM C150/C150M - Standard Specification for Portland Cement.
- W. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- X. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- Y. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
- Z. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
- AA. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- AB. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
- AC. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
- AD. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
- AE. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- AF. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
- AG. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- AH. CRSI (DA4) - Manual of Standard Practice.
- AI. ICC (IBC)-2015 - International Building Code.

1.04 Definitions

- A. Cold Weather: A period when for more than three successive days the average daily outdoor temperature drops below 40 F. The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight. When temperatures above 50 F occur during more than half of any 24 hr duration, the period shall no longer be regarded as cold weather.

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- B. Hot Weather: Hot weather is any combination of the following conditions that tends to impair the quality of freshly mixed or hardened concrete by accelerating the rate of moisture loss and rate of cement hydration, or otherwise causing detrimental results:
 - 1. High ambient temperature
 - 2. High concrete temperature
 - 3. Low relative humidity
 - 4. Wind speed
 - 5. Solar radiation

1.05 Submittals

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 26 - Concrete Documents and Inspection.
- D. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
- E. Test Reports: Submit report for each test or series of tests specified.
- F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- G. Formwork Design Submittal: As required by authorities having jurisdiction.
- H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
- I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 Quality Assurance

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

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- D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for placement as required by the manufacturer's warranty.

1.07 Warranty

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- C. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
 - 1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
 - 2. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.

PART 2 PRODUCTS

2.01 Formwork

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces of trenched footings unless expressly allowed in the General Notes in the structural drawings. Natural rock formations that maintain a stable vertical edge may be used as side forms for below-grade concrete.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 4. Form Ties: Cone snap type that will leave no metal within the clear cover zone of the concrete surface as specified in the Minimum Concrete Cover for Cast-in-Place Non-Prestressed Members table included in the General Notes of the structural drawings.

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2.02 Reinforcement Materials

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars, weldable.
 - 1. Unfinished.
- C. Reinforcement Accessories:
 - 1. Joint Dowel Bars: ASTM A615/A615M, Grade 60 (60,000 psi) plain-steel bars, cut true to length with ends square and free of burrs.
 - 2. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 3. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - a. Continuous slab bolsters shall be used to support the bottom reinforcing bars of all reinforced slabs-on-grade.
 - 4. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement of reinforcing steel within 1-1/2 inches of weathering surfaces and for concrete surfaces that will be exposed to view.
- D. Fabrication of Reinforcing:
 - 1. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
 - 2. Welding of reinforcement is permitted only with the specific approval of Architect/Engineer. Perform welding in accordance with AWS D1.4/D1.4M.
 - 3. Locate reinforcing splices not indicated on drawings at point of minimum stress.

2.03 Concrete Materials

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 Admixtures

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- D. Water Reducing Admixture: ASTM C494/C494M Type A.

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- E. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission with no adverse effect on concrete properties or finish flooring.
 - 1. Provide admixture in slabs to receive adhesively applied flooring.
 - 2. Manufacturers:
 - a. Barrier One, Inc; Barrier One Moisture Vapor Reduction Admixture: www.barrierone.com/#sle.
 - b. Substitutions: Substitutions shall comply with the use of concrete staining/dye products. See Section 01 6000 - Product Requirements.
- 2.05 Accessory Materials
- A. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Grout: Comply with ASTM C1107/C1107M.
- 2.06 Bonding And Jointing Products
- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
 - B. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.
 - C. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.
 - D. Slab Isolation Joint Filler: 1/2 inch (13 mm) thick, height equal to slab thickness.
 - 1. Material: ASTM D1751, cellulose fiber.
- 2.07 Evaporation Retarders
- A. Evaporation Retarder: Liquid thin film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement. These products provide a protective film shield over plastic concrete, dissipate as soon as the concrete is no longer plastic, and are not curing products.
 - 1. Manufacturers:
 - a. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.
 - b. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
 - c. W. R. Meadows, Inc ; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

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2.08 Curing Materials

- A. Moisture-Retaining Sheet: ASTM C171.
 - 1. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 - 2. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- B. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- C. Water: Potable, not detrimental to concrete.

2.09 Concrete Mix Design

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- D. Normal Weight Concrete: Refer Structural General Notes for mix requirements for various classes of concrete.

2.10 Mixing

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 Examination

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 Preparation

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent according to bonding agent manufacturer's instructions.

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1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 2. Use latex bonding agent only for non-load-bearing applications.
- E. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.
- F. In locations where new concrete is doweled to existing work, drill holes in existing concrete, clean out drilled holes, inject the adhesive indicated on drawings and/or General Notes, and insert steel dowels, all in accordance with adhesive manufacturer's installation instructions.
- G. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade in accordance with manufacturer's instructions, ASTM E1643, ASTM F710 and ACI 302.2R.
1. Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
 2. Lap vapor retarder sheet over footings and seal to previously placed concrete foundations.
 3. Lap joints minimum 6 inches (150 mm).
 4. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.
 5. No penetration of vapor retarder is allowed except for reinforcing steel and permanent utilities.
 6. Repair damaged vapor retarder before covering with other materials.
 7. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
- 3.03 Installing Reinforcement And Other Embedded Items
- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
 - B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
 - C. Verify that anchors, seats, plates, reinforcement, waterstops and other items to be cast into concrete are

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accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 Placing Concrete

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 48 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- G. Finish slab-on-grade and shored elevated floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 Slab Jointing

- A. Locate and install joints as indicated on drawings and Slab-On-Grade Schedule or as submitted by Contractor and approved by structural engineer.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- E. Saw Cut Contraction Joints: Saw cut joints shall be installed with early-entry dry-cut saw before concrete begins to cool, within 1 to 4 hours after completing the slab finishing operations; commence in approximately 1 hour in hot weather or approximately 4 hours in cold weather. Use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab. Refer to Slab-On-Grade Schedule in drawings for additional requirements.

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3.06 Floor Flatness And Levelness Tolerances

- A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for compliance with specified tolerances.
- B. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
 - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
 - 3. Under Carpeting: 1/4 inch in 10 feet.
- C. Correct the slab surface if surface variations exceed specified tolerances.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 Concrete Finishing

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
 - 3. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.
 - 4. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

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- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal (approximately 1/8 inch per foot).

3.08 Curing And Protection

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Uniformly apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss due to evaporation approaching 0.2 lb/sq.ft./h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing. A methodology for calculating the moisture loss due to evaporation is provided in ACI 305.1.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than seven (7) days.
- D. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- E. Surfaces Not in Contact with Forms:
 - 1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than seven (7) days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for seven (7) days.
 - b. Spraying: Spray water over floor slab areas and maintain wet.
 - c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
 - 2. Final Curing: The surface shall be protected against rapid moisture loss upon the termination of initial curing by replacing wet burlap or similar coverings with plastic sheets until the surface has dried under the sheets.
 - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.

3.09 Field Quality Control

- A. An independent testing agency will perform Special Inspections and field quality control tests as required by

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Chapter 17 of ICC (IBC)-2015. The testing outlined below includes some, but not all, of the testing and observations required to meet the Special Inspection provisions of the building code. Refer to the following parts of the structural drawings for additional Special Inspection requirements:

1. Statement of Special Inspection Notes
 2. Table 1705.3 titled "Required Special Inspections and Tests of Concrete Construction"
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - C. Submit approved mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 - D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
 - E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure four concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed each day.
 - F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
 - H. Air Content: ASTM C173/C173M, one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - I. Concrete Temperature: ASTM C1064/C1064M, one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 - J. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.
- 3.10 Defective Concrete
- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
 - B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
 - C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

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D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 Protection

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

DIVISION 5 - STRUCTURAL STEEL

SECTION 05120 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 Section Includes

- A. Structural steel framing members.
- B. Base plates, shear stud connectors and anchor rods.
- C. Grouting under base plates.

1.02 Related Requirements

- A. Section 05 2100 - Steel Joist Framing.
- B. Section 05 3100 - Steel Decking: Support framing for small openings in deck.
- C. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. AISC (MAN) - Steel Construction Manual.
- C. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.
- D. AISC 360 - Specification for Structural Steel Buildings.
- E. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
- F. ASTM A29/A29M - Standard Specification for Steel Bars, Carbon Alloy, Hot-Wrought, General Requirements.
- G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- K. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- L. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- M. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- N. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
- O. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts (Metric).

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- P. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 - Q. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.
 - R. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - S. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
 - T. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film.
 - U. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments.
 - V. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry.
 - W. ASTM E709 - Standard Guide for Magnetic Particle Testing.
 - X. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions.
 - Y. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
 - Z. ASTM F1852 - Standard Specification for "Twist Off" Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - AA. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - AB. AWS D1.1/D1.1M - Structural Welding Code - Steel.
 - AC. ICC (IBC)-2015 - International Building Code.
 - AD. MPI #79 - Primer, Alkyd, Anti-Corrosive for Metal.
 - AE. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections.
 - AF. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").
 - AG. SSPC-SP 3 - Power Tool Cleaning.
 - AH. SSPC-SP 6 - Commercial Blast Cleaning.
- 1.04 Submittals
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections.
 - 3. Indicate cambers and loads.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

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- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
 - D. Product Data: For shop primers, include manufacturer's technical information including basic materials analysis and application instructions.
 - E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
 - F. Delegated Connection Design Submittal: Provide delegated connection design submittals as required by the General Notes included in the Project Drawings.
 - G. Erection Sequence: Provide erection sequence submittal as required by the General Notes included in the Project Drawings.
- 1.05 Quality Assurance
- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
 - B. Fabricator Qualifications:
 - 1. A steel fabricator specializing in performing the work of this section with minimum 10 years of experience.
 - C. Erector Qualifications:
 - 1. An erector specializing in performing the work of this section with minimum 5 years of experience.
 - D. Delegated Connection Designer Qualifications: Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of steel connections and licensed in the State in which the Project is located.
- 1.06 Delivery, Storage And Handling
- A. Comply with the requirements of the General Conditions and of ASTM A6/A6M, including the following.
 - B. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
 - C. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.

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3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.01 Materials

- A. Steel Angles, Plates, and Channels: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.
- D. Pipe: ASTM A53/A53M, Grade B, Finish black.
- E. Headed Stud Anchors: AWS D1.1 Type B, ASTM A29 Grades 1010 through 1020.
- F. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M, Class C.
- G. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade C heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
- H. Tension Control Bolts: Twist-off type: ASTM F1852.
- I. Unheaded Anchor Rods: ASTM F1554, Grade 55, Supplementary Requirement S1, Weldable, plain, with matching ASTM A563 or ASTM A563M nuts and ASTM F436/F436M Type 1 washers.
- J. Deformed Bar Anchors: AWS D1.1/D1.1M Type C, ASTM A1064 Grade 70.
- K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- L. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 1. Minimum Compressive Strength at 48 Hours: 3000 pounds per square inch.
 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
 3. Height Change, Plastic State; when tested according to ASTM C827/C827M:
 - a. Maximum: Plus 4 percent.
 - b. Minimum: Plus 1 percent.
- M. Shop and Touch-Up Primers: As required below, complying with VOC limitations of authorities having jurisdiction.
 1. Steel Exposed to Exterior Weather or an Uncontrolled Environment: Two-component, high performance, zinc-rich, aromatic urethane, compatible with topcoat and complying with SSPC-Paint 20.

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2. Interior Steel: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI #79 and compatible with topcoat.
 - N. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- 2.02 Fabrication
- A. Shop fabricate to greatest extent possible. Fabricate according to AISC 303 and to AISC 360.
 - B. Fabricate connections for bolt, nut, and washer connectors.
 - C. Develop required camber for members.
 - D. Fabricated uncambered beams with rolling camber up.
- 2.03 Finish
- A. Prepare structural component surfaces in accordance with SSPC-SP3 for interior steel or SSPC-SP6 for all steel exposed to exterior weather or an uncontrolled environment.
 - B. Shop prime structural steel members:
 1. Do not prime surfaces that will be galvanized, fireproofed, field welded, in contact with concrete, or [in slip surfaces of slip-critical connections].
 2. All steel exposed to exterior weather or an uncontrolled environment shall be blast cleaned and primed with a submitted and approved zinc-rich primer.
 3. Interior steel shall be shop primed with the fabricators standard shop primer.
 - C. Galvanize structural steel members to comply with ASTM A123/A123M.
- 2.04 Source Quality Control & Quality Assurance
- A. Unless the fabricator is designated an AISC-Certified Plant, Category STD, or is accredited by the IAS Fabricator Inspection Program for Structural Steel, an independent testing agency will perform Special Inspections and field quality control and quality assurance tests in the fabricator's shop as required by Chapter 17 of ICC (IBC)-2015 and Chapter N of AISC 360. Refer to the following parts of the structural drawings for additional Special Inspection requirements.
 1. Statement of Special Inspection Notes
 2. Two tables titled "Required Verification and Inspection of Steel Construction"

PART 3 - EXECUTION

3.01 Examination

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

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3.02 Erection

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing. Refer to the "Construction Loads and Stability" section of the General Notes in the Project Drawings for additional information and requirements.
- C. Field weld components, deformed bar anchors and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".
- E. Do not field cut or alter structural members without approval of Structural Engineer.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 Field Quality Control & Quality Assurance

- A. An independent testing agency will perform Special Inspections and field quality control and quality assurance tests as required by Chapter 17 of ICC (IBC)-2015 and Chapter N of AISC 360. Refer to the following parts of the structural drawings for additional Special Inspection requirements:
 - 1. Statement of Special Inspection Notes
 - 2. Two tables titled "Required Verification and Inspection of Steel Construction"

END OF SECTION

DIVISION 5 - STRUCTURAL STEEL

SECTION 05310 - STEEL DECKING

PART 1 - GENERAL

1.01 Section Includes

- A. Roof deck.
- B. Supplementary framing for openings up to and including 8 inches.
- C. Bearing plates and angles.

1.02 Related Requirements

- A. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 8 inches.
- B. Section 05 2100 - Steel Joist Framing: Support framing for openings larger than 8 inches.
- C. Section 05 5000 - Metal Fabrications: Steel angle at deck edges.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- F. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel.
- G. ICC (IBC)-2015 - International Building Code.
- H. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks.
- I. SDI (QA/QC) - Standard for Quality Control and Quality Assurance for Installation of Steel Deck.
- J. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

1.04 Submittals

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- D. Submit manufacturer's installation instructions.

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- E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- 1.05 Quality Assurance
- A. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck shall be in accordance with the quality assurance inspection requirements of SDI (QA/QC).
 - B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience.
- 1.06 Delivery, Storage, And Handling
- A. Cut plastic wrap to encourage ventilation.
 - B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 - PRODUCTS

- 2.01 Steel Deck
- A. Roof Deck: Non-composite type, dovetail steel sheet:
 - 1. Galvanized Steel Sheet: ASTM A653, Structural Steel (SS) Grade 40, with G60 galvanized coating.
 - 2. Structural Properties: As indicated in General Notes.
- 2.02 Accessory Materials
- A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.
 - B. Welding Materials: AWS D1.1/D1.1M.
 - C. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
 - D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
 - E. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- 2.03 Fabricated Deck Accessories
- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 20 gauge, 0.0359 inch thick sheet steel; of profile and size as indicated; finished same as deck.
 - B. Roof Sump Pans: Formed sheet steel, 14 gauge, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.

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SECTION 05310 - STEEL DECKING

PART 3 - EXECUTION

3.01 Examination

- A. Verify existing conditions prior to beginning work.

3.02 Installation

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 2 inch bearing at discontinuous ends of deck and minimum 3 inch bearing length of continuous roof deck over interior supports.
- D. Fasten deck to steel support members as indicated at spacings indicated on the drawings using methods specified.
- E. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
- F. Where roof deck changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Attach both sides of cover plate to roof deck below with the same fasteners and spacings as required for deck to supports.
- G. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
- H. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

3.03 Field Quality Control

- A. An independent testing agency will perform Special Inspections and field quality control tests as required by Chapter 17 of ICC (IBC)-2015 and SDI (QA/QC). Refer to the following parts of the structural drawings for additional Special Inspection requirements:
 - 1. Statement of Special Inspection Notes
 - 2. Table titled "Required Inspection of Cold-Formed Steel Deck"
- B. Concurrent with the submittal of special inspection reports to the Owner's Representative, the special inspector shall submit to the Owner's Representative and the Installer a list of nonconforming items.

END OF SECTION

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.01 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 Summary

- A. This Section includes the following:
 - 1. Exterior and interior non-load-bearing wall framing.
 - 2. Soffit joist framing.
- B. Related Sections include the following:
 - 1. Division 5 Section "Metal Fabrications" for masonry shelf angles and connections.
 - 2. Division 9 Section "Gypsum Board Assemblies" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

1.03 Performance Requirements

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: Design loads shall be calculated components and cladding load per ASCE/SEI 7 edition indicated on the drawings.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/600 of wall height at areas backing up brick veneer, and 1/240 of wall height at areas backing up other materials.
 - b. Soffit Joist Framing: Vertical deflection of 1/240 of the span.
 - 3. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1 inch.
- B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
 - 2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

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SECTION 05400 - COLD-FORMED METAL FRAMING

1.04 Submittals

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - 1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Research/Evaluation Reports: For cold-formed metal framing.

1.05 Quality Assurance

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
 - 2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

1.06 Delivery, Storage, And Handling

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

PART 2 - PRODUCTS

2.01 Manufacturers

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
1. Allied Studco.
 2. AllSteel Products, Inc.
 3. California Expanded Metal Products Company.
 4. Clark Steel Framing.
 5. Consolidated Fabricators Corp.; Building Products Division.
 6. Craco Metals Manufacturing, LLC.
 7. Custom Stud, Inc.
 8. Dale/Incor.
 9. Design Shapes in Steel.
 10. Dietrich Metal Framing; a Worthington Industries Company.
 11. Formetal Co. Inc. (The).
 12. Innovative Steel Systems.
 13. MarinoWare; a division of Ware Industries.
 14. Quail Run Building Materials, Inc.
 15. SCAFCO Corporation.
 16. Southeastern Stud & Components, Inc.
 17. Steel Construction Systems.
 18. Steeler, Inc.
 19. Super Stud Building Products, Inc.
 20. United Metal Products, Inc.

2.02 Materials

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: ST33H (ST230H).
 2. Coating: G60 (Z180).
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 50 (340), Class 1 or 2.
 2. Coating: G90 (Z275).

2.03 Exterior Non-Load-Bearing Wall Framing

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0428 inches (1.09 mm).
 2. Flange Width: 1-5/8 inches (41 mm).

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SECTION 05400 - COLD-FORMED METAL FRAMING

- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0538 inches (1.37 mm)
 - 2. Flange Width: 1-1/2 inches.
- C. Vertical Deflection Clip Option: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dietrich Metal Framing; a Worthington Industries Company.
 - b. MarinoWare, a division of Ware Industries.
 - c. SCAFCO Corporation
 - d. The Steel Network, Inc.
- D. Single Deflection Track Option: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
 - 2. Flange Width: 1 inch (25 mm) plus the design gap for 1-story structures and 1 inch (25 mm) plus twice the design gap for other applications.
- E. Double Deflection Track Option: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 - 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
 - b. Flange Width: 1 inch (25 mm) plus the design gap for 1-story structures and 1 inch (25 mm) plus twice the design gap for other applications.
 - 2. Inner Track: Of web depth indicated, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
 - b. Flange Width: Equal to sum of outer deflection track flange width plus 1 inch.

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2.04 Soffit Joist Framing

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depth indicated, unpunched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: As indicated on drawings.
 - 2. Flange Width: 1-5/8 inches (41 mm) minimum.

2.05 Framing Accessories

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.
 - 8. Stud kickers, knee braces, and girts.
 - 9. Joist hangers and end closures.
 - 10. Hole reinforcing plates.
 - 11. Backer plates.

2.06 Anchors, Clips, And Fasteners

- A. Anchor Bolts: ASTM F 1554, Grade 55, threaded carbon-steel headless bolts, with encased end threaded, and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C or mechanically deposition according to ASTM B 695, Class 50.
- B. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- C. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- D. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- E. Welding Electrodes: Comply with AWS standards.

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2.07 Miscellaneous Materials

- A. Galvanizing Repair Paint: ASTM A 780.
- B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
- C. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
- D. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.08 Fabrication

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
 - 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening

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requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.01 Examination

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Installation, General

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
 1. Cut framing members by sawing or shearing; do not torch cut.
 2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for

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which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation, specified in Division 7 Section "Building Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 Exterior Non-Load-Bearing Wall Installation

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to bottom track, unless otherwise indicated. Fast both flanges to top track if required by deflection option selected. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406 mm).
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Single Deflection Track Option: Install single-leg deflection tracks and anchor to building structure.
 - 2. Double Deflection Track Option: Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Deflection Clip Option: Connect vertical deflection clips to infill studs and anchor to building structure.

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- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - 1. Top Bridging for Single Deflection Track Option:
Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - a. Install solid blocking at maximum 96-inch (2440-mm) centers and as shown on approved Shop Drawings.
 - 2. Bridging Options:
 - a. Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - b. Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - c. Proprietary bridging bars installed according to manufacturer's written instructions.
 - F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.
- 3.04 Joist Installation
- A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.
 - B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
 - 1. Unless shown otherwise in drawings, install joists over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).
 - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on drawings.
 - C. Space joists not more than 2 inches (51 mm) from abutting walls, and as follows:
 - 1. Joist Spacing: As indicated.

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

- D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.
 - E. Install bridging at intervals indicated. Fasten bridging at each joist intersection as follows:
 - 1. Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
 - F. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.
- 3.05 Field Quality Control
- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - B. Field and shop welds will be subject to testing and inspecting.
 - C. Testing agency will report test results promptly and in writing to Contractor and Architect.
 - D. Remove and replace work where test results indicate that it does not comply with specified requirements.
 - E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 3.06 Repairs And Protection
- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
 - B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensures the cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

DIVISION 5 - STRUCTURAL STEEL

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.01 Section Includes

- A. Shop fabricated steel items.

1.02 Related Requirements

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 05 2100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
- E. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
- F. Section 05 5100 - Metal Stairs.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- K. MPI #79 - Primer, Alkyd, Anti-Corrosive for Metal.
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

DIVISION 5 - STRUCTURAL STEEL

SECTION 05500 - METAL FABRICATIONS

1.04 Submittals

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
 - a. Include the following, as applicable:
 - 1) Design criteria.
 - 2) Engineering analysis depicting stresses and deflections.
 - 3) Member sizes and gauges.
 - 4) Details of connections.
 - 5) Support reactions.
 - 6) Bracing requirements.

PART 2 - PRODUCTS

2.01 Materials - Steel

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- F. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Shop and Touch-Up Primer: As required below, complying with VOC limitations of authorities having jurisdiction.
 - 1. Steel Exposed to Exterior Weather or an Uncontrolled Environment: Two-component, high performance, zinc-rich, aromatic urethane, compatible with topcoat and complying with SSPC-Paint 20.
 - 2. Interior Steel: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI #79 and compatible with topcoat.

DIVISION 5 - STRUCTURAL STEEL

SECTION 05500 - METAL FABRICATIONS

- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- 2.02 Fabrication
- A. Fit and shop assemble items in largest practical sections, for delivery to site.
 - B. Fabricate items with joints tightly fitted and secured.
 - C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
 - D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- 2.03 Fabricated Items
- A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking and joists; prime paint finish.
 - B. Lintels: As detailed; prime paint finish.
 - C. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.
 - D. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.
 - E. Toilet Partition Suspension Members: Steel channel sections; prime paint finish.
- 2.04 Finishes - Steel
- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
 - B. Prepare surfaces to be primed in accordance with SSPC-SP3 for interior steel or SSPC-SP6 for all steel exposed to exterior weather or an uncontrolled environment.
 - C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
 - D. Prime Painting: One coat.
 - E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
 - F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
- 2.05 Fabrication Tolerances
- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
 - B. Maximum Offset Between Faces: 1/16 inch.

DIVISION 5 - STRUCTURAL STEEL

SECTION 05500 - METAL FABRICATIONS

- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 - EXECUTION

3.01 Examination

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 Preparation

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 Installation

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 Tolerances

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

DIVISION 6 - WOOD & PLASTIC

SECTION 06100 - ROUGH CARPENTRY

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Wood Treatment - Section 06300

1.03 Quality Assurance:

- A. Grades specified shall conform to the most recent grading rules as established by the following bureaus and associations.
 - 1. PS 20 - American Softwood Lumber Standard.
 - 2. Western Wood Products Association
 - 3. Southern Pine Inspection Bureau
- B. Grade and trade mark each piece of lumber or bundle on bundled stock. Use only the recognized official marks of association under whose rules it is graded. Grade and trade marks will not be required if each shipment is accompanied by certificate of inspection issued by grading association.

1.04 Submittals:

- A. Product Data: for each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing and finishing treated material.
 - 2. As requested by authorities having jurisdiction include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials both before and after exposure to elevated temperatures when tested according to ASTM D5516 and ASTM D 5664.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

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SECTION 06100 - ROUGH CARPENTRY

4. Research / evaluation reports - for the following, showing compliance with building code in effect for Project:
 - a. Fire-retardant treated wood.
 - b. Power-driven fasteners.
 - c. Power-actuated fasteners.
 - d. Expansion anchors.
 - e. Metal framing anchors.

1.05 Delivery, Storage and Handling:

- A. Stack lumber, plywood, sheathing, and other materials: provide spacers between each bundle to provide air circulation around bundled material. Provide proper air circulation between stacks and under coverings.

Part 2 - Products

2.01 General:

- A. Provide best quality of respective grades and kinds. Lumber and plywood shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship". Factory mark each piece of lumber with grade stamp of grading agency.
- B. Maximum moisture content of lumber 19%.
- C. Provide dressed lumber (S4S) unless otherwise indicated.
- D. Where nominal sizes are indicated, provide actual sized required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

2.02 Grades and Applications of Lumber:

- A. Framing lumber for the following shall be "Standard" grade Douglas Fir (WCLIB or WWPA).
 1. Concealed blocking/nailers, cants, grounds, and miscellaneous wood items used in conjunction with the roofing work and as indicated on the Drawings.
 2. Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the Grading Agency indicated.

2.03 Fire-retardant Treated Materials:

- A. General - where fire-retardant treated materials are required by authorities having jurisdiction, provide materials that comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant treated wood with appropriate classification

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SECTION 06100 - ROUGH CARPENTRY

marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.04 Panel Products:

- A. Miscellaneous Concealed Plywood: shear wall sheathing, span rating to suit framing in each location, and thickness indicated. Refer to Structural Drawings.
- B. Telephone and Electrical Equipment Backing Panels: DOC PS 1, C-D Plugged, fire-retardant treated, in thickness indicated, or if not indicated, not less than ½ inch thick.

2.05 Fasteners:

- A. All nails, spikes, bolts, connectors and other fasteners used in connections with this work shall be galvanized.
 - 1. Nails, wire, brads and staples - FS-FF-N-105.
 - 2. Power-driven Fasteners - CABO NER-272.
 - 3. Wood screws - ASME B18.6.1.
 - 4. Screws for fastening to cold formed metal framing: ASTM C954 length as recommended by screw manufacturer for material to be fastened.
 - 5. Lag bolts - ASME B18.2.1.
 - 6. Bolts - steel bolts complying with ASTM A 307, Grade A with ASTM C563 hex nuts and, where indicated, flat washers.
 - 7. Expansion anchors - anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - a. Material for interior applications: carbon steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - b. Material for exterior applications: stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, alloy group 1 or 2.

2.06 Metal Framing Anchors:

- A. General: provide galvanized steel framing anchors of structural capacity, type, and size indicated and acceptable to authorities having jurisdiction.
- B. Galvanized Steel Sheet: hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

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SECTION 06100 - ROUGH CARPENTRY

Part 3 - Execution

3.01 Sizes and Applications (General Framing):

- A. Members shall be accurately cut and fitted, true to line and level, avoiding shims and wedges as much as possible. Discard material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Where applicable, apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- C. At wood ground, blocking and nailer installation: install where indicated and required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- D. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless noted otherwise.

3.02 Rough Hardware:

- A. Provide all sufficient nails, screws, etc. to insure rigidity and structural soundness. Provide hot-dipped galvanized fasteners at all weather exposed locations.
- B. Spiking and nailing shall be done using largest size spikes and nails practicable and as indicated on the drawings. Securely attach carpentry according to applicable codes and recognized standards.
- C. Bolt nailers and blocking to steel or concrete members with bolts of proportionate strength of members attached, length required, spaced 4'-0" o.c. maximum and 4" from each end, except as otherwise indicated. Countersink fastener heads on exposed carpentry work and fill holes with wood fiber.
- D. Pre-drill members when necessary to avoid splitting of wood.

3.03 Panel Product Installation:

- A. Wood structural panels: comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential and Commercial", for types of structural-use panels and applications indicated. Comply with "Code Plus" provisions in above referenced guide.

End of Section

DIVISION 6 - WOOD & PLASTIC

SECTION 06200 - FINISH CARPENTRY

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- B. The erection of wall and partition wood finish materials, installation of door and hardware, and shelving incidentals necessary to finish the carpentry.

1.02 Related Work Specified Elsewhere:

- A. Wood Doors - Section 08200
- B. Hardware and Specialties - Section 08700

1.03 Quality Assurance:

- A. Standards:
 - 1. Architectural Woodwork Institute:
 - a. Architectural Woodwork Quality Standards.
 - 2. National Electrical Manufacturers Association:
 - a. NEMA Publication LD-1.
 - 3. Western Wood Products Association:
 - a. Standard Grading Rules for Western Lumber.
 - 4. American Plywood Association:

1.05 Product Delivery, Storage and Handling:

- A. All finish materials, trim, etc. shall be inspected to insure that no sub-grade, defective, or machine-marked pieces are installed.

Part 2 - Products

2.01 General:

- A. Grades specified shall conform to the most recent grading rules of the association or bureau under whose rules the lumber is produced.
- B. Quality standards specified shall conform to the latest edition of the Architectural Woodwork Institute's "Quality Standards".
- C. Lumber shall be kiln-dried to 10% to 12% moisture content which shall be maintained during the fabrication of millwork and cabinetry.

Part 3 - Execution

3.01 Miscellaneous Trim and Frames:

- A. Install all trim in longest possible lengths. Stagger joints in adjacent member. Cope at returns and miter at corners. Attach securely in place with fine finishing nails where exposed; set for filling.

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SECTION 06200 - FINISH CARPENTRY

- B. Immediately prior to final inspection of building, the contractor shall repair or replace all millwork or cabinetry items which have been damaged in any way.

End of Section

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SECTION 06300 - WOOD TREATMENT

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. American Wood Preservers Association:
 - a. AWPA Standard P-5 (Preservative)
 - b. AWPA Standard Commodity Standards (Treating Process).
 - 2. Federal Specifications:
 - a. TT-W-550 (Preservative).
 - b. TT-W-571 (Treating Process).
- B. All lumber and plywood receiving wood treatment shall bear the trademark of the process used.
- C. Submit certificate and guarantee of the lumber treated.

Part 2 - Products

2.01 Materials:

- A. Description: Waterborne chemical salts intended for pressure impregnation as a wood preservative. Preservatives with a petroleum vehicle are not permitted.

Part 3 - Execution

3.01 Installation:

- A. Location of treated lumber:
 - 1. All blocking, plates, nailers and curbs used in conjunction with gravel guards, roof edges and all other wood components used in the roofing project.
- B. Materials shall be pressure treated in accordance with the standards of the American Wood Preservers Institute and the chemical manufacturer's specifications.
- C. Treated material shall conform to AWPB LD-2 and treated to a maximum retention of 0.23 pound of oxide per cubic foot.
- D. Moisture content of finish products shall not exceed 19%.

End of Section

DIVISION 6 - WOOD & PLASTICS

SECTION 06410 - CUSTOM CASEWORK

Part 1 - General

1.01 Section Includes:

- A. Special fabricated cabinet units as indicated on drawings.
- B. Countertops.
- C. Hardware
- D. Preparation for site finishing.
- E. Preparation for installing utilities.
- F. Related Documents: The Contract Documents, as defined in Section 01110-Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

1.02 Related Sections:

- A. Section 06100-Rough Carpentry: Grounds and support framing.
- B. Section 06200-Finish Carpentry: Related trim not specified in this section.
- C. Section 08700-Door Hardware: Cabinet hardware.
- D. Section 09900- Paints and Coatings: Finishing cabinet exterior and interior.

1.03 References:

- A. ANSI/BHMA A156.9-Cabinet Hardware.
- B. AWI-Quality Standards
- C. FS L-F 508-Plastic Sheet, Laminated, Decorative and non-Decorative.
- D. FS MM-L-736-Lumber, Hardware.
- E. FS MMM-A- 130-Adhesive, Contact.
- F. NEMA LD-3-High Pressure Decorative laminates.
- G. PS 1-Construction and Industrial Plywood.
- H. PS 20-American Softwood Lumber Standard.
- I. PS 51-Hardwood and Decorative Ply.

1.04 Submittals:

- A. Shop Drawings: Indicated materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location, and schedule of finishes.

1.05 Quality Assurance: Perform work in accordance with AWI Custom quality.

1.06 Qualifications: Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years of experience.

1.07 Delivery, Storage, and Handling:

- A. Protect units from moisture damage.
- B. Store materials in ventilated, interior locations under

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SECTION 06410 - CUSTOM CASEWORK

constant, minimum temperatures of 60 degrees F. And maximum relative humidity of 55 percent.

1.08 Field Measurements: Verify that field measurements are as indicated on shop drawings.

1.09 Coordination: coordinate work with plumbing and electrical rough-in.

Part 2 - Products

2.01 Wood Materials:

A. Softwood Lumber:PS20; graded in accordance with AWI Custom; average moisture content of 6 percent; species and grades as follows:

<u>Item</u>	<u>Species</u>	<u>Cut</u>
Cabinet Frame	Douglas Fir	Economy
Internal Construction	Douglas Fir	Economy
Miscellaneous framing	Douglas Fir	Economy
Sub-Tops	Douglas Fir	Economy

B. Hardwood Lumber FS MM-L-736; graded in accordance with AWI Custom; average moisture content of 6 percent; species and grade as follows:

<u>Item</u>	<u>Species</u>	<u>Cut</u>
Exposed Stiles and Rails	Red Oak	Economy
Miscellaneous Trim	Red Oak	Economy

2.02 Sheet Materials:

A. Softwood Plywood: PS 1; graded in accordance with; core material of veneer or lumber, species and cut as follows:

<u>Item</u>	<u>Face</u>	<u>Cut</u>
Drawer Construction	Douglas Fir	Economy
Gables and Backs	Douglas Fir	Custom
Sub-tops	Douglas Fir	Economy
Non-sight exposed shelving	Douglas Fir	Custom
Miscellaneous	Douglas Fir	Custom

B. Hardwood Plywood: PS 51;AM graded in accordance with AWI; core material fo veneer or lumber; type of glue recommended for application; face veneer and cuts as follows:

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<u>Item</u>	<u>Face Species</u>	<u>Cut</u>
Door and Drawer Fronts	Red Oak	Economy
Drawer Construction	Red Oak	Economy
Gable and Backs	Red Oak	Economy

- C. Wood Particles-PS 1;AM standard, composed of wood= chips, medium density, made with high waterproof resin binders; of grade to suit application; sanded faces, located as follows:

Item
Drawer Construction

- D. Hardboard: Pressed wood fiber with resin binder, tempered grade, 1/4 inch thick, smooth one side, located as follows:

Item
Drawer Bottoms

2.03 Laminated Materials: Plastic Laminated: NEW LD-T;00550 inch General Purpose Grade; suede surface finish, color and pattern as selected by Architect. All sight exposed surfaces fo cabinets to be laminate finished.

2.04 Accessories:

- A. Adhesive: FS MMM-A-130 contact adhesive, water base type, recommended by laminate manufacturer to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins and Screws: Of size and type to suit application; galvanized finish in concealed locations and cadmium plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Lumber for Shimming, Blocking, and Miscellaneous Applications: Softwood lumber of Douglas Fir species.
- F. Primer. Alkyd primer sealer type.
- G. Wood filler: Solvent base, tinted to match surface finish color.
- H. Plastic Grommets: provide at openings in countertop as indicated on the Drawings. Color to be "black".

2.05 Architectural Cabinet Tops (Countertops):

- A. Quality Standard: Comply with AWI Section 400 and its Division 400C.
- B. Type of Top: High pressure decorative laminate complying with the following:
 - 1. Grade: Custom
 - 2. Laminate Cladding for Horizontal Surface: High pressure decorative laminate as follows:

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SECTION 06410 - CUSTOM CASEWORK

- a. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1.) Provide selections made by Architect from manufacturer=s full range of standard colors and finishes in the following categories:
 - 2.) Grade: GP-50 (0.050-inch nominal thickness).
 - 3.) Grain Direction: Parallel to longest dimension.
 - 4.) Edge Treatment: Lumber edge for transparent finish matching wood species and cut on cabinet surfaces.
- 2.06 Factory Finishing of Interior Architectural Woodwork:
- A. Quality Standard: Comply with AWI Section 1500 unless otherwise indicated.
 - B. The finish of custom casework is included under this Section, regardless of whether factory applied or applied after installation.
 - C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of custom casework, as applicable to each unit of work.
 - D. Factory Finishing: The extent to which the final finish is applied to architectural woodwork a factory is Contractor=s option, except factor apply at least prime/base coat to the greatest extent possible before delivery.
 - E. Transparent finish for Open-Grain Woods: Comply with requirements indicated below for grade Finish system, staining, effect, and sheen, with sheen measured on 60 degree gloss meter per ASTM D 523.
 1. Grade: Custom
 2. AWI Finish System No. 5: Catalyzed polyurethane.
 3. Staining: Match Architect=s sample.
 4. Effect: Closed grain (filled finish).
 5. Sheen: Medium-gross ribbed effect 35-45 deg.
 - F. Transparent Finish for Closed-grain Woods: Comply with requirements indicated below for grade, finish system staining, effect, and sheen.
 1. Grade: Custom
 2. AWI Finish System No. 5: Catalyzed polyurethane.
 3. Staining: Match Architect=s sample.
 4. Effect: Closed grain.
 5. Sheen: Medium-gloss rubbed effect 35-45 deg.

DIVISION 6 - WOOD & PLASTICS

SECTION 06410 - CUSTOM CASEWORK

2.07 Fabrication:

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Fit shelves, doors and exposed edges with 3/8 inch matching hardwood edging. Use full length pieces only.
- C. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- D. Door and Drawer Fronts: 3/4 inch thick; overlay style.
- E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
- G. Mechanically fasten back splash to countertops with sleet brackets at 16 inches on center.
- H. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes; and fixtures and fitting. Verify locations of cutouts from on-site dimensions. Prime paint contact surfaces of cut edgy.

2.08 Finishing:

- A. Sand work smooth and set exposed nails and screw.
- B. Apply wood filler in exposed nail (and screw) indentations.
- C. On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.
- D. Seal, stain and varnish exposed to view surfaces. Brush apply only.
- E. Seal and varnish internal exposed to view and sem-concealed surfaces. Brush apply only.
- F. Seat internal surfaces of cabinets with one coat of shellac. Brush apply only.
- G. Seal surfaces in contact with cementitious materials.

2.09 Hardware:

- A. Shelf Standard and Supports: KV-256 and KV-255. Note: line bored holes every 1.5" with metal shelf pins are acceptable for shelf supports in lieu of shelf standards and clips.
- B. Drawer and Door Pulls: Chrome, U-shaped wire pulls.
- C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed.
- D. Catches: Magnetic, Stanley SF-45 and SP-46. Provide other types required for special conditions.
- E. Drawer Slides: Knappe and Vogt: KV1284 typical with KV1485 full

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- extension ball bearing tracks.
- F. Hinges: Blum Model 170-concealed hinges with 170 degree opening or Grass System 1200 (176 degree opening) self-closing with 1000-80 base plate. Two hinges per door up to 36" and 3 hinges per door up to 48" and 4 per door up to 60" high.
 - G. Coat Hooks: Provide HangSafe Hooks 6400 Series - flat-profile, hook secured with stainless steel #14 x 2" screws and finishing washers. Provide mounting holes at 16" on center minimum and expansion anchor to walls as recommended by manufacturer. Hooks shall be secured to 1.5" thick x 3.5" tall red oak back board x length required.
 - 1. Quantity: as indicated on the Drawings.
 - 2. Wood Finish: as indicated in the Color Schedule on the Drawings.
 - H. Grommets: Provide plastic grommets at all penetrations through countertop for cabling, power cords, etc. as indicated on the Drawings.

Part 3 - Execution

3.01 Examination: Verify adequacy of backing and support framing.

3.02 Installation:

- A. Install woodwork to comply with AWI Section 1700 for same grade specified above for type of casework involved.
- B. Set and secure casework in place; rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for waif mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinet and counter bases to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Install without distortion so that doors and drawers fit openings properly and are accurately aligned.
- I. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork.
- J. Complete the finishing work specified in this section to

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whatever extent not completed at shop or before installation of woodwork,

3.03 Adjusting:

- A. Adjust moving or operating parts to function smoothly and correctly.

3.04 Cleaning:

- A. Clean work under provisions of 01700-Contract Closeout.
- B. Clean casework, counters, shelves, hardware, fittings and fixtures.

3.05 Schedules:

- A. Furnish and install all items listed in this schedule at location indicated on the Drawings, complete as to function intended.
- B. Casework indicated on the Drawings; custom grade construction.
 - 1. Counter Tops.
 - 2. Base Cabinets.
 - 3. Overhead Cabinets.
 - 4. Wall Cabinets.
 - 5. Shelving-adjustable and fixed.
 - 6. Other items such as shims and fillers as indicated on the Drawings or as required for a complete cabinetwork installation.

END OF SECTION

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SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Fixed modular laminate clad casework and components.
- B. Flexible rail mounted laminate clad casework and components.
- C. Solid Surface countertops and backsplash.

1.02 RELATED SECTIONS

- A. Blocking within walls where indicated: Section 06100 Rough Carpentry.
- B. Millwork, trim, etc.: Section 06200 Finish Carpentry.
- C. Hardware: Section 06410 Custom Casework.
- D. Glass: not applicable.
- E. Base molding: Division 9.
- F. Appliances: Division 11 and drawings.
- G. Sinks and service fixtures, service waste lines, connections, and vents: Division 15.
- H. Electrical service fixtures: Division 16.

1.03 DEFINITIONS

- A. Identification of casework components and related products by surface visibility.
 - 1. Open Interiors: Any open storage unit without solid door or drawer fronts, units with full glass insert doors and/or acrylic doors, and units with sliding solid doors.
 - 2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts.
 - 3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
 - 4. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
 - 5. Semi-Exposed Surfaces: Interior surfaces which are exposed to view when doors or drawers are opened, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
 - 6. Concealed Surfaces: Any surface not visible after installation.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial

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stability (if requested), bonding capacity, and adequate facilities and personnel required to perform on this project.

- B. Manufacturer: Provide products certified as meeting or exceeding ANSI-A 161.1-2000 testing standards.
- C. Single Source Manufacturer: Casework, countertops and architectural millwork products must all be engineered and built by a single source manufacturer in order to ensure consistency and quality for these related products. Splitting casework, countertops and/or architectural millwork between multiple manufacturers will not be permitted.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's Architectural Woodwork Quality Standards for grades of interior architectural woodwork, construction, finishes and other requirements.

1.05 SUBMITTALS

- A. Comply with Special Conditions, unless otherwise indicated.
- B. Product Data: Manufacturer's catalog with specifications and construction details.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
 - 1. Include section drawings of typical and special casework, work surfaces and accessories.
 - 2. Indicate locations of plumbing and electrical service field connection by others.
 - 3. Provide one set of shop drawings which includes all products within this section, engineered and built by a single source manufacturer, with seamless coordination amongst all products.
- D. Casework Samples (To be available upon request):
 - 1. Base cabinet: Cabinet conforming to specifications, with drawer and door.
 - 2. Wall cabinet: Cabinet conforming to specifications, with door.
 - 3. Cabinet samples shall be complete with specified hardware for doors, drawers and shelves.
 - 4. Component samples: Two sets of samples for each of the following:

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- a. Decorative laminate color charts / PVC and ABS edgings.

1.06 PRODUCT HANDLING

- A. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 25 percent to 55 percent.
- B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 JOB CONDITIONS

- A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.
 1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
 2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.
- B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 WARRANTY

- A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Manufacturer - Basis for Design:
 1. TMI Systems Corporation.
 - a. Specifications are based on manufacturer's literature from TMI SYSTEMS CORPORATION, 50 South Third Avenue West, Dickinson, North Dakota, 58601, Phone: 800-456-6716, fixed modular, flexible rail mounted, and mobile casework and accessories.

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- b. Other manufacturers shall comply with the minimum levels of material and detailing indicated on the drawings or as specified.

2.02 MATERIALS

- A. Core Materials:
 1. Particleboard up to 7/8 inch thick: Industrial Grade average 45-pound density particleboard, ANSI A 208.1-2009, M-2 requirements.
 2. Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particle-board, ANSI A 208.1-2009, M-2 requirements.
 3. Medium Density Fiberboard 1/4 inch thick: Minimum average density 45-50 lbs., ANSI A208.2-2009 requirements.
 4. MR Moisture Resistant Particleboard: Average 45-pound density particleboard, ANSI A208.1 1-2009, M-2 requirements.
 5. Toe Base Plywood: 3/4 inch thickness, CC/CD/CDC grades, of western softwood veneers, with NAUF exterior fully water resistant phenolic glues.
- B. Decorative Laminates: GREENGUARD Indoor Air Quality Certified
 1. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2005.
 2. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2005.
 3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2005.
 4. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2005.
 5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2005.
 6. Thermally fused melamine TFM laminate, NEMA Test LD 3-2005. (TFM allowed on casework interiors only, as specified below. Utilization of TFM on any exterior casework surfaces, including door and drawer faces and finished ends, will not be permitted.)
- C. Laminate Color Selection: Maximum 1 color per unit face and 5 colors per project. (See Color Selection in section 3.05).
- D. Edging Materials:
 1. 1mm PVC banding, machine applied.

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2. 3mm PVC banding, machine applied and machine profiled to 1/8 inch radius.
- E. Glass:
Not applicable.

2.03 SPECIALTY ITEMS

- A. Support Members:
1. Countertop support brackets: Epoxy powder coated, 11 gauge steel with integral cleat mount opening and wire management opening.
 2. Undercounter support frames: Epoxy powder coated.
 3. Legs: Epoxy powder coated.

2.04 CABINET HARDWARE

- F. Refer to Section 06410 Custom Casework for cabinet hardware.

2.05 FABRICATION:

- A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.
- B. All casework panel components must go through a supplemental sizing process after cutting, producing a panel precisely finished in size and square to within 0.010 inches, ensuring strict dimensional quality and structural integrity in the final fabricated product.
- C. Cabinet Body Construction:
1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets. (Mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.)
 - a. Tops, bottoms and sides of all cabinets are particleboard core.
 2. Cabinet backs: 1/4 inch thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4 inch x 4 inch particleboard rails will be placed behind the back panel at the top and bottom, and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt

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- glue to further secure back and increase overall strength.
- a. Exposed back on fixed or movable cabinets: 3/4 inch thick particleboard with the exterior surface finished in VGS laminate as selected.
 3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick plywood. Base is 102mm (nominal 4 inch) high unless otherwise indicated on the drawings.
 4. Base units, except sink base units: Full sub-top glued and doweled to cabinet sides. (Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.)
 - a. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
 5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
 6. Exposed and semi exposed edges.
 - a. Edging: 1mm PVC machine applied.
 7. Adjustable Shelves in Cabinets
 - a. Core: Particleboard.
 - b. Core Thickness: 3/4 inch up to 30 inches wide, 1 inch over 30 inches wide.
 - c. Edge: 1mm PVC on Front Edge Only.
 8. Interior finish, units with open Interiors:
 - a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
 9. Interior finish, units with closed Interiors:
 - a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
 10. Exposed ends:
 - a. Faced with high-pressure decorative VGS laminate. Use of TFM on exposed ends will not be permitted.
 11. Wall unit bottom:

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- a. Faced with thermally fused melamine laminate.
- 12. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.
- D. Drawers:
 - 1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with TFM Thermally Fused Melamine doweled and glued into sides. Top edge banded with 1mm PVC.
 - 2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with TFM Thermally Fused Melamine, screwed directly to the bottom edges of drawer box.
 - 3. Paper storage drawers: Minimum 3/4 inch thick particleboard sides, back, and sub front laminated with TFM Thermally Fused Melamine. Minimum 1/2 inch thick particleboard drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.
- E. Door/Drawer Fronts:
 - 1. Core: 3/4 inch thick particleboard.
 - 2. High-pressure decorative VGS laminate exterior, balanced with high-pressure cabinet liner CLS. Use of TFM on exterior or interior surfaces of door/drawer fronts will not be permitted.
 - 3. Edges: 3mm PVC, machine applied, external edges and outside corners machine profiled to 1/8 inch radius.
 - 4. Provide double doors in opening in excess of 24 inches wide.
- F. Door Fronts with Glass Insert captured by Retainer Clips (CUSTOM GRADE):
 - 1. Core: 3/4 inch thick particleboard.
 - 2. High-pressure decorative VGS laminate exterior, balanced with high-pressure VGS laminate. Use of TFM on exterior or interior surfaces of door fronts will not be permitted.
 - 3. Edges: 3mm PVC, machine applied, external edges and outside corners machine profiled to 1/8 inch radius.

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4. Provide cutout in door panel resulting in 3-3/8 inch frame. Exposed cutout edge to be finished with 1mm PVC edgebanding.
 5. Notch cutout 3/8 inch x 1/4 inch for glass panel to set into, mounting flush with the back side (interior side) of the door panel. Interior cutout edge to be painted a compatible color to the interior surface.
 6. Glass panel to be captured and held in place utilizing glass retainer clips, screwed in place. Minimum eight clips per glass panel located in the four corners of the cutout.
- G. Miscellaneous Shelving (not in Cabinets):
1. Core material: 1 inch thick particleboard.
 2. High-pressure decorative VGS laminate on both faces.
 3. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

2.06 ARCHITECTURAL CABINET SOLID SURFACE TOPS (Countertops):

- A. Design Load: deflection limited to 1/360.
- B. Type of Top: homogeneous solid sheets of filled plastic resin complying with the following:
1. Colors and Patterns: as selected by Architect from manufacturer's full range.
 2. Special Features: eased edge treatment.
 3. Accessories:
 - a. Adhesives: for seams and drop edges, Formica Solid Surfacing Seaming Cartridges, 9 ounce, color to blend with sheet material.
 4. Fabrication: assemble work at shop and deliver to job ready for installation. Manufacture in largest practical pieces for handling and shipping without seams.
 - a. Fabricate work square and to required lines.
 - b. Recess and conceal fasteners connections and reinforcing.

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- c. Design, construction, and installation: details to allow for expansion and contraction of materials. Properly install material with hairline joints held rigidly in place.
 - d. Fabricate countertops and vanities with back splash and side splash pieces to profiles and sizes indicated.
 - e. Fabricate items to profiles shown with connections and supports as indicated or as required for complete installation in accordance with manufacturer's written instruction and approved submittals.
 - f. Provide cut-outs for plumbing fixtures and trim, washroom accessories, appliances, and related items: confirm layout with manufacturer's cut-out templates before beginning work. Round corners of cut-outs and sand edges smooth.
 - g. Do not exceed manufacturer's recommended unsupported overhang distances.
 - h. Finish exposed surfaces smooth and polish to low sheen.
 - i. Radius corners and edges.
 - j. Tolerances: variations in size or openings shall not exceed +/-1/4".
5. Acceptable manufacturer: Formica Solid Surfacing as manufactured by Formica Group / Fabrications, Cincinnati, Ohio **or approved equal.**

PART 3- EXECUTION

3.01 INSPECTION:

- A. The casework contractor must examine the job site and the conditions under which the work under this section is to be performed and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

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SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

3.02 PREPARATION:

- A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION:

- A. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
- B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
- C. Repair minor damage per plastic laminate manufacturer's recommendations.

3.04 CLEANING:

- A. Remove and dispose of all packing materials and related construction debris.
- B. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

3.05 COLOR SELECTION:

- A. Laminate Color Selection:
 - 1. Select from the full range of standard Wilsonart® and Formica® stock color charts.
 - 2. Thermally fused melamine laminate matched to White color.
- B. Hardware Color Selection:
 - 1. Hinge: Select from your choice of epoxy powder coating stock colors matched to White, Beige, Gray, Black and Chrome.
 - 2. Pulls: Select from design specific finish options available in the TMI Vendor Stock Pull Program.
 - 3. Miscellaneous Hardware (support brackets, metal components, etc.): Select from your choice of epoxy powder coating stock colors matched to White, Beige, Gray, Black and Chrome.
- C. PVC Edge Banding Color Selection:
 - 1. 3mm PVC: Select from the TMI Vendor Stock PVC Program, including over 200 pattern, woodgrain and solid colors matched to Wilsonart® and Formica® laminates.
 - 2. 1mm PVC: Select from the TMI Vendor Stock PVC Program, including over 200 pattern, woodgrain

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and solid colors matched to Wilsonart® and
Formica® laminates.

End of Section

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07200 - INSULATION

Part 1 - General

1.01 Work Included:

- A. All materials, labor and services and incidentals necessary for the completion of this section of work.

1.02 Quality Assurance:

A. Standards:

1. Federal Specifications:

- a. HH-I-524C, Type IV, Class C, Rigid Insulation.
- b. ASTM C 665-84, Type 1, Insulation Blankets.
- c. ASTM D1621, Compressive Strength.
- d. ASTM E84, Flame Spread and Smoke Developed.

B. Submittals:

- 1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.03 Product Delivery, Storage and Handling:

- A. Rigid insulation board is combustible. During storage and installation, observe good fire safety practice, including job site housekeeping.

- 1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Rigid Insulation: FS-HH-I-1972/1, Class 2 Rigid Insulation.
 - 1. Type: Glass fiber reinforced polyisocyanurate core with foil facing each side (glass fiber facing at roof insulation), and a compressive strength of 25 p.s.i. and a maximum water vapor transmission rate of >.03 perm-inch.
 - a. Application: 2 layers of rigid insulation. First layer shall be 2" thick / second layer shall be 1.5" thick for a total thickness of 3.5" with a minimum total thermal resistance of R-20, for installation above metal decking and exterior wall at cavities. Refer to Drawings.
 - 2. Type: expanded polystyrene insulation (if applicable).
 - a. Application: 2" thick with a thermal resistance of R-10.4, **for foundation wall perimeter below grade installation only.**
 - 3. Adhesive: as recommended by manufacturer of rigid insulation board.

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SECTION 07200 - INSULATION

- B. Fibrous Insulation: ASTM C 665-84, Type 1
 - 1. Type:
 - a. 6" thick and 2" thick (approx.) mineral wool or fiberglass fire resistant insulating blanket or batt, with kraft paper facing. Thermal resistance R-19 (6" thick). Refer to Drawings for locations.
- C. Vapor Retarder:
 - 1. Roof Deck Installation:
 - a. Two layers of high strength kraft paper laminated with an adhesive and reinforced at edges with fiberglass yarns.
 - b. Type Example: Permstop - Owens Corning.

Part 3 - Execution

3.01 Installation - Rigid Insulation:

- A. Install rigid insulation horizontally against back-up wall, or to roof deck, as shown on the Drawings.
- B. **Rigid insulation and other components applied to metal decking at membrane roofing shall be fastened with approved fasteners at the rate of 1 per 2 square feet to meet FM I-90 requirements.**
- C. Install 2 layers of rigid insulation to metal roof deck and at wall cavity. Stagger joints of insulation to provide continuous insulation coverage.
- D. Cut insulation by means of a saw, knife, or other sharp tool to fit around obstructions across the wall, such as vents, louvers, pipes and conduit.
- E. If mastic adhesive is used to supplement holding the insulation in place, observe label directions.
- F. Install 6" thick batt insulation where indicated on the drawings primarily above acoustical ceilings and in walls. Install 2" thick batt insulation in metal stud furr-outs at exterior walls as indicated on the drawings.

End of Section

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07240 - EXTERIOR WALL INSULATION AND FINISH SYSTEM

Part 1 - General

1.01 Work Included:

- A. The General Conditions and applicable sections of Division 1 shall apply to this entire section.
- B. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Flashing and Sheet Metal - Section 07600
- B. Sealants - Section 07900

1.03 Quality Assurance:

1. Standards:

1. American Society For Testing and Materials:
 - a. ASTM C-150, Standard Specification for Portland Cement.
 - b. ASTM E-96, Standard Test Methods for Water Vapor Transmission of Materials.
 - c. ASTM E-2134, Test Method for Evaluating the Tensile-Adhesion Performance of Exterior Insulation and Finish Systems (EIFS).
 - d. ASTM E-2430, Standard Specification for Expanded Polystyrene Thermal Insulation Boards for use in Exterior Insulation and Finish Systems.
 - e. ASTM E-2486, Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems.
 - f. ASTM E-2568, Standard Specification for PB Exterior Insulation and Finish Systems.
 - g. ASTM E96, Water Vapor Transmission, Revyvit is permeable to water vapor.
 - h. ASTM G155, Accelerated Weathering, passes 2000 hours.
 - i. Mil Std 810B, Mildew Resistance, passes.
2. All other standards as required by the system specified.
3. System Manufacturer shall have a minimum of 10 years of experience in the manufacturing of Exterior Insulation and Finish Systems.
4. System Installer shall have a minimum of 5 years of experience in the installation of Exterior Insulation and Finish Systems. Installer shall have a current required certification from system manufacturer.

1.04 Submittals:

- A. Submit a 2' x 4' sample panel of the finish system indicating color and texture to be used for this project. Panel shall be prepared using same tools and techniques as for the actual project.

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SECTION 07240 - EXTERIOR WALL INSULATION AND FINISH SYSTEM

- B. Submit complete shop drawings, including erection drawings and details, manufacturer's product data describing materials to be used on this project, and test reports if requested by the Architect.
- 1.05 Product Delivery, Storage, and Handling:
- A. Deliver all materials to the job site in manufacturer's unopened containers, with legible manufacturer's identification.
 - B. Upon delivery, inspect materials for physical damage, freezing, or overheating. Questionable materials shall not be used.
 - C. Store materials in a cool, dry place protected from sunlight, and the elements.
 - D. Manufacturer's environmental requirements for installation shall be strictly adhered to - temperatures, humidity, etc.
- 1.06 Warranty: provide manufacturer's standard limited written warranty.

Part 2 - Products

- 2.01 General:
- A. **Products of Revyvit System as manufactured by Dryvit Systems, Inc. are specified herein to simplify descriptions of design, construction, and materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**
- 2.02 Materials - Finish System On Existing Wall Insulation:
- A. First Coat: Shall be compatible with the existing EIFS system and shall have a coverage depending upon type of texture, time of exposure, climate, and elevation exposure conditions. Coverage of first coat can vary from 350-500 s.f. per pail depending on conditions.
 - B. Second Coat: coverage of second coat shall vary from 400-600 s.f. per pail.
 - B. Drying Time: drying time is dependent upon the air temperature and relative humidity. Under average drying conditions 70 degrees F / 55% R.H. shall provide an approximate drying time of 4 hours. Protect work from rain for at least 24 hours.
 - D. Temperature for Application: 45 degrees or higher for a minimum of 24 hours.
 - F. Finish: Revyvit by Dryvit Systems.
 - 1. Color: **Refer to Drawings. Final color selections to be made by Architect.**
 - 2. Texture: match existing and as selected by the Architect.
 - G. Water: Clean and potable.
 - H. Trim and Accessories: As indicated on the Drawings, Dryvit.
- 2.03 Mixing:
- A. Mix factory prepared finish material in strict accordance with

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SECTION 07240 - EXTERIOR WALL INSULATION AND FINISH SYSTEM

manufacturer's recommendations.

Part 3 - Execution

3.01 Application:

- A. Before commencing application, inspect all surfaces to receive wall finish system for any irregularities or defects. Substrate shall be free of foreign materials, such as, oil, dust, dirt, form release agents, efflorescence, paint, wax, water replants, moisture, frost, and any other condition that inhibit adhesion.
- B. Wall finish system shall be applied in strict accordance with manufacturer's written instruction. Sealant shall not be applied directly to textured finishes or base coat surfaces.
- C. Materials shall be protected by permanent or temporary means from inclement weather and other sources of damage prior to, during, and following application until completely dry.
- D. Protect adjoining work and property during coating installation. All excess materials shall be removed from the site.

End of Section

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07260 - VAPOR BARRIER

PART 1 - GENERAL

1.01 Work Included

- A. Furnish all labor, materials, services and equipment required in conjunction with or properly incidental to the installation of under-slab vapor barriers described herein and/or as shown on the drawings.

1.02 Related Work

- A. Section 03300: Cast-In-Place Concrete.

1.03 Job Conditions

- A. Subbase: Smooth and level, free from damaging protrusions that would puncture vapor barrier.

1.04 References

- A. ASTM E 1643 - Standard Practice for Installation of Water Vapor Barriers Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. ASTM E 1745 - Standard Specification for Plastic Water Vapor Barriers Used in Contact with Soil or Granular Fill under Concrete Slabs: Exceeds Class B
- C. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- D. ASTM E 154 - Standard Test Methods for Water Vapor Barriers Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
- E. ASTM D 1709 - Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
- F. ASTM F 1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor
- G. ACI 302.1R - Vapor barrier component (plastic membrane) not less than 10 inches thick.

1.05 Submittals

- A. Submit in accordance with Division 1 requirements.
- B. Product Data: Provide manufacturers printed product literature and description, including tests and standards that have been performed on the vapor barrier material.
- C. Samples: Submit two, 8 1/2 x 11 inch in size, illustrating the vapor barrier and two (2) 8-1/2-in long sample strips of the joint tape.
- D. One each of all accessories that will be used in the installation.
- E. Verification by Independent testing labs indicating that materials comply with specified requirements.
- F. Certificates: Certify that products of this section meet or exceed specified requirements.

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SECTION 07260 - VAPOR BARRIER

- G. Manufacturer's Instructions: Indicate complete installation instructions.

PART 2 - PRODUCTS

2.01 Available Products

- A. Stego Wrap 15 mil Vapor Barrier by Stego Industries, L.L.C.
- B. Perminator™ 15 mil by W.R. Meadows .
- C. Vapor Block 15 (mil) by Raven Industries, Inc.
- D. Moistop Ultra 15 (mil) by Fortifiber Building Systems Group
- E. Viper Vaporcheck II 15 mil by Insulation Solutions, Inc.

2.02 Source Quality Control And Testing

- A. Vapor barrier membrane shall have following properties:
 - 1. Water Vapor Barrier: Meets or exceeds Class A according to ASTM E 1745.
 - 2. Water Vapor Transmission Rate: 0.012 grains/ft²/hour or lower according to ASTM E 96.
 - 3. Water Vapor Permeance: 0.01 perms or lower according to ASTM E 154 Sec. 7 or F 1249 (max.).
 - 4. Tensile Strength: 45.0 lbf/in according to ASTM E 154 Sec. 9.
 - 5. Puncture Resistance: 2200 g according to ASTM D 1709, Method B

2.03 Accessories

- A. Tape:
 - 1. High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 4".
- B. Pipe Boot:
 - 1. Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions.

PART 3 - EXECUTION

3.01 Examination

- A. Verify that conditions are acceptable for the placement of the vapor barrier.

3.02 Preparation

- A. Ensure that subsoil is approved by Geotechnical Engineer.
 - 1. Vapor Barrier shall be installed on top of the aggregate, sand or tamped earth base or carton forms. At carton forms provide a vertical leg down to grade and adhered the vapor barrier to the grade beam at or just below the dirt line. Vapor barrier may be placed either above or beneath any carton form slip sheet.

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SECTION 07260 - VAPOR BARRIER

3.03 Installation

- A. Install vapor barrier per manufacturer's instructions, illustrations and ASTM E 1643 Standard Practice for Installation of Water Vapor Barriers Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - 1. Level and tamp or roll granular base.
 - 2. Place Vapor Barrier with the longest dimension parallel with the direction of the pour.
 - 3. Lap Vapor Barrier over footings and seal to foundation walls. Seal all penetrations.
 - 4. Lap joints 6 inches and seal with the recommended pressure sensitive tape.
 - 5. Seal pipe penetrations with pipe boot made from vapor barrier and tape.
 - 6. Protect vapor barrier from damage during installation of reinforcing steel and utilities.
 - 7. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all four sides with pressure sensitive tape.

3.04 Interface With Other Work

- A. Coordinate work of all other trades related to the slab base and utility services.

END OF SECTION

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SECTION 07410 - WALL PANEL SYSTEMS

Part 1 - General

1.01 Work Included:

- A. Single-skin, concealed fastener, prefinished metal wall panels.
- B. Metal trim, accessories, fasteners, and sealants related to the wall panel system.

1.02 Quality Assurance:

- A. Manufacturer shall demonstrate a minimum of ten (10) years of experience in the specified products and applications.
- B. American Architectural Manufacturer=s Association (AAMA):
 - 1. AAMA 620
 - 2. AAMA 621
- C. American Society of Civil Engineers (ASCE):
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- D. ASTM International (ASTM):
 - 1. ASTM A653/A653M
 - 2. ASTM A755/A755M
 - 3. ASTM B209
 - 4. ASTM 920
 - 5. ASTM C1007
 - 6. ASTM E283

1.03 Panel Performance Requirements:

- A. Structural designs shall have been established from tests per ASTM E72 chamber method. Ultimate loads shall be established without the use of exposed or back-side fastening.
- B. Air Infiltration: maximum 0.06 cfm/s.f. per ASTM E283 at a static-air-pressure difference of 1.57 lbf/s.f., using minimum 10x10 foot test panel that includes side joints.
- C. Water Penetration, Static Pressure: no uncontrolled water penetration per ASTM E331 at a minimum static differential pressure of 6.24 lbf/s.f., using a minimum 10x10 foot test panel that includes side joints.
- D. Structural Performance: provide metal wall panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, per ASTM E72.
 - 1. Maximum allowable deflection limited to L/180 deflection of panel perimeter normal to plane of wall with no evidence of failure.
- E. Provide metal wall panels and panel accessories from a single manufacturer.

1.04 Submittals:

- A. Product data, including certified independent test data

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- indicating compliance with requirements.
- B. Shop Drawings including full elevations showing openings and penetrations. Include details of each condition of installation and attachment.
 - 1. Indicate points of supporting structure that must coordinate with metal wall panel assembly installation.
 - 2. Indicate details of fastening, including clip spacing.
 - C. Load span tables including evaluation of panel clip and panel side joint interaction.
 - D. Samples of each component.
 - E. Installer Project References: minimum of 5 installations not less than 5 years old, with Owner and Architect contact information.
- 1.05 Warranty:
- A. Manufacturer shall warrant for a period of two (2) years that the panels, trim and accessories furnished by the manufacturer will be free from defects in materials and factory workmanship.
 - 1. Provide Special Panel Finish Warranty: Manufacturer shall agree to repair or replace metal wall panels that evidence deterioration of finish for the period of twenty (20) years from date of substantial completion.
- 1.06 Delivery, Storage, and Handling:
- A. Protect metal wall panel products during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage.
- 1.07 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 Panel Design
- A. Panel units shall consist of Metallic-Coated Steel Face Sheet: Coil-coated, ASTM A755/A755M.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 (Class Z275), structural steel quality.
 - 2. Aluminum-zinc alloy-coated Steel Sheet: ASTM A792/A792M, Class AZ50 Grade 50 (Class ASM150, Grade 275), structural steel quality.
 - 3. Face Sheet: minimum 20 gage nominal uncoated thickness.
 - B. Panel edges shall have an interconnecting design with factory applied vapor sealant in the side laps. Structural fasteners and clips shall be concealed.
 - C. Panel unit shall be Concept Series, CS-620, as manufactured

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by Centria.

2.02 Metal Wall Panel Finish:

- A. Fluoropolymer Three-Coat System: 0.8 mil primer with 0.8 mil 70 percent PVDF fluoropolymer color coat, and a 0.8 mil 70 percent PVDF fluoropolymer clear coat, AAMA 621. Centria Duraguard PLUS.

2.03 Fabrication

- A. Steel trim shall be the same finish and gage as the exterior and/or interior of the panels.
- B. Panels and trim bundles shall be protected with water resistant paper and provided with wood collars to permit handling and stacking in the field.

2.04 Secondary Metal Subgirt Framing:

- A. Miscellaneous framing components, general: cold-formed metallic-coated steel sheet, ASTM A653/A653M, G90 (Z180).
 1. Hat Channels: 0.053 inch / 16 ga. minimum.
 2. Sill Channels: 0.053 inch / 16 ga. minimum.

2.05 Base Metal and Finish: match metal wall panel base metal and finish.

Part 3 - Execution

3.01 Inspection:

- A. Building tolerances on the panel support steel shall not exceed those defined by the panel manufacturer.
 1. 1/4 inch in any 20 foot length vertically or horizontally.
 2. 1/2 inch in any building elevation.
- B. Alignment of the panel support system should be checked and defects corrected prior to installing panels.
- C. Verify that window, door, and other penetrations match layout on shop drawings.

3.02 Secondary Framing Installation:

- A. Install secondary metal framing components to tolerances indicated, as shown on approved shop drawings. Install secondary metal framing and other metal panel supports per ASTM C1007 and metal wall panel manufacturer's recommendations.

3.03 Installation:

- A. Install metal wall panels in accordance with approved shop drawings and manufacturer's recommendations. Install metal wall panels in orientation, sizes, and locations indicated. Anchor metal wall panels and other components securely in place. Provide for thermal and structural movement.
- B. Trim, accessories, and sealants shall be installed in accordance with approved shop drawings to insure a functional and weather tight installation.
 1. Install clips to supports with self-tapping fasteners. Fasteners shall be stainless steel.
 2. Provide weatherproof escutcheons for pipe and conduit

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- penetrating exterior walls.
- 3. Dissimilar Materials: where elements of metal wall panel system come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.
- C. Dry wipe-down of the exterior surface should be done as the panels are installed.
- D. Joint Sealers: install joint sealants where indicated on approved shop drawings.
- 3.04 Cleaning and Protection:
 - A. Remove protective films. Clean finished surfaces as recommended by metal wall panel manufacturer. Clear weep holes and drainage channels of obstructions, dirt and sealant. Maintain in a clean condition during construction.
 - B. Replace damaged panels and accessories that cannot be repaired by finish touch-up or minor repair.
- 3.04 Closeout Submittal:
 - A. Provide maintenance data.

End of Section

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SECTION 07415 - PREFINISHED METAL SOFFIT PANELS

Part 1 - General

- 1.01 Work Included:
- A. The General Conditions and applicable sections of Division 1 shall apply to this entire section.
 - B. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- 1.02 Related Work Specified Elsewhere:
- A. Metal Fabrications - Section 05500
 - B. Modified Bitumen Membrane Roofing System - Section 07550
 - C. Flashing and Sheet metal - Section 07600
- 1.03 Quality Assurance:
- A. Qualifications of Installer: Competent and skilled sheet metal applicator familiar with this type installation with successful completion of projects of familiar scope. Applicator shall have at least two years of experience in prefinished sheet metal applications.
- 1.04 Shop Drawings:
- 1.1 Submit complete shop drawings on all prefinished metal applications, showing layouts of seams, joints, details, and installation methods. Show details of weatherproofing at edges, terminations and penetrations in metal work.
- 1.05 Applicator and Guarantee:
- C. All work shall be done by one contractor with 5 years minimum experience in this type of metal work.
 - B. Provide ten (10) years guarantee written on contractor's letterhead for work of this Section.
- 1.06 Warranty:
- A. Provide a 20-year manufacturer's warranty covering color fade, chalk and film integrity at no charge.
- 1.07 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only.**

Part 2 - Products

- 2.01 Acceptable Manufacturers:
- A. Quality of Manufacturers: The products, colors and finishes herein are of AEP-Span products to establish standards of quality and appearance. The products of other manufacturers are acceptable subject to meeting or exceeding the requirements of these specifications, and the approval of the contracting officer.
- 2.02 Materials -
- A. Prefinished Metal Soffits:
 - 1. Flush Panel, (FP 12-2) 24 gauge steel with embossed finish.

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SECTION 07415 - PREFINISHED METAL SOFFIT PANELS

2. Color: match existing or as selected by Architect.
3. Flashings, Closures, and Trim shall be fabricated from same material, gauge, and finish as panels.
4. Finish: Kynar 500.

Part 3 - Execution

3.01 Installation:

- A. Fabricate and install prefinished metal facings in accordance with drawings and recognized sheet metal practices using conventional hand or power tools. Keep cut edges sharp, clean, properly dressed and closely aligned. Exercise care during fabrication and erection to avoid damage.
- B. Structural framing members and fasteners shall be sized and located as recommended by the panel manufacturer. The applicator shall insure that the correct fastener has been chosen for size and length necessary for loading requirements. Special care shall be exercised installing fasteners so as not to overdrive or misdirect fasteners which could cause damage to panels or trim. Use colored pop rivets on trim items and where exposed fasteners are necessary. Keep exposed fasteners to very minimum.
- C. Only minor scratches and abrasions will be allowed to be touched up. Any other damaged material shall be replaced.

End of Section

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SECTION 07540 - THERMOPLASTIC POLYOLEFIN (TPO) ROOFING SYSTEM

Part 1 - General

1.01 Section Includes:

- A. Preparation of Substrate to Receive Roofing Materials
- B. Roof Insulation Application to Prepared Substrate
- C. Roof Membrane Application
- D. Roof Flashing Application
- E. Incorporation of Sheet Metal Flashing Components and Roofing Accessories into the Roof System

1.02 Products Installed But Not Furnished Under This Section:

- A. Sheet Metal Flashing and Trim

1.03 Related Sections:

- A. Rough Carpentry - Section 06100
- B. Insulation - Section 07200
- C. Flashing & Sheet Metal Section 07600

1.04 Reference Standards:

References in these specifications to standards, test methods and codes, are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies which may be used as references throughout these specifications.

ASTM	American Society for Testing and Materials Philadelphia, PA
FM	Factory Mutual Engineering and Research Norwood, MA
NRCA	National Roofing Contractors Association Rosemont, IL
OSHA	Occupational Safety and Health Administration Washington, DC
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Chantilly, VA
UL	Underwriters Laboratories, Northbrook, IL

1.05 Description Of Work:

- A. **Project Type:** new installation over cover board.
Deck: Metal **Slope:** as indicated on the Drawings.
- B. **Rigid Insulation:**
 - 1. Top and Bottom Layers: Polyisocyanurate, having a total thickness of **3.5"** - top layer of 1 1/2" and bottom layer of 2". Refer to Section 07200, Insulation.
 - 2. Crickets: Polyisocyanurate (tapered) providing a roof slope to roof drains (refer to Drawings.)
- C. **Roof System:** Smooth type, scrim reinforced 115 mil TPO (Thermoplastic Polyolefin) Fleece Backed System applied as described below.
- D. **Flashing System:** Smooth type, scrim reinforced 60 mil

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thermoplastic polyolefin membrane as described below.

1.06 Submittals:

- A. Submittals Prior to Contract Award:
 - 1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system and eligibility to obtain warranty specified in this section.
 - 2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the manufacturer's requirements in order to qualify the project for the specified guarantee.
- B. Submittals Prior to Project Close-out:
 - 1. Manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.
- C. Product Data: provide product data sheets for each type of product indicated in this section.
- D. Shop Drawings: provide manufacturer's standard details and approved shop drawings for the roof system specified.
- E. Samples: provide samples of insulations, fasteners, membrane materials, and accessories for verifications of quality.

1.07 Quality Assurance:

- A. Acceptable Products: Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years. **The following products and manufacturers are acceptable on this project:**
 - 1. **Firestone Fleece Backed TPO** by **Firestone Building Products** - Nashville, TN 37201.
- B. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.
 - 1. Underwriters Laboratories Class A acceptance of the proposed roofing system without additional requirements for gravel or coatings.
- C. Acceptable Contractor: Contractor shall have a minimum of 10 years of experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products.
 - 1. Roofer shall have an office, warehouse with supplies,

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- and permanent roofing crews within the State of Oklahoma.
2. Roofer shall have had "NDL" approval for 5 years AT THIS OFFICE from manufacturer and shall perform a minimum of ten (10) NO DOLLAR LIMIT manufacturer guarantees per year.
 3. **Owner's Roofing Contractor (Universal Roofing and Sheet Metal located in Moore, Oklahoma) shall be utilized on this project. The bid shall be based on the provided drawings, specifications, and agreed-to pricing.**
- D. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractors' Association, amended to include the acceptance of a phased roof system installation.
- E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.
- F. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.
- G. The specified roofing assembly must be rated by Factory Mutual Global (FMG) to meet or exceed the factored uplift pressures outlined in FMG Property Loss Prevention Data Sheet I-28, and complies with FMG Property Loss Prevention Data Sheet I-29 for enhancements at the perimeter and corners.
- 1.08 Product Delivery Storage And Handling:
- A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.
 - B. Storage: Store materials out of direct exposure to the elements. Store roll goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on

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ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents and adhesives products away from open flames, sparks or excessive heat. Cover all material using a breathable cover such as a canvas. Polyethylene or other non-breathable plastic coverings are not acceptable.

- C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.
- D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, removed and replaced at the Contractor's expense.

1.09 Project/Site Conditions:

- A. Requirements Prior to Job Start
 1. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
 2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.
 3. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.
- B. Environmental Requirements:
 1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
 2. Temperature Restrictions: Do not apply adhesive when surface and / or ambient temperatures are below 45F degrees. Drums of adhesive must be stored at a minimum of 55F degrees at the time of use.
- C. Protection Requirements:
 1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
 2. The contractor shall exercise caution during adhesive spraying to avoid overspray. Maintain hand-held wind screens on-site for use as necessary.
 3. Limited Access: Prevent access by the public to materials, tools and equipment during the course of

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the project.

4. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials. Take precautions to prevent drains from becoming clogged during roofing application.
5. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.
6. When loading materials onto the roof, installer must comply with requirements of the Owner's Representative to prevent overloading and possible disturbance to the building structure.
7. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.

1.10 Guarantee/Warranty:

- A. Provide manufacturer's system No Dollar Limit Roofing System Guarantee.
 1. Single-source special guarantee includes roofing plies, base flashings, liquid applied flashing, roofing membrane accessories, fasteners, base sheet, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
 2. Guarantee Period: 10 years from date of Substantial Completion.
- B. Installer's Guarantee: Submit roofing Installer's guarantee, signed by Installer, covering Work of this Section, including all components of roofing system for the following warranty period:
 1. Guarantee Period: Two Years from date of Substantial Completion.

Part 2 - Products:

2.01 Roofing System Assembly/Products:

- A. Insulation: refer to Section 07200.

2.02 Description Of Systems:

- A. Cover Board: Underlayment or overlayment board with a water/mold-resistant and polymer coated, with glass fiber mesh embedded on both sides and edges, and pre-primed on one side.
 1. Acceptable Material: Firestone ISO-Guard Roof Board as manufactured by Firestone Building Products.
 2. Thickness: 1/2".

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- B. Roofing Membrane Materials: furnish a smooth type, polyester scrim reinforced fleece backed thermoplastic polyolefin membrane with a nominal 1.15 inch (115 mil) thickness, for use as a single ply roofing membrane. Membrane shall meet or exceed the minimum requirements of ASTM D-6878, UL Listed, FM Approved, Dade County Product Approval, and Florida Building Code Approved.
 - 1. Color: white membrane shall be Energy Star Listed, CRRC Listed and Title 24 Compliant.
 - 2. Acceptable Material: Firestone Fleece Backed TPO 115 mil thermoplastic single-ply roofing membrane by Firestone Building Products.
 - C. Flashing Materials: A smooth type, polyester scrim reinforced thermoplastic polyolefin membrane with a nominal 0.060 inch (60 mil) thickness, for use as a single ply roofing membrane. Membrane shall meet or exceed the minimum requirements of ASTM D-6878, UL Listed, FM Approved, Dade County Product Approval, and Florida Building Code Approved.
 - 1. Color: white.
 - 2. Acceptable Material: Firestone TPO 60 mil thermoplastic single-ply roofing membrane.
- 2.03 Roofing Accessories:
- A. Roofing Adhesives:
 - 1. Polymer-based Bonding Adhesive: one part, synthetic polymer based adhesive, two-sided application for use with Firestone TPO membranes.
 - 2. One part, membrane edge sealing agent required to protect field-cut edges of Firestone TPO membranes. Applied directly from a squeeze bottle, Firestone TPO Edge Sealant by Firestone Building Products.
 - 3. One part, synthetic polymer-based primer for preparing surfaces to receive butyl based adhesive tapes, Firestone Primer by Firestone Building Products.
 - 4. Solvent based seam cleaner used to clean exposed or contaminated seam prior to heat welding, Firestone TPO Membrane Cleaner by Firestone Building Products.
 - 5. Solvent based, synthetic elastomeric sealant. Durable and UV resistant suitable for use where caulk is typically used such as termination bar applications, by Firestone Building Products.
 - 6. One part butyl based high viscosity sealant, by Firestone Building Products. Provide between flashing membrane and substrate surface behind exposed termination bars, and between roofing membrane and drain flange.
 - 7. 100% solids epoxy based two-part sealant, Epoxy - Part

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A / Polyamide - Part B, 2-Part Pourable Sealant by Firestone Building Products. Provide at irregularly-shaped penetrations.

- B. Flashing Accessories:
1. A smooth type, 0.060 inches (60 mil) thick unreinforced thermoplastic polyolefin based membrane for use as an alternative flashing / reinforcing material for penetrations and corners, TPO Detailing Membrane. Provide where preformed vent boots cannot be used. Color shall be white.
 2. Mechanical Fasteners (fasteners to be determined by pull tests):
 - a. #12 Purlin Roofing Fasteners: self drilling fastener with $\frac{3}{4}$ " long pilot point to prevent existing metal roof panel from "jacking" up the threads during drilling operation. Fasteners to have Tru-Kote Epoxy E-Coating. Factory Mutual Approved, SAE C1022, heat treated, #4 drill point, #3 square drive, for use on metal roofing panels.
 3. Extruded aluminum termination bar with angled lip caulk receiver, and lower leg bulb stiffener. Bar shall be pre-punched with slotted holes at 6" o.c. minimum and 0.090 inches thick.
 4. 6 inch wide, smooth type, heat-weldable polyester scrim reinforced thermoplastic polyolefin membrane strip. Provide as cover strip over non-coated metal edges and flanges. TPO Heat-Weld Cover Tape by approved manufacturer.
 5. 24 gauge steel with 0.025 inch thick TPO based film as required for fabrication into metal gravel stop and drip edge profiles, metal base and curb flashings, sealant pans, and scupper sleeves. TPO Coated Metal by approved manufacturer.
- C. Wall and Curb Accessories:
1. 0.060" thick molded TPO membrane outside corners of base and curb flashing, Firestone TPO Universal Corners by Firestone Building Products. Hot-air weld directly to TPO membrane. Size to be 6" diameter. Color to be white.
- D. Penetration Accessories:
1. 0.075" thick molded TPO membrane sized to accommodate most common pipe and conduit penetrations (1"-6" diameter pipes), including square tubes. Hot-air weld directly to TPO membrane, supply with stainless steel clamping rings, Firestone TPO Preformed Vent Boots.
 2. 0.045" or 0.06" thick molded TPO membrane preformed

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- boots, split to accommodate most common pipe and conduit penetrations, TPO Split Pipe Boots by Firestone Building Products.
3. 0.045" or 0.06" thick molded TPO membrane preformed square boots, split to accommodate most common square penetrations and conduits, TPO Square Tube Wraps by Firestone Building Products.
 4. 0.07" thick molded penetration pocket to provide structure and foundation for the application of pourable sealant at required roof penetrations, weldable, TPO Pourable Sealer Pocket by Firestone Building Products.
- E. Field of Roof Accessories:
1. Universal style expansion joint covers - fabricate to accommodate all roof to wall and roof to roof applications. Provide 0.06" reinforced TPO membrane, TPO Expansion Joint Covers by Firestone Building Products.
 2. 0.055" thick smooth type, unreinforced thermoplastic polyolefin membrane designed for use as a conforming membrane seal over T-joints, T-Joint Patches by Firestone Building Products.
 3. 0.156" thick extruded and textured TPO roll 30" wide, heat weld directly to roofing membrane. Provide with herringbone traction surface, Firestone TPO Walkpad Rolls by Firestone Building Products. Color to be grey.
- F. Pipe Supports Typical:
1. Roller System: A Aroller-bearing@ pipe support for roof-mounted gas pipes, RTU condensate lines, and electrical conduit up to 4" I.D. or 5"O.D. Pipes rest on a self-lubricating roller system which is made of a stainless steel or glass-filled nylon rod and a sturdy polycarbonate resin roller. Pipe support base shall be manufactured of polycarbonate resin with a roller rod of glass-filled nylon, and stainless steel metal parts.
 2. Load Weight: Maximum load weight may not exceed 125 lbs. per pipestand.
 3. Spacing: Not to exceed 10 foot centers. Do not exceed 125 lbs. load weight and adjust pipe stand in height to even load.
 4. Acceptable Manufacturer: Pillow Block Pipestand Model 4-R, Miro Industries, Inc., 1780 West 2300 South, Salt Lake City, Utah 84119.
- G. Pipe Supports at Turns In Large Piping:
1. Pipe Support Hangers: A Aclevis hanger@ pipe support

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- hanger for roof mounted gas pipes at all large (over 4" I.D.) piping corners, bends, and Atees@/pipe intersections. Pipes rest on a clevis hanger with a support base of stainless steel polycarbonate. All other metal parts are hot-dip galvanized steel.
2. Load Weight: Maximum load weight not to exceed 310 lbs. per pipestand or 155 lbs. on each base.
 3. Spacing: Locate Aclevis@ type pipe hangers at all corners, bends, and Atees@/pipe intersections not to exceed 10'-0" o.c. maximum. Do not exceed 310 lbs. load weight (155 lbs. on each base) and make certain each pipestand is adjusted in height to even load at all pipestands.
 4. Acceptable Manufacturer: Pillow Block Pipestand Model 6-H, Miro Industries, Inc., 1780 West 2300 South, Salt Lake City, Utah 84119.

Part 3- Execution

3.01 Preparation:

- A. General: Sweep or vacuum all surfaces, removing all loose substances prior to commencement of roofing.

3.02 Substrate Preparation:

- A. Existing Built-up Roofing System:
 1. After removal and disposal of existing roofing system, Roofer shall inspect substrate and determine surface is acceptable for installation of new roofing system.
 2. Verify surfaces are dry, clean, and smooth.
 3. Verify all roof openings or penetrations through the roof are solidly set, and that all flashings are tapered.

- ##### 3.03 Recover Board Panel:
- Mechanically attach the recover board panels, using the specified fasteners, as directed above. Do not install more recover board than will be completely waterproofed each day.

3.04 Flashing:

- A. General:
 1. Refer to Section 07600 and below.
 2. All penetrations shall be a minimum of 24" from curbs, walls, and edges to provide adequate space for proper flashing.
 3. Flash all perimeter, curb, and penetration conditions with coated metal, membrane flashing, and flashing accessories as appropriate to the site condition.
 4. All coated metal and membrane flashing corners shall be reinforced with preformed corners or non-reinforced membrane.

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5. Hot-air weld all flashing membranes, accessories, and coated metal. A minimum 2" wide (hand welder) weld is required.
 6. All cut edges of reinforced membrane must be sealed with Firestone TPO Cut Edge Sealant.
 7. Refer to manufacturer's application and specifications manual for additional information and specific construction details.
- B. Coated Metal Flashings (where applicable):
1. Coated and metal flashings shall be formed in accordance with approved manufacturer's current construction details and SMACNA guidelines.
 2. Coated metal sections used for roof edging, base flashing and coping shall be butted together with a $\frac{1}{4}$ " gap to allow for expansion and contraction. Hot-air weld a 6" wide reinforced membrane flashing strip to both sides of the joint, with approximately 1" on either side of the joint left un-welded to allow for expansion and contraction. 2" wide aluminum tape can be installed over the joint as a bond-breaker, to prevent welding in this area.
 3. Coated metal used for sealant pans, scupper inserts, corners of roof edging, base flashing and coping shall be overlapped or provided with separate metal pieces to create a continuous flange condition, and pop-riveted securely. Hot-air weld a 6" wide reinforced membrane flashing strip over all seams that will not be sealed during subsequent flashing installation.
 4. Provide a $\frac{1}{2}$ " hem for all exposed metal edges to provide corrosion protection and edge reinforcement for improved durability.
 5. Provide a $\frac{1}{2}$ " hem for all metal flange edges whenever possible to prevent wearing of the roofing and flashing membranes at the flange edge.
 6. Coated metal flashings shall be nailed to treated wood nailers or otherwise mechanically attached to the roof deck, wall or curb substrates, in accordance with construction detail requirements.
- C. Reinforced Membrane Flashing:
1. The thickness of the flashing membrane shall be the same as the thickness of the roofing membrane.
 2. Membrane flashing may either be installed loose or fully adhered to the substrate surface in accordance with "Construction Detail Requirements".
 3. Where flashings are to be fully adhered, apply bonding adhesive at a rate resulting in 60 square feet/gallon of finished roofing material for solvent-based bonding

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adhesives, and at a rate of 125 square feet/gallon of finished roofing material for water-borne bonding adhesive. Apply bonding adhesive to both the underside of the membrane and the substrate surface at 120 square feet per gallon (Solvent Based) and 250 square feet per gallon (Water Based). A great quantity of bonding adhesive may be required based upon the substrate surface condition. The bonding adhesive must be allowed to dray until tacky to the touch before flashing membrane application.

4. Apply the adhesive only when outside temperature is above 40 degrees Fahrenheit. Recommended minimum application temperature is 50 degrees Fahrenheit to allow for easier adhesive application.
 5. The membrane flashing shall be carefully positioned prior to application to avoid wrinkles and buckles.
- D. Un-reinforced Membrane Flashings:
1. Un-reinforced membrane is used to field-fabricate penetration or reinforcement flashings in locations where preformed corners and pipe boots cannot be properly installed.
 2. Penetration flashings constructed of un-reinforced membrane are typically installed in two sections, a horizontal piece that extends onto the roofing membrane and a vertical piece that extends up the penetration. The two pieces are overlapped and hot-air welded together.
 3. The un-reinforced membrane flashing shall be adhered to the penetration surface. Apply bonding adhesive at a rate resulting in 60 square feet/gallon of finished roofing material for solvent-based bonding adhesives, and at a rate of 125 square feet/gallon of finished roofing material for water-borne bonding adhesive. Apply bonding adhesive to both the underside of the membrane and the substrate surface at 120 square feet per gallon (Solvent Based) and 250 square feet per gallon (Water Based). A greater quantity of bonding adhesive may be required based upon the substrate surface condition. The bonding adhesive must be allowed to dry until tacky to the touch before flashing membrane application.
- E. Roof Edges:
1. New wood nailers are to be installed at the entire perimeter edge of the roof to match the depth of the insulation. All eave trim, edge trim and ridge trim metal is to be removed and replaced with new 24 gauge prefinished metal. If coated metal is utilized, owner

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- will pick a color from the approved manufacturer's standard range of colors.
2. Roof edge flashings are applicable for gravel stop and drip edge conditions as well as for exterior edges of parapet walls.
 3. Flash roof edges with metal flanges nailed 4" O.C. to pressure-treated wood nailers. Where required, hot-air weld roof membrane to coated metal flanges.
 4. When the fascia width exceeds 4", coated metal roof edging must be attached with a continuous cleat to secure the lower fascia edge. The cleat must be secured to the building no less than 12" O.C.
 5. Alternatively, roof edges may be flashed with a 2-piece snap on fascia system, adhering the roof membrane to a metal cant and face nailing the membrane 8" on center prior to installing a snap-on fascia.
 6. Flash roof edge scuppers with a coated metal insert that is mechanically attached to the roof edge and integrated as a part of the metal edging.
- F. Parapet and Building Walls (where applicable):
1. Flash walls with TPO membrane adhered to the 5/8" thick plywood substrate with bonding adhesive.
 2. Secure membrane flashing at the top edge of parapet wall / new wood blocking.
 3. Roof membrane must be mechanically attached along the base of walls with screws and plates (deck securement) or screws and inverted termination bar (wall securement) at the following rate: 12" o.c.
 4. All coated metal wall flashings and loose applied membrane flashings must be provided with separate metal counterflashings, or metal copings.
 5. Metal counterflashings may be optional with fully adhered flashings depending on guarantee requirements. Exposed termination bars must be sealed with approved manufacturer's all purpose caulking.
- G. Curbs and Ducts:
1. Flash curbs and ducts with TPO membrane adhered to the curb substrate with bonding adhesive, loose applied (Less than 18" in height) or with coated metal flashing nailed 4" on center to pressure-treated wood nailers.
 2. Secure membrane flashing at the top edge with a termination bar. Water Block shall be applied between the curb/duct surface and membrane flashing underneath all termination bars. Exposed termination bars shall be mechanically fastened every 8"o.c.; termination

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bars that are counter flashed shall be fastened 12" on center.

3. Roof membrane must be mechanically attached along the base of walls with screws and plates (deck securement) or screws and inverted termination bar (wall securement) at the following rate: 12" o.c.
4. All coated metal curb flashings and loose applied membrane flashings must be provided with separate metal counterflashings, or metal copings.
5. Metal counterflashings may be optional with fully adhered flashings depending on guarantee requirements. Exposed termination bars must be sealed with the approved manufacturer's all purpose caulking.

3.05 Traffic Protection (where applicable):

- A. Install walkway pads/rolls at all roof access locations and other designated locations including roof-mounted equipment work locations and areas of repeated rooftop traffic.
- B. Walkway pads must be spaced 2" apart to allow for drainage between the pads.
- C. Fully adhere walkway pads/rolls to the roof membrane with solvent-based bonding adhesive, applied at the rate of 1 gal. per 100 sq. ft. to both the walkway and roof membrane surfaces. Press walkway in position once adhesive is tacky to the touch.
- D. Alternatively, walkway pads/rolls may be hot-air-welded to the roof membrane surface continuously around the perimeter of the pad/roll.

3.08 Daily Seal and Roof Protection:

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the workday, a daily seal must be performed to temporarily close the membrane to prevent water infiltration. Temporary tie-ins shall be removed prior to commencement of work the following day.
- B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.
- C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.

3.09 Field Quality Control And Inspections:

- A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the site on a daily basis.

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- B. Properly clean the finished roof surface after completion, and verify the drains are not clogged. Clean and restore all damaged surfaces to their original condition.
- C. Notification Of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.
- D. Final Inspection:
 - 1. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.
- E. Issuance Of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

End of Section

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SECTION 07600 - FLASHING AND SHEET METAL

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Modified Bitumen Membrane Roofing System - Section 07550
- B. Sealants - Section 07900

1.03 Quality Assurance:

- A. Standards:
 - 1. American Society of Testing and Materials
 - a. ASTM A-526, Steel Sheet, Zinc-Coated (Galvanized), Commercial Quality.
 - b. ASTM B-32, Solder Metal
 - 2. Federal Specifications:
 - a. SS-C-153B, Cement, Bituminous, Plastics
 - 3. Sheet Metal and Air Conditioning Contractors National Association:
 - a. Architectural Sheet Metal Manual

- 1.04 Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Prefinished Sheet Metal overflow scuppers and Prefinished Metal Coping:
 - 1. Galvanized iron, prefinished one side.
 - 2. Gauge: 24 gauge, of design and width as detailed.
 - 3. Acceptable manufacturer: Color Klad - Vincent Brass and Aluminum Co.
 - 4. Finish: Kynar 500 - Refer Color Schedule
- B. Sheet Metal:
 - 1. Galvanized Sheet Steel: ASTM A-526, Commercial Quality.
 - 2. Gauge: 22 Gauge minimum or as required by Drawings or Specifications.
- C. Fasteners: Nails, screws, and other fasteners used in conjunction with this work shall be galvanized or cadmium plated.
- D. Solder: ASTM B-32, alloy grade 58, 50% tin, 50% lead.
- E. Flux: Muriatic acid with zinc.
- F. Sealants: Rubber based compound - refer to Section 07900.
- G. Bituminous Plastic Cement: FS SS-C-153B.

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- H. Accessories: Provide accessories as recommended by manufacturer or as indicated on Drawings.

Part 3 - Execution

3.01 Fabrication:

- A. Shape and install sheet metal as indicated on Drawings. Comply with recommendations of SMACNA "Architectural Sheet Metal Manual."
- B. Form exposed faces flat and free of buckles, excessive wave and tool marks. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
- C. Hem all exposed edges.
- D. Make waterproof corner joints by soldering solidly. Joints shall be full-lapped.
- E. Soldering: Shall be done slowly with well heated coppers to thoroughly heat the sheet and completely sweat the solder through the full width of the seam. Ample solder shall be used and the seam shall show a least one full inch of evenly flowed solder. Soldering coppers: Shall be heavy and blunt design, properly tinned before using. Neutralize all excess flux.
- F. Provide for thermal expansion of running trim, flashing and other items exposed for more than 15'-0" continuous length. Locate expansion seams at 10'-0" intervals and 2'-0" each side of corners and intersections.
- G. Angle bottom edges of exposed vertical surfaces to form drips.

3.02 Installation and Application:

- A. General:
 - 1. Furnish those items to be installed by other trades to proper grade for installation.
 - 2. Cooperate with and coordinate installation of sheet metal with roofing work as specified under Membrane Roofing - Section 07550.
 - 3. Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
 - 4. Embed all flashing in plastic cement. Coat dissimilar metals from contact with bituminous coating.
- B. Metal Coping:
 - 1. Material: 24 gauge, prefinished sheet metal.
 - 2. Fabricate and install in accordance with drawings, and recognized sheet metal practices.
 - 3. Secure coping bedded in plastic cement to blocking.
 - 4. At joints, bed coping in plastic cement and secure on side to backing strip by soldering solid. Do not use screws

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- or nails in exposed face to coping.
5. Lower edge of coping to be securely hooked to hook strip. Secure to wood blocking with No. 8 x 1" galvanized sheet metal screws at 8 o.c.

End of Section

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SECTION 07840 - FIRESTOPPING

Part 1 - General

1.01 Related Documents:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Section, apply to work specified in this section.

1.02 Definitions:

- A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

1.03 General Description of the Work:

- A. Only tested firestop systems shall be used in specific locations as follows:
 1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
 2. Safing slot gaps between edge of floor slabs and curtain walls.
 3. Openings between structurally separate sections of wall or floors.
 4. Gaps between the top of walls and ceilings or roof assemblies.
 5. Expansion joints in walls and floors.
 6. Openings and penetrations in fire-rated partitions or walls containing fire doors.
 7. Openings around structural members which penetrate floors or walls.

1.04 Related Work Specified Elsewhere:

- A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:
 1. Section 03300 - Cast-In-Place Concrete
 2. Section 04810 - Masonry
 3. Section 07900 - Sealants
 4. Section 09250 - Gypsum Wallboard
 5. Section ***** - Fire Suppression Piping
 6. Section ***** - Common Work Results for Plumbing
 7. Section ***** - Common Work Results for HVAC
 8. Section ***** - HVAC Insulation
 9. Section ***** - Basic Electrical Materials and Methods

1.05 References:

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- A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops".
- B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops".
- C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems".
- D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
 - 1. UL Fire Resistance Directory:
 - a. Firestop Devices (XHJI)
 - b. Fire Resistance Ratings (BXRH)
 - c. Through-Penetration Firestop Systems (XHEZ)
 - d. Fill, Voids, or Cavity Material (XHHW)
 - e. Forming Materials (XHKU)
 - f. Joint Systems (XHBN)
 - g. Perimeter Fire Containment Systems (XHDG)
 - 2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).
- E. Test Requirements: ASTM E 1966, "Standard Test Method for Fire Resistive Joint Systems".
- F. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops".
- H. ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials".
- I. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments.
- J. All major building codes: ICBO, SBCCI, BOCA, IBC
- K. NFPA 101 - Life Safety Code
- L. NFPA 70 - National Electric Code

THROUGH-PENETRATION UL CLASSIFICATION SYSTEM

Fire Stopping Systems

UL Classification System

		Construction Penetrated	Type Of Construction	System Identification
1	No Penetrating Items:	F, W, C	A, B, J, K, L	0001-0999
2	Metallic Pipes, Conduit or Tubing:	F, W, C	A, B, J, K, L	1001-1999
3	Nonmetallic Pipe, Conduit or Tubing:	F, W, C	A, B, J, K, L	2001-2999
4	Electric Cables:	F, W, C	A, B, J, K, L	3001-3999
5	Cable, Trays with Electric Cables:	F, W, C	A, B, J, K, L	4001-4999
6	Insulated Pipes:	F, W, C	A, B, J, K, L	5001-5999
7	Electrical Bussduct Penetrations:	F, W, C	A, B, J, K, L	6001-6999

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8	Mechanical Ductwork Penetrations: Multiple Penetrations Through Common	F, W, C	A, B, J, K, L	7001-7999
9	Openings:	F, W, C	A, B, J, K, L	8000-8999

Construction Penetration

F	Floor penetration
W	Wall penetration
C	Either floor or wall penetration

Type of Construction

A-	Concrete floors equal to or less than 5-inches thick
B-	Concrete floors greater than 5-inches thick
J-	Concrete or masonry walls equal to or less than 8-inches thick
K-	Concrete or masonry walls greater than 8-inches thick
L-	Framed walls

JOINT UL CLASSIFICATION SYSTEM

Fire-Resistant Joint Systems	UL Classification System	UL Classification System	UL Classification System	
	Joint System	Movement Capability	Joint Width	
1	Floor-to-Floor	FF	D	0000-0999
2	Wall-to-Wall	WW	D	0000-0999
3	Floor-to-Wall:	FW	D	0000-0999
4	Head of Wall:	HW	D	0000-0999

Movement Capability

D-	Has movement capability
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Joint Width
0000-0999 Less than or equal to 2-inches

1.06 Quality Assurance

A. **Installer Responsibilities:** A firm experienced installing through-penetration firestop systems similar in material, design and extent to that indicated for this Project, whose work has resulted in construction with a record of

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successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements.

- B. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- E. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

1.07 Submittals:

- A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified tested firestop systems to be used and manufacturer's installation instructions.
- B. Submit Manufacturer's engineering judgment identification number and drawing details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.
- C. Submit material safety data sheets provided with product delivered to job-site.

1.08 Installer Qualifications:

- A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements.
- B. The work is to be installed by a contractor with at least one of the following qualifications:
 - 1. FM 4991 Approved Contractor
 - 2. UL Approved Contractor
 - 3. Hilti Accredited Fire Stop Specialty Contractor
- C. Installer shall have not less than 3 years of experience with fire stop installation.

1.09 Delivery, Storage and Handling:

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements,

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- including temperature restrictions.
 - D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
 - E. Do not use damaged or expired materials.
- 1.10 Project Conditions:
- A. Do not use materials that contain flammable solvents.
 - B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
 - C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
 - D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
 - E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.
- 1.11 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers, providing they meet or exceed that specified.**

Part 2 - Products

- 2.01 Firestopping, General:
- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
 - B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
 - C. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.
- 2.02 Acceptable Manufacturers:
- A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN), and perimeter firestop systems (XHDG) listed in Volume 2 of the UL Fire Resistance Directory; provide products of the following manufacturers as identified below:

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1. Hilti, Inc., Tulsa, Oklahoma
800-879-8000 / www.us.hilti.com

2.03 Materials:

- A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- B. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products are acceptable:
 1. Hilti CP 680-P Cast-In Place Firestop Device
 - a. Add Aerator adaptor when used in conjunction with aerator ("sovent") system.
 2. Hilti CP 681 Tub Box Kit for use with tub installations.
 3. Hilti CP 680-M Cast-In Place Firestop Device for use with noncombustible penetrants.
 4. Hilti CP 653 Speed Sleeve for use with cable penetrations.
- C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
 1. Hilti FS-ONE Intumescent Firestop Sealant
 2. Hilti CP 604 Self-leveling Firestop Sealant
 3. Hilti CP 620 Fire Foam
 4. Hilti CP 606 Flexible Firestop Sealant
 5. Hilti CP 601s Elastomeric Firestop Sealant
- D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
 1. Hilti CP 601s Elastomeric Firestop Sealant
 2. Hilti CP 606 Flexible Firestop Sealant
 3. Hilti FS-ONE Intumescent Firestop Sealant
- E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
 1. Hilti CP 672 Speed Spray
 2. Hilti CP 601s Elastomeric Firestop Sealant
 3. Hilti CP 606 Flexible Firestop Sealant
 4. Hilti CP 604 Self-leveling Firestop Sealant
- F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.
 1. Hilti CP 777 Speed Plugs
 2. Hilti CP 767 Speed Strips
- G. Intumescent sealants, caulking materials for use with

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combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

1. Hilti FS-ONE Intumescent Firestop Sealant
- H. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti FS-ONE Intumescent Firestop Sealant
 2. Hilti CP 620 Fire Foam
 3. Hilti CP 601s Elastomeric Firestop Sealant
 4. Hilti CP 606 Flexible Firestop Sealant
- I. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti CP 618 Firestop Putty Stick
 2. Hilti CP 658T Firestop Plug
- J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
1. Hilti CP 617 Firestop Putty Pad
 2. Hilti Firestop Box Insert
- K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
1. Hilti CP 643N Firestop Collar
 2. Hilti CP 644 Firestop Collar
 3. Hilti CP 648E/CP648S Wrap Strips
- L. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
1. Hilti CP 637 Firestop Mortar
 3. Hilti FS 657 FIRE BLOCK
 4. Hilti CP 620 Fire Foam
 5. Hilti CP 675T Firestop Board
- M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
1. Hilti FS 657 FIRE BLOCK
 2. Hilti CP 675T Firestop Board
- N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
1. Hilti CP 672 Speed Spray
 2. Hilti CP 601s Elastomeric Firestop Sealant
 3. Hilti CP 606 Flexible Firestop Sealant

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- 4. Hilti CP 604 Self-Leveling Firestop Sealant
- O. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:
 - 1. Hilti FS 657 FIRE BLOCK
 - 2. Hilti CP 658T Firestop Plug
- P. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- Q. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

Part 3 - Execution

3.01 Preparation:

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify penetrations are properly sized and in suitable condition for application of materials.
 - 2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
 - 3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
 - 4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
 - 5. Do not proceed until unsatisfactory conditions have been corrected.

3.02 Coordination:

- A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.
- B. Responsible trades to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interferences.

3.03 Installation:

- A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.
 - 1. Seal all holes or voids made by penetrations to ensure

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an air and water resistant seal.

2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
3. Protect materials from damage on surfaces subjected to traffic.

3.04 Field Quality Control:

- A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
- D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.05 Identification:

- A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
 1. The words: "Warning -Through Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's Name, address, and phone number.
 3. Through-Penetration firestop system designation of applicable testing and inspecting agency.
 4. Date of Installation.
 5. Through-Penetration firestop system manufacturer's name.
 6. Installer's Name.

3.06 Adjusting and Cleaning:

- A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

End of Section

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SECTION 07840 - FIRESTOPPING

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SECTION 07900 - SEALANTS

Part 1 - General

1.01 Work Included:

- A. All materials, labor services, and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. TT-S-00230C, Sealing Compound, One Component.
 - 2. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.03 Submittals:

- A. Submit manufacturer's specifications and color chart for each type of sealant.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Product test reports.
- E. Preconstruction compatibility and adhesion test reports.
- F. Preconstruction field-adhesion test reports.
- G. Field-adhesion test reports.

1.04 Warranty:

- A. All work done under this section of the work shall be guaranteed for a period of two years from date of final acceptance of the building. Guarantee shall include materials and workmanship required to repair any leaks or the repairs thereof.
- B. Special Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section for a period of 10 years from date of final acceptance.

1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Building Sealant: One part high performance polyurethane waterproofing sealant, FS-TT-S-00230C.
 - 1. Acceptable Manufacturer: Sonneborn NP1 Building Sealant.
 - 2. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall

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comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

- a. Architectural Sealants: 250 gIL.
 - b. Sealant Primers for Nonporous Substrates: 250 gIL.
 - c. Sealant Primers for Porous Substrates: 775 gIL.
3. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - a. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
 4. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
 5. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- B. Silicone Joint Sealants:
1. Mildew-Resistant Neutral-Curing Silicone Joint Sealant: ASTM C 920.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. BASF Building Systems.
 2. Dow Corning Corporation.
 3. GE Advanced Materials - Silicones.
 4. Pecora Corporation.
 5. Sika Corporation; Construction Products Division.
 6. Tremco Incorporated.
- C. Urethane Joint Sealants: Urethane Joint Sealant: ASTM C 920.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work

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- include, but are not limited to, the following:
- a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Lymtal, International, Inc.
 - d. Pecora Corporation.
 - e. Sika Corporation; Construction Products Division.
 - f. Tremco Incorporated.
- D. Latex Joint Sealants: Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, GradeNF.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Tremco Incorporated.
- E. Preformed Joint Sealants: Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Specialty Chemicals.
 - b. EM SEAL Joint Systems, Ltd.
 - c. Sandell Manufacturing Co.
 - d. Schul International, Inc.
 - e. Willseal USA, LLC.
- F. Acoustical Joint Sealants: Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation.

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SECTION 07900 - SEALANTS

- b. USG Corporation.
- G. Joint Sealant Backing: cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type 0 (open-cell material) or any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.
- H. Miscellaneous Materials: as recommended by sealant manufacturer.
 - 1. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
 - 2. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
 - 3. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
 - 4. Joint Cleaner
 - 5. Joint Primer/Sealer
 - 6. Bond Breaker Tape
 - 7. Joint Backer-Rod: Closed-cell compressible rod stock, size and shape as required by application.
- I. Caulking compound: Watertight, gun consistency, conforming to FS-TT-C-598, Type 1.
- J. Accessories: As recommended by sealant manufacturer.
- K. Color: to be selected from manufacturer's standard colors.

Part 3 - Execution

- 3.01 Preparation:
 - A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 - B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant

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manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.02 Installation: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

- A. Do not leave gaps between ends of sealant backings.
- B. Do not stretch, twist, puncture, or tear sealant backings.
- C. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- G. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
- H. Clean off excess sealant or sealant smears adjacent to

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joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.03 Joint Sealant Schedule:

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non traffic surfaces.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.
- F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal non traffic surfaces.

3.04 Additional Information:

- A. Application: All sight exposed caulking, and all exterior applications.
- B. Comply with sealant manufacturer's printed instructions.
- C. Any surfaces requiring priming, shall be prepared according to manufacturer's recommendations.
- D. Install sealants to depths as shown or as recommended by sealant manufacturer. Smooth uneven surfaces.
- F. Do not disturb compound by touching, washing, or otherwise until it has cured tack free.
- G. Excess compound shall be removed from surfaces after curing.
- H. Follow manufacturer's recommendations for painting over sealant.

End of Section

DIVISION 8 - DOORS & WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES

Part 1 - General

1.01 Work Included:

- A. All material labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Hardware and Specialties - Section 08700

1.03 Quality Assurance:

A. Standards:

1. American Society for Testing and Materials
 - a. ASTM A-366, Steel Sheets, Carbon, Cold-Rolled, Commercial Quality.
 - b. ASTM A-569, Steel, Carbon, Hot-rolled Sheet and strip, commercial quality.
2. Underwriters' Laboratories, Inc.
3. Steel Door Institute (SDI): Recommended specifications for Steel Doors and Frames.

- B. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- C. Source Limitations: Obtain standard steel doors and frames through one source from a single manufacturer.

- D. Fire-Rated Door Frame Assemblies: Assemblies complying with IBC 2009 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire protection ratings indicated.

1. Test Pressure: Test according to NFPA 252. After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches (1000 mm) or less above the sill.
2. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.
3. Smoke-Control Door Assemblies: Comply with NFPA 105.

1.04 Submittals:

- A. Shop Drawings: Product Data: Include construction details, material descriptions, core descriptions, label compliance, and finishes for each type of steel door and frame specified.

1. Submit shop Drawings showing details for each frame and door type, elevations and details of construction. Provide a schedule of doors and frames referenced to detail and openings as shown on the Drawings.
 - a. Elevations of each door design.
 - b. Details of doors, including vertical and horizontal edge details.
 - c. Frame details for each frame type, including dimensioned profiles.
 - d. Details and locations of reinforcement and

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- preparations for hardware.
 - e. Details of each different wall opening condition.
 - f. Details of anchorages, accessories, joints, and connections.
 - g. Details of glazing frames and stops showing glazing.
 - h. Details of conduit and preparations for electrified door hardware and controls.
 - 2. It is the manufacturer's responsibility to obtain templates of finish hardware. The shop Drawings must indicate all hardware applications to the doors and frames.
 - 3. Begin fabrication only after receiving approved shop Drawings.
 - 4. Qualification Data: For Installer.
- 1.05 Product Delivery, Storage and Handling:
- A. All materials shall be protected for shipping so that they may arrive at the job site without undue damage or damage from storage at the job.
 - B. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
 - D. Store doors and frames under cover at Project site. Place units in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber.
 - 1. If wrappers on doors become wet, remove cartons immediately. Provide minimum 14-inch space between each stacked door to permit air circulation.
- 1.06 Project Conditions:
- A. Field Measurements: Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating standard steel frames without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.
- 1.07 Coordination:
- A. Coordinate installation of anchorages for standard steel frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves,

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concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in masonry. Deliver such items to Project site in time for installation.

1.08 Warranty: Provide manufacturer's standard warranty.

Part 2 - Products

2.01 Acceptable Manufacturers:

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CURRIES Company; an ASSA ABLOY Group Company.
2. Steelkraft; and Ingersoll-Rand Company.
3. Or Approved Equal.

2.02 Materials:

- A. Cold-Rolled Steel Sheet: ASTM A 100S/A 100SM, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 zinc-iron-alloy (galvannealed) coating designation.
- D. Electrolytic Zinc-Coated Steel Sheet: ASTM A 5911A 59 1M, Commercial Steel (CS), Class B coating; mill phosphatized.
- E. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.
- F. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M.
- G. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-developed indexes of 25 and 50 respectively; passing ASTM E 136 for combustion characteristics.
- H. Glazing: Comply with requirements in Division S Section "Glazing."
- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- J. Grout: In masonry construction use grout for masonry as specified in Division 4. In stud walls use cementitious sprayed fire-resistive material manufactured by the following:

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SECTION 08100 - METAL DOORS AND FRAMES

1. Monokote Type MK-6; W.R. Grace Construction Products.
 2. Cafco 300; Isolatek International Corp.
- 2.03 Requirements: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces, unless otherwise indicated. Comply with ANSI A250.8.
- A. Doors - Flush Panel: (SDI Door Type III, Style 2, Seamless):
1. Door, as indicated on the Drawings shall be constructed of 16 gauge cold-rolled, stretcher leveled sheet steel. Doors shall be insulated with foamed urethane, full length and width of doors. Construct doors with smooth, flush surfaces without visible joints or seams on exposed face or vertical edges. Doors shall be 1-3/4" thick unless noted otherwise.
 2. Close top and bottom edges with a recessed channel end closure or a flush end closure treatment.
 3. Vertical Edges for Single-Acting Doors: Square edge unless beveled edge is indicated.
 - a. Beveled Edge: 1/8 inch in 2 inches.
 4. Vertical Edges for Double-Acting Doors: Round vertical edges with 2-1/8-inch radius.
 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
 6. Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- B. Frames:
1. Hollow metal frames shall be of 16 gauge cold-rolled, pickled steel, except that all frames for single doors over 3'-0" wide, frames for pairs of doors over 4'-0" wide and frames for doors over 9'-0" high shall be of 14 gauge steel. Frames shall be neatly mitered and continuously welded and ground smooth for invisible joints.
 2. Furnish anchors as shown on Drawings or as recommended by manufacturer, to secure frames to adjacent construction, formed of not less than 18 gauge galvanized steel. Install anchors at a maximum of 24" centers of jamb height.
 3. Frames against masonry or concrete are to be slush filled.
 4. Knock-down frames are not permitted.
 5. Frames against masonry or concrete are to be slush filled.
 6. Jamb Anchors:
 - a. Masonry Type: Adjustable strap-and-stirrup or T - shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated

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- straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
- b. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - c. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.
 - d. Ceiling Struts: Minimum 3/8-inch-thick by 2-inch-wide steel.
 - e. Plaster Guards: Formed from same material as frames, not less than 0.016-inch thick.
7. Sidelight Frames: Provide closed tubular members with no visible face seams or joints; fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
- C. Hardware Reinforcement:
- 1. Reinforcements for locks shall be 3/16" for fronts, with 14 gauge for roses and escutcheons. Hinge reinforcements shall be at least 10 gauge x 1 2" x 9". Provide steel strike and hinge reinforcement cover for frames.
- D. Jamb Anchors: Provide number and spacing of anchors as follows:
- 1. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - a. Two anchors per jamb up to 60 inches in height.
 - b. Three anchors per jamb from 60 to 90 inches in height.
 - c. Four anchors per jamb from 90 to 120 inches in height.
 - d. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 120 inches in height.
 - 2. Stud-Wall Type: Locate anchors not more than 18 inches

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from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

- a. Three anchors per jamb up to 60 inches in height.
 - b. Four anchors per jamb from 60 to 90 inches in height.
 - c. Five anchors per jamb from 90 to 96 inches in height.
 - d. Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 96 inches in height.
 - e. Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
- E. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Provide plastic plugs to keep holes clear during construction.
1. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 2. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- F. Stops and Moldings:
1. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.
 2. Fixed Frame Moldings: Formed integral with standard steel frames, minimum 5/8 inch high, unless otherwise indicated.
 3. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.
- G. Labeled Doors and Frames:
1. Where doors and frames are called for on Drawings as labeled, their construction shall conform to all requirements and bear the appropriate U.L. label.
- H. Steel Finishes
1. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - a. Finish standard steel door and frames after assembly.
 2. Metallic-Coated Steel Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

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- a. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
3. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel; comply with SSPC-SP 3, "Power Tool Cleaning," or SSPC-SP 6/NACE No.3, "Commercial Blast Cleaning."
4. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.
 - a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

Part 3 - Execution

3.01 Fabrication:

- A. All doors, and frames shall be cleaned of rust, grease and other impurities, and all welds ground and filled smooth, Metallic filler to conceal defects is not acceptable.
- B. Doors and frames shall be mortised, reinforced, drilled, and tapped for all mortise hardware in accordance with Hardware schedule and templates furnished by the hardware supplier, except that drilling and tapping for surface door closers, door closer brackets, surface panic devices and/or other surface applied hardware shall be done in the field. Frames shall be accurate and done in a neat, workmanlike manner.

3.02 Installation:

- A. Standard Steel Frames: Install standard steel frames for doors sidelights borrowed lights and other openings, of size and profile indicated. Comply with SDI 105.
 1. Bituminous coating and grout: Any material lost, removed or damaged during transportation or installation shall be replaced.
 2. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary

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SECTION 08100 - METAL DOORS AND FRAMES

braces, leaving surfaces smooth and undamaged.

- a. At fire-protection-rated openings, install frames according to NFP A 80.
 - b. Install frames with removable glazing stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of post installed expansion anchors if so indicated and approved on Shop Drawings.
 4. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
 5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar as specified in Division 4 Section "Unit Masonry Assemblies."
 6. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
 7. Installation Tolerances: Adjust standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

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- B. Standard Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFP A 80.
 - 3. Smoke-Control Doors: Install doors according to NFPA 105.
 - C. Glazing: Comply with installation requirements in Division 8 Section "Glazing" and with standard steel door and frame manufacturer's written instructions.
- 3.03 Adjusting and Cleaning:
- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including standard steel doors or frames that are warped, bowed, or otherwise unacceptable.
 - B. Clean grout and other bonding material off standard steel doors and frames immediately after installation.
 - C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
 - D. Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions. Do not use abrasive, caustic or acid cleaning agents.
 - E. Protect doors and frames from damage until final acceptance by Contracting Officer. Replace/repair any damaged items as directed above.

End of Section

DIVISION 8 - DOORS & WINDOWS

SECTION 08200 - WOOD DOORS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Finish Hardware - Section 08700

1.03 Quality Assurance:

A. Standards:

- 1. Architectural Woodwork Institute:
 - a. Architectural Woodwork Quality Standards
- 2. Underwriter's Laboratories, Inc.

- B. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-Accredited certification body.

- C. Source Limitations: Obtain flush wood doors from single manufacturer.

- D. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."

- E. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at according to NFPA 252 and UL 10B.

- 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- 2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.
- 3. Fire-Rated Doors must be provided with fire labels.

1.04 Submittals:

A. Shop Drawings:

- 1. It is the manufacturer's responsibility to obtain templates of finish hardware. The shop Drawings must indicate all hardware applications to the doors.
- 2. Begin fabrication only after receiving approved shop Drawings.
- 3. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
- 4. Samples for Initial Selection: Color charts consisting

DIVISION 8 - DOORS & WINDOWS

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of actual materials in small sections.

5. Samples for Verification:
 - a. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
6. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.05 Products Delivery, Storage and Handling:

- A. When doors are delivered to job site, doors shall receive first coat of finish. Store in a protected area.
- B. Comply with requirements of referenced standard and manufacturer's written instructions.
- C. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- D. Mark each door on bottom rail with opening number used on Shop Drawings.

1.06 Warranty:

- A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span, or do not comply with tolerance limitations in referenced quality standard.
 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 2. Warranty shall be in effect during the following period of time after date of Final Completion.
 - a. Solid Core Interior Doors: Life of installation.

Part 2 - Products

2.01 Doors (non-labeled):

- A. Doors shall be 1 3/4" thick interior grade, veneered, with a particleboard core. Construction shall meet AWI 1300 PC, "Custom" standard. Doors shall have I.S. "Premium" grade

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SECTION 08200 - WOOD DOORS

faces - Plain Sliced Red Oak. Provide hardwood top, bottom, and side edges.

2.02 Doors (labeled):

- A. Doors shall be 1 3/4" thick interior grade, veneered, with a mineral core (refer to Drawings for ratings). Construction shall meet AWI 1300 FD, "Custom" standard. Doors shall have I.S. "Premium grade faces - Plain Sliced Red Oak. Provide hardwood top, bottom, and side edges.
- B. Where doors are called for on drawings as labeled their construction shall conform to all U.L. requirements and bear the appropriate U.L. label.

2.03 Acceptable Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Algoma Hardwoods, Inc.
- 2. Ampco, Inc.
- 3. Buell Door Company Inc.
- 4. Chappell Door Co.
- 5. Eagle Plywood & Door Manufacturing, Inc.
- 6. Eggers Industries.
- 7. Graham; an Assa Abloy Group company.
- 8. Haley Brothers, Inc.
- 9. Ideal Architectural Doors & Plywood.
- 10. Ipik Door Company.
- 11. Lambton Doors.
- 12. Marlite.
- 13. Marshfield Door Systems, Inc.
- 14. Mohawk Flush Doors, Inc.; a Masonite company.
- 15. Oshkosh Architectural Door Company.
- 16. Poncraft Door Company.
- 17. Vancouver Door Company.
- 18. VT Industries Inc.

2.04 Door Construction - General:

- A. Particleboard-Core Doors:
 - 1. Particleboard: ANSI A208.1, Grade 1L-1, made with binder containing no ureaformaldehyde resin.
 - 2. Blocking - Provide wood blocking in particleboard-core doors as follows:
 - a. 5-inch top-rail blocking, in doors indicated to have closers.
 - b. 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 - 3. Provide doors with structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.
- B. Fire-Protection-Rated Doors: Provide core specified or

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mineral core as needed to provide fire protection rating indicated.

1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 3. Pairs: Provide formed-steel edges and astragals with intumescent seals.
- C. Factory Finishing: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
 2. Finish doors at factory.
 3. Finish doors at factory that are indicated to receive transparent finish. Field finish doors indicated to receive opaque finish.
4. Transparent Finish:
1. Grade: Premium.
 2. Finish: WDMA TR-6 catalyzed polyurethane.
 3. Staining: Water-based stain with transparent ultraviolet cured catalyzed polyurethane. Color as selected by Architect from manufacturer's full range.
 4. Effect: Open-grain finish.
 5. Sheen: Semigloss.

Part 3 - Execution

3.01 Examination:

- A. Examine doors and installed door frames before hanging doors.
 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Installation:

- A. Provide clean properly sized and accurately placed mortises

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and drilled holes for all mortise and surface mounted finish hardware, in accordance with Hardware Schedule and templates furnished by the hardware supplier.

- B. Comply with the tolerance requirements of AWI for prefabricating. Install in accordance with the requirements of the NWMA Door Guarantee.
 - C. Repair or replace doors damaged during installation. Repair doors which do not swing or operate properly.
 - D. Hardware: For installation, see Division 08 Section "Door Hardware."
 - E. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
 - F. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFP A 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
 - 3. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
 - G. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
 - H. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- 3.03 Adjusting:
- A. Operation: Rehang or replace doors that do not swing or operate freely.
 - B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

End of Section

DIVISION 8 - DOORS & WINDOWS

SECTION 08310 - TORNADO DOORS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 System Description:

- A. Design Requirements - Tornado Doors:
 - 1. ICC 500-2014 Tornado Doors.

1.03 Submittals:

- A. Shop Drawings: Indicate details and dimensions of fabrications and installation, including any operators and controllers.
- B. Manufacturer's Literature: Descriptive literature and installation instructions.

1.04 Quality Assurance:

- A. Qualifications:
 - 1. Manufacturer Qualifications: Minimum five years of experience in producing doors of the type specified.
 - 2. Installer Qualifications: Manufacturer's approval.
 - 3. Doors shall have fire resistance rating as per the drawings.

1.05 Delivery Storage and Handling:

- A. Follow manufacturer's instructions.

1.06 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 General:

- A. Refer to Drawings for location, size, and details.

2.02 Tornado Door:

- A. Locations: provide where indicated on the drawings (Doors #43 and 52).
- B. Acceptable Manufacturer:
 - 1. Manufacturer and model number:
 - a. Steelcraft - Ingersoll Rand Security Technologies / Paladin PW-Series Flush Doors and FP14 Frame.
 - b. Republic Doors and Frames, Inc. / DE Series - FEMA 361 Flush Doors.
 - c. Provide Underwriters Laboratories, Inc. label for the fire rating classification where applicable.

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SECTION 08310 - TORNADO DOORS

C. Materials:

1. Door Construction:
 - a. Face Skins: 14 gage A-60 Galvannealed Steel.
 - b. Hinge and Rail Reinforcement: hinge edge is non-beveled and reinforced with a continuous 10 gage steel channel projection welded at 5" on center maximum.
 - c. Top and Bottom Channels: inverted steel channel - 14 gage at top and 16 gage at bottom, welded at 2.5" on center maximum.
 - d. Core: steel stiffened (both doors) with filler as required to obtain applicable strength rating at DoorS #43 and 52.
 - e. Lock Rail: beveled and reinforced with continuous 14 gage steel channel welded at 5" on center maximum.
 - f. Closer Reinforcement: 14 gage.
 - g. Stiffeners: 18 gage, 4" wide spaces at 6" on center maximum and welded at 5" on center maximum vertically.
 - h. Top and Bottom Channels: 14 gage inverted steel channels with additional 12 gage flush channel.
2. Provide factory applied baked-on rust inhibiting primer in accordance with ANSI A250.10-1998.
3. Refer to Section 08700 Finish Hardware for additional information concerning hardware for these doors and frames.

2.03 Hardware:

- A. Provide hardware as per the following:

Hardware Group No. T1 - Doors #43 & 52: Provide each interior tornado door with the following:

Quantity	Description	Model Number	Finish	Mfr
3 EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1 EA	FIRE EXIT HARDWARE	WS9827/9927L 996L-R/V LENGTH AS REQUIRED	626	VON
1 EA	RIM CYLINDER	20-057 ICX	626	SCH
1 EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2 EA	CLASSIC CORE	23-030	626	SCH
1 SET	ASTRAGAL	9115A HEIGHT AS REQ	AL	NGP
1 EA	SURFACE CLOSER	4040SE-3038 MTG BRKTS, 72MC AS REQ	SPCRS, PLATES, & 689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	FLOOR STOP / HOLDOPEN	FS41	628	IVE
1 SET	SEALS	5050B H & J	BLK	NGP

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SECTION 08310 - TORNADO DOORS

SUPPLIER TO VERIFY HARDWARE SPECIFIED AND REVISE AS NECESSARY TO MEET THE REQUIREMENTS OF FEMA 361.

Part 3 - Execution

3.01 Installation:

- A. Verify that openings are prepared with headers level, jambs plumb, floor level, without projections, etc. and are correctly dimensioned to receive doors.
- B. Install in compliance with manufacturer's instruction. Hang straight, plumb and level, and adjust for smooth, quiet operation.
 1. At tornado doors, comply with FEMA Regulations and follow manufacturer's instructions. **Provide complete assembly to meet FEMA 361 and other applicable codes.**
- C. Prior to final acceptance of the project, inspect all work done under this section, and make all necessary adjustments, repairs or replacements of defective work.

End of Section

DIVISION 8 - DOORS AND WINDOWS

SECTION 08400 - ENTRANCES AND STOREFRONTS

PART 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of all work as shown on the Drawings and specified herein.
- B. All necessary anchors and accessories required for the complete installation of the Storefront units.
- C. Perimeter Sealant.

1.02 Related Work Specified Elsewhere:

- A. Sealants - Section 07900.
- B. Hardware and Specialties - Section 08700.
- C. Glazing - Section 08800.

1.03 Performance And Testing Requirements:

- A. Provision for Thermal Movements:
 1. Storefront framing systems shall be designed to provide for thermal movement of all component materials resulting from a cycling temperature range of 180 degrees F. without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects. Operating windows and doors shall function normally over this temperature range.
- B. Test Procedures and Performance:
 1. Air Infiltration Test, Fixed Unit:
 - a. Test Fixed Unit in accordance with ASTM E 283 at static air pressure difference of 6.24 psf.
 - b. Air infiltration shall not exceed .06 cfm per square foot of fixed wall area.
 2. Air Infiltration Test, Doors:
 - a. Test Doors in accordance with ASTM E 283 at static air pressure difference of 1.57 psf.
 - b. Air infiltration shall not exceed .10 cfm per foot of perimeter crack length for pair of doors.
 3. Water Resistance Test:
 - a. Test unit in accordance with ASTM E 331.
 - b. There shall be no uncontrollable water leakage at a static test pressure of 12.00 psf.
 4. Uniform Load Deflection Test:
 - a. Test in accordance with ASTM E 330.
 - b. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with 2009 International Building Code.
 - c. Deflection under design load shall not exceed

DIVISION 8 - DOORS AND WINDOWS

SECTION 08400 - ENTRANCES AND STOREFRONTS

L/175 of the clear span.

5. Uniform Load Structural Test:
 - a. Test in accordance with ASTM 330 at a pressure 1.5 times the design wind pressure in 1.05B.3.b.
 - b. At conclusion of the test, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage which would cause the storefront to be defective.
6. Condensation Resistance Test (CRF):
 - a. Test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall be not less than 70.
7. Thermal Transmittance Test (Conductive U Value):
 - a. Test in accordance with AAMA 1503.1.
 - b. Conductive thermal transmittance (U Value) shall be not more than .44 BTU/HR/degree F/sf. Unless otherwise specified, units tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.

1.04 Quality Assurance:

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the storefront manufacturer's letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.

1.05 Submittals:

- A. Contractor shall submit shop drawings to the Architect for his approval. Drawings shall show scale elevations and sections. Full size sections shall be shown only when needed for clarity. Drawings shall show construction of all parts of the work, including metal and glass thickness, methods of joining, details of all field connections and anchorage, fastening and sealing methods, metal finishes and all pertinent information. Relationship to other work should be clearly indicated. No work shall be fabricated until shop drawings for that work have been finally approved for fabrication.
- B. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the framing combined with the specified glass, and the glass spacer

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SECTION 08400 - ENTRANCES AND STOREFRONTS

used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.

1.06 Delivery, Storage And Handling:

- A. Deliver, handle, store and protect system components in accordance with manufacturer's instructions.
- B. After erection, the Contractor shall adequately protect all exposed portions of the grid framing metal work from damage by grinding and polishing machines, plaster, lime, acid, cement, or other harmful compounds.
- C. Immediately prior to final acceptance of building, inspect all aluminum framing for weather tightness and make all necessary repairs and adjustment.

1.07 Warranties:

A. Total Storefront System

1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the framing, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc. as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings. A manufacturer's material written warranty shall be provided for a minimum of 3 years from substantial completion for all items listed above except for glass which shall have a written warranty of 10 years.
2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor during the warranty period.

1.08 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

PART 2 - PRODUCTS

2.01 Entrance and Storefront System:

- A. EFCO Corporation S-406 Wall Thermal Storefront System, with Series D318 DuraStyle Medium Style aluminum entrance doors.
- B. Finish - clear anodized aluminum. Coordinate with Architect.

2.02 Material:

- A. Aluminum:
 1. Extruded aluminum shall be 6063-T6 alloy and temper.
- B. Glass:

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SECTION 08400 - ENTRANCES AND STOREFRONTS

1. Glass for Fixed Units shall be according to Glazing Schedule.
Glass for Entrance Doors shall be 1 inch insulated tempered glass units factory glazed.
 - C. Thermal Barrier:
 1. The thermal barrier material shall be a poured-in-place, two-part polyurethane system. **A nonstructural thermal barrier is unacceptable.**
 - D. Dissimilar Metals:
 1. All dissimilar metals must be properly insulated to prevent galvanic action.
 - E. Fasteners:
 1. All exposed fasteners shall be aluminum or stainless steel.
- 2.03 Fabrication - Fixed Units:
- A. General:
 1. All aluminum frame extrusions shall have a minimum wall thickness of .080 inches.
 2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.
 - B. Frames - for 1" glazing:
 1. Depth of frame shall not be less than 6.5 inches.
 2. Face dimension shall not be less than 2 inches
 3. Covers shall connect to frame back members with internally connected and locked celcon insulator clips.
 4. Frame components shall be screw spline construction. Door frames shall be shear block construction.
 - C. Glazing
 1. All units shall be "dry" glazed with E. P. D. M. gasket on both exterior and interior.
- 2.04 Fabrication - Entrance Doors:
- A. General:
 1. Major portions of the door sections shall have .188" wall thickness.
 2. Glazing stop sections shall have .050" wall thickness.
 - B. Entrance Doors:
 1. Door stiles shall be no less than 3- $\frac{1}{2}$ " wide (not including glass stops).
 2. Door stiles and rails shall have hairline joints at corners. Heavy concealed reinforcement brackets shall be secured with screws and shall be deep penetration and fillet welded.
 3. All doors shall have an adjusting mechanism in the top

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SECTION 08400 - ENTRANCES AND STOREFRONTS

- 4. Weather-stripping shall be wool pile and shall be installed and shall be installed in one stile of pairs of doors and in jamb stiles of center pivoted doors.
 - 5. Door stops shall include wool pile weather-stripping.
 - C. Glazing:
 - 1. All units shall be dry glazed with extruded pressure fitting aluminum glazing stops, and E.P.D.M. gasket.
 - D. Door Frame:
 - 1. Depth of frame shall not be less than 6".
 - 2. Face dimension shall not be less than 2".
 - 3. Shear block construction shall be utilized throughout. System design shall be such that raw edges will not be visible at joints.
- 2.05 Finish:
- A. Finish - clear anodized aluminum. Coordinate with Architect.

PART 3 EXECUTION

- 3.01 Inspection:
- A. Job Conditions:
 - 1. All openings shall be prepared to the proper size and shall be plumb, level and in the proper location and alignment as shown on the Drawings.
- 3.02 Installation:
- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
 - B. Storefront system shall be erected plumb and true, in proper alignment and relation to established lines and grades.
 - C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather-stripping contact and hardware movement shall be checked and final adjustment made for proper operation and performance of units.
 - D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.
 - E. Sealing materials specified shall be used in strict accordance with the manufacturer's printed instructions and shall be applied only by mechanics specially trained and experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

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SECTION 08400 - ENTRANCES AND STOREFRONTS

3.03 Anchorage:

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning:

- A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The contractor shall remove any protective coatings as directed by the Architect and shall clean the aluminum surfaces as recommended for the type of finish applied.

End of Section

DIVISION 9 - FINISHES

SECTION 09120 - CEILING SUSPENSION SYSTEMS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Gypsum Wallboard - Section 09250
- B. Acoustical Treatment - Section 09500

1.03 Quality Assurance:

- A. Standards:
 - 1. American Society for Testing and Materials
 - a. ASTM C-635, Metal Suspension Systems for Acoustical Tile and Lay-In-Panel Ceilings.
 - b. ASTM C-636, Recommended Practice of Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In-Panels.
 - 2. All materials to comply with NFPA 101, 16-3.3.2, where applicable.
- B. Submittals:
 - 1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Suspended Acoustical Ceiling - Exposed Grid: ASTM C-635, intermediate structural classification.
 - 1. Main Beams, Cross Tees and Concealed Members: .015 cold rolled zinc coated steel.
 - 2. Wall Angle: .020 cold rolled zinc coated steel.
 - 3. Special Members: Provide special shaped members as shown on the Drawings.
 - 4. Member Finish: Exposed surfaces shall be flat white low-gloss grid.
 - 5. Hanger Wire: No. 12 gauge cold drawn, annealed, galvanized.
 - 6. Accessories: Provide wall clips, hold-down clips (shall be removable without damage to boards; two each panels opposite sides), beam clamps leveling splines, hanger clips, splice plates), (keep to a minimum), for a complete installation.

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7. Acceptable Manufacturer: 200 Snap-Grid System, Chicago Metallic Corporation
8. Acoustical "Cloud" Edge Trim:
 - a. Axiom Classic Trim as manufactured by Armstrong World Industries, Inc.
 - b. Commercial quality extruded aluminum alloy 6063 trim channel with factory applied baked polyester paint finish.
 - c. Color - white (to match ceiling grid).
 - d. Height - 8".
 - e. Provide all necessary accessories including, but limited to, corner posts, T-bar connection clips, galvanized steel splice plates, etc. Do not hang acoustical clouds from edge trim.
- B. Suspended Gypsum Board Ceilings:
 1. Structural Channels: Cold-rolled, 16 gauge, galvanized steel.
 2. Furring Channels: Roll-formed, hat sections, 20 gauge.

Part 3 - Execution

3.01 General:

- A. Coordinate with electrical and mechanical contractors in placement of light fixtures, grilles, etc. to conform with ceiling pattern.
- B. Construct necessary scaffolding, adequate and safe, in accordance with applicable laws and ordinances. Maintain during this work and remove after completion.
- C. Provide thorough and competent foreman and skilled mechanics.

3.02 Installation:

- A. Suspended Acoustical Ceiling:
 1. Deflection of any component shall not exceed $1/360$ of the span.
 2. Main tees shall be suspended on 48" centers by 12 gauge wire spaced not more than 48" o.c. along main tee.
 3. Cross tees shall be placed at 24" o.c. or as required by the Drawings.
 4. Install wall angles at intersection of suspended ceiling and all vertical surfaces. Miter corners where wall molding intersects.
 5. Install grid system and ceiling panels with faces in a plane.
 6. Provide intersection clips at intersection of all tees.
 7. Provide additional hangar wire at four corners of light fixtures.
 8. Provide additional hangar wires to insure proper placement

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and alignment of grid system.

9. Prior to the final acceptance of the building, examine and adjust water level to be certain that all planes and lines are plumb, square and smooth. Replace all marked, marred or otherwise damaged materials.

B. Suspended Gypsum Board Ceilings:

1. Coordinate location of hangars with other work.
2. Install ceiling framing independent of walls, columns and above ceiling work.
3. Install ceiling framing system in accordance with manufacturer's recommendations.
4. Reinforce openings in ceilings in accordance with manufacturer's recommendations.
5. Laterally brace entire suspension system where required.

3.03 Clean-Up:

- A. Completely remove from the job site, at the completion of the work, all cartons, packaging, etc., and all other scraps and waste caused by this trade.

End of Section

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SECTION 09250 - GYPSUM WALLBOARD

Part 1 - General

- 1.01 Work Included:
 - A. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- 1.02 Quality Assurance:
 - A. Standards:
 - 1. American Society for Testing and Materials:
 - a. ASTM C-36, Gypsum Wallboard
 - b. ASTM C-475, Joint Treatment for Gypsum Wallboard Construction.
 - B. Federal Specifications:
 - 1. FS-SS-L-30D, Type III, Grade X, Class 1, Gypsum Wallboard.
- 1.03 Submittals:
 - A. Provide submittals in the form of samples, and documentation, to the Architect for review.
- 1.04 Product Delivery, Storage and Handling:
 - A. All materials shall be delivered to the job site with manufacturer's labels intact and stored in an enclosed shelter providing protection from damage and exposure to the elements.

Part 2 - Products

- 2.01 Gypsum Wallboard:
 - A. Type: **Fire-rated**, ASTM C-36.
 - B. Size: 5/8" thick x 48" wide x 96" or as required.
 - C. Edges: Tapered.
 - D. Location: All gypsum board.
- 2.02 Gypsum Wallboard:
 - A. Type: **Impact Resistant, Fire-rated**, ASTM C-36 / C-1396, Impact Resistance ASTM E-695, Indentation Resistance ASTM D-5420, Abrasion Resistance ASTM D-4977,
 - B. Size: 5/8" thick x 48" wide x 96" or as required.
 - C. Edges: Tapered.
 - D. Location: Where indicated on drawings and / or exposed in corridors.
- 2.03 Fasteners:
 - A. Screws: Self-drilling, self-tapping, bugle head, Type S.
 - B. Nails: Annular ring: GWB-54.
- 2.04 Joint Treatment Materials:
 - A. Joint Tape: Perforated Tape, ASTM C-475.
 - B. Joint Compound: ASTM C-475.
- 2.05 Accessories:
 - A. Metal Edge: Similar to United States Gypsum Trim No. 402.
 - B. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized coated steel sheet.

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2. Shapes:
 - a. Cornerbead.
 - b. L-Bead: L-shaped; exposed long flange receives joint compound.
 - c. Expansion (control) joint.
 - d. Curved-Edge Cornerbead: With notched or flexible flanges.
- C. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
 1. Minimum Base Metal Thickness: 0.0312 inch.
- D. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

Part 3 - Execution

3.01 Installation:

- A. Apply gypsum board to horizontal surfaces first, then to vertical.
- B. Install gypsum board parallel to studs at vertical surfaces.
- C. To minimize joints, use panels of maximum practical lengths.
- D. Position all ends and edges of gypsum board over nailing or fastening members. Fit ends and edges closely; do not force together. Stagger end joints.
- E. Cut ends, edges, scribe or make cutouts within field of panel in a workmanlike manner.
- F. Install trim at all intersections of gypsum board and other surfaces. Provide corner bead at all vertical or horizontal corners.
- G. Fasteners:
 1. Drive fasteners in field of panel first, work toward ends and edges.
 2. Perimeter fasteners shall be a least 3/8" from ends and edges.
 3. Attach panels to wood framing members with specified nails spaced out 8" for ceiling, and 8" o.c. at ends and 12" o.c. at each support.
 4. Drive nail head slightly below surface of panel in a uniform dimple without breaking face paper.
 5. Screw fasteners shall be spaced 12" o.c. at each support in the field of the board and 8" o.c. at all edges and ends.
 6. Screws shall be power-driven with an electric screwdriver and screw heads shall provide a slight depression below surface of panel without breaking face paper.

3.02 Joint Treatment:

- A. Treat all exposed joints and trim with a three-coat approved system applied in strict accordance with manufacturer's

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recommendations.

3.03 Applying Texture Finishes:

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns. Provide light orange peel finish.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

3.04 Clean-Up:

- A. Use all necessary care during execution of the Work of this Section to prevent undue scattering of drywall scraps and dust and to prevent tracking of joint and finishing compounds onto floor surfaces. On completion of each installation segment in a room or space, promptly pick up and remove from the working area all scraps, debris and surplus material.

End of Section

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SECTION 09300 - TILE

Part 1 - General

1.01 Work Included:

- A. All materials, labor services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

A. Standards:

- 1. Tile Council of America:
 - a. Handbook for Ceramic Tile Installation.
- 2. American National Standards Institute:
 - a. ANSI A108.6, Ceramic Tile installed with Epoxy Mortar.
 - b. ANSI A108.4, Ceramic Tile installed water-resistant organic adhesive.
 - c. ANSI A108.5, Ceramic Tile installed with latex Portland Cement.
 - d. ANSI A118.4, Latex Portland Cement Mortar.
 - e. ANSI A118.3, Epoxy Mortar and Grout.
 - f. ANSI A136.1, Type 1 Organic Adhesive.
 - g. ANSI A137.1, Ceramic Tile.
 - h. ANSI A137.3, Porcelain Tiles and Porcelain Tile Panels/Slabs
- 3. American Society for Testing and Materials:
 - a. ASTM C-144, Aggregate.
 - b. ASTM C-150, Portland Cement, Type 1.
 - c. ASTM C-206, Special Finish Hydrated Lime.

- B. All materials shall meet IBC 2009, where applicable.

- C. Floor surfaces and elevation changes shall comply with ADAABAAG 302 and 303.

- D. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

- 1. Level Surfaces: Minimum.
- 2. Step Treads: Minimum.
- 3. Ramp Surfaces: Minimum.

- E. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.

- 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

- F. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

- G. Source Limitations for Other Products: Obtain each of the

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following products specified in this Section from a single manufacturer for each product:

1. Stone thresholds.
2. Joint sealants.
3. Cementitious backer units.
4. Metal edge strips.

1.03 Submittals:

- A. Submit samples of all tile and grout specified under this section for approval and color selection prior to installation.
- B. Submit a "Master Grade Certificate" bearing signatures of both manufacturer and contractor.
- C. Submit tile manufacturer's maintenance guides for owner's use in maintaining all tile work specified in this section.
- D. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- F. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- G. Samples for Verification:
 1. Full-size units of each type and composition of tile and for each color and finish required.
 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 24 inches square, but not fewer than 4 tiles. Use grout of type and in color or colors approved for completed Work.
 3. Full-size units of each type of trim and accessory for each color and finish required.
 4. Stone thresholds in 6-inch lengths.
 5. Metal edge strips in 6-inch lengths.
- H. Qualification Data: For qualified Installer.
- I. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- J. Product Certificates: For each type of product, signed by product manufacturer.
 1. Material Test Reports: For each tile-setting and - grouting product and special purpose tile.

1.04 Product Delivery, Storage and Handling:

- A. Deliver all materials to job site in manufacturer's unopened containers with grade seal unbroken and labels intact. Keep containers dry. Comply with requirements in

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- ANSI A137.1 for labeling tile packages.
 - B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
 - C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
 - D. Store liquid materials in unopened containers and protected from freezing.
 - E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.
- 1.05 Project Conditions:
- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.
- 1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 General:
- A. All tile shall be standard grades conforming to ANSI 137.1 unless noted otherwise.
 - B. Both glazed and unglazed ceramic tile shall be manufactured by the same manufacturer.
 - C. **Refer to Color Schedule for tile color. Colors will a determining factor in tile approval.**
 - D. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
 - E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do

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not coat unexposed tile surfaces.

- G. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Olean; Division of Dal-Tile International Inc.
 - 2. Crossville, Inc.
 - 3. Daltile; Division of Dal-Tile International Inc.

2.02 Ceramic Tile:

- A. Wall Tile and Floor Tile:
 - 1. Type: Unglazed colorbody porcelain.
 - 2. Nominal Face Size: 12" x 24" - orient as per Drawings.
 - 3. Edge: All-purpose cushion.
 - 4. Acceptable Manufacturer: American Olean - Subtle Strands.
- B. Trim Shapes and Bases:
 - 1. Type: Same as floor tile.
 - 2. Includes bases, caps, stops, returns, trimmers and other shapes to finish installation.
 - a. Base for Thin-Set Mortar Installations: Straight, module size 6 by 12 inches.
 - b. External Corners for Portland Cement Mortar Installations: provide metal corner trim as manufactured by Schluter Systems LP unless otherwise indicated.
 - c. External Corners for Thin-Set Mortar Installations: same as above.
 - d. Internal Corners: Field-buttet square corners. For base and cap use angle pieces designed to fit with stretcher shapes.
- C. Setting Materials:
 - 1. Epoxy Mortar: ANSI A118.3
 - 2. Organic Adhesive: ANSI A136.1
 - 3. Latex Portland Cement Mortar: ANSI A118.4
 - 4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Boiardi Products; a QEP company.
 - b. Bonsai American; an Oldcastle company.
 - c. Bostik, Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.

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- i. Southern Grouts & Mortars, Inc.
 - j. Summitville Tiles, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
 - D. Grouting Materials:
 1. Floor Tile: Epoxy Grout.
 2. Wall Tile: Portland Cement Type.
 3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Boiardi Products; a QEP company.
 - b. Bonsai American; an Oldcastle company.
 - c. Bostik, Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Southern Grouts & Mortars, Inc.
 - j. Summitville Tiles, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
 - E. Granite Thresholds:
 1. Type: Polished granite.
 2. Size: 1 1/4" wide x 1/2" high, double-beveled.
 3. Location: Provide marble threshold at centerline of doors at transition between ceramic tile flooring and exposed concrete.
 - F. Accessories: Provide vitreous china accessories of type and size indicated, suitable for installing by same method as adjoining wall tile.
 1. Color and Finish: Match adjoining glazed wall tile.
 - G. Elastomeric Sealants:
 1. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
 - a. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - b. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
 2. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
 3. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25;

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Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, 0; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

- a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
 2. Dow Corning Corporation; Dow Corning 786.
 3. GE Silicones; a division of GE Specialty Materials; Sanitary 1700.
 4. Laticrete International, Inc.; Latasil Tile & Stone Sealant.
 5. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 6. Tremco Incorporated; Tremsil 600 White.
- H. Miscellaneous Materials:
 1. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
 2. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic base, designed specifically for required applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
 - a. Equal to products manufactured by Schluter Systems LP.
 - b. Provide in minimum lengths of 10' where possible and practical.
 - c. Provide at ALL exposed edges of ceramic wall tile - i.e. top, exterior corners, expansion joints, etc.
 3. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - a. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM

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- D 87.
- b. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- 4. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
 - 5. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Bonsai American; an Oldcastle company; Grout Sealer.
 - 2. Bostik, Inc.; CeramaSeal Grout & Tile Sealer.
 - 3. C-Cure; Penetrating Sealer 978.
 - 4. Custom Building Products; Grout Sealer.
 - 5. Jamo Inc.; Penetrating Sealer.
 - 6. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout and 004, Keraseal Penetrating Sealer for Unglazed Grout and Tile.
 - 7. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
 - 8. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
 - 9. TEC; a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.

Part 3 - Execution

3.01 Examination:

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, and free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or

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- silicone; and comply with flatness tolerances required by ANSI A108.0 for installations indicated.
2. Verify that concrete substrates for tile floors installed with adhesives or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
 5. At Porcelain Wall Tile Panels: verify wall substrate has a maximum allowable variation of 1/8" in 10' from required plane with no more than 1/16" variation in 24'. +
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.02 Preparation:
- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tilesetting material manufacturer.
 - B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
 - C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
 - D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.
- 3.02 Installation:
- A. All workmanship and materials shall conform in all respects

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- to specifications and requirements and in accordance with the standard practice of the Tile Council of America.
- B. All ceramic floor tile shall be installed using the following Tile Council of America specifications.
 - 1. Floor Tile, TCA F131-2K (Concrete).
 - C. Provide all required trim shapes required to module with field tile, unless otherwise noted on Drawings. All exterior corners shall have metal corner trim as manufactured by Schluter Systems LP.
 - D. Layout all tile work as to minimize cuts less than one-half tile in size. Align all joints to give straight uniform grout lines, plumb and level or parallel with walls. Strike all joints with a rounded, non-staining tool.
 - 1. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
 - 2. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
 - 3. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Layout tile work and center tile fields in both directions in each space or on each wall area. Layout tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - a. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - b. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
 - 4. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - a. Wall Tile: 1/16 inch.
 - 5. Layout tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
 - 6. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction,

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and isolation joints, where indicated or required by tile manufacturer. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

- a. Where joints occur in substrates, locate joints in tile surfaces directly above them.
 - b. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
 - c. At Porcelain Wall Tile Panels: provide movement joint every 20' to allow for needed movement of tile layer.
7. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
- a. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin set).
 - b. Do not extend cleavage membrane waterproofing or crack isolation membrane under thresholds set in dry-set portland cement mortar. Fill joints between such thresholds and adjoining tile set on crack isolation membrane with elastomeric sealant.
 1. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
8. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- E. Slope entire room or area to floor drains.
- 3.03 Tile Backing Panel Installation:
- A. Install cementitious backer units and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.
- 3.04 Waterproofing Installation:
- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof

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membrane of uniform thickness and bonded securely to substrate.

- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.05 Cleaning and Protecting:

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.
- E. Immediately prior to final inspection, replace all damaged tile.
- F. Contractor will supply 2% of the total quantity of each tile used. Contractor will supply 3% of the total quantity of each grout used. Place materials in clean marked containers for future use at building.

End of Section

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SECTION 09500 - ACOUSTICAL TREATMENT

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Ceiling Suspension Systems - Section 09120

1.03 Quality Assurance:

A. Standards:

1. American Society for Testing and Materials:
 - a. ASTM C-636 Recommended Practice of Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - b. ASTM E-84 Surface Burning Characteristics of Building Materials.
2. Federal Specifications:
 - a. SS-S-118B, Sound Controlling Blocks and Boards. Underwriter's Laboratories, Inc.

B. Submittals:

1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers**

Part 2 - Products

2.01 Acoustical Ceiling Panels:

A. 2x2 Tile - Square Edge:

1. Type: FS-SS-S-118B, Class 25
2. Size: 24" x 24" x 5/8". Provide special sizes as indicated on Drawings or as required by others.
3. Finish: Board finish shall be a factory-applied white latex paint, medium textured non-direction fissured surface with a minimum light reflection of 80%.
4. Noncombustibility: Board shall meet class 25-Federal Specification SS-S-118B, ASTM E-84; and, classified by Underwriter's Laboratories for Flame Spread Index 0-25.
5. Type Example and Manufacturer:
 - a. Armstrong Fine Fissured No. 1728, square (2x2)

B. 2x2 Tile - Tegular Edge:

1. Type: FS-SS-S-118B, Class 25
2. Size: 24" x 24" x 5/8". Provide special sizes as indicated on Drawings or as required by others.

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3. Finish: Board finish shall be a factory-applied white latex paint, medium textured non-direction fissured surface with a minimum light reflection of 80%.
4. Noncombustibility: Board shall meet class 25-Federal Specification SS-S-118B, ASTM E-84; and, classified by Underwriter's Laboratories for Flame Spread Index 0-25.
5. Type Example and Manufacturer:
 - a. Armstrong Fine Fissured No. 1732, beveled tegular 2x2).

Part 3 - Execution

3.01 Installation:

- A. Install in specified grid system per ASTM C-636 and manufacturer's recommendations, as shown on the Drawings.
- B. Provide ten (10) pieces of ceiling panels in cartons for future use. Panels shall be in perfect condition.

End of Section

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SECTION 09650 - RESILIENT FLOORING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Installation Qualification: contractors for floor covering installation shall be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified with a minimum of three years of documented experience. Installer shall be trained by flooring manufacturer and - if applicable - certified to install the specified flooring by the manufacturer.
- B. Manufacturer Qualifications: company specializing in manufacturing the specified flooring with minimum three years documented experience.

1.03 Submittals:

- A. Submit product data for each type of product indicated.
- B. Submit samples for color selection / verification.
- C. Maintenance Data and Instructions Furnish manufacturer's recommended maintenance methods and procedures.

1.04 Delivery, Storage, and Handling:

- A. Store resilient products and installation materials in dry spaces protected from the weather, at temperatures required by the product manufacturer. Store tiles on flat surfaces.

Part 2 - Products

2.01 General:

- A. Refer to color schedule - available tile colors WILL be a factor in product acceptance.

2.02 Materials:

- A. Resilient Floor Tile:
 - 1. Type Example: Luxury Vinyl Composition Tile (LVT-1 and LVT-2) as manufactured by Interface LVT.
 - 2. Size: 25cm x 1m.
 - 3. Thickness: 4.5mm.
 - 4. Pattern: Studio Set Vol. 2 Colorline.
 - 5. Location: as shown on the Drawings.
 - 6. Colors: refer to Drawings.
- B. Rubber Cove Base: ASTM F 1861, Type TP-Rubber as manufactured by Armstrong Cork Company or approved equal.
 - 1. Size: 4" high x .018 gauge.
 - 2. Provide preformed inside and outside corners.
- C. Edging Strips and Tile Reducers: size and length as

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SECTION 09650 - RESILIENT FLOORING

- required.
- D. Primer and Adhesive: As recommended by manufacturer of resilient floor tile for this particular project. All wall base and reducer strips shall be applied with epoxy adhesive.
 - E. Cleaner or other finishing material: As recommended by flooring manufacturer for the particular type of floor material.

Part 3 - Execution

3.01 Installation:

- A. Comply with manufacturer's written instructions for installing specified tile flooring.
- B. The Contractor shall be responsible for the manufacturer's representative making mat moisture and PH tests and reporting condition of concrete slab to the Architect in writing prior to placing floor materials.
- C. Carefully examine the surfaces on which the above materials are to be applied, report to Architect in writing any unsatisfactory surface and do not begin work until all defective surfaces have been corrected. Otherwise, the Contractor shall assume responsibility for all failures and defects resulting from such defective surfaces.
- D. Installation shall not begin until the work of all other trades, including painting, has been completed. The Contractor shall maintain all rooms and sub-floors at a minimum of 70 degrees F. for several days before and after application of tile.
- E. The floor shall be thoroughly cleaned and any pockets or cracks shall be filled in accordance with manufacturer's instructions flush with floor surface.
- F. The material shall be applied in a first class, workmanlike manner by skilled mechanics experienced in this type of work.
- G. Primer and adhesive shall be as recommended by the manufacturer of the flooring for this particular project. The adhesive for applying all materials shall be waterproof and shall be furnished and guaranteed by the flooring manufacturer.
- H. Lay tile from center of room or space, working toward perimeter, so that tile at opposite edges of room are of equal width. Adjust as necessary to avoid cut widths of less than 3 inches at room perimeter. Lay tile square to room axis.
- I. Fit floor material neatly and tightly into breaks and

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SECTION 09650 - RESILIENT FLOORING

recesses, against bases, around pipes and penetrations, under saddles or thresholds, and around permanent cabinets and equipment.

- J. Install reducer at each transition from tile to concrete floor.
- K. After the flooring has been installed and before the waterproof adhesive has thoroughly set, the surface shall be rolled both ways with rollers made for this purpose, and all excess adhesive on the surface or in the joints shall be removed and the entire surface shall be left perfectly clean.

3.02 Cleaning and Waxing:

- A. When, in the opinion of the Contractor, the flooring has sufficiently sealed itself to permit cleaning, the floors shall be thoroughly cleaned with a neutral cleaner as recommended by the manufacturer of the flooring used. After the floors have been cleaned, the Contractor shall protect the floors either with building paper or by keeping traffic off the floors until the building is ready for occupancy.

3.03 Replacement Tile and Base:

- A. Provide enough spare floor tile, of each major color, in cartons to cover 50 square feet for future use. Provide 20 linear feet of spare rubber wall base. Resilient floor tile and wall base shall be in perfect condition.

End of Section

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SECTION 09670 - RESINOUS FLOORING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
- C. No requests for substitutions shall be considered that would change the generic type of the specified System.
- D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
- E. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.
- F. A pre-installation conference shall be held between Applicator, General Contractor and the Architect for review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.03 Submittals:

- A. Provide submittals in the form of samples (3 x 3 inch square), and documentation, to the Architect for review.

1.04 Product Delivery, Storage and Handling:

- A. All materials shall be delivered to the job site with manufacturer's labels intact and stored in an enclosed dry storage area providing protection from damage, out of direct sunlight, and exposure to the elements in accordance with the manufacturer's recommendations and relevant health and safety regulations.

1.05 System Description:

- A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with Q-Rok quartz aggregate broadcast and novolac epoxy topcoat.
- B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/4 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- C. Cove base (if required) to be applied where noted on plans and

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SECTION 09670 - RESINOUS FLOORING

per manufacturers standard details unless otherwise noted.

1.06 Project Conditions:

A. Site Requirements:

1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
3. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured for 14 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests. Outside of these parameters manufacturer shall be consulted.
2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not to be used.
4. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements:

1. The Owner shall be responsible for the removal of foodstuffs from the work area.
2. Non-related personnel in the work area shall be kept to a minimum.

1.07 Waste Disposal:

- A. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.08 Warranty:

- A. Dur-A-Flex, Inc. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to Dur-A-Flex, Inc. published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
- B. Dur-A-Flex, Inc. liability with respect to this warranty is strictly limited to the value of the material purchase.

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SECTION 09670 - RESINOUS FLOORING

Part 2 - Products

2.01 Flooring:

- A. Dur-A-Flex, Inc, Poly-Crete MDB (self leveling broadcast quartz), Novolac topcoat seamless flooring system.
 - 1. System Materials:
 - a. Topping: Dur-A-Flex, Inc, Poly-Crete MD resin, hardener and MD aggregate.
 - b. The aggregate shall be Dur-A-Flex, Inc. Q-Rok quartz aggregate.
 - d. Topcoat: Dur-A-Flex, Inc. Dur-A-Glaze Novolac resin and hardener.
 - 2. Patch Materials:
 - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete MD (up to ¼ inch).
 - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Dur-A-Tex UM

2.02 Manufacturer:

- A. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802
- B. Manufacturer of Approved System shall be single source and made in the USA.

2.03 Product Requirements:

- A. Topping Poly-Crete MD
 - 1. Percent Reactive 100 %
 - 2. VOC 0 g/L
 - 3. Bond Strength to Concrete ASTM D 4541 >400 psi, substrates fails
 - 4. Compressive Strength, ASTM C 579 9,000 psi
 - 5. Tensile Strength, ASTM D 638 2,175 psi
 - 6. Impact Resistance @ 125 mils, MIL D-3134, >160 inch lbs
No visible damage or deterioration
- B. Topcoat Dur-A-Glaze Novolac
 - 1. Percent Solids 100 %
 - 2. VOC 8 g/L
 - 3. Flexural Strength, ASTM C 580 5,500 psi
 - 4. Tensile Strength, ASTM D 638 2,500 psi
 - 5. Flexural Modulus, ASTM D 790 1.95 x 10⁶ psi
 - 6. Coefficient of thermal expansion ASTM D 696 2.2 x 10⁻⁵ in/in/F
 - 7. Water Absorption ASTM D 570 0.05 %, 24 hrs in water
 - 8. Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles 0.075 mg weight loss
 - 9. Flammability, ASTM D 636 Self-Extinguishing

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SECTION 09670 - RESINOUS FLOORING

10. Potlife @ 70 F	30 minutes
11. Tack Free Time @ 70 F (ready for re-coat)	8-10 hours
12. Cure Time for Traffic @ 70 F	24 hours
13. Heat Resistance Limitation	250 F

Part 3 - Execution

3.01 Examination:

A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.02 Preparation:

A. General:

1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
 - a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.

3. Mechanical surface preparation

- a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-6 as described by the International Concrete Repair Institute.
- b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
- c. Wherever a free edge will occur, including doorways, wall perimeters, expansion joints, columns, doorways, drains and equipment pads, a ¼ inch deep by 1/4 inch wide keyways shall be cut in.

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d. Cracks and joints (non-moving) greater than 1/4 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.

4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.03 Applying Texture Finishes:

A. General:

1. The system shall be applied in three distinct steps as listed below:
 - a. Substrate preparation
 - b. Topping/overlay application with quartz aggregate broadcast.
 - c. Topcoat application
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Topping:

1. The topping shall be applied as a self-leveling system as specified. The topping shall be applied in one lift with a nominal thickness of 3/16 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using a pin rake, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a 15/16 inch spiked roller.
 6. Quartz aggregate shall be broadcast to excess into the wet material at the rate of 1 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

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- C. Topcoat:
 - 1. The topcoat shall be squeegee applied and back rolled with a coverage rate of 60 sf per kit
 - 2. The topcoat shall be comprised of a liquid resin and a liquid hardener that is mixed as a kit in and installed per the manufacturer's recommendations.
 - 3. The finish floor will have a nominal thickness of 1/4 inch.
- 3.04 Field Quality Control:
 - A. Tests, Inspection:
 - 1. The following tests shall be conducted by the Applicator:
 - a. Temperature
 - 1. Air, substrate temperatures and, if applicable, dew point.
 - b. Coverage Rates
 - 1. Rates for all layers shall be monitored by checking quantity of material used against the area covered.
- 3.05 Cleaning and Protection:
 - A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
 - B. Remove Masking - perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

End of Section

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SECTION 09681 - CARPET TILE

Part 1 - General

1.01 Work Included:

- A. Work includes but is not limited to providing carpet tile and installation.

1.02 Quality Assurance:

A. Standards:

- 1. The carpet manufacturer shall have no less than fifteen years of production experience with modular carpet similar to type specified. Published product literature of carpet manufacturer must clearly indicate compliance of products with requirements of this section.

B. Installer Qualifications:

- 1. The installation provider must be directly responsible for the quality of the completed floor covering installation, including both the quality of the materials and labor used in the installation. The installation provider must directly warrant to owner that all products, materials and services related to the floor covering installation (including any floor covering(s), adhesive(s) and/or other products or materials used in the installation) will meet specifications set forth herein. The product warranty required herein must be provided directly by the carpet manufacturer.
- 2. The installation provider must have successful carpet installation experience similar to the work of this Section and be recommended, trained and approved by the carpet manufacturer.

1.03 Submittals:

- A. Manufacturer's Data - copies, as required, of carpet manufacturer's specifications and installation instructions for carpet and related items specified.
- B. Fiber Verification - Certification from the fiber producer verifying use of the premium branded, Post-Consumer Content Type 6 fiber in the submitted carpet product.
- C. All applicable product warranties provided by manufacturer.

1.04 Delivery and Storage:

- A. Deliver all materials to the installation site in the manufacturer's original packaging. Packaging to contain

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- manufacturers name, identification number and related information.
- B. Product to be delivered as required by manufacturer. Store in pallet form as supplied by manufacturer. Do not stack pallets.
 - C. Store materials in area of installation for a minimum period of 48 hours prior to installation.
- 1.05 Installation Quality Assurance:
- A. Flooring contractor to be specialty contractor normally engaged in this type of work and shall have three (3) years minimum documented experience in the installation of these materials.
 - B. Flooring contractor and sub-contractors must be approved by the architect and/or the carpet manufacturer.
 - C. Flooring contractor will be responsible for the proper product installation, including floor preparation in all the areas indicated in the drawings to receive carpet. The carpet installation standard will be as listed in The Carpet and Rug Institute's **Standard for Installation of Commercial Carpet CRI-104**.
 - D. Flooring contractor to provide owner a written warranty that guarantees the completed installation to be free from defects in materials and workmanship for a period of no less than one (1) year after job completion.
 - F. Qualifications of Installers: All work shall be done by installation firms specializing in commercial carpet installation. It is required, that the firm shall be a member of the Floor Covering Installation Contractors Association (FCICA) and/or certified by the Floor Covering Installation Board (FCIB).
 - G. Floor temperatures must be a minimum of 65° for 24 hours prior to installation. Floor temperature can usually vary 5-10° lower than room temperature. Modules must be conditioned to room temperature for 24 hours prior to installation. Relative humidity must be between 10%-65% maximum for 24 hours prior to installation. These conditions must also be maintained for 48 hours after completion of installation.
 - H. All carpet modules must be installed in the order they were manufactured. Select pallets in sequential order and follow the numbers located on each carton of tiles. Typically, an installation will begin with the lowest

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carton numbers and progress through the highest numbers until project is complete.

- I. Full Spread Adhesive System: Requires a full spread adhesive system for the most trouble free installation. Fully spread adhesive using a 1/32 x 1/16 x 1/16 "U" or "V" notch trowel. Allow to completely dry so adhesive does not transfer when touched. The proper amount of adhesive is mandatory to prevent the modules from shifting or moving.

1.06 Job Conditions:

- A. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document.
- B. Carpet installation shall not commence until painting and finishing work is complete and ceiling and overhead work is tested, approved, and completed.
- C. Site conditions shall include those specified in the carpet manufacturer's installation manual and shall also include sufficient heat, light, and power required for effective and efficient working conditions.

1.07 Extra Materials:

- A. Provide five percent (5%) extra material for shelf stock of carpet for each color and type specified.

1.08 Warranty - Carpet:

- A. Warranties must be the standard, printed warranties on the carpet manufacturer's letterhead. All warranty items to be full term, not pro-rated for the indicated period. All warranties must be issued by the manufacturer as standard published warranties on all types of carpet within this document. If the product fails to perform as warranted when properly installed and maintained according to procedures, the affected area will be repaired or replaced at the expense of the manufacturer. The carpet manufacturer, will provide standard published written performance warranties for the following:
 1. **Lifetime against excessive surface wear.** Excessive wear means no more than 10% loss of pile fiber weight measured before and after use as tested under ASTM D-3936.
 2. **Lifetime static protection,** meaning built-in protection below 3.0 kv as tested under AATCC-134.
- B. Carpet manufacturer shall warrant carpet manufactured with secondary backing for the useful life of the original installation against product failure from:

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1. Tuft Bind (edge ravel, yarn pulls, zippering)
 2. Delamination
 3. Moisture Penetration
 4. Dimensional Stability
- C. All warranties to be sole source responsibility of the carpet manufacturer. Second source warranties that involve parties other than the carpet manufacturer are unacceptable.
- D. Warranties shall not be written only for this purchase or purchaser. All warranties shall be standard issue nationally of official documents.
- 1.09 Performance Insurance General:
- A. Flammability Requirements:
1. Pill Test / DOC-FF-1-70 (ASTM D-2589)
Requirement: Pass
 2. Flooring Radiant Panel / ASTM E-648
Requirement: Class 1 (Above .45 w/cm)
 3. Optical Smoke Density Test / NFPA-258 NBS Smoke Chamber (ASTM E-662)
Requirement: Less than 450, Flaming Mode
 4. Comply with the Carpet and Rug Institute (CRI) VOC Chamber Test/Indoor Air Quality test (CRI-IAQ) Green Label Test
- B. Face Fiber Characteristics for **all** Carpets
1. Bulked Continuous Filament (BCF),
 2. Acceptable Fiber Systems: as manufactured by Aquafil.
- C. Sustainable Carpet Assessment Standard:
1. NSF - 140 Gold.
 2. Carpet manufacturer and/or fiber producer must be a signatory of the National Carpet Recycling Agreement memorandum of understanding.
- 1.10 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

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SECTION 09681 - CARPET TILE

Part 2 - Products

2.01 General:

- A. Certified test reports shall be submitted by the carpet manufacturer, for all performance assurance specifications listed below.
- B. Requirements listed below must be met by all products being submitted for approval.
- C. All submitted test numbers should represent average for standard production goods.

2.02 Product Specification - Modular carpet tile shall meet the following specifications:

- A. Style: InterfaceFLOR
 - 1) Color "A" - Field: Open Air Neutrals 410 Colorline.
 - 2) Color "B" - Accent: Aerial Flying Colors AE317.
- B. Yarn: 100% Nylon (with minimum 4% post-consumer content and +/- 60% total recycled content)
- C. Dye Method: 100% Solution / Yarn Dyed
- D. Pile Thickness: 0.093 inch
- E. Density: 6,968
- F. Backing System: CQuest GB
- G. Color: refer to Room Finish Schedule.
- H. Special Treatments: ProTekt

2.03 Minimum Construction Standards:

- A. Nylon Specification - All nylon fiber shall be branded (premium) type 6 nylon from Aquafil with performance certification from the fiber manufacturer.
- B. Antimicrobial, registered by the EPA for use in carpeting with broad spectrum efficacy against the growth of bacteria and fungi for a minimum of 15 years, assuming proper maintenance. The antimicrobial ingredient shall meet standards set by the U.S. General Services Administration (GSA) for Antimicrobial Carpet as supported by independent lab testing less than six months old.
 - 1. Intersept (AATCC 138 Washed).
 - 2. The preservative should be incorporated into the primary latex coating of the product during the manufacturing process, not topically applied to the carpet fibers.
 - 3. The antimicrobial treated carpet when new must pass GSA parameters for treated carpets via AATCC method

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174 parts II and III. Initial performance must be 90% reduction of the microorganisms (Staphylococcus aureus 6538 and Klebsiella pneumoniae 4352) and no fungal growth on either the primary backing or fibers both on washed (AATCC method 174) and non-washed samples.

4. The antimicrobial treated carpet must maintain, for the warranted life of the carpet, a minimum of 90% reduction of the microorganisms (Staphylococcus aureus 6538 and Klebsiella pneumoniae 4352) listed in AATCC method 171 part II, provided the carpet is maintained as specified. Additionally, the antimicrobial treated carpet must maintain a "no macroscopic growth" rating against Aspergillus niger 6275 at the primary backing in accordance with AATCC 171 part III.
5. The preservative must be environmentally responsible i.e. (biodegradable and not toxic to non-target species).
6. Efficacy of the preservative should be documented in professional peer reviewed scientific publications.

2.04 Related Carpet Materials:

- A. Leveling compound - Latex type as recommended by carpet manufacturer. Must be compatible with carpet adhesive and curing/sealing compound on concrete.
- B. Releasable pressure sensitive type adhesive - Adhesive must be water-based and allow for removal of carpet tile at any time without damage to carpet or substrate. Adhesive must contain antimicrobial preservative and have "zero" calculated VOC's.
- C. Carpet edge guard, non-metallic - Extruded or molded heavy duty vinyl or rubber carpet edge guard of size and profile indicated, and with minimum two inch wide anchorage flange; colors selected by architect/designer from among standard colors available within the industry.
- D. Miscellaneous materials - As recommended by manufacturer of carpet. Other carpeting products to be selected by installation provider to meet project requirements.
- E. Electrostatic (Dissipation low-generation):
 1. < 3.0 KV (AATCC 16-E).
- F. Lightfastness:
 1. \geq 4.0 @ 60 AFU's.

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Part 3 - Execution

3.01 Installation:

A. General

1. Comply with manufacturer's instructions and recommendations for uniformity of direction.
2. Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.
3. Provide cut outs where required. Conceal cut edges with protective edge guards or overlapping flanges.
4. Run carpet under open bottom items such as heating convectors and install tight against walls, columns and cabinets so that the entire floor area is covered with carpet. Cover over all floor type door closures.
5. Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise.
6. Cutting shall be done in accordance with the manufacturer's recommendation, using the tools designed for the carpet being installed.
7. Use leveling compound where necessary. Any floor filling or leveling shall have a minimum of 4'0" of feather.
8. Expansion joints - Do not bridge building expansion joints with continuous carpeting.

B. Installation

1. Install carpet according to carpet manufacturer's printed instructions and in accordance with the Carpet and Rug Institute's Installation Standard.

3.03 Cleaning and Protection:

- A. On completion of the installation in each area, all dirt, carpet scraps, etc. must be removed from the surface of the carpet.
- B. Remove debris, and sort pieces to be saved from scraps to be redirected and recycled.
- C. Construction manager shall protect carpeting against damage during construction.

3.04 Inspection:

- A. Upon completion of the installation, verify that work is complete, properly installed and acceptable.

End of Section

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this entire section of the work.
- B. Consult Drawings, finish schedules, details and specification section.

1.02 Quality Assurance:

- A. All painted surfaces shall be uniform in color, texture and finish to the satisfaction of the Architect.

1.03 Submittals:

- A. Submit manufacturer's specifications, including paint label analysis and application instructions for each material specified.
- B. Submit color samples for review of color and texture.
- C. Provide samples of all natural and stained wood finishes.
- D. Final samples: Prepare samples of finishes on the job to the satisfaction of the Architect. If required, a 4' x 8' portion of wall surface finished as final sample.

1.04 Product Deliver, Storage and Handling:

- A. Materials shall be delivered to the project site in strong, undamaged, waterproof containers with manufacturer's label intact. Materials in previously opened or unsealed containers, are not acceptable.
- B. Include on label of container: Manufacturer's name, type of paint, number and application instructions.
- C. Immediately upon delivery to the project site, all painter materials shall be stored and locked in a watertight shed with floor well off the ground. The shed shall remain locked at all times except for adding or removing materials.
- D. No materials of any manufacturer will be allowed on the project site any time during construction except those of the manufacturers specified or approved by the Architect.

1.05 Job Conditions:

- A. Comply with manufacturer's recommendations as to environmental conditions under which coating and coating systems can be applied.
- B. Do not apply finishes in areas where dust is being generated or where work in progress may affect finish quality.
- C. Protect finished work of other trades, and all surfaces not being painted concurrently, or not to be painted.

Part 2 - Products

2.01 General:

- A. The following specifications for Finishes is not intended to mention every particular item which will receive painter finish, but is intended to establish type and quality of finish which shall be required on various materials.
- B. **Products of Sherwin-Williams are specified herein to simplify descriptions of types and qualities of finishes required only.**

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.

- C. Wherever the abbreviation "SW" appears in the following detailed specification, it shall be understood to mean Sherwin-Williams.
 - D. Primers shall be as specified by manufacturers of finish paint used and as approved by the Architect.
- 2.02 Acceptable Manufacturers:
- A. Sherwin-Williams.
 - B. PPG Industries.
 - C. Cook Paint and Varnish Co.
 - D. Pratt and Lambert.
 - E. Kelly-Moore.
- 2.02 Exterior Finishes:
- A. Enamel on Ferrous Metals:
 - 1. One coat SW Kem Kromik Primer, (Alkyd primer).
 - 2. Two coats SW Industrial Enamel, (Alkyd gloss enamel).
 - B. Enamel on Exterior Door Frames and Doors:
 - 1. Shop coat by others-touch up as required.
 - 2. Two coats SW Industrial Enamel, (Alkyd gloss enamel).
 - C. Enamel on Galvanized Metal:
 - 1. One Coat SW Galvite primer.
 - 2. 2 Coats SW Industrial Enamel, (Alkyd gloss enamel).
 - D. Enamel on Exterior Concrete Block:
 - 1. One coat SW Promar Latex Block Filler B25W25.
 - 2. Two coats SW A-100 Semi-Gloss Latex Enamel.
- 2.03 Interior Finishes:
- A. Enamel on Metal: All miscellaneous and ornamental metal items which are left exposed, hollow metal doors and frames.
 - 1. Shop coat by others - touch up as required.
 - 2. Two coats SW Promar 200 Semi-Gloss. Enamel, (Alkyd semi-gloss enamel).
 - B. Enamel on Concrete Block:
 - 1. One coat SW Promar 200 Block Filler (vinyl acrylic latex).
 - 2. Two coats SW Promar 200 Semi-Gloss Enamel.
 - C. Enamel on Gypsum Board Ceilings/Facias/Walls
 - 1. One coat SW Promar 200 Wall Primer with Medium Texture. (Vinyl Acrylic Latex Wall Primer.)
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
 - D. Tape and Float: Joints on Gypsum Board.
 - 1. As per manufacturer's instructions.
 - 2. All joints shall be sanded ready for primer's finish.
 - E. Interior Millwork and Cabinetry:
 - 1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
 - F. Enamel on Wood Trim:
 - 1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
 - G. Back-Painting, Interior Work:
 - 1. Two coats SW Promar 200 Alkyd Enamel Primer/Undercoat.

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

- H. Enamel on Exposed Metal Piping:
 - 1. One coat SW Galvite primer.
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.

Part 3 - Execution

3.01 Inspection:

- A. Notify Contractor of any surface not in proper condition to be finished before proceeding with the work. Starting work will constitute the painter's acceptance of preceding work, and conditions under which finish will be applied and his assumption of responsibility for results to be obtained.

3.02 Preparation of Surfaces:

- A. Wood:
 - 1. Sand to a smooth even surface, then dust off.
 - 2. Touch-up knots, resinous spots, etc., on all surfaces with shellac 18 hours before applying prime coat.
 - 3. Fill nail holes, cracks and blemishes flush after priming coat has dried.
- B. Concrete Block and Concrete:
 - 1. Repair cracks and irregularities to provide uniform surface texture.
- C. Ferrous Metal Surfaces:
 - 1. Remove rust and scale, clean grease or oil surfaces with turpentine or benzine before painting.

3.03 Application:

- A. Number of coats and quality of finish shall be in accordance with these specifications, which requires the use of material which will product first quality finish if properly applied.
- B. Apply coats of material in strict accordance with manufacturer's currently published specifications, except where requirements of these specifications are in excess or manufacturer's requirements.
- C. Except as otherwise approved by the Architect, the first two coats of painter's finish shall be applied by roller or brush application. Finish coats may be applied by spray application.
- D. Comply with recommendation of product manufacturer for drying time between succeeding coats allow additional as required until finish is dry.
- E. All work where a coat of material has been applied must be inspected and approved before application of succeeding coat, otherwise, no credit for the coat well be given. Notify Architect when a particular coat has been completed for inspection and approval.
- F. Shellacs, oils, turpentine, etc., shall be of the highest quality and subject to approval of Architect. Materials shall be mixed in and applied directly from containers which they are purchased except when use of other containers is approved.
- G. First Coat of all finishes, except of varnish and stains, shall be white.

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

- H. Sand lightly between coats where shellac, varnish or enamel is used.
 - I. Remove all hardware, accessories, machined surfaces, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.
- 3.04 Clean-up:
- A. Clean and paint spots from work and touch-up or otherwise repair any defective or damaged work.
 - B. Remove all surplus materials and equipment after work is completed.
 - C. Leave entire job clean and acceptable to the Architect.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10100 - CHALKBOARDS AND TACKBOARDS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. American Society for Testing and Materials:
 - a. ASTM A-424, Steel Sheets for Porcelain Enameling.
 - 2. Federal Specifications:
 - a. LL-B-810B, Hardboard.
 - 3. Military Specifications:
 - a. MIL-C-15116C, Cork Sheet.

1.03 Submittals:

- A. Shop Drawings: Submit dimensioned shop Drawings indicating location, type, size, arrangement, adhesive, backing, anchor or mounting details, trim, and accessories.
- B. Submit samples showing the full range of colors available for each unit.

Part 2 - Products

2.01 Materials:

- A. Porcelain Enamel Steel Markerboards:
 - 1. Type: Factory-built aluminum framed unit.
 - 2. Construction: Factory LCS face on 24 gauge steel laminated to 3/8" hardboard with .015 aluminum back-up.
 - 3. Color: LCS faces shall be white.
 - 4. Trim: Provide "H" bar joint cover at adjacent panels, color to match narrow leg showing, map rail with cork inserts and chalk trough.
 - 5. Accessories: Provide two map hooks with paper clips at each chalkboard unit.
 - 6. Mounting System: Concealed metal spline system. **At exterior walls provide "stand-off" mounting brackets to prevent condensation behind boards.**
- B. Tackboard:
 - 1. Type: Factory-built aluminum framed unit.
 - 2. Construction: Vinyl covered surface bonded to a 2" thick insulation board core, with a 7/8" x 5/8" aluminum frame. Refer to Color Schedule.
 - 3. Mount System: Manufacturer's standard.
 - 4. Acceptable manufacturer: Best-Rite Vin-Tak tackboards.

DIVISION 10 - SPECIALTIES

SECTION 10100 - CHALKBOARDS AND TACKBOARDS

Part 3 - Execution

3.01 Installation:

- A. Install units straight, plumb, and level with metal splice system. Refer to Drawings.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10150 - COMPARTMENTS AND CUBICLES

Part 1 - General

1.01 Description:

- A. Stainless steel compartment work includes the following:
 - 1. Floor-supported, overhead-braced partitions.
- B. Furnish all labor and materials necessary for the completion of work in this section as shown on the contract drawings and specified herein.
- C. Work in this section shall include, but is not limited to:
 - 1. Toilet compartments.
 - 2. Hardware for toilet compartments and stainless steel partitions.
 - 3. Shop drawings and working drawings.
 - 4. Manufacturer's guarantee.
- D. Related work specified elsewhere shall include accessories and anchorage/blocking for attachment of compartments.

1.02 Products:

- A. Stainless steel finish shall be selected from the manufacturer's full range.
- B. Hardware samples shall be submitted for approval to the Architect upon request.

1.03 Warranty:

- A. Provide manufacturer's standard 15 year warranty.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Manufacturer:

- A. Toilet compartments, and urinal screens shall be by MILLS BRADLEY Corp., Deer Park, New York, or approved equal.

2.02 Materials:

- A. Doors, panels, and pilasters to be 1" thick type 304 stainless steel which are waterproof and non-absorbent.

2.03 Construction:

- A. Doors, panels, and pilasters shall be 1" thick with uniformly machined edges.
- B. Doors and panels shall be 55" high and mounted at 14" above the finished floor. Door shall be mounted to the pilasters with an integral hinge or a "bank-vault" type die-cast aluminum alloy wraparound hinge.
- C. Pilasters shall be 81-1/2" high and anchored to the panels and walls with three 2" long heavy-duty aluminum stirrup brackets.

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SECTION 10150 - COMPARTMENTS AND CUBICLES

Pilasters shall include a mounting system comprised of at least one 3/8" x 1" steel mounting bar attached to the pilaster, having 3/8" steel-plated bolts secured to 1/8" semicylindrical plug loc imbedded within a contoured aperture transversely piercing the core. Each mounting bar shall be secured to the building structure with 3/8" steel-plated studs. A 4-piece shoe shall conceal each floor mounting, having an internal cross section conforming to the pilaster and fabricated from type 304 stainless steel having a #4 finish.

- D. Pilasters are overhead braced with an extruded anti-grip aluminum headrail.
- E. Urinal Partitions: Shall have full height aluminum wall brackets and shall be overhead-braced.

2.04 Hardware:

- E. Door hardware shall be as noted:
 - 1. Integral hinges shall be fabricated into the door and the pilaster with no exposed metal parts. The hinge mechanism is integrated into the door and pilaster with a 1/2" diameter nylon gravity/cam unit with a 3/16" stainless steel center pin (at bottom) and a 1/2" nylon rod (at top). Integral hinges are not factory set and are installed at the job site. Pilaster shall be a minimum of 5" wide.
 - 2. Heavy-duty "Bank Vault" hinge shall have gravity-acting cams and are fabricated from a die cast aluminum alloy with a brushed polish chrome-plated finish and wraparound flanges. The cam is constructed from a 3/4" diameter nylon rod and a 3/8" stainless steel pin. Hinges are through-bolted onto doors and pilasters using stainless steel, tamper-resistant through bolts. Hinges are easily adjusted at the job site to a full close or partially open position, as required.
 - 3. Aluminum stirrup brackets shall be 2" long made of heavy-duty anodized extruded aluminum (6063-T5 alloy). Stirrup brackets shall be 1/8" thick and mounted with stainless steel, tamper-resistant screws. Panels shall be attached with stainless steel, tamper-resistant through bolts. The attachment of brackets to the adjacent wall construction shall be accomplished with #14 x 2-1/2" stainless steel, tamper-resistant screws and plastic anchors.
- B. Stainless steel pilaster shoes shall be 5-1/2" high, constructed from 22-gauge stainless steel. Pilaster shoes are anchored to the pilaster with #14 stainless steel, tamper-resistant screws.
- C. Slide latches shall be fabricated from a die cast aluminum alloy with a brushed polish chrome-plated finish and mounted to the

DIVISION 10 - SPECIALTIES

SECTION 10150 - COMPARTMENTS AND CUBICLES

- door with stainless steel, tamper-resistant through bolts.
- D. Strike and keepers shall be fabricated from a die cast aluminum alloy with a brushed polish chrome-plated finish. Keepers provide for emergency access into the stall by lifting up on the bottom of the door. Strikes and keepers shall be attached to the doors and pilasters with stainless steel through bolts.
 - E. Headrail shall be made of heavy-duty anodized extruded aluminum (6063-T5 alloy). Headrail is anti-grip and attaches to the top of the pilaster with stainless steel, tamper-resistant screws. Headrail is attached to the adjacent wall construction with a die cast headrail bracket.
 - F. Headrail brackets shall be made from a die cast aluminum alloy and shall be attached to the adjacent wall construction with #14 x 2-1/2" stainless steel, tamper-resistant screws and plastic anchors.

Part 3 - Execution

3.01 Preparation:

- A. Examine areas to receive toilet compartments for correct height and spacing of anchorage/blocking and plumbing fixtures that may affect installation of compartments. Report any discrepancies to the architect.
- B. Take complete and accurate measurements of complete toilet compartment locations.
- C. Start of work constitutes acceptance of job.

3.02 Installation:

- A. Install compartments in a rigid, straight, plumb and level manner, with steel laid out as shown on the shop drawings and manufacturer's installation instructions.
- B. All doors and panels to be mounted at 14" above the finished floor.
- C. Clearance at vertical edges of door shall be uniform top to bottom.
- D. No evidence of cutting, drilling, and/or patching shall be visible on the finished work.
- E. Finished surfaces shall be cleaned after installation and be left free of all imperfections.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this entire section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. UFAS Fed. Std. 795-Requirements for the physically handicapped.
 - 2. MIL Spec. L-P-387a, type NDP, rated self-extinguishing, for sign materials.

1.03 Submittals:

- A. Provide manufacturer's catalog cut and data sheets, complete parts list and installation requirements for each item specified.
- B. Schedules: Indicate location and placement for all graphic items.

1.04 Product Delivery, Storage and Handling:

- A. Handle and store all items with care to prevent damage and injury to finish surfaces.

Part 2 - Products

2.01 Products of the manufacturers listed below have been specified herein to simplify descriptions of design, construction, and materials only. All items have been selected for visual and performance design quality which shall serve as a basis for acceptance of equivalent products by other manufacturers.

2.02 Signage System:

- A. Material: 1/8 inch thick, type ES melamine plastic.
- B. Size: 8" x 8" x 1/8", with 1/2" radius corners. Custom design - refer to 2.04 for text and symbols.
- C. Mounting: All graphics shall be permanently mounted to wall or door surface with tamper resistant screws.
- D. Color: black background with white letters. Submit color samples with submittals, prior to approval. **Colors will be a factor in product acceptance.**
- E. Letter Style: Helvetica Medium.
- F. Standard Grade 2 braille shall be below all copy, all signs.
- G. All graphic material shall meet the requirements of UFAS Fed. Std. 795, and MIL spec L-P-387a.
- H. Acceptable Manufacturer: Series 200A, Type D format, Mohawk Sign systems.

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

2.03 Plaque Groupings Required (letter designation refers to 2.04):

Quantity Plaque Mounting Location

**Coordinate location with Architect

Plaque	Quantity	Location
A	2	1 each @ doors no. 53 & 59
B	2	1 each @ doors no. 54 & 60
C	1	1 each @ door no. 39
D	21	1 each @ doors no. 22, 24, 26, 30, 31, 33, 34, 37, 42, 44, 46, 49, 50, 57, 62, 64, 68, 69, 72, 75, & 76
E	4	1 each @ doors no. 40, 41, ** & **
F	1	1 each @ door no. 19
G	2	1 each @ doors no. 16 & 18
H	1	1 each @ door no. 68
I	1	1 each @ door no. 15
J	5	1 each @ doors no. 12, 13, 14, 17, & 81
K	19	1 each @ doors no. 20, 23, 25, 27, 28, 29, 32, 35, 36, 45, 47, 48, 51, 58, 63, 65, 66, 70, & 71
L	4	1 each @ doors no. 55, 61, 82, & **
M	1	1 each @ door no. 11
N	1	1 each @ door no. 77
O	1	1 each @ door no. 79
P	2	1 each @ doors no. 56 & 67
Q	1	1 each @ door no. 10

DIVISION 10 - SPECIALTIES

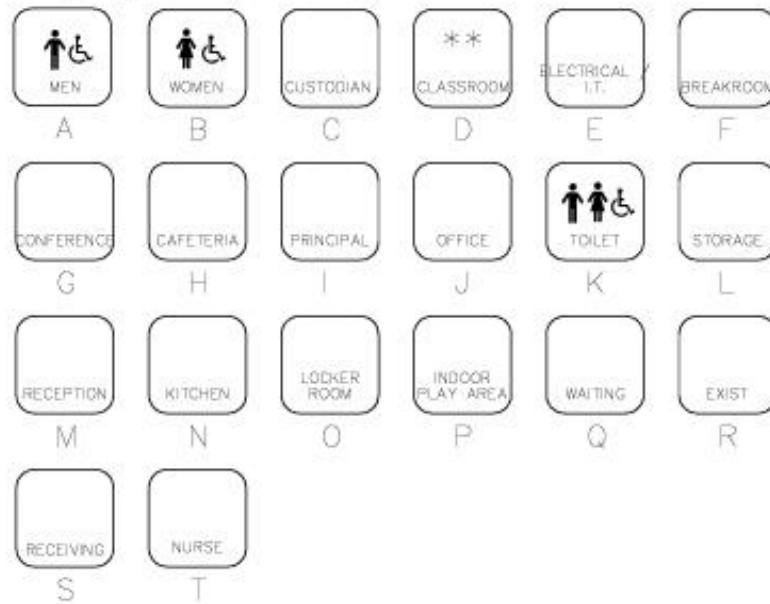
SECTION 10400 - INTERIOR SIGNAGE

R	5	1 each @ doors no. 3, 5, 7, 9, & 10
S	1	1 each @ door no. 38
T	1	1 each @ door no. 21

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

2.04 Signage Plaques Required:

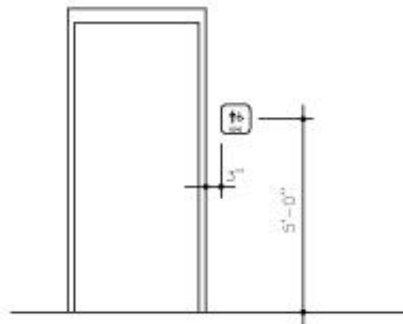


Note: all signage plaques shall have grade 2 braille translations under text.

* INDICATES FLOOR LEVEL (L THRU 3) @ EACH STAIR WAY (8 TOTAL SIGNS)

** INDICATES INFORMATION TO BE COORDINATED WITH ARCHITECT

2.05 Typical Mounting:



Mounting Height

Typical Wall Location

Verify location with architect.

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

Part 3 - Execution

3.01 Installation:

- A. Comply with manufacturer's installation instructions and details on the Drawings. Set all units plumb and level in location indicated on the Drawings or as directed.
- B. Provide all necessary accessories: Items to support or attach Identifying Devices to result in a complete installation.
- C. Protect all signage plaques to prevent damage after installation.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10420 - LETTERS AND PLAQUES

Part 1 General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this entire section of the work.

1.02 Submittals:

- A. Shop Drawings: Indicate details and dimensions of fabrication and installation including layouts and assemblies. Begin fabrication only after receiving approved shop Drawings.
- B. Manufacturer's Literature: Descriptive literature and installation instructions.

1.03 Product Delivery, Storage, and Handling:

- A. Handle and store all items with care to prevent damage and injury to finish surfaces.

Part 2 - Products

2.01 Cast Letters at interior locations:

- A. Finish: Clear anodized aluminum finish.
- B. Color: **Color will be a factor in product selection.**
- C. Letter Style: **OPTIMA.**
- D. Size: height - **12"**.
- E. Mounting: Projected mounting with 1" spacer sleeve.
- F. Quantity: Sufficient letters to spell out the following (quantities in parentheses):

- 1. **RECEPTION** (x 1)

- G. Verify exact spelling/punctuation with Architect.
- H. Location: refer to the Drawings.
- I. Acceptable Manufacturer: A.R.K. Ramos, Oklahoma City.

2.02 Cast Letters at exterior locations:

- A. Finish: painted finish.
- B. Color: **BLACK.**
- C. Letter Style: **OPTIMA.**
- D. Size: height - **24" at building name / 12" at address.**
- E. Mounting: concealed fasteners. Provide bracing (channels, metal studs, etc.) to interior of building as required to properly mount/anchor letters.
- F. Quantity: Sufficient letters to spell out the following (quantities in parentheses):

- 2. **MOORE PUBLIC SCHOOLS - CHILD CARE CENTER** (24" X 1)
- 3. **201 NORTH EASTERN AVENUE**

- G. Verify exact spelling/punctuation with Architect.

DIVISION 10 - SPECIALTIES

SECTION 10420 - LETTERS AND PLAQUES

- H. Location: refer to the Drawings.
 - I. Acceptable Manufacturer: A.R.K. Ramos, Oklahoma City.
- 2.03 Cast Metal Plaque at interior location:
- A. Castings shall be free from pits, scale, sand holes, or other defects. Comply with requirements specified for metal, border style, background texture, and finish, and with requirements shown for thickness, size, shape, and copy. Hand-tool and buff borders and raised copy to produce the manufacturer's standard satin polished finish. **Coordinate final design with Architect.**
 - 1. Metal: aluminum.
 - 2. Border Style: Type 504.
 - 3. Background Texture: manufacturer's standard No. 2 black pebble texture.
 - 4. Letter Style: Helvetica upper case - raised satin aluminum finish.
 - 5. Mounting Method: No. 4 concealed fasteners.
 - 6. Finish: manufacturer's satin aluminum finish.
 - 7. Size: 20 inches x 24 inches.
 - 8. Content **(coordinate final layout with Architect):**

CHILD CARE CENTER
MOORE PUBLIC SCHOOLS

SUPERINTENDENT OF SCHOOLS:
DR. ROBERT ROMINES

BOARD OF EDUCATION:	
MANDY KINCANNON	PRESIDENT
ERIN MORRISON	VICE PRESIDENT
ALLISON RICHEY	MEMBER
STACI PRUETT	MEMBER
JENNY NGUYEN-STATLER	MEMBER

ASSISTANT SUPERINTENDENT – OPERATIONS:
JEFF HORN

ARCHITECT:
AGP – THE ABLA GRIFFIN PARTNERSHIP LLC
MOORE, OKLAHOMA

CONTRACTOR:
OMNI CONSTRUCTION LLC
MOORE, OKLAHOMA

DIVISION 10 - SPECIALTIES

SECTION 10420 - LETTERS AND PLAQUES

9. Type Example: ARK-Ramos Manufacturing Company, Inc.
10. Location: locate in Room #401, "Waiting Area" as directed by Architect.

Part 3 - Execution

3.01 Installation:

- A. Install units plumb and level in locations indicated on the Drawings, following manufacturer's recommendations.
- B. Provide all necessary accessories: Items to support or attach metal letters to result in a complete installation.
- C. Protect all finishes to prevent damage before, during and after installation.

End of Section

DIVISION 10 - SPECIALTIES - SOUTHMOORE HS STADIUM UPGRADES

SECTION 10500 - LOCKERS

Part 1 General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this entire section of the work.

1.02 Submittals:

- A. Shop Drawings: Indicate details and dimensions of fabrication and installation including layouts and assemblies. Begin fabrication only after receiving approved shop Drawings.
- B. Manufacturer's Literature: Descriptive literature and installation instructions.

1.03 Product Delivery, Storage, and Handling:

- A. Handle and store all items with care to prevent damage and injury to finish surfaces.
- B. Protect adjacent existing surfaces from damage.

1.04 Quality Assurance:

- A. Standards:
 - 1. Federal Specification: AA-L-486.

1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. **Lockers Type 1** - Double Tier "Quiet" Lockers - at the Kitchen Locker Room - 4 / 8 units:
 - 1. Construction: Each unit shall have individual door and frame of cold rolled steel.
 - a. Body: shall be 16 gauge steel, flanged to give double thickness of metal at back vertical corners; 18 gauge backs.
 - b. Door Frame: shall be 16 gauge steel formed channels with vertical members having an additional flange to form continuous door strike. Corners shall be lapped and welded into a rigid assembly; in addition, bottom cross members shall have tang at each end that fits through slot in rear slot of upright frame member to prevent twisting out of alignment. Top and bottom cross members shall provide support for front edge of locker top and locker bottom.

DIVISION 10 - SPECIALTIES - SOUTHMOORE HS STADIUM UPGRADES

SECTION 10500 - LOCKERS

- c. Door: shall be 14 gauge steel, one piece, with both vertical edges formed into a channel shape and top and bottom flanged at 90 degree angle. Welded construction with reinforced top and bottom with intermediate stiffener ribs, grind and finish all edges smooth.
- d. Coat Hooks: provide three single prong coat hooks made of cadmium-plated or zinc-plated steel.
- e. Ventilation: door perimeter and verti-vents.
- 2. Quantity: Refer to Drawings.
- 3. Size: 15"w x 18"d x 36"h per tier for a total locker height of 72".
- 4. Base: None - mount to top of continuous concrete masonry / wood framed base.
- 5. Hardware:
 - a. Hinge to be full loop, 2" 5-knuckle hinges nested in door slot, welded to frame and double-riveted to door.
 - b. Handle to be stainless steel recessed handle with plastic-protected lifting trigger. Must be able to accept padlock and meet ADA requirements for accessibility.
 - c. Latching to be quiet, multi-point latching on heavy gauge frame hooks with rubber silencers. Concealed quiet lock bar locked in place and isolated from metal to metal contact by polyethylene glides.
- 6. Provide aluminum number plates - coordinate numbering system with Architect.
- 7. Provide end finishing panels to closeout to adjacent / perpendicular walls and at corners.
- 8. Color: refer to Color Schedule.
- B. General: Locker manufacturer shall provide all appropriate matching trim and closure pieces for a complete and finished installation.
- B. Acceptable Manufacturer: Republic Storage Systems.

Part 3 - Execution

3.01 Installation:

- A. Field verify prepared bases are in correct position and configuration.
- B. Install equipment as located on the Drawings and comply with manufacturer's written instructions for equipment

DIVISION 10 - SPECIALTIES - SOUTHMOORE HS STADIUM UPGRADES

SECTION 10500 - LOCKERS

provided.

Secure lockers with anchor devices with a minimum pull-out force of 100 lbs.

Provide any additional items necessary for support or to complete installation.

- C. Clean work after installation including locker interior and exterior surfaces.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10520 - FIRE PROTECTION SPECIALTIES

Part 1 General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this entire section of the work.

1.02 Submittals:

- A. Submit Manufacturer's Literature: Descriptive literature, product data and installation instructions.

1.03 Product Delivery, Storage and Handling:

- A. Handle and store all items with care to prevent damage to equipment. Damaged equipment shall be rejected.

1.04 Quality Assurance:

- A. Standards:
 - 1. Conform to NFPA 10 requirements for portable fire extinguishers.
- B. Provide fire extinguishers, cabinets and accessories by a single manufacturer.

1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Fire Extinguishers:
 - 1. Model No. 10E - Cosmic multi-purpose dry chemical fire extinguisher. UL, 4A-60-BC.
- B. Fire Extinguisher Cabinets:
 - 1. Model No.: Academy 1026V10 with return trim as required with rolled edge.
 - 2. Door Style: Contemporary V, with flat trim.
 - 3. Glazing: 1/4" clear acrylic.
 - 4. Finish: Aluminum, mill finish, clear anodized.
 - 5. Fire Rated Enclosure: provide fire stopping material to protect integrity of fire rated partition as required by applicable codes and standards.

Part 3 - Execution

3.01 Installation:

- A. Install equipment as located on the Drawings and comply with manufacturer's written instructions for equipment provided.
- B. Prepare recesses in walls for fire extinguisher cabinets as required for type and size of cabinet and style of trim, and

DIVISION 10 - SPECIALTIES

SECTION 10520 - FIRE PROTECTION SPECIALTIES

- to comply with manufacturer's instructions.
- C. Securely fasten mounting brackets and fire extinguisher cabinets to the structure, square and plumb, to comply with manufacturer's instructions.
 - D. Check extinguishers for proper charge operation.
 - E. Remove and replace damaged, defective or under charged units.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10650 - OPERABLE PARTITIONS

Part 1 - General

1.01 Description:

A. General:

1. Furnish and install operable partitions and suspension system. Provide all labor, materials, tools, equipment, and services for operable walls in accordance with provisions of contract documents.

1.02 Related Work By Others:

- A. Any deviation of site conditions contrary to approved shop drawings must be called to the attention of the Contracting Officer.
- B. All header, blocking, support structures, jambs, track enclosures, surrounding insulation, and sound baffles as required in 1.04 Quality Assurance.
- C. Prepunching of support structure in accordance with approved shop drawings.
- D. Paint or otherwise finishing all trim and other materials adjoining head and jamb of operable partitions.

1.03 Submittals:

- A. Complete shop drawings shall be provided prior to fabrication indicating construction and installation details.

1.04 Quality Assurance:

- A. Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions.
- B. The partition STC (Sound Transmission Classification) shall be achieved per the standard test methods ASTM E90.
- C. Noise isolation classifications shall be achieved per the standard test methods ASTM E336 and ASTM E413.
- D. Noise Reduction Coefficient (NRC) ratings shall be per ASTM C423.
- E. The manufacturer shall have a quality system that is registered to the ISO 9001 standards.
- F. Rack testing for 10 years (tensional strength stress test).

1.05 Product, Delivery, Storage, And Handling:

- A. Provide proper storage of partitions before installation and continued protection during and after installation.

1.06 Warranty:

- A. Provide Manufacturer's standard warranty.

1.07 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

DIVISION 10 - SPECIALTIES

SECTION 10650 - OPERABLE PARTITIONS

Part 2 - Products

2.01 Acceptable Manufacturer:

- A. Materials:
 - 1. Product shall be top supported, Series 642 paired panels as manufactured by Hufcor Inc.
- B. Construction:
 - 1. Panels shall be nominally 4" thick, to 48" in width, and hinged in groups of two.
 - 2. Panel faces shall be laminated to appropriate substrates to meet the STC requirement in 2.04 Acoustical Performance.
 - 3. Frames shall be of 16 gauge painted steel with factory applied aluminum vertical edge and face protection.
 - 4. Vertical interlock seals between panels shall provide minimum 1-1/4" panel-to-panel interlock. The lead panel shall seal against the adjacent wall without the need for wall mounted jambs.
 - 5. Horizontal top seals shall be retractable, provide 1" nominal operating clearance, and exert upward force when extended.
 - 6. Horizontal bottom seals shall be retractable, provide a maximum of 2" nominal operating clearance, and exert downward force when extended.
 - 7. Horizontal trim shall be of aluminum.
 - 8. Hinges on basic panels shall be of steel and project no more than 1/4" beyond panel faces. Each pair of panels shall have a minimum of three hinges.
- B. Weight of the panels shall be 7.8-13.6 lbs. per sq. ft. based on options selected.
- C. Suspension system:
 - 1. Track shall be of clear anodized architectural grade extruded aluminum alloy 6063-T6. Track design shall provide integral support for adjoining ceiling, soffit, or plenum sound barrier. Track shall be connected to the structural support by min. 3/8" dia. threaded steel hanger rods. Guide rails and/or track sweep seals shall not be required.
 - a. Each panel shall be supported by one 4-wheeled carrier. Wheels shall be of hardened steel ball bearings encased with molded polymer tires.
- D. Finishes:
 - 1. Face finish shall be:
 - a. Factory applied high pressure laminate. Color shall be selected from manufacturer's standard color selections.

DIVISION 10 - SPECIALTIES

SECTION 10650 - OPERABLE PARTITIONS

2. Frame and horizontal trim color shall be:
 - a. Gray (standard)
3. Aluminum track shall be clear anodized.

2.03 Operation:

- A. Panels shall be manually moved from the storage area, positioned in the opening, and seals set.
- B. Retractable Horizontal Seals
 1. Retractable horizontal seals shall be activated by a removable quick-set operating handle located approximately 42" from the floor in the panel edge.
 2. All retractable seals in each hinged panel group shall be operated simultaneously.
 3. Seal activation requires approximately 15 lbs. of force per panel and approximately a 190 degree turn of the removable handle.
- C. Final partition closure to be by:
 1. Expanding jamb which compensates for minor wall irregularities and provides a minimum of 250 lbs. seal force against the adjacent wall for optimum sound control. The jamb activator shall be located approximately 45" from the floor in the panel face and be accessed from either side of the panel. The jamb shall be equipped with a mechanical rack and pinion gear drive mechanism and shall extend 4"-6" by turning the removable operating handle.
- D. Stack/Store Panels
 1. Retract seals with removable operating handle and move to storage area.

2.04 Acoustical Performance:

- A. Acoustical performance shall be tested at a laboratory accredited by the U.S. Dept. of Commerce, National Institute of Standards and Technology, under the National Voluntary Laboratory Accreditation Program (NVLAP) and in accordance with ASTM E90 Test Standards. Standard panel construction shall have obtained an STC rating of 43.
 1. Complete, unaltered written test report is to be made available upon request.

Part 3 - Execution

3.01 Installation:

- C. The complete installation of the operable wall system shall be by an authorized factory-trained installer and be in strict accordance with the approved shop drawings and manufacturer's standard printed specifications, instructions, and recommendations.

DIVISION 10 - SPECIALTIES

SECTION 10650 - OPERABLE PARTITIONS

3.02 Cleaning:

- A. All track and panel surfaces shall be wiped clean and free of handprints, grease, and soil.
- B. Cartoning and other installation debris shall be removed from the job site.

3.03 Training:

- A. Contractor shall demonstrate proper operation and maintenance procedures to Contracting Officer's representative.
- B. Operating handle and owners manuals shall be provided to Contracting Officer.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10800 - TOILET AND BATH ACCESSORIES

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.

1.02 Submittals:

- A. Provide manufacturer's catalog cut and data sheets, complete parts list and installation requirements for each accessory item specified.
- B. Where applicable, submit maintenance data, operating instructions and keys required for each type of equipment and lock.

- 1.03 Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 The following model numbers refer to products of Bradley Corporation (except where noted otherwise).

2.02 Accessories:

A. Grab Bars:

1. Model No. 8120-001360-36".
2. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201a, 201b, 201c, 201d, 201e, 301a, 301b, 301c, 301d, 301e, 413, 414, 417a, 417b, 416b, 423, and 436a

B. Grab Bars:

1. Model No. 8120-001420-42".
2. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201a, 201b, 201c, 201d, 201e, 301a, 301b, 301c, 301d, 301e, 413, 414, 417a, 417b, 416b, 423, and 436a

C. Grab Bars:

1. Model No. 8120-001180-18".
2. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201a, 201b, 201c, 201d, 201e, 301a, 301b, 301c, 301d, 301e, 413, 414, 417a, 417b, 416b, 423, and 436a

D. Tilted Stainless Steel Mirror (Frame and Surface):

1. Model No. 740-1830.
2. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201a, 201b, 201c, 201d, 201e, 301a, 301b, 301c, 301d, 301e, 413, 414, 417a, 417b, 416b, 423, and 436a (above

DIVISION 10 - SPECIALTIES

SECTION 10800 - TOILET AND BATH ACCESSORIES

- lavatories)
- E. Custodian's Utility Shelf/With Mop & Broom Holder:
 - 1. Model No. 9984, 36" long.
 - 2. Quantity: 1 @ room 433
 - G. Toilet Paper Dispenser to be provided by Owner and installed by Contractor.
 - 1. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201b, 201c, 413, 414, 417a, 417b, 416b, 423, and 436a
2 each @ rooms 201a, 201d, 201e, 301a, 301b, 301c, 301d, and 301e
 - H. Paper Towel Dispenser to be provided by Owner and installed by Contractor.
 - 1. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201a, 201b, 201c, 201d, 201e, 301a, 301b, 301c, 301d, 301e, 413, 414, 417a, 417b, 416b, 423, 436a and 427
 - I. Soap Dispenser to be provided by Owner and installed by Contractor.
 - 1. Quantity: 1 each @ rooms 001a, 001b, 001c, 001d, 001e, 101a, 101b, 101c, 101d, 101e, 201a, 201b, 201c, 201d, 201e, 301a, 301b, 301c, 301d, 301e, 413, 414, 417a, 417b, 416b, 423, 436a and 427

Part 3 - Execution

3.01 General:

- A. Install where noted on the Drawings and mount as indicated or per manufacturer's recommendations.
- B. Use concealed or tamper-proof fasteners of same material and finish as unit. Provide anchors, bolts, and other mounting devices and attach units securely.

End of Section



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MA
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OCTOBER 2024
date
revisions



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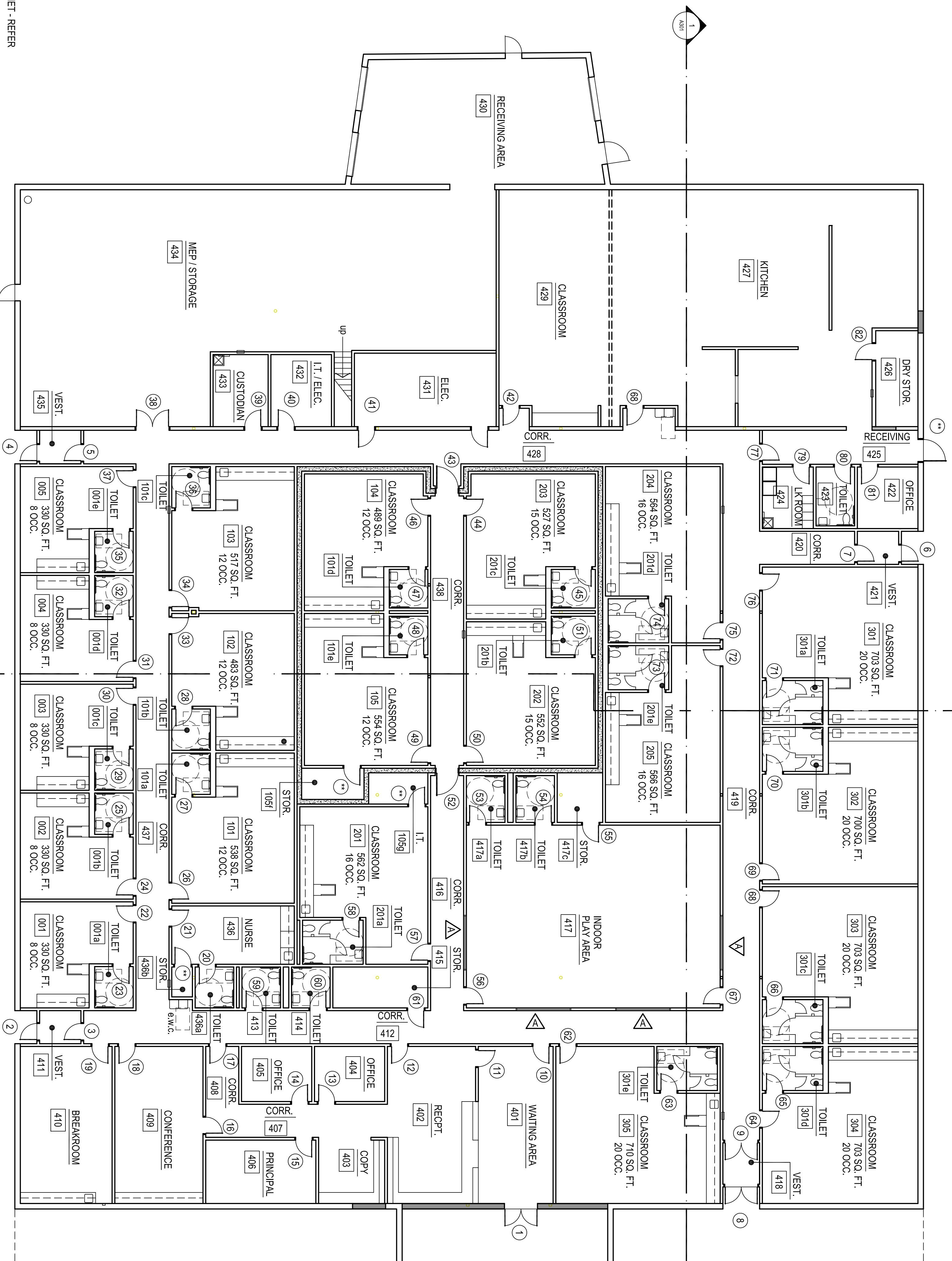
CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No.:

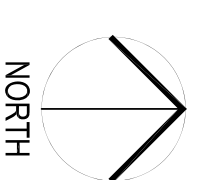
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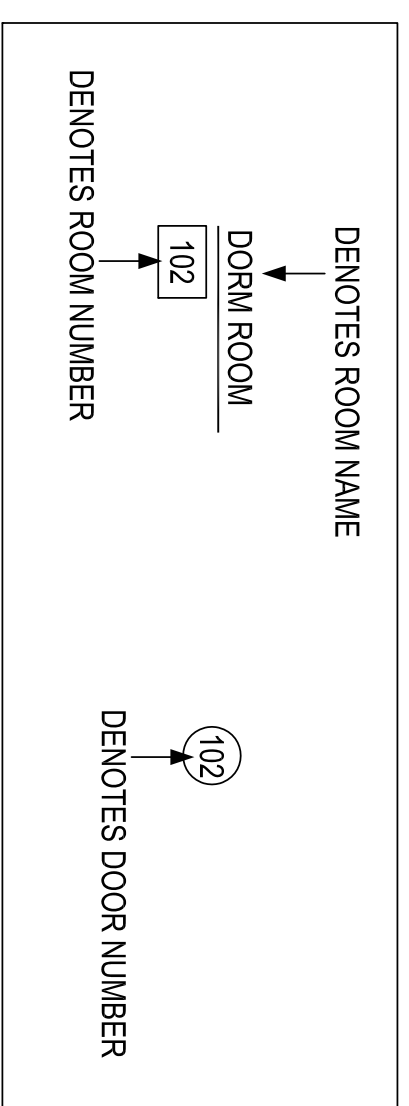
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- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. REFER SHEETS A100a FOR DIMENSION PLAN
 5. NUMBER OF CLASSROOM STUDENT OCCUPANTS ARE BASED ON DEPARTMENT OF HUMAN SERVICES' 2022 LIMITS



OVERALL FLOOR PLAN
3/82" = 1'-0"





CG
drawn by
MA
checked by
OCTOBER 2024
date
revisions



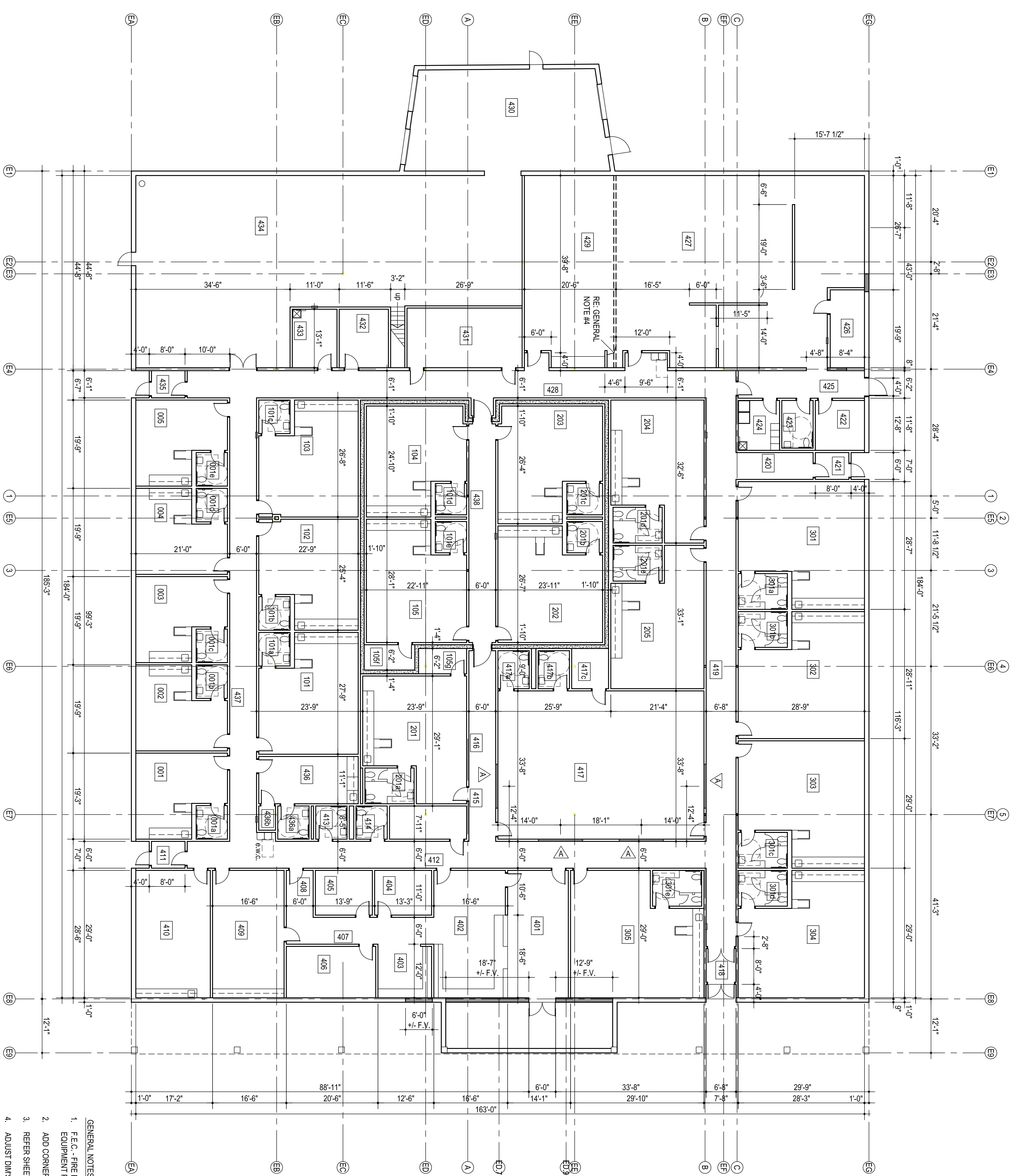
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CHILD CARE FACILITY
201 N. EASTERN AVE.

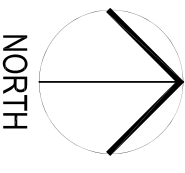
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A100a

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- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. ADJUST DIMS AS REQUIRED FOR MOVEABLE PARTITION SUPPLIED



DIMENSION PLAN
3/32" = 1'-0"

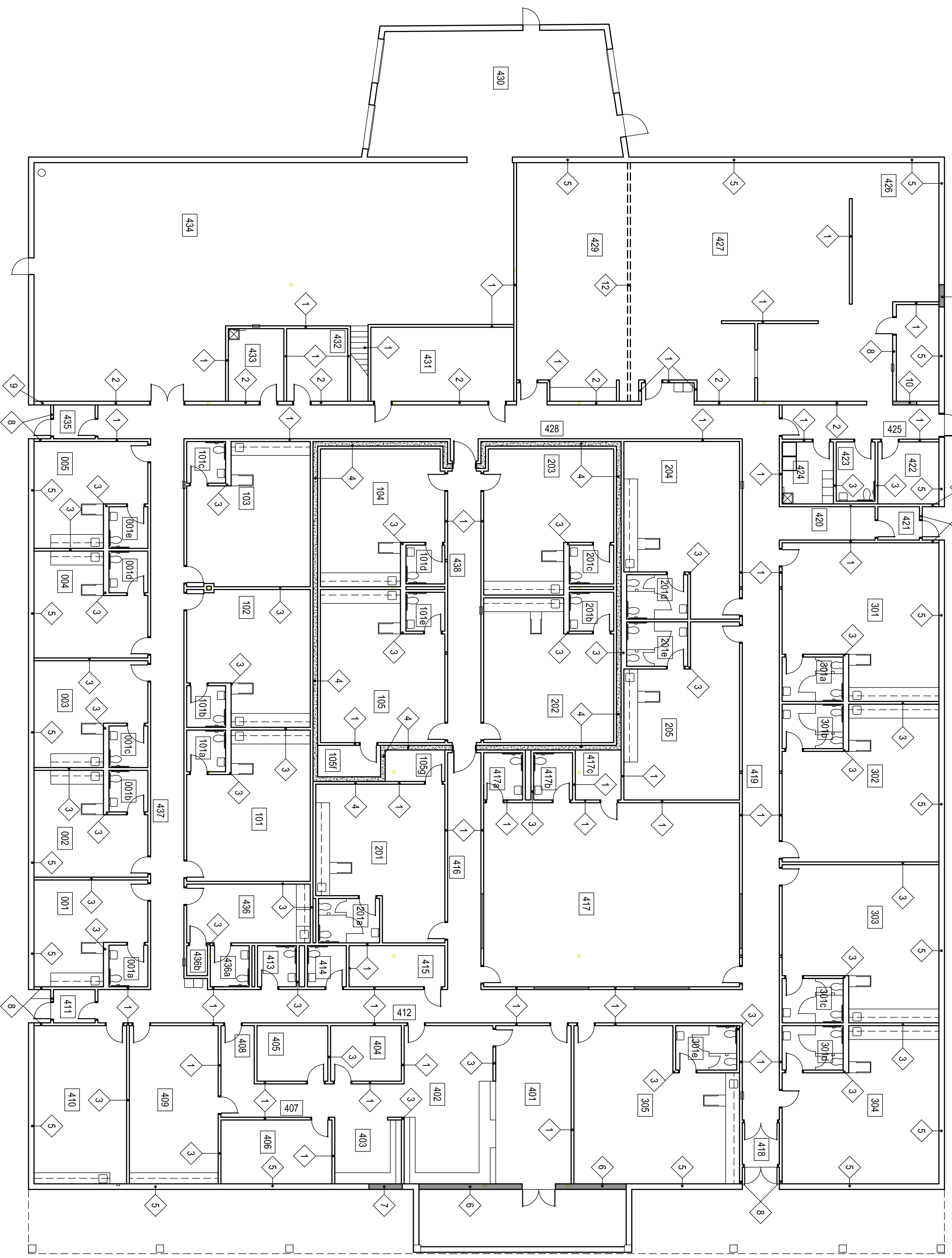


WALL / PARTITION LEGEND

- 1 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 2 EXISTING LOAD BRNG. 6" CMU WALL
1 LAYER FIRE RATED GYP. BD. EA.SIDE ON 7/8" FURRING STRIPS
HEIGHT: 6" ABOVE CEILING
PROVIDE FIRE STOPPING AS REQUIRED AT TOP OF EXISTING CMU WALL
- 3 STUD WALL / CHASE WALL (12" CLEAR)
1 LAYERS GYPSUM BOARD EACH SIDE, 3.58" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
- 4 SHELTER WALL
1 LAYER GYP. BD. EA. SIDE ON 3/8" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
10" CONC. WALL TO SLAB ABOVE - 12'-6", RE. STRUCT.
- 5 EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. ON 2" FURRING STRIPS W/ 2" BATT INSULATION
HEIGHT: SLAB TO 6" ABOVE CEILING
- 6 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO MATCH
EXISTING CMU WIDTH
HEIGHT: SLAB TO DECK ABOVE
- 7 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. AND EXTERIOR SHEATHING ON METAL STUDS TO
MATCH EXISTING CMU WIDTH. MATCH EXISTING E.F.I.S. THICKNESS
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 8 STUD WALL / METAL WALL PANEL
1 LAYERS GYPSUM BOARD, 6" METAL STUDS, EXTERIOR SHEATHING W/
METAL WALL PANELS
HEIGHT: 6" STUDS AND GYP. BD.-SLAB TO DECK ABOVE. SHEATHING
AND METAL WALL PANEL. TO SOFFIT ABOVE
- 9 EXISTING CMU WALL / METAL WALL PANEL
7/8" FURRING STRIPS, EXTERIOR SHEATHING W/ METAL WALL PANELS
HEIGHT: SHEATHING AND METAL WALL PANEL. TO SOFFIT ABOVE
- 10 NEW STUD IN-FILL AT EXISTING 8" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO
MATCH EXISTING CMU WIDTH.
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 11 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 12 MOVABLE PARTITION
REFER SPECIFICATIONS

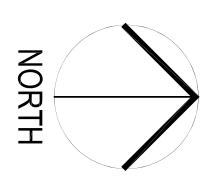
REFER ROOM FINISH SCHEDULE, COLOR SCHEDULE,
INTERIOR ELEVATIONS & SPECIFICATIONS FOR ADDITIONAL
WALL FINISH INFORMATION

CONSTRUCTION MANAGER & SUBCONTRACTORS SHALL
COORDINATE FINAL CONSTRUCTION OF ALL WALLS
PRIOR TO BEGINNING WORK



WALL TYPE PLAN

3/32" = 1'-0"



CONSTRUCTION DATA (TABLE 603):

CONSTRUCTION TYPE -	E & I-4
TYPE II - B	
BASIC ALLOWABLE AREA -	E - 58,000 S.F. / I-4 - 52,000 S.F. PER FLOOR
ALLOWABLE STORIES -	3 / 3
ACTUAL STORIES -	1 / 1
ACTUAL HEIGHT -	23'-4"

BUILDING SIZES:
BUILDING : 1 STORY @ 32,200 S.F.

STRUCTURAL FIRE PROTECTION (TABLE 601):	0 HOUR
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
COLUMNS	0 HOUR
BEAMS	0 HOUR
PERMANENT PARTITIONS	NONCOMBUSTIBLE
FLOOR ASSEMBLIES	0 HOUR
ROOF ASSEMBLIES	0 HOUR
EXTERIOR OPENINGS	N/A

PASSIVE FIRE SAFETY SYSTEM:
PORTABLE FIRE EXTINGUISHERS (REF: SHEETS A104)
TRAVEL DISTANCE = 250'-0" MAX.
ACTUAL MAX. TRAVEL DISTANCE = 170'-0"
DEADEND - 50'-0" MAX.
ACTUAL DEADEND - NONE

ACTIVE FIRE SAFETY SYSTEMS (EXISTING & NEW ADDITION):
FIRE SPRINKLER SYSTEM THROUGHOUT
FIRE ALARM SYSTEM
SMOKE DETECTION
AUTOMATIC AIR HANDLING EQUIP. SHUTDOWN
EXIT LIGHTS/EMERGENCY LIGHTS BATTERY

CODES/REGULATIONS USED: CITY OF MOORE;
2018 IBC - INTERNATIONAL BUILDING CODE;
AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE
2009 ENERGY CONSERVATION CODE
ASSOCIATED SUPPLEMENTS TO EACH CODE

OCCUPANT LOAD (TABLE 1004.1.1.1):

BUILDING RENOVATION: 278 CHILDREN
12 ADMIN / STAFF
40 TEACHERS
330 TOTAL OCCUPANTS

EGRESS WIDTH:

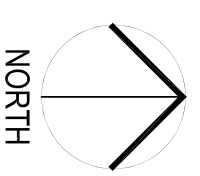
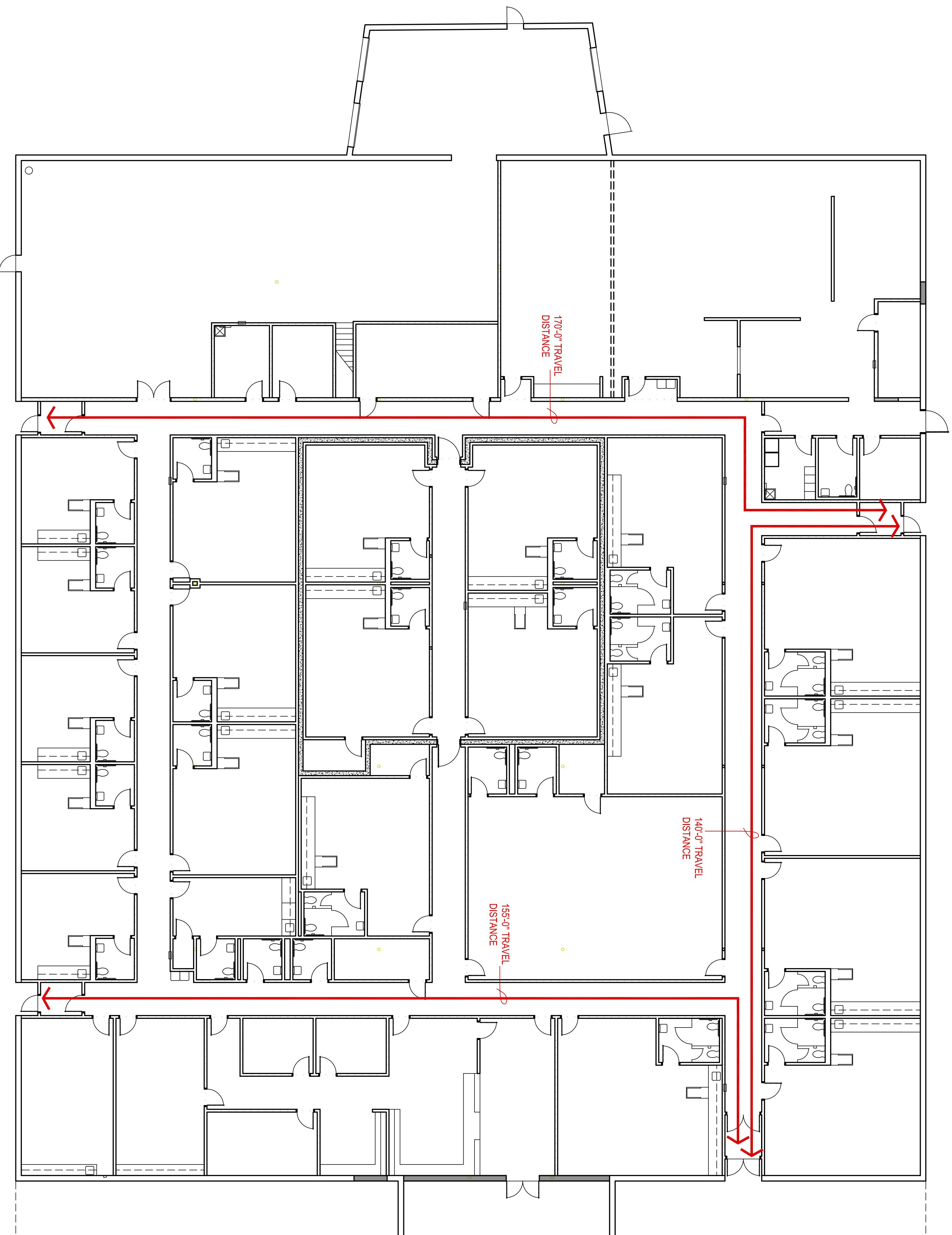
BUILDING RENOVATION: REQUIRED 66"
BUILDING RENOVATION: PROVIDED 432"

PLUMBING FIXTURES (TABLE 2902.1):

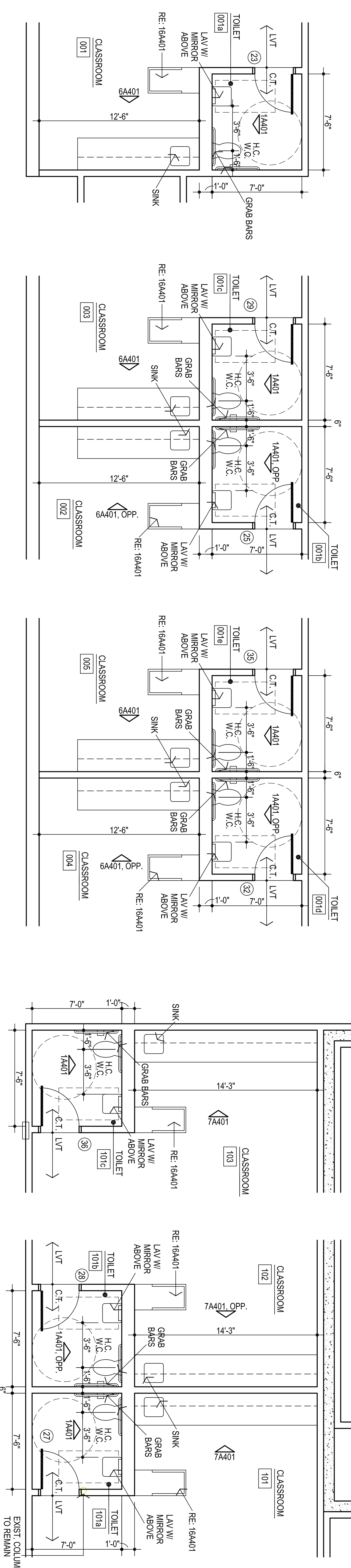
TOTAL OCCUPANT LOAD (INSTITUTIONAL) = 330

TOTAL REQUIRED:	TOTAL PROVIDED
WATER CLOSETS = 22	WATER CLOSETS = 34
LAVATORIES = 22	URINALS = 0
DRINKING FOUNTAINS = 4	LAVATORIES = 49
SERVICE SINKS = 1	DRINKING FOUNTAINS = 4
	SERVICE SINKS = 2

DEVOTES 1 HR. RATED PARTITIONS CLOSE-OUT TO
BOTTOM OF DECKING - CLOSE-OUT PARTITIONS TO
BE CMU WHERE INDICATED ON STRUCTURAL FOR
LOAD BEARING CONDITIONS. ALL OTHER INDICATED
LOCATIONS TO BE CONSTRUCTED OF 1 LAYER
OF 5/8" FIRE RATED GYP. BOARD EACH SIDE
ON 6" METAL STUDS @ 16" O.C. STAGGER ALL
JOINTS & PROVIDE FIRE TAPE SEAL ALL PENETRATIONS
W/ CONTINUOUS FIRE STOPPING INSULATION
& OR SEALANT.



1 LIFE SAFETY PLAN
3/32" = 1'-0"



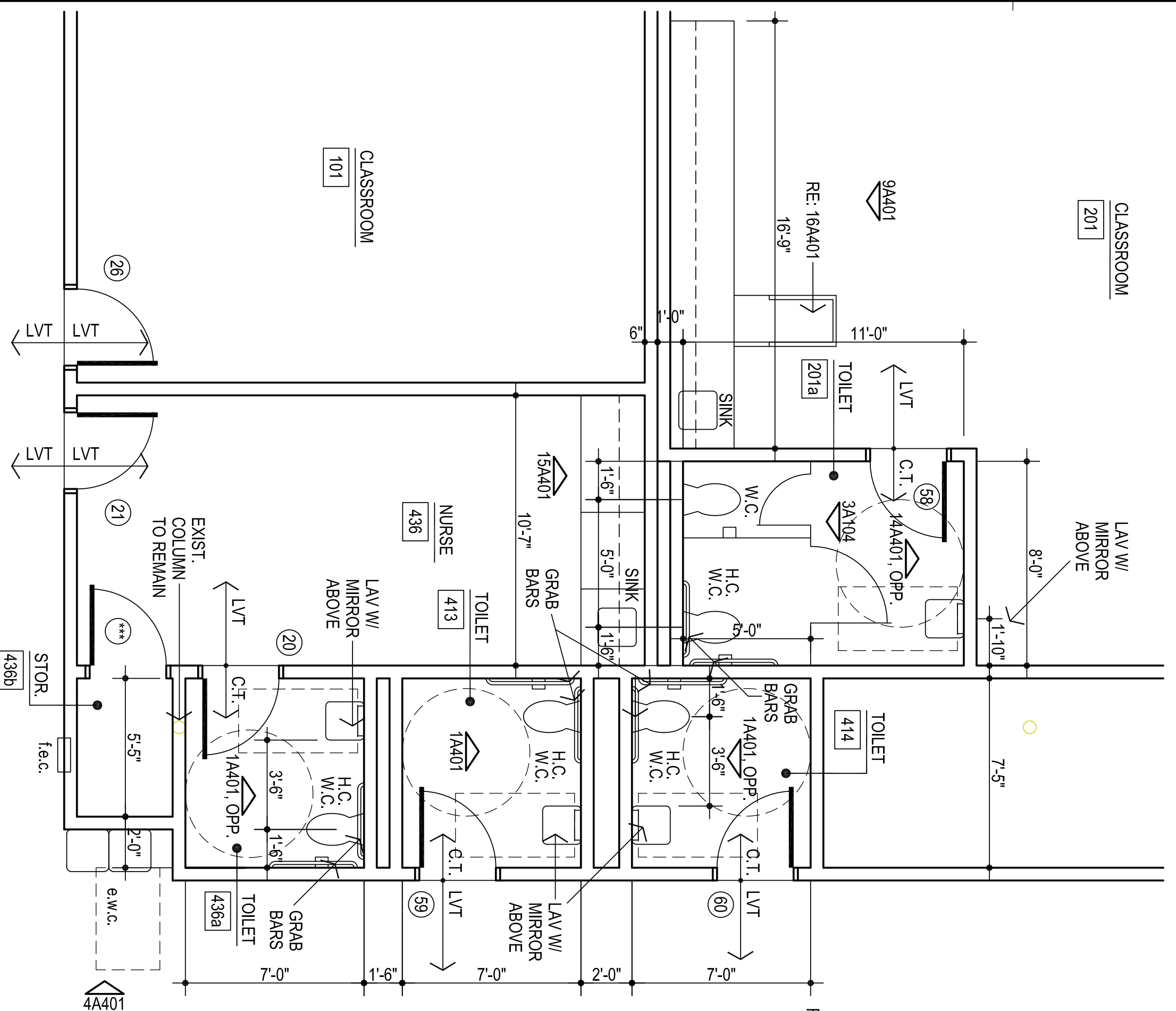
ENLARGED FLOOR PLAN
ROOM # 001 & 001a
1/4" = 1'-0"

ENLARGED FLOOR PLAN
ROOM # 002, 003, 001b & 001c
1/4" = 1'-0"

ENLARGED FLOOR PLAN
ROOM # 004, 005, 001d & 001e
1/4" = 1'-0"

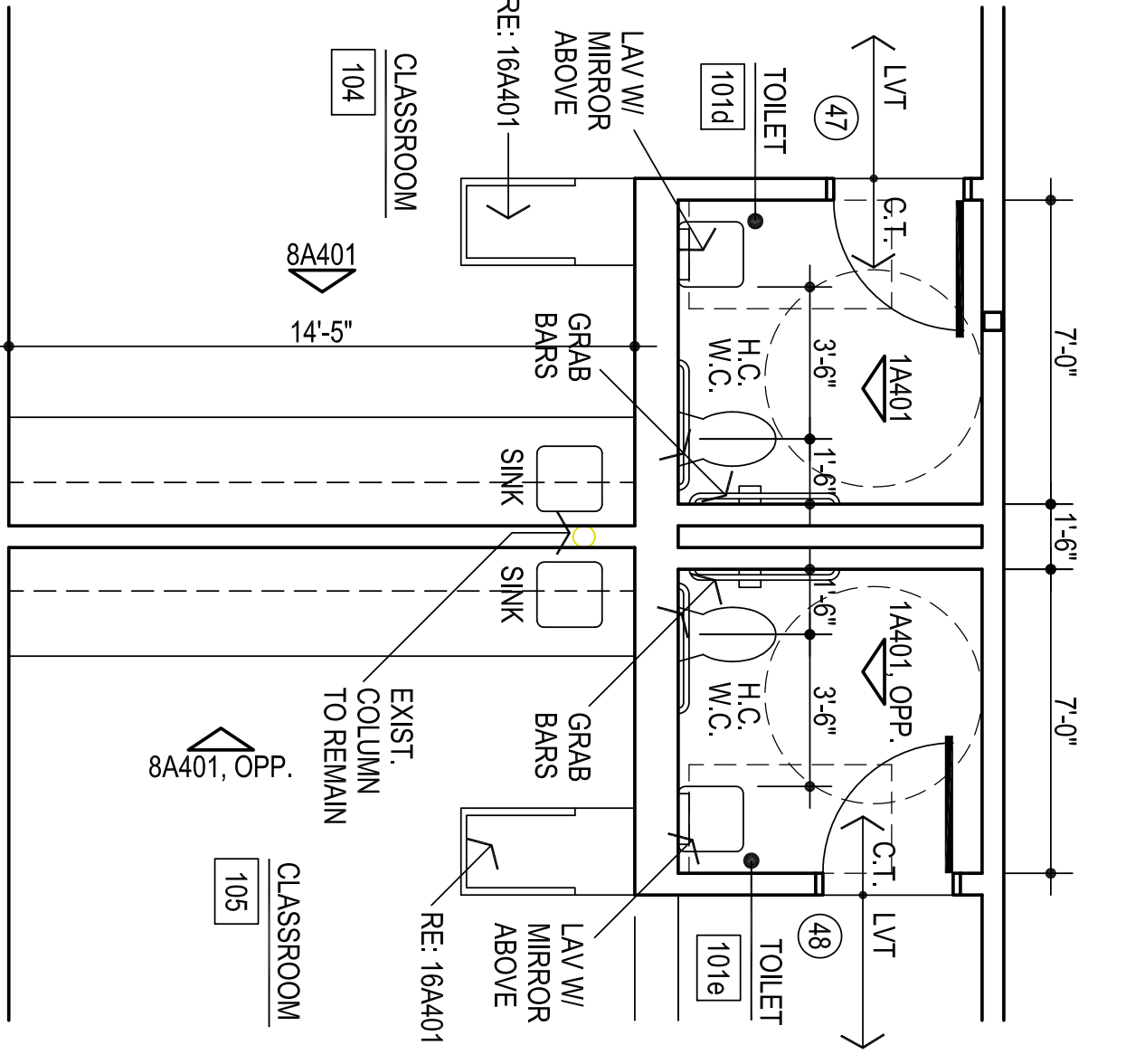
ENLARGED FLOOR PLAN
ROOM # 103 & 101c
1/4" = 1'-0"

ENLARGED FLOOR PLAN
ROOM # 101, 102, 101a & 101b
1/4" = 1'-0"



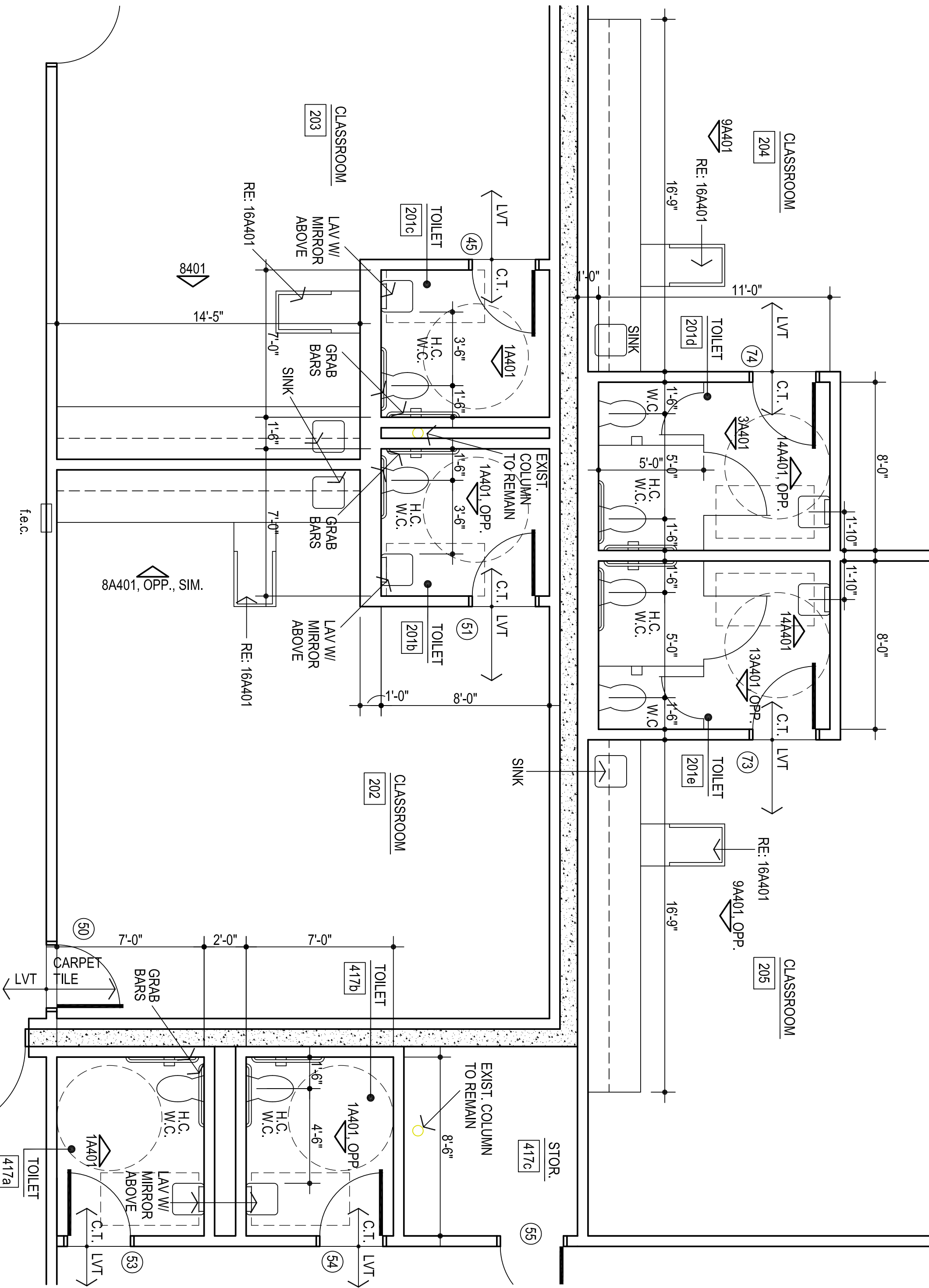
6
1/4" = 1'-0"

ENLARGED FLOOR PLAN
ROOM # 101, 201, 201a, 413, 414, 436, 436a & 436b
1/4" = 1'-0"



7
1/4" = 1'-0"

ENLARGED FLOOR PLAN
ROOM # 104, 105, 101d & 101e
1/4" = 1'-0"



8
1/4" = 1'-0"

ENLARGED FLOOR PLAN
ROOM # 202, 203, 204, 205, 201b, 201c, 201d, 201e, 417a, 417b & 417c
1/4" = 1'-0"

AGP
the Abia Griffin
Partnership L.L.C.

313 S. E. 5th Street
MOORE, OK, 73160
ACGP@theACGP.net
www.theACGP.net

CEDAR CREEK
CIVIL
KFC ENGINEERING
STRUCTURAL
SALAS O'BRIEN
MECHANICAL/ELECTRICAL

10/22/24
MICHAEL L. MOORE
STATE OF OKLAHOMA
LICENSED PROFESSIONAL ARCHITECT
2639

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MA
checked by
OCTOBER 2024
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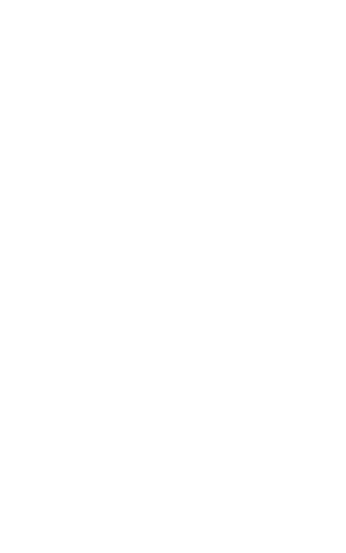
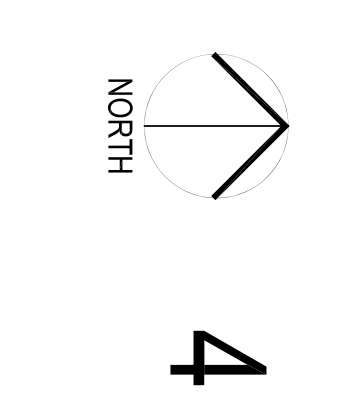
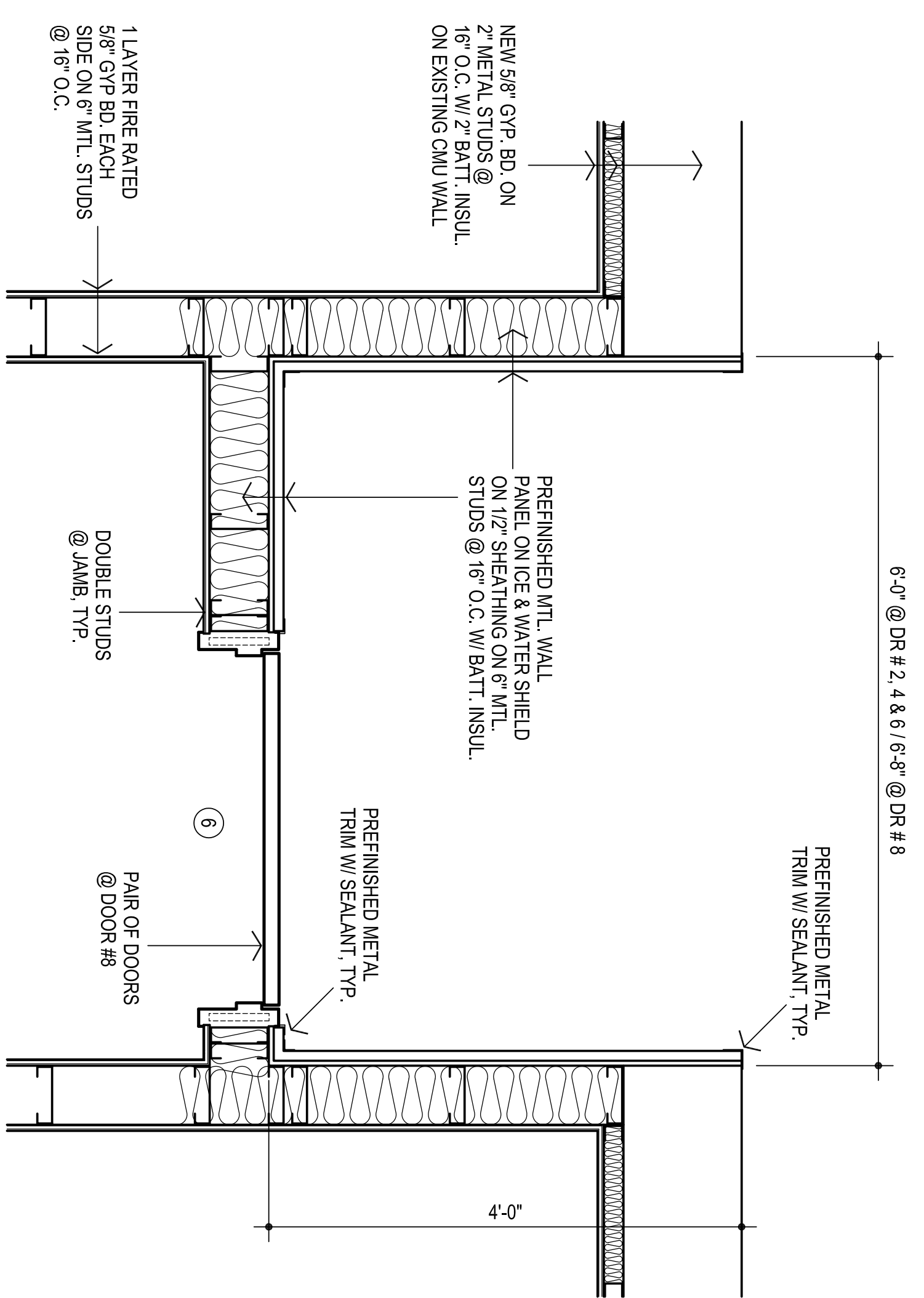
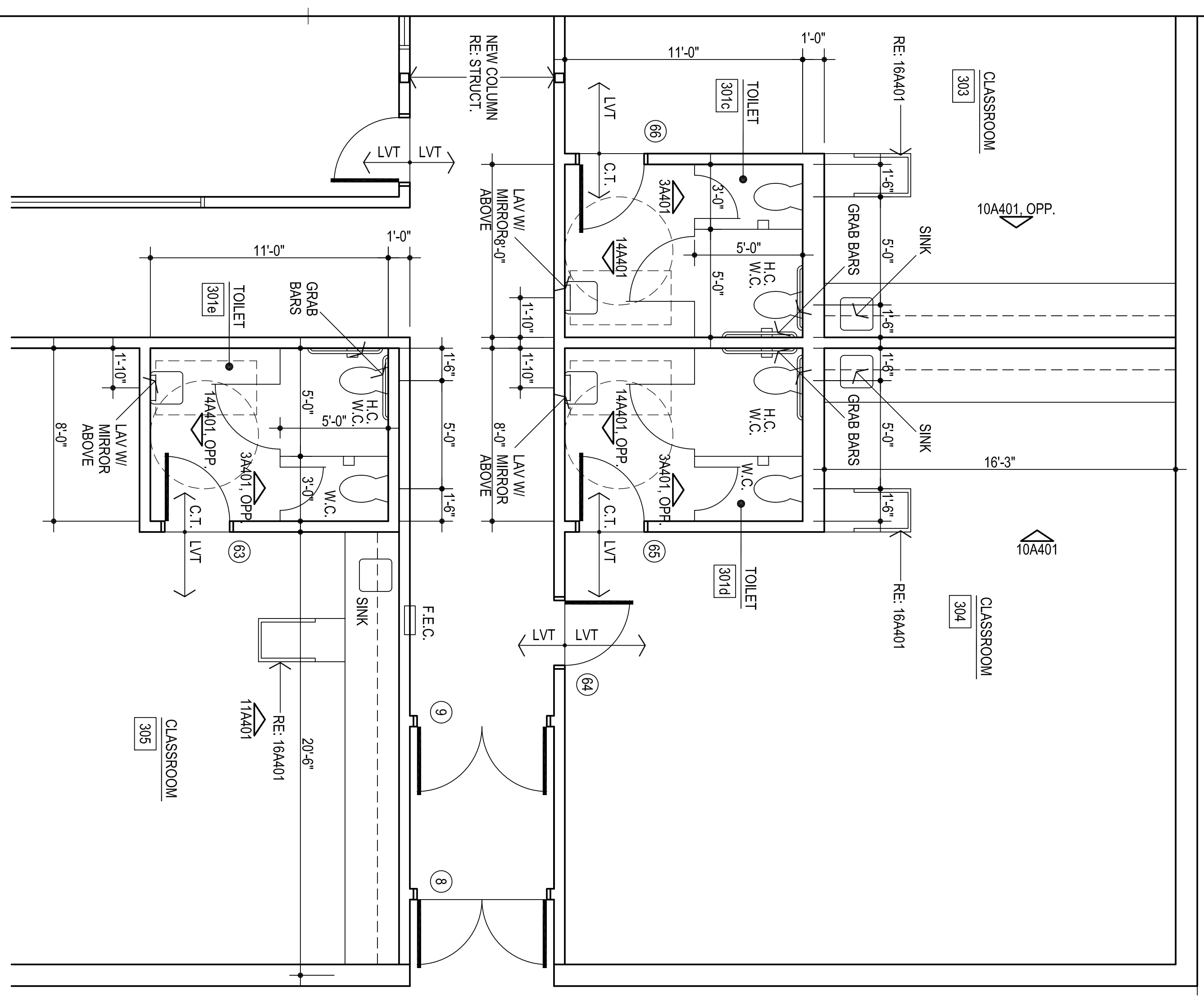
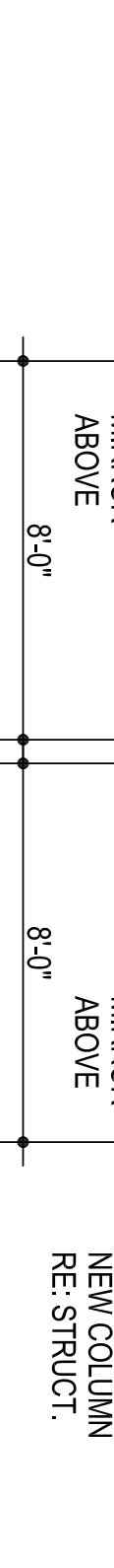
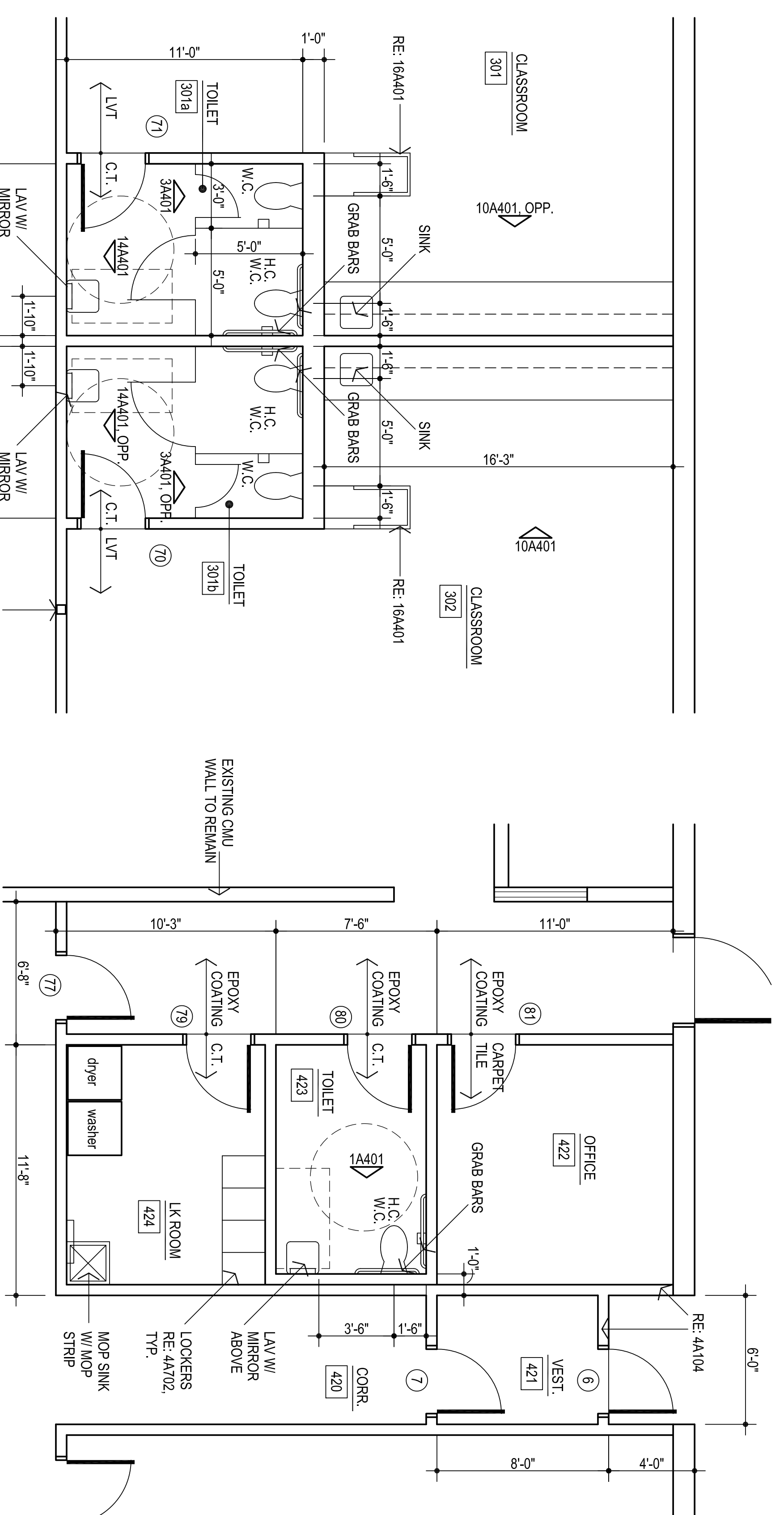
MOORE
PUBLIC SCHOOLS

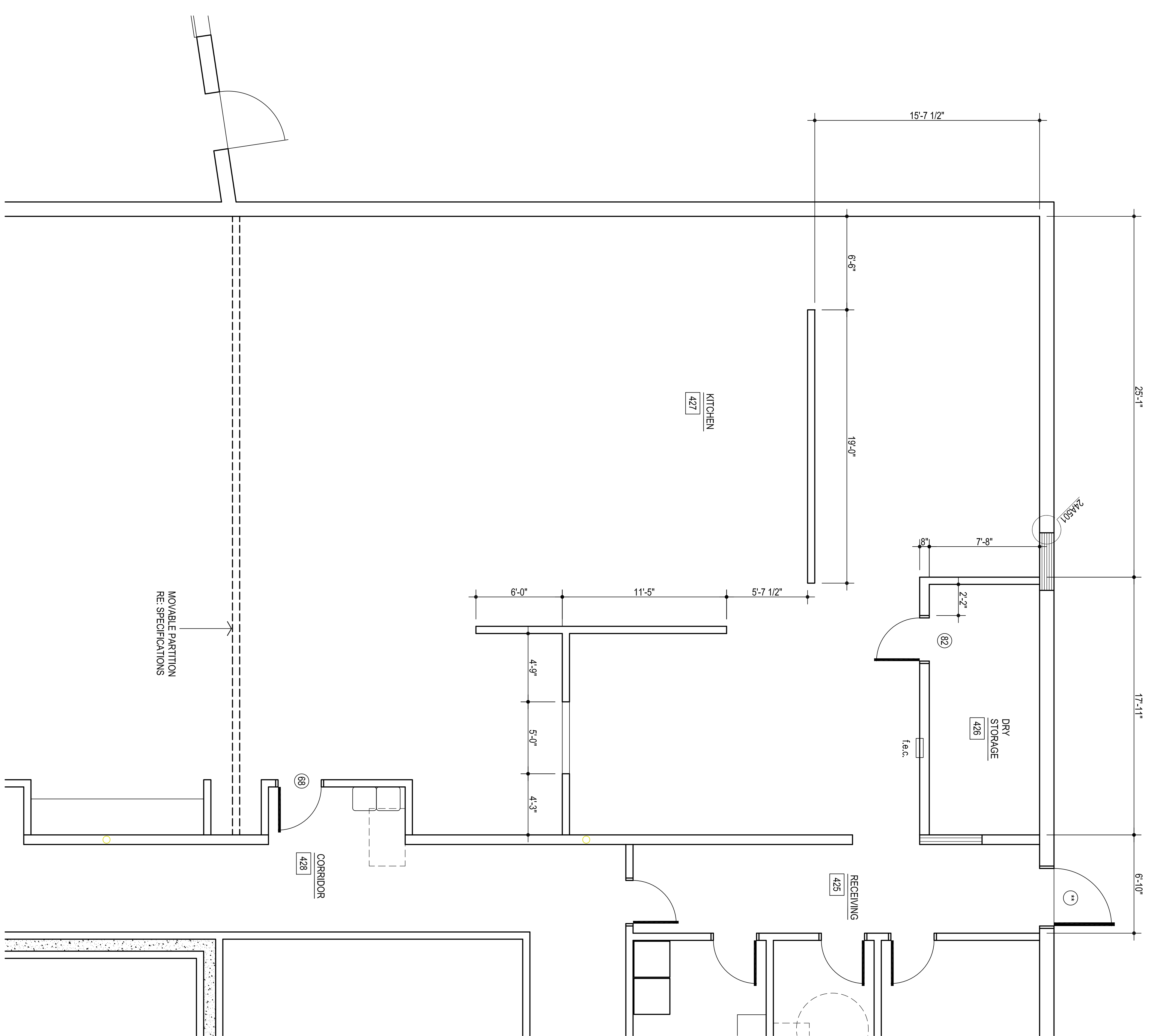
CHILD CARE FACILITY
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A103

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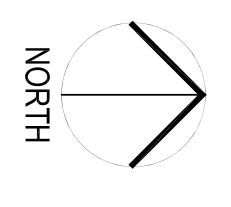




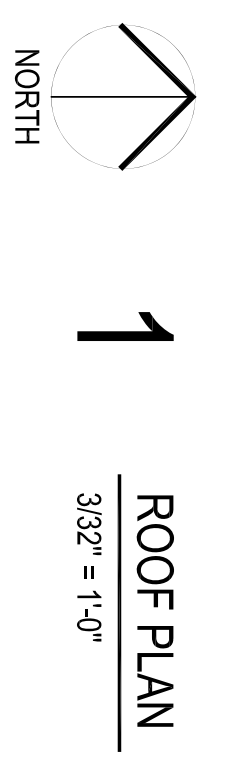
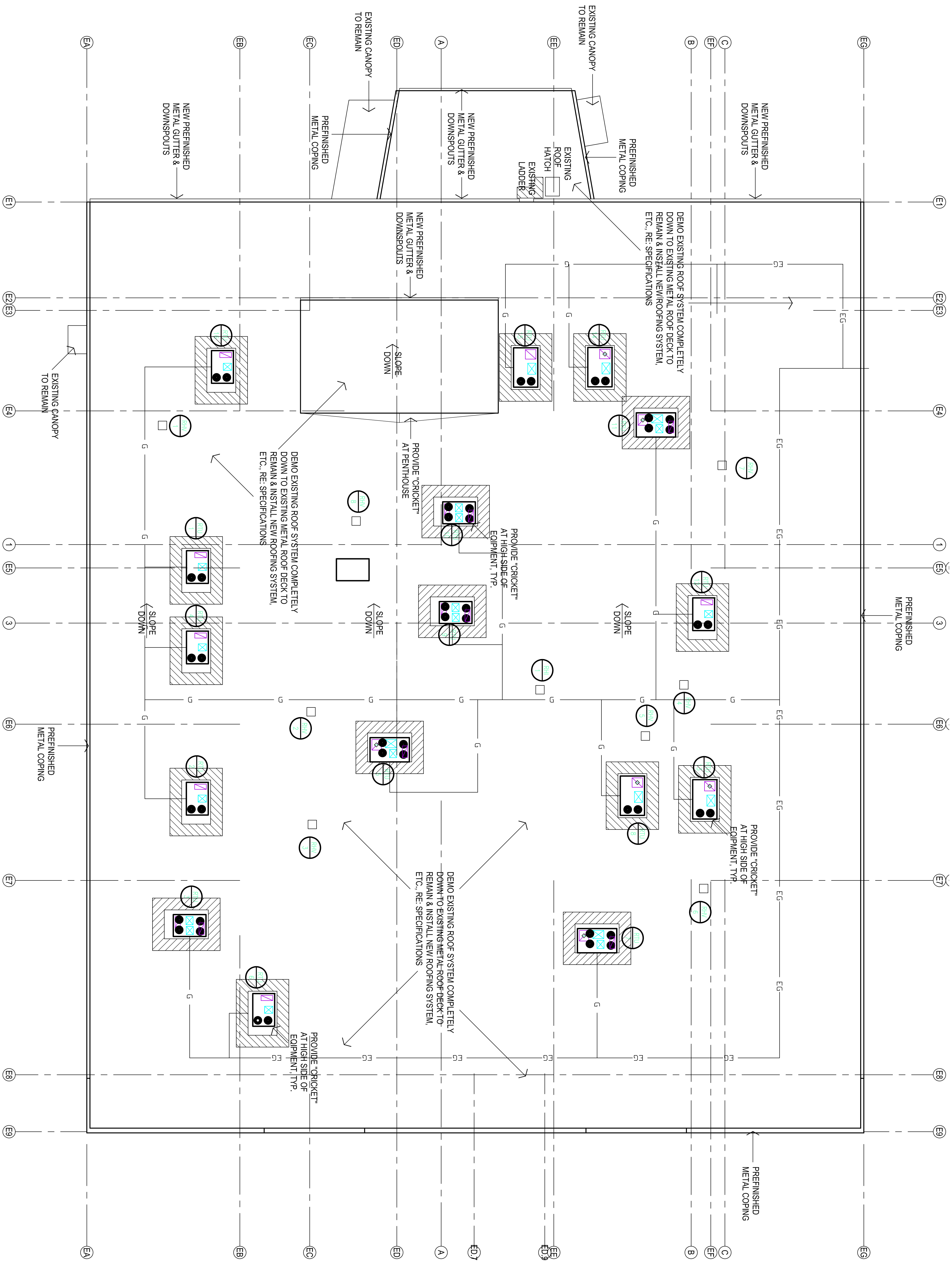
RE: KITCHEN EQUIPMENT SHEETS
FOR KITCHEN INFORMATION

ENLARGED FLOOR PLAN ROOM # 425, 426 & 427

1/4" = 1'-0"



1

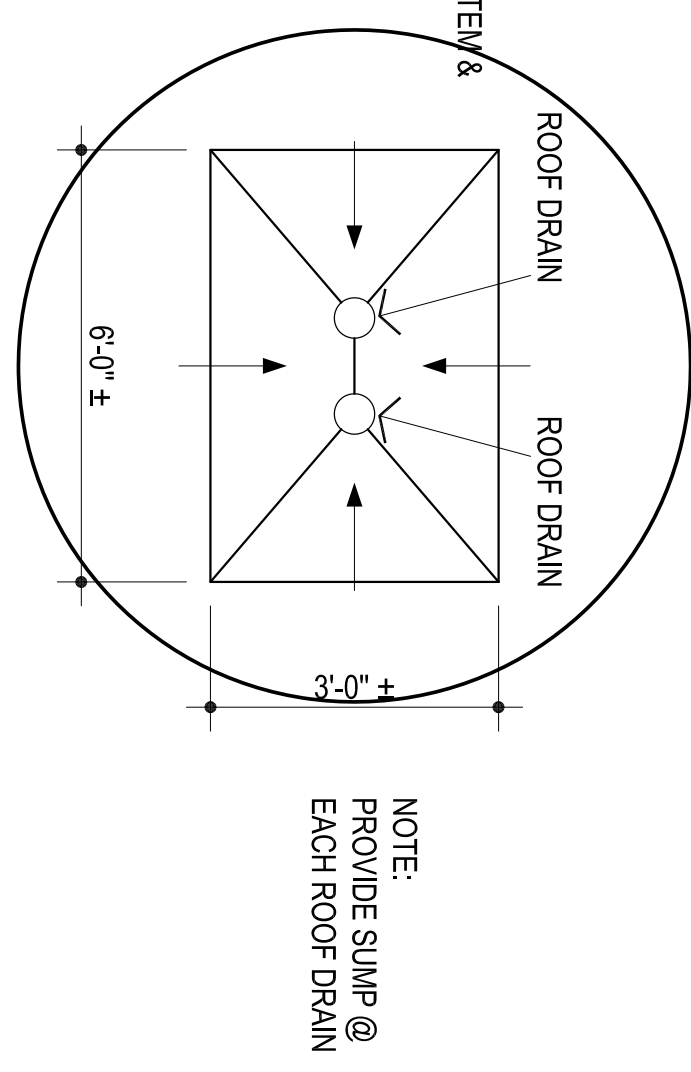
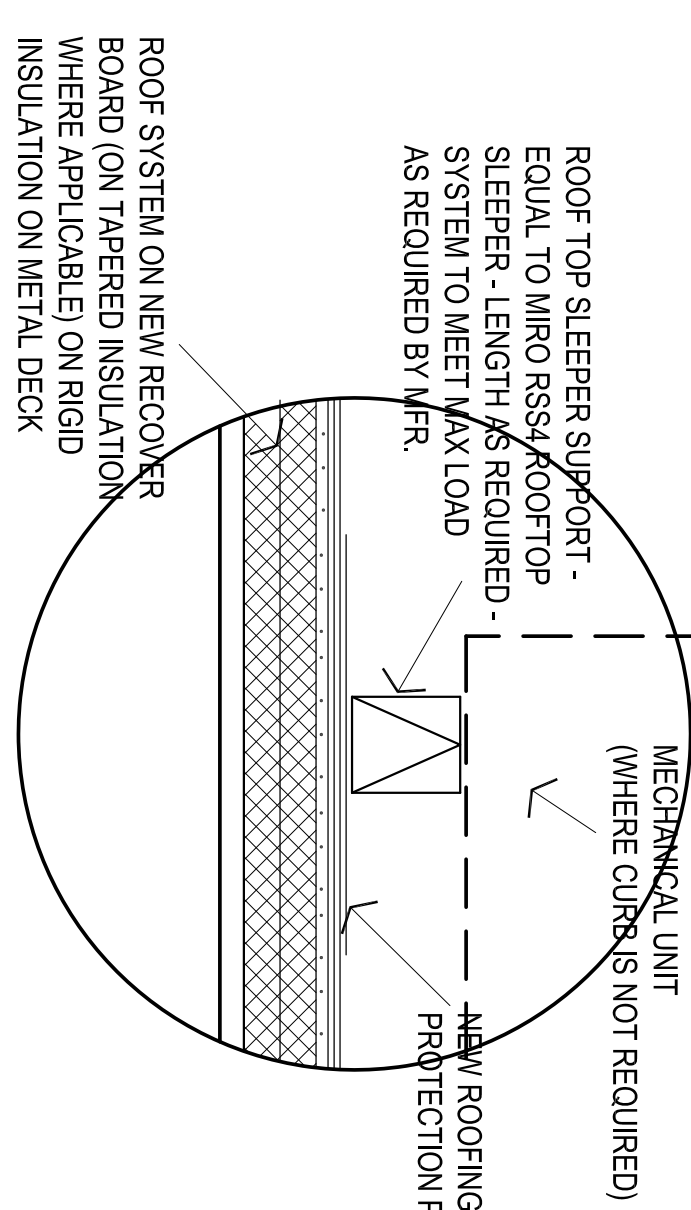
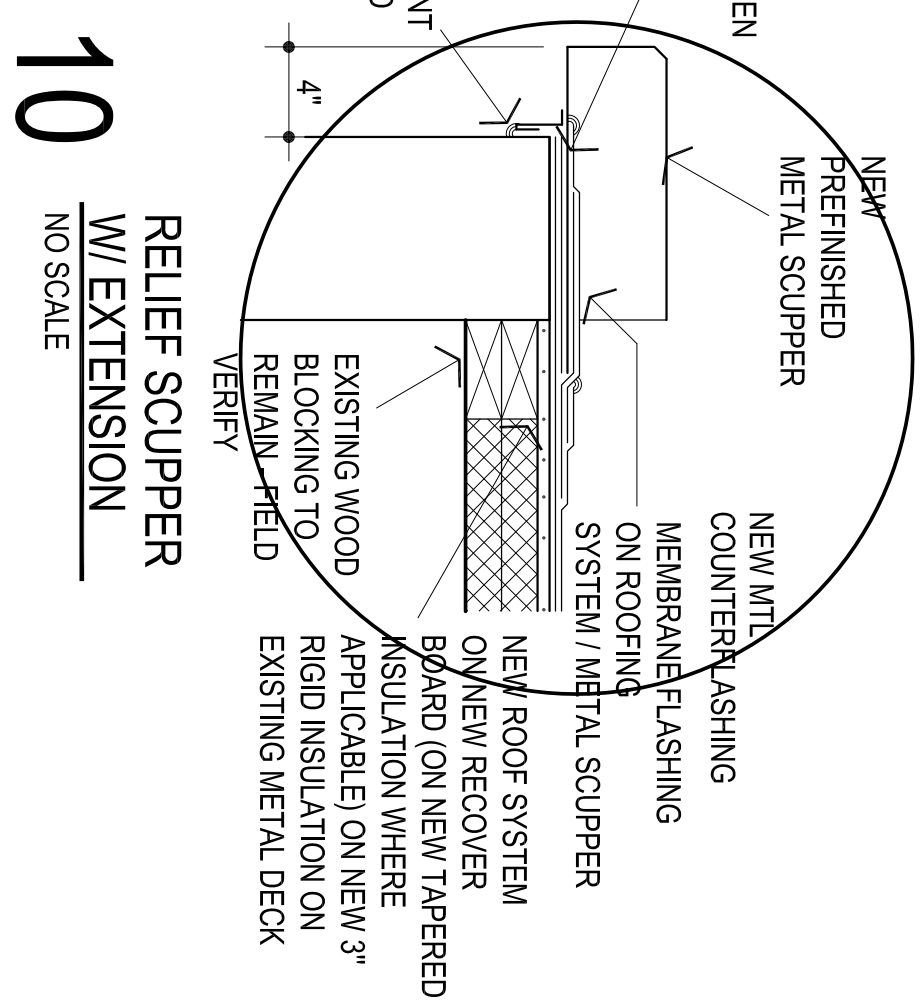
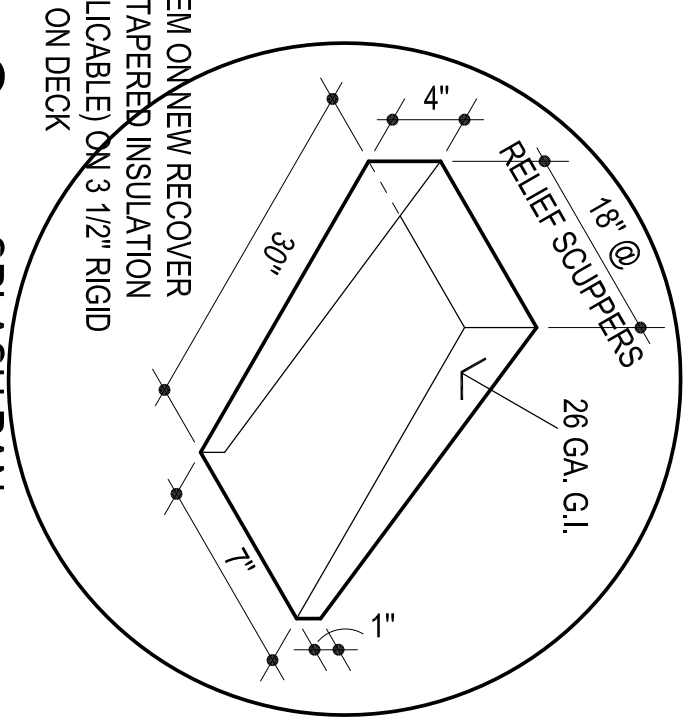
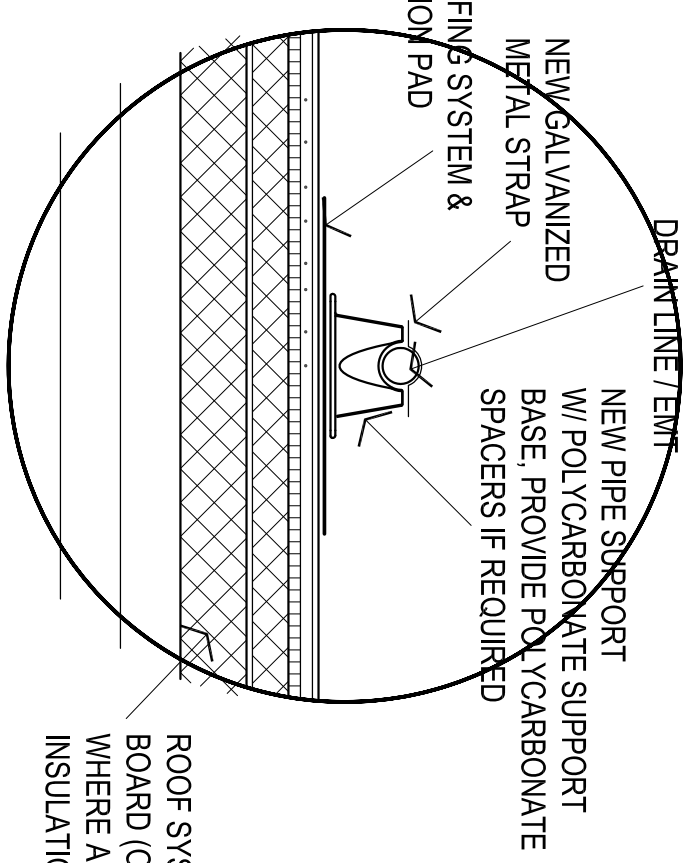
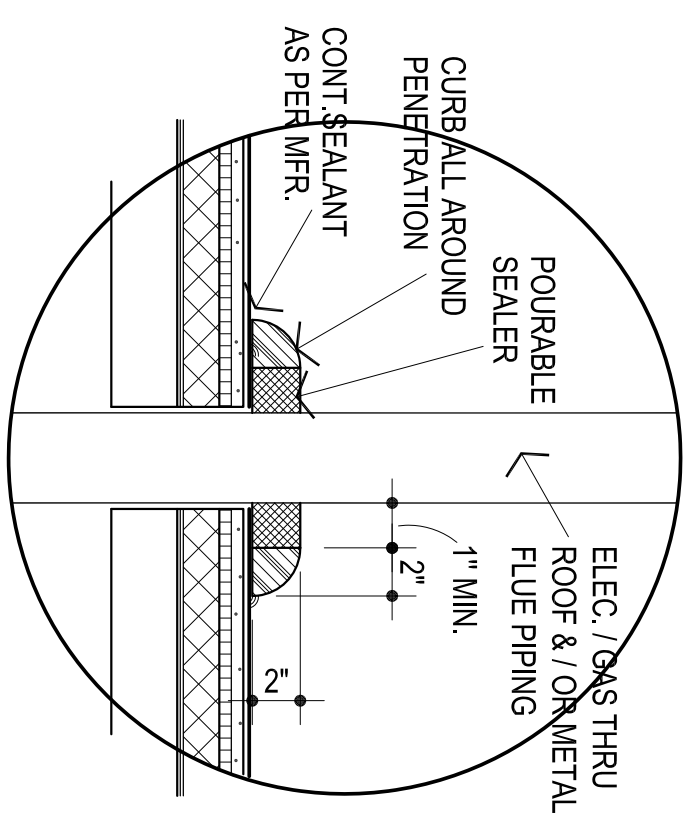
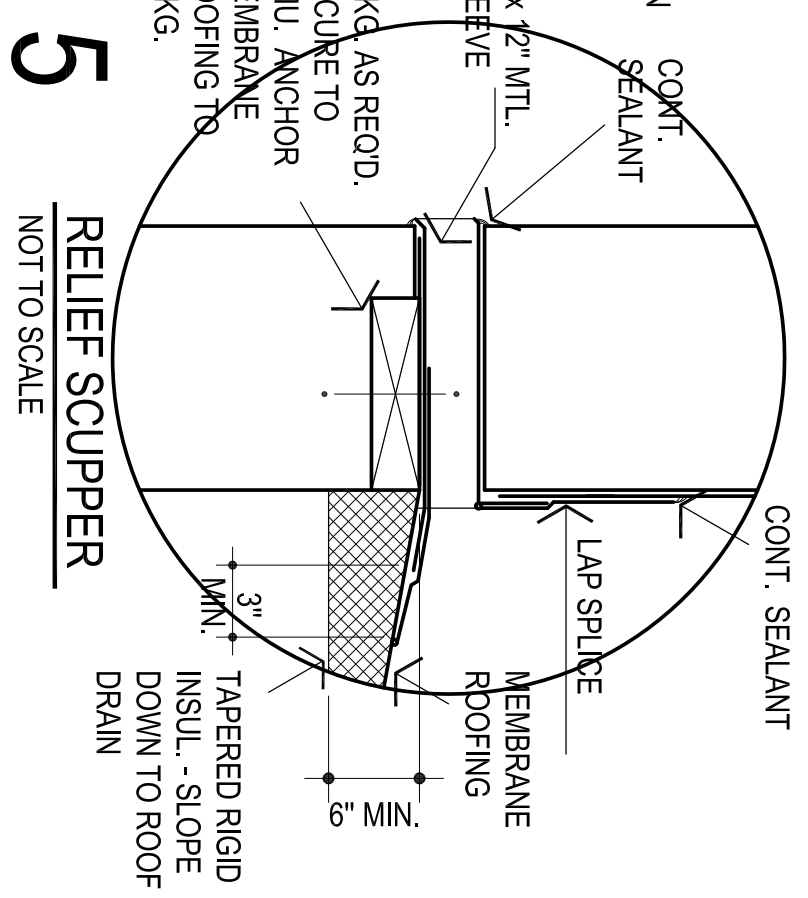
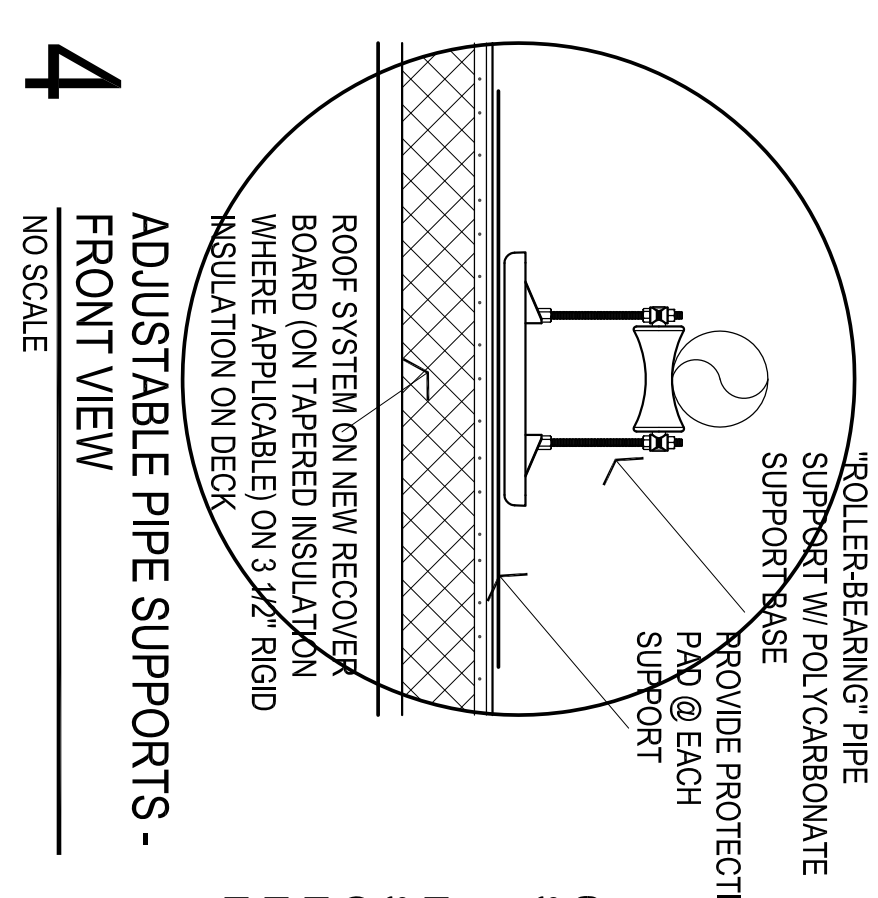
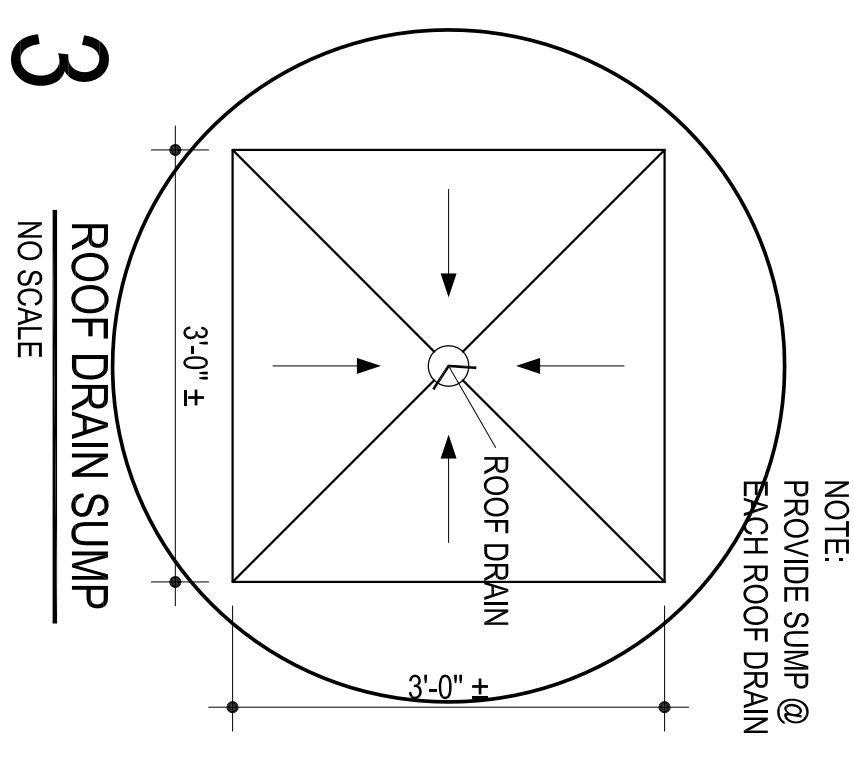
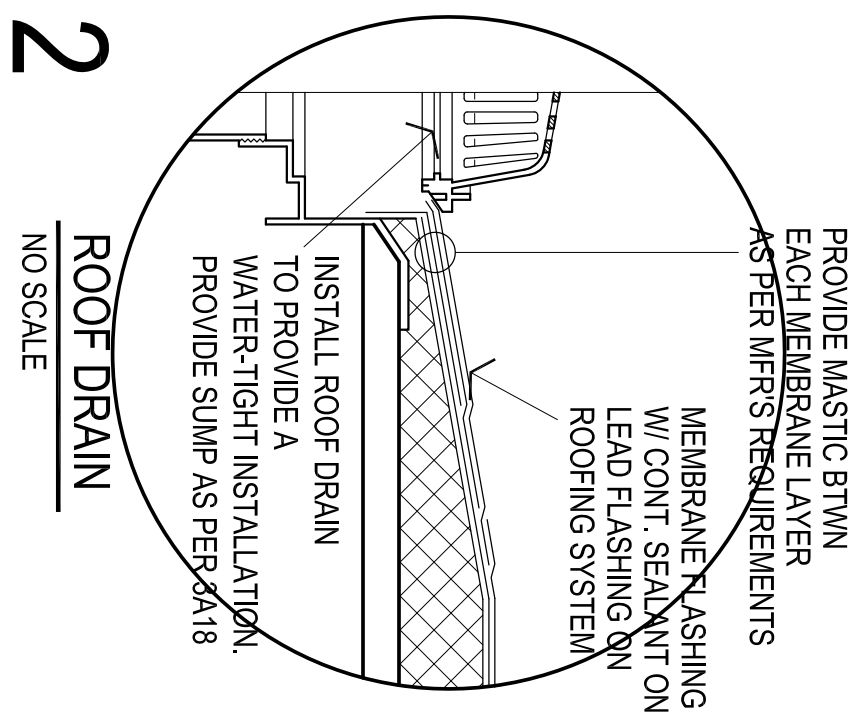


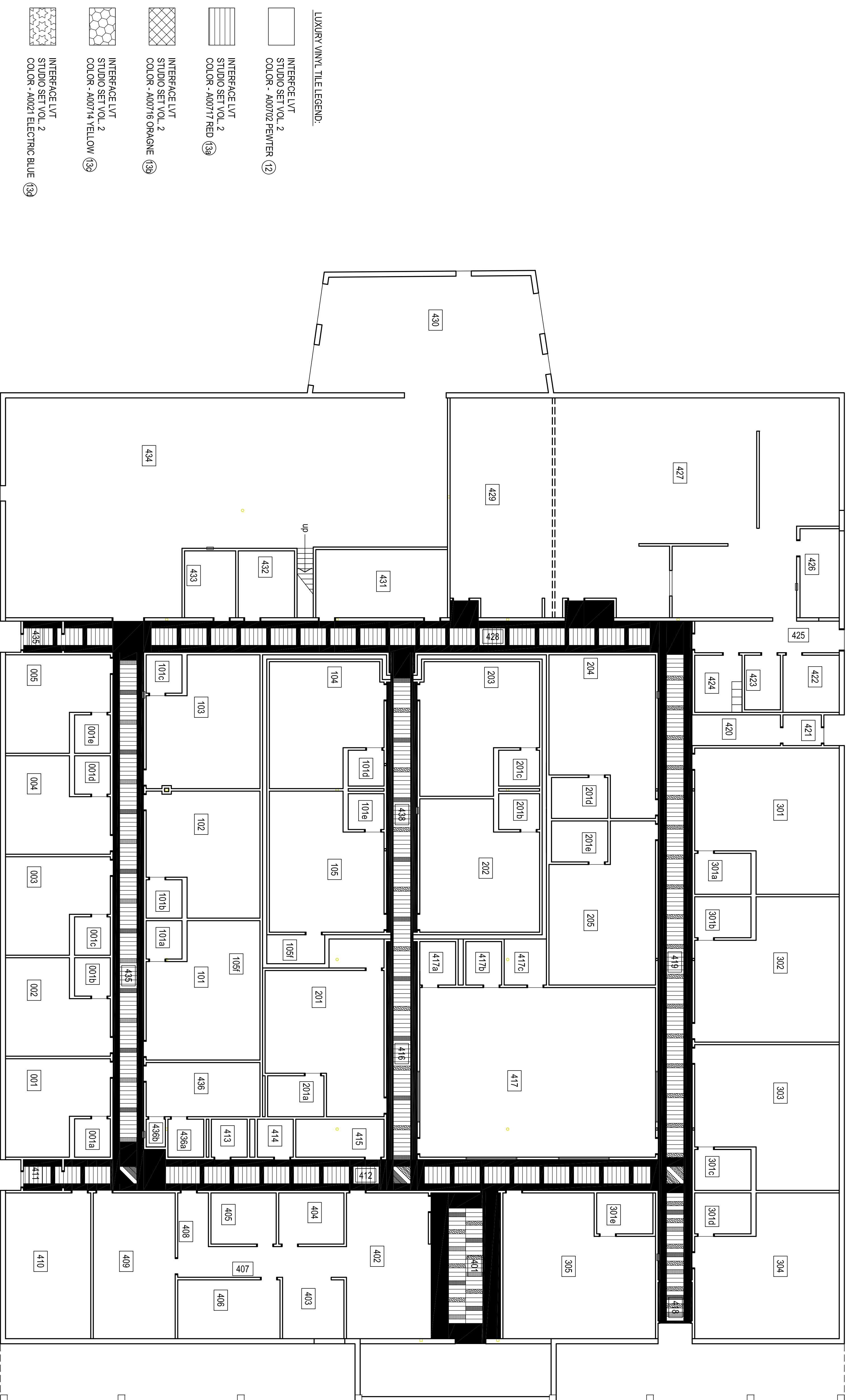
ROOF PLAN
3/32" = 1'-0"

NOTES:

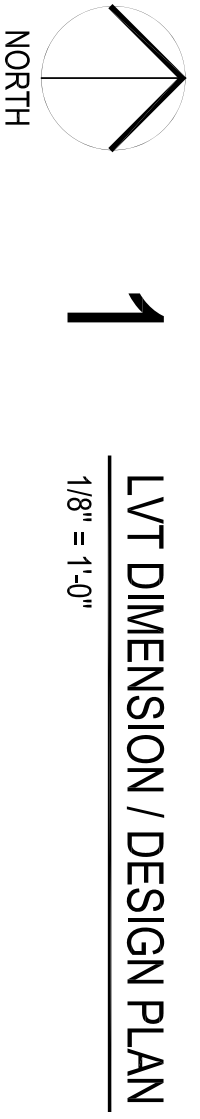
1. RE: MECH & ELEC. FOR ADDITIONAL ROOF MOUNTED ITEMS. CONTRACTOR TO COORDINATE ALL ROOF MOUNTED ITEMS & PENETRATIONS W/ APPLICABLE TRADES
2. CONTRACTOR TO COORDINATE ROOF VENT PENETRATIONS W/ ARCHITECT.
3. INDICATES NEW WALKWAY PAD LOCATIONS - CUT PADS INTO 5'-0" MAX LENGTHS & PLACE 2" APART TO COVER AREAS INDICATED.
4. PROVIDE @ ALL ROOF PENETRATIONS - PENETRATION DAM / SEALER POCKETS AS PER SHEET A107a
5. MECHANICAL ROOF TOP EQUIPMENT IDENTIFICATION, COORDINATE W/ MECHANICAL DRAWINGS

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REFER TO ROOM FINISH SCHEDULE FOR ADDITIONAL LOCATIONS OF LVT





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date

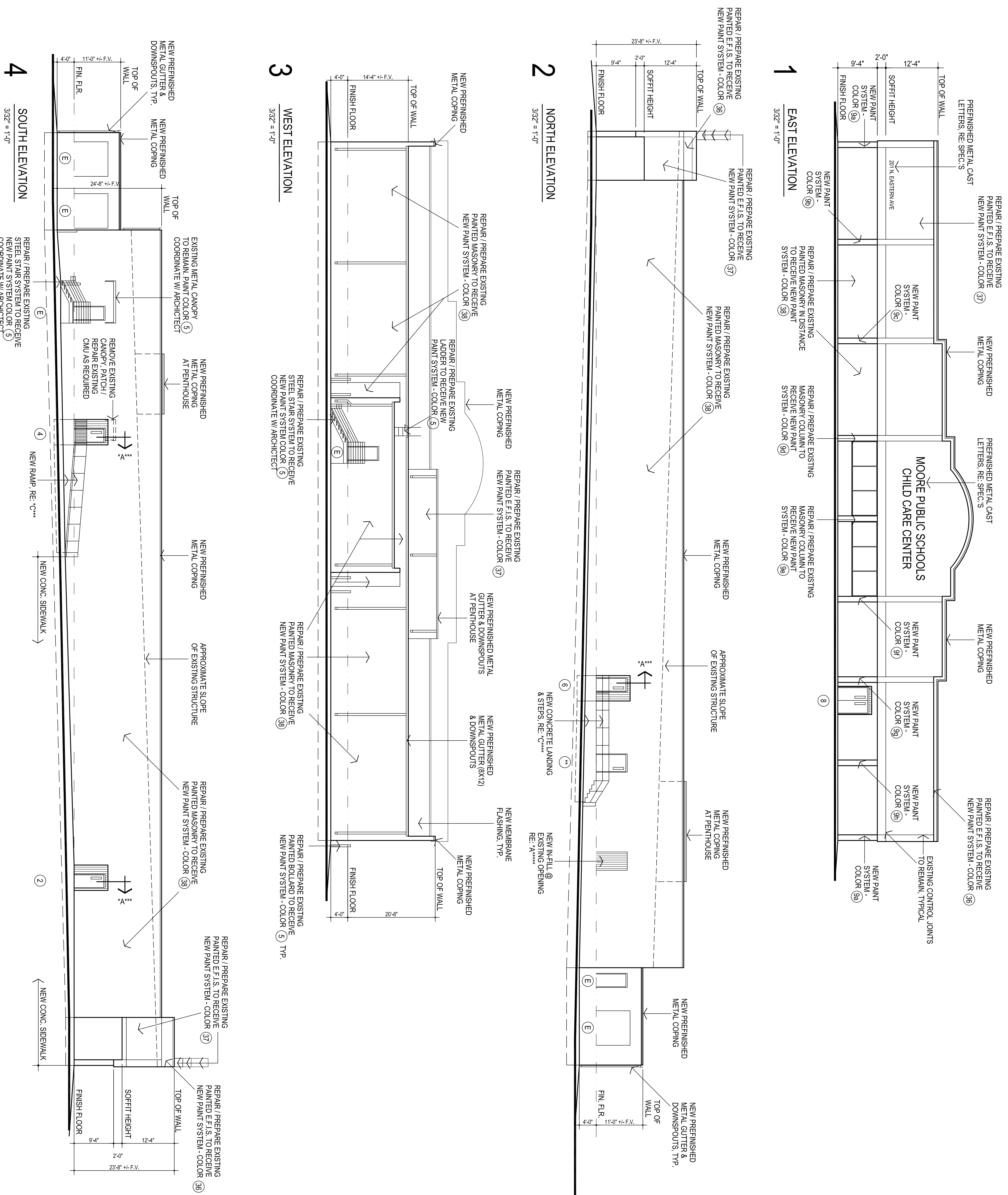
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CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No.:
A201

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REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (37)

NEW PREFINISHED
METAL COPING

PREFINISHED METAL CAST
LETTERS, RE: SPEC'S

NEW PREFINISHED
METAL COPING

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (38)

**MOORE PUBLIC SCHOOLS
CHILD CARE CENTER**

NEW PAINT
SYSTEM -
COLOR (37)

NEW PAINT
SYSTEM -
COLOR (39)

NEW PAINT
SYSTEM -
COLOR (39)

NEW PAINT
SYSTEM -
COLOR (39)

EXISTING CONTROL JOINTS
TO REMAIN, TYPICAL

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (36)

REPAIR / PREPARE EXISTING
PAINTED MASONRY IN DISTANCE
TO RECEIVE NEW PAINT
SYSTEM - COLOR (38)

REPAIR / PREPARE EXISTING
MASONRY COLUMN TO
RECEIVE NEW PAINT
SYSTEM - COLOR (38)

REPAIR / PREPARE EXISTING
MASONRY COLUMN TO
RECEIVE NEW PAINT
SYSTEM - COLOR (38)

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (38)

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (36)

REPAIR / PREPARE EXISTING
PAINTED MASONRY TO RECEIVE
NEW PAINT SYSTEM - COLOR (38)

NEW PREFINISHED
METAL COPING

APPROXIMATE SLOPE
OF EXISTING STRUCTURE

NEW PREFINISHED
METAL COPING
AT PENTHOUSE

NEW PREFINISHED
METAL COPING

NEW PREFINISHED
METAL GUTTER &
DOWNSPOUTS, TYP.

2
NORTH ELEVATION
3/32" = 1'-0"

NEW PREFINISHED
METAL COPING

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (38)

REPAIR / PREPARE EXISTING
LADDER TO RECEIVE NEW
PAINT SYSTEM - COLOR (5)

NEW PREFINISHED
METAL COPING

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (37)

NEW PREFINISHED METAL
GUTTER & DOWNSPOUTS
AT PENTHOUSE

NEW PREFINISHED
METAL GUTTER (8X12)
& DOWNSPOUTS

NEW MEMBRANE
FLASHING, TYP.

NEW PREFINISHED
METAL COPING

3
WEST ELEVATION
3/32" = 1'-0"

EXISTING METAL CANOPY
TO REMAIN, PAINT COLOR (5)
COORDINATE W/ ARCHITECT

NEW PREFINISHED
METAL COPING
AT PENTHOUSE

NEW PREFINISHED
METAL COPING

APPROXIMATE SLOPE
OF EXISTING STRUCTURE

REPAIR / PREPARE EXISTING
PAINTED MASONRY TO RECEIVE
NEW PAINT SYSTEM - COLOR (38)

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (37)

REPAIR / PREPARE EXISTING
PAINTED E.F.I.S. TO RECEIVE
NEW PAINT SYSTEM - COLOR (38)

NEW PREFINISHED
METAL GUTTERS &
DOWNSPOUTS, TYP.

NEW PREFINISHED
METAL COPING

REMOVE EXISTING
CANOPY, PATCH/
REPAIR EXISTING
CMU AS REQUIRED

NEW RAMP, RE: C***

NEW CONC. SIDEWALK

NEW CONC. SIDEWALK

NEW CONC. SIDEWALK

NEW CONC. SIDEWALK

SOFFIT HEIGHT
2'-0"
23'-8" +/- F.V.

4
SOUTH ELEVATION
3/32" = 1'-0"

REPAIR / PREPARE EXISTING
STEEL STAIR SYSTEM TO RECEIVE
NEW PAINT SYSTEM COLOR (5)
COORDINATE W/ ARCHITECT

NEW RAMP, RE: C***

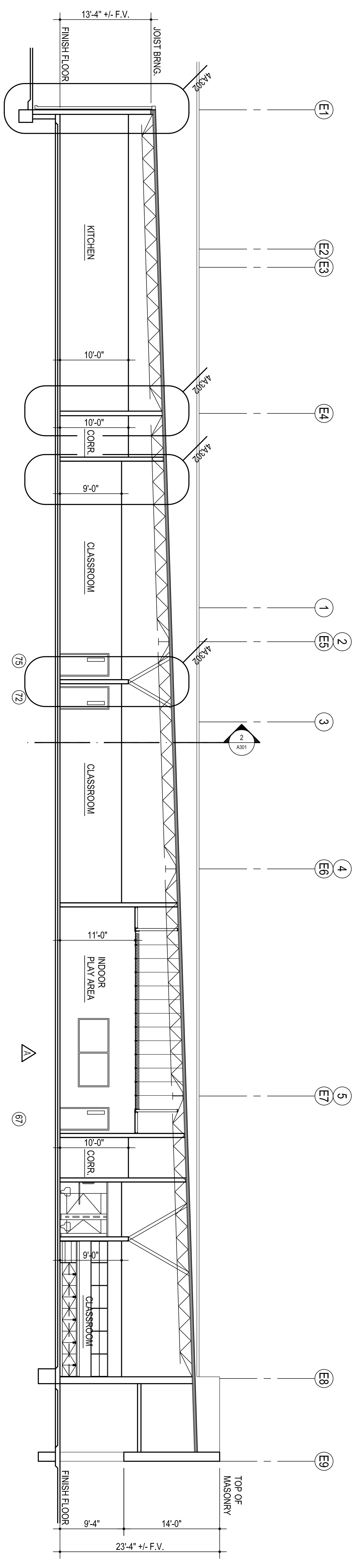
NEW CONC. SIDEWALK

NEW CONC. SIDEWALK

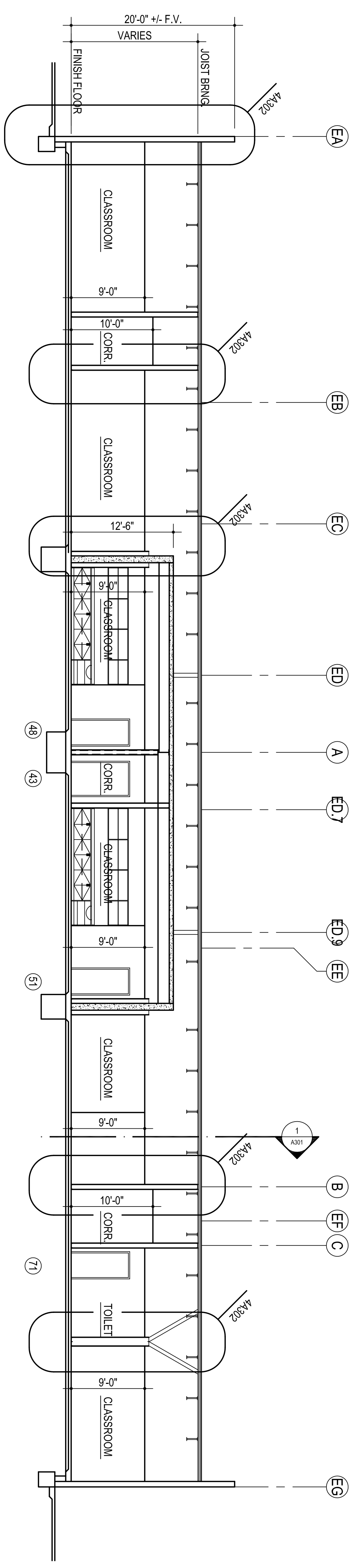
NEW CONC. SIDEWALK

NEW CONC. SIDEWALK

SOFFIT HEIGHT
2'-0"
23'-8" +/- F.V.



1
BUILDING SECTION
1/8" = 1'-0"



2
BUILDING SECTION
1/8" = 1'-0"

10/22/24

MOORE
MICHAEL L.
2639
STATE OF OKLAHOMA
LICENSED PROFESSIONAL ENGINEER
MECHANICAL/ELECTRICAL

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MA	checked by
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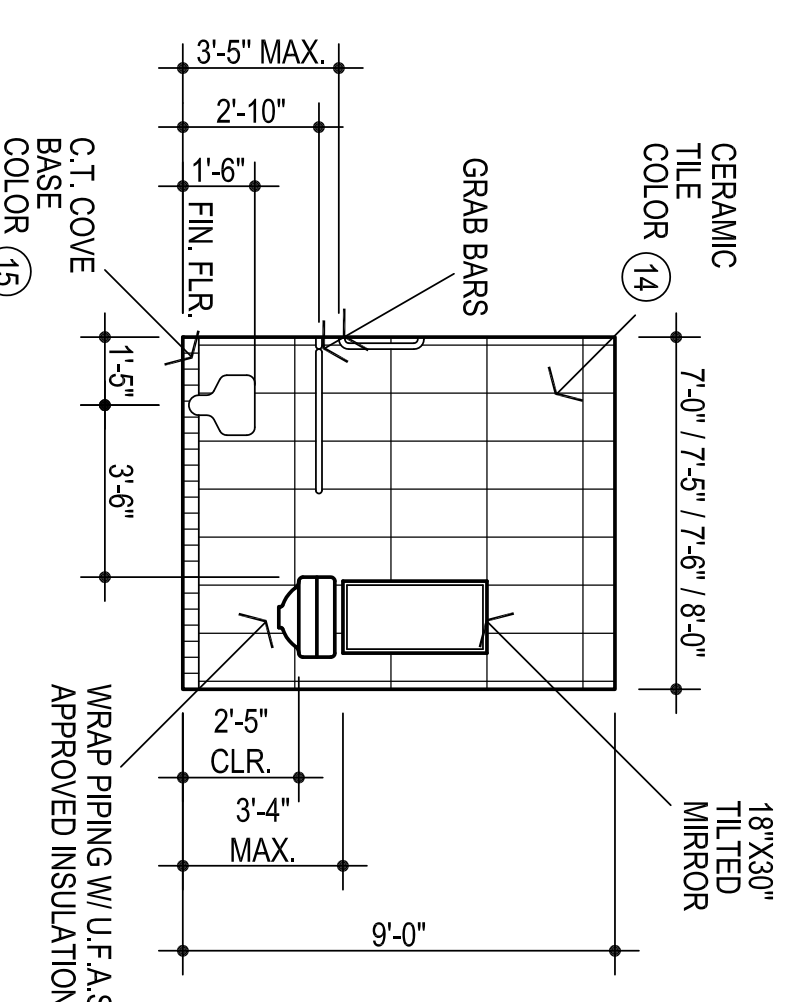
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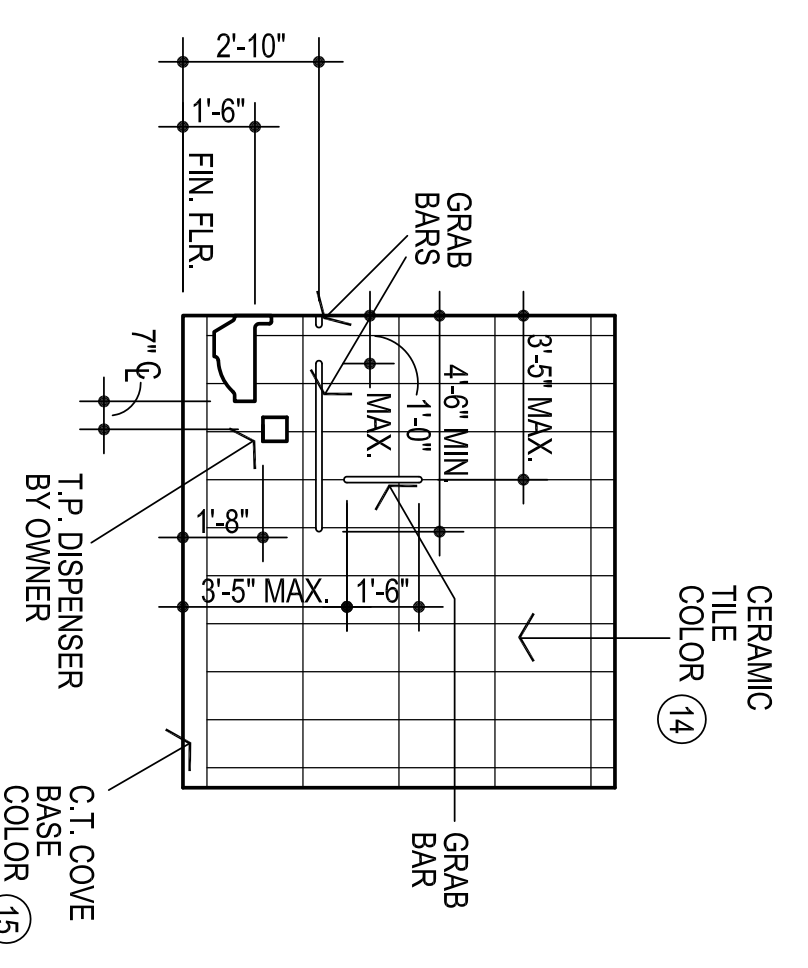
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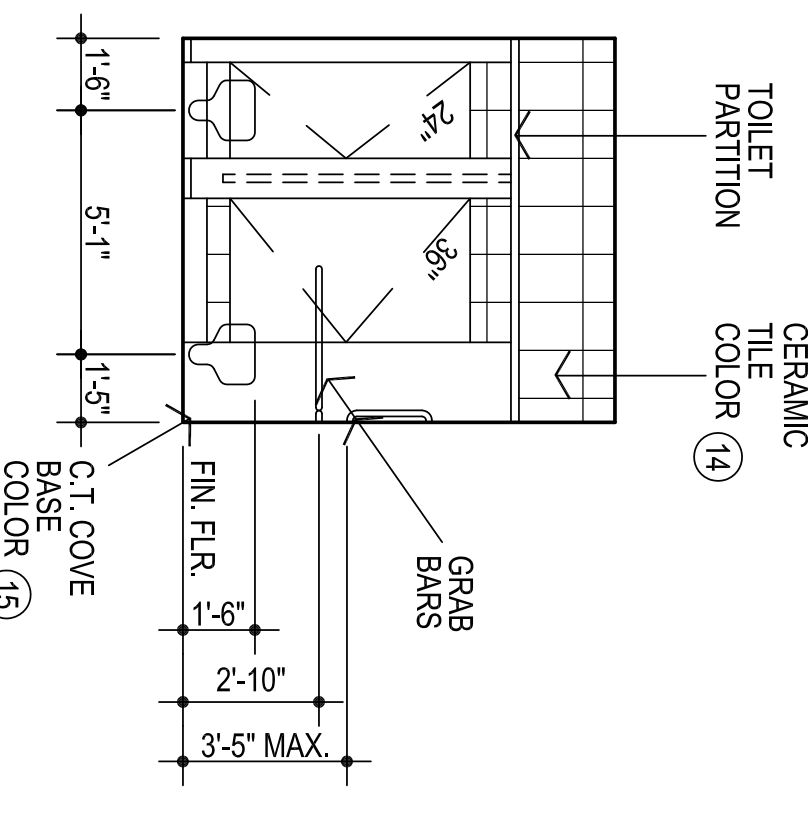
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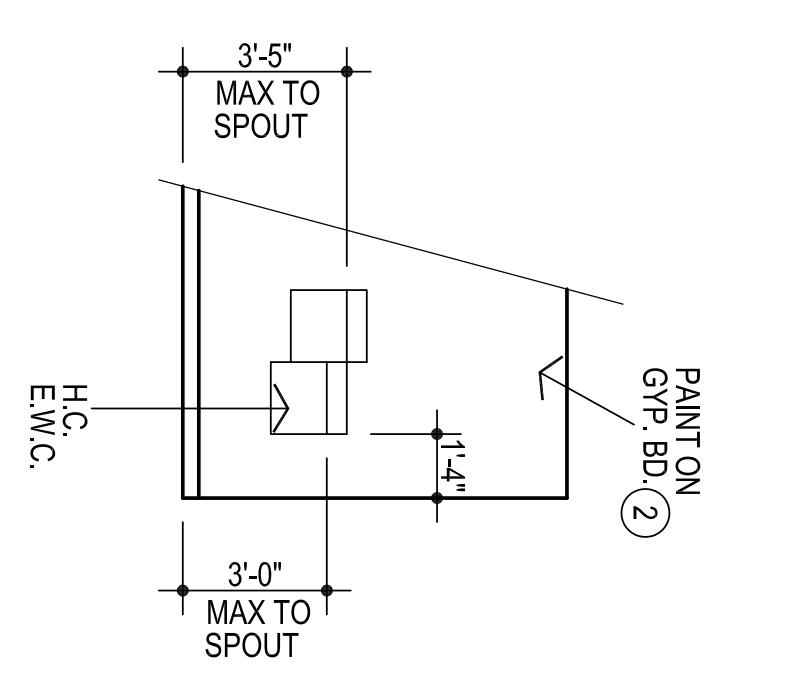
1
TYPICAL SINGLE TOILET
1/4" = 1'-0"
CONTRACTOR TO PROVIDE C.T. LAYOUT FOR REVIEW PRIOR TO INSTALLATION OF C.T.



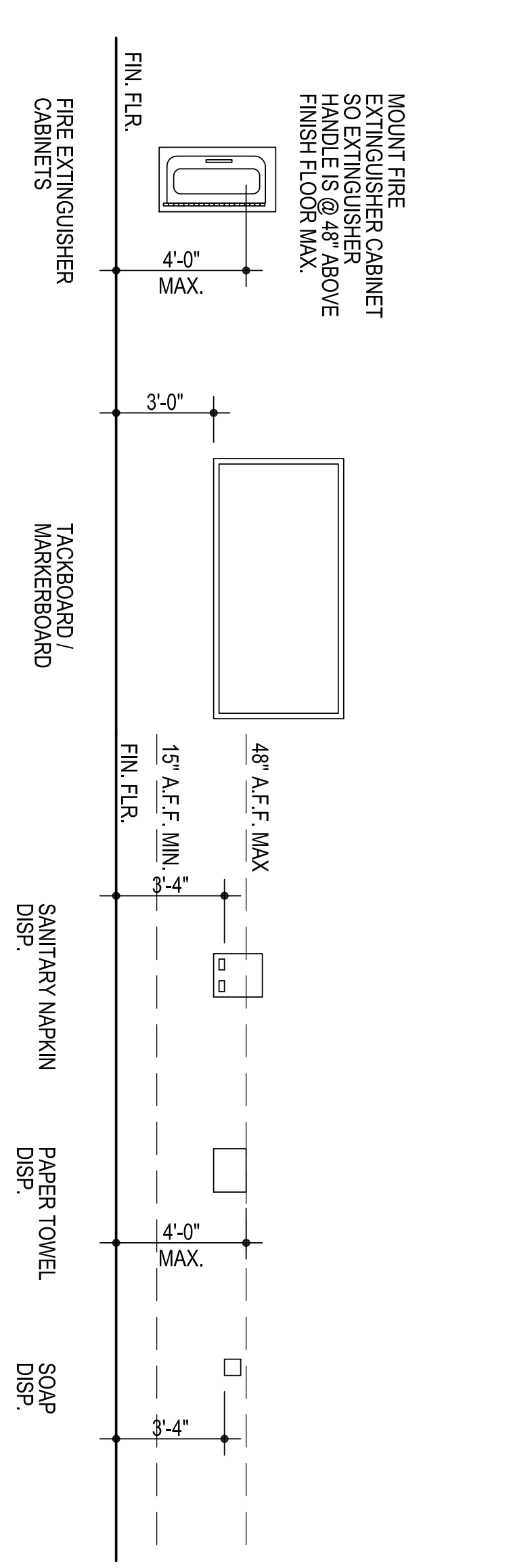
2
HANDICAP ACCESSIBLE W.C.
1/4" = 1'-0"



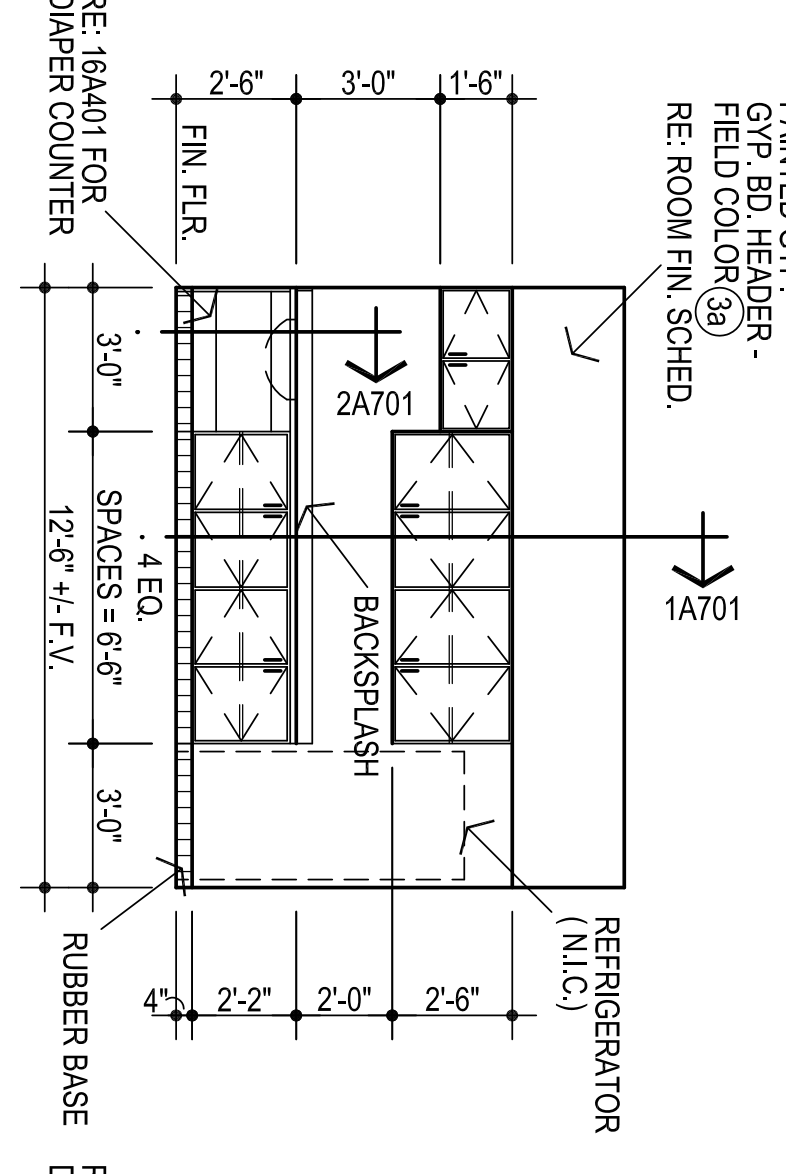
3
TYPICAL DOUBLE TOILET
1/4" = 1'-0"
CONTRACTOR TO PROVIDE C.T. LAYOUT FOR REVIEW PRIOR TO INSTALLATION OF C.T.



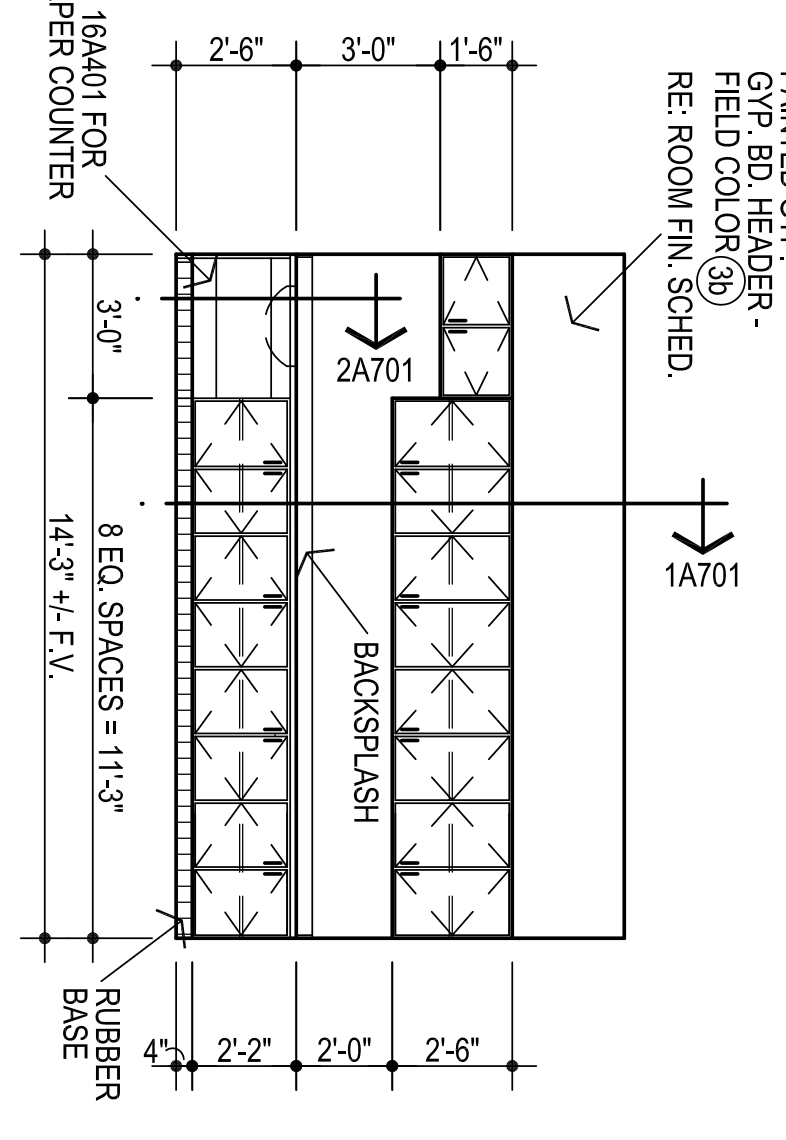
4
TYP. DOUBLE E.W.C.
1/4" = 1'-0"



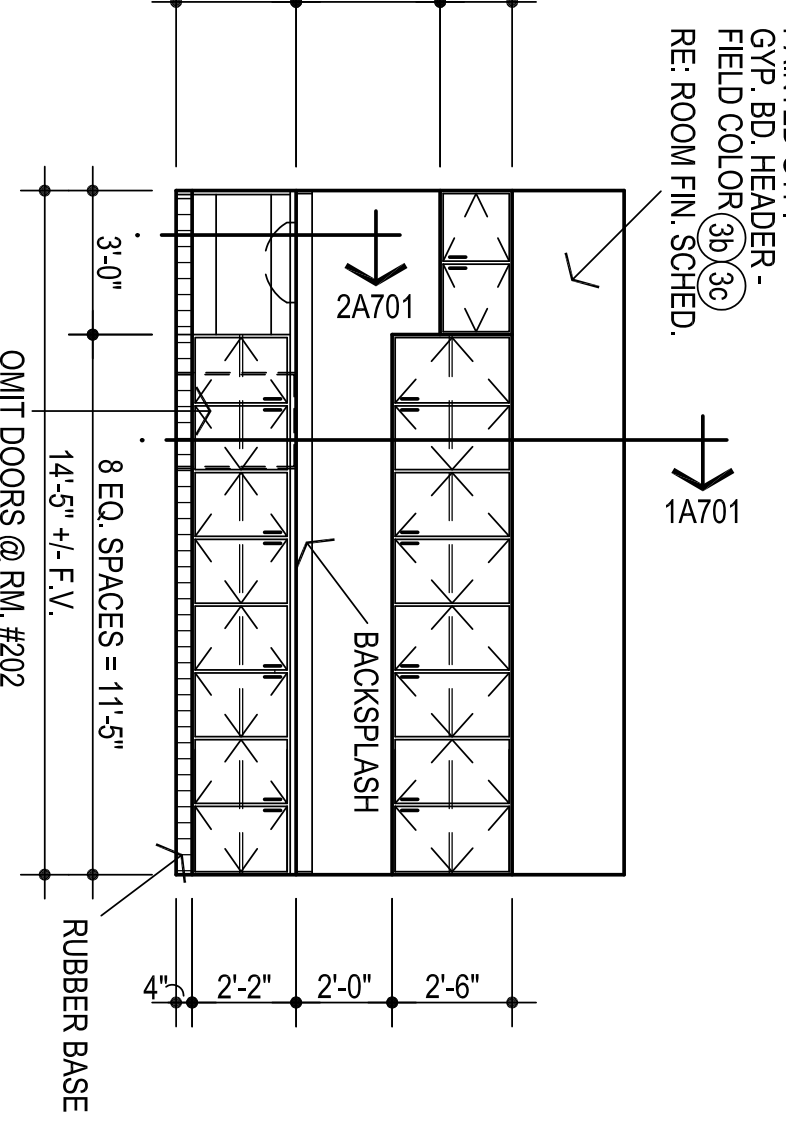
5
TYPICAL MOUNTING HEIGHTS
1/4" = 1'-0"



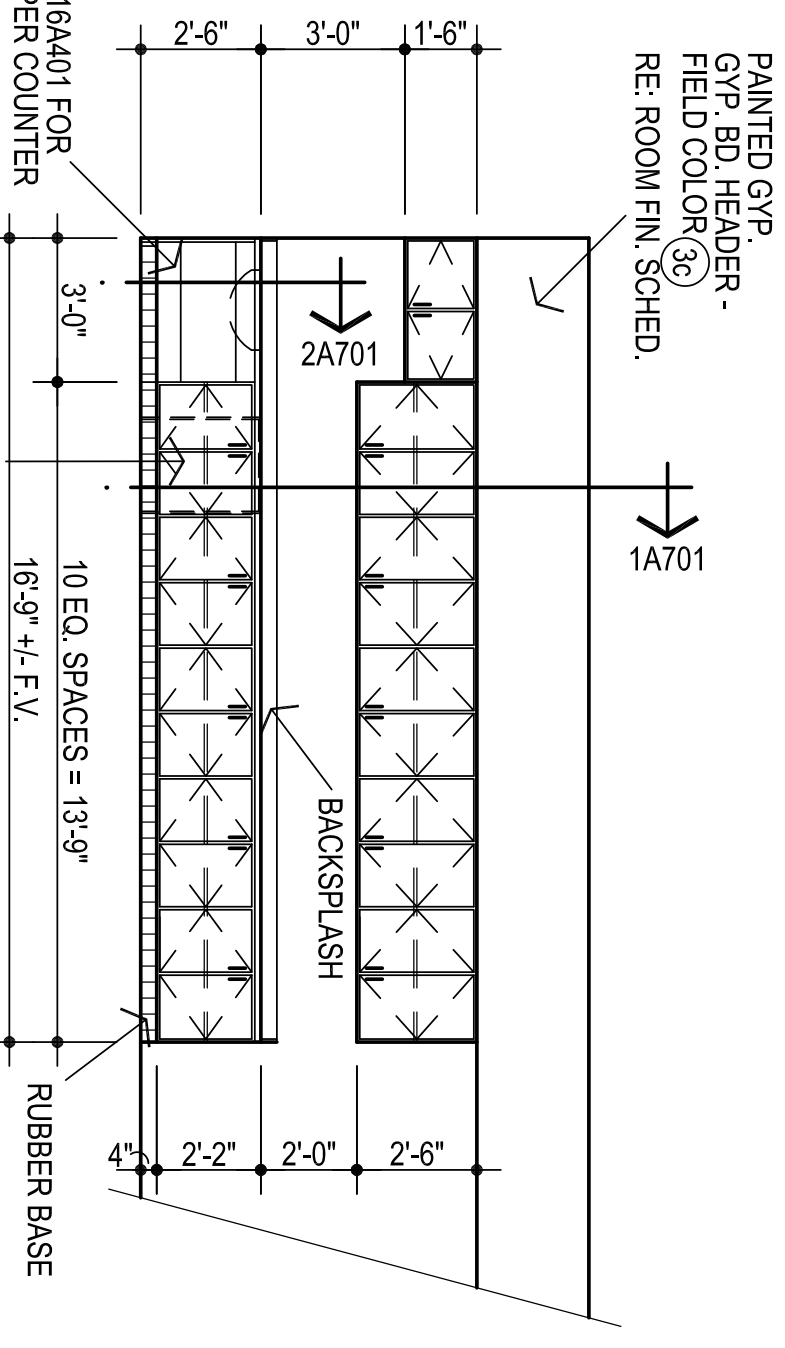
6
TYP. CLASSROOM ELEVATION ROOM # 001, 002, 003, 004, & 005
1/4" = 1'-0"



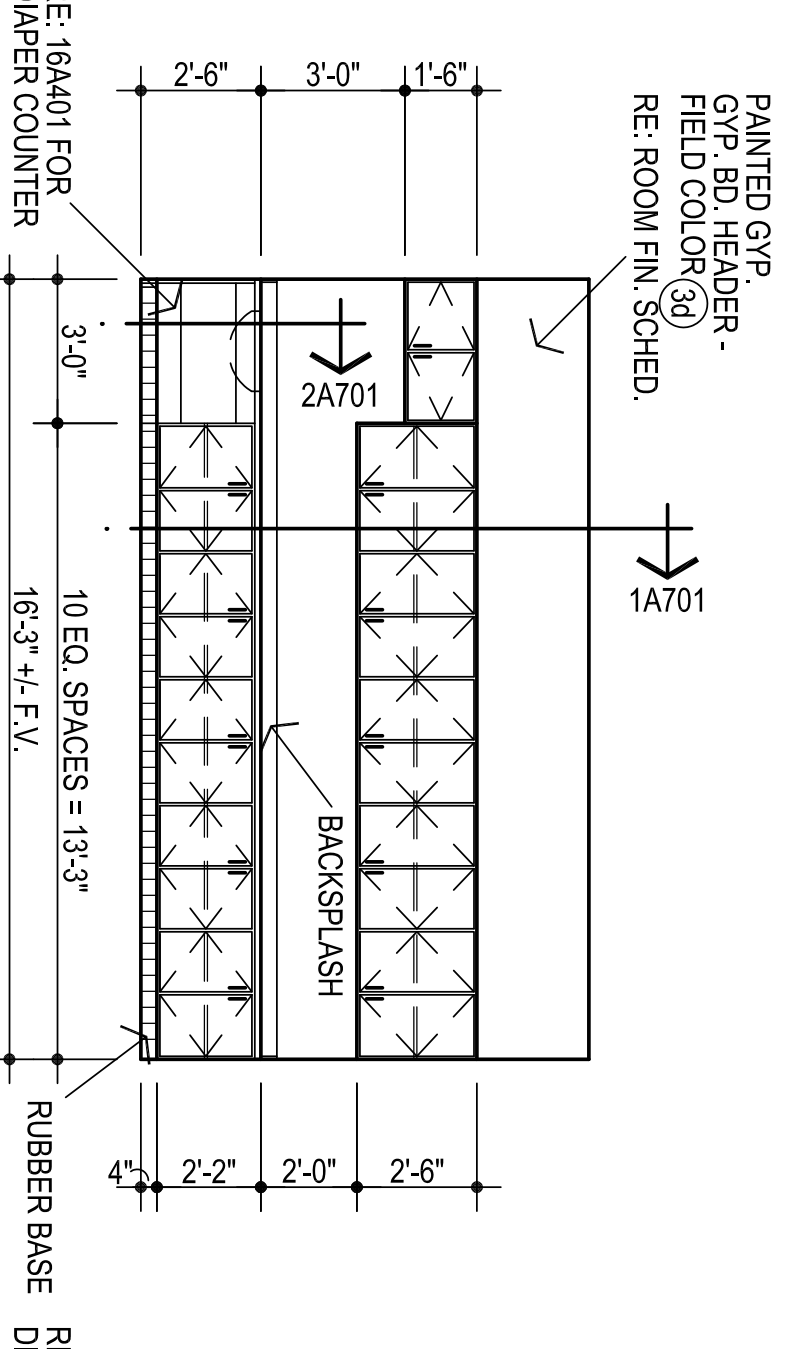
7
TYP. CLASSROOM ELEVATION ROOM # 101, 102, & 103
1/4" = 1'-0"



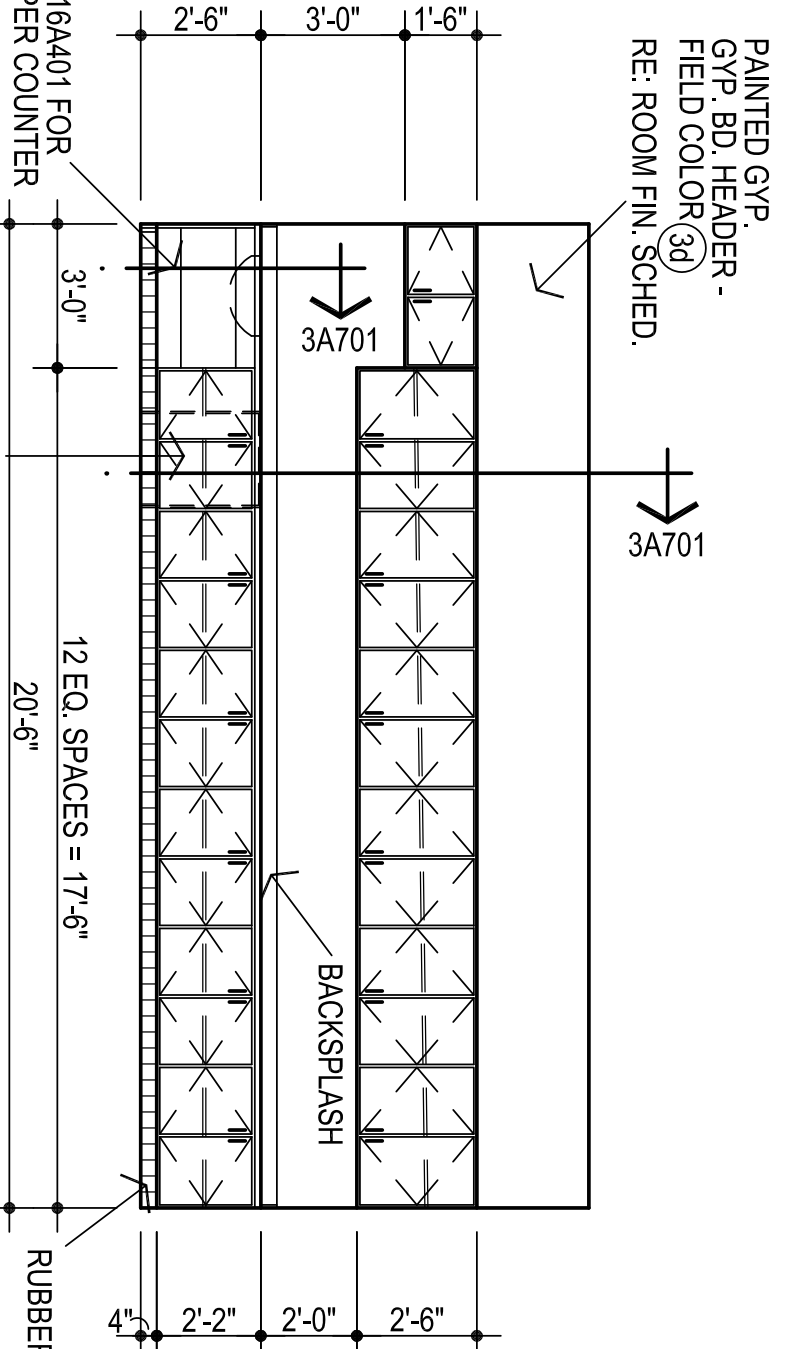
8
TYP. CLASSROOM ELEVATION ROOM # 104, 105, 202 & 203
1/4" = 1'-0"



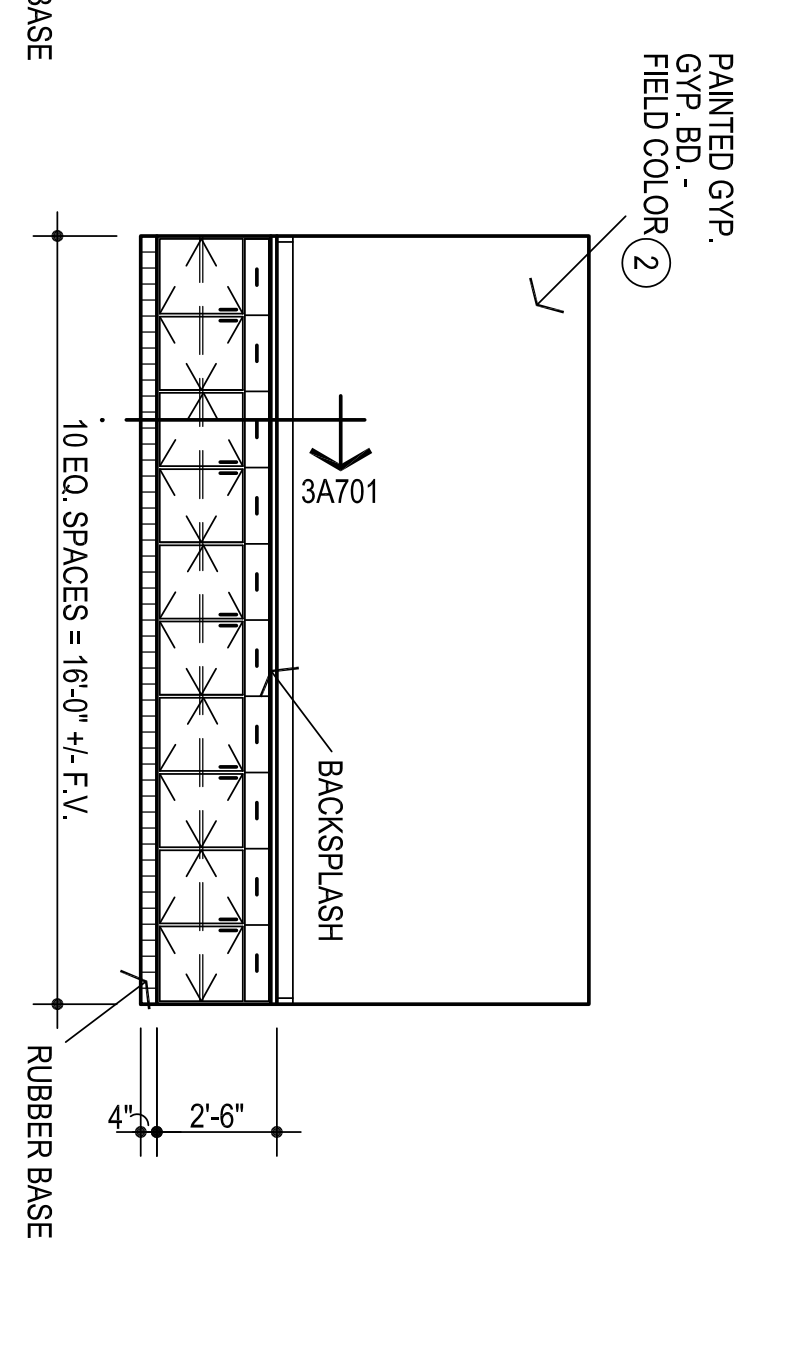
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TYP. CLASSROOM ELEVATION ROOM # 201, 204 & 205
1/4" = 1'-0"



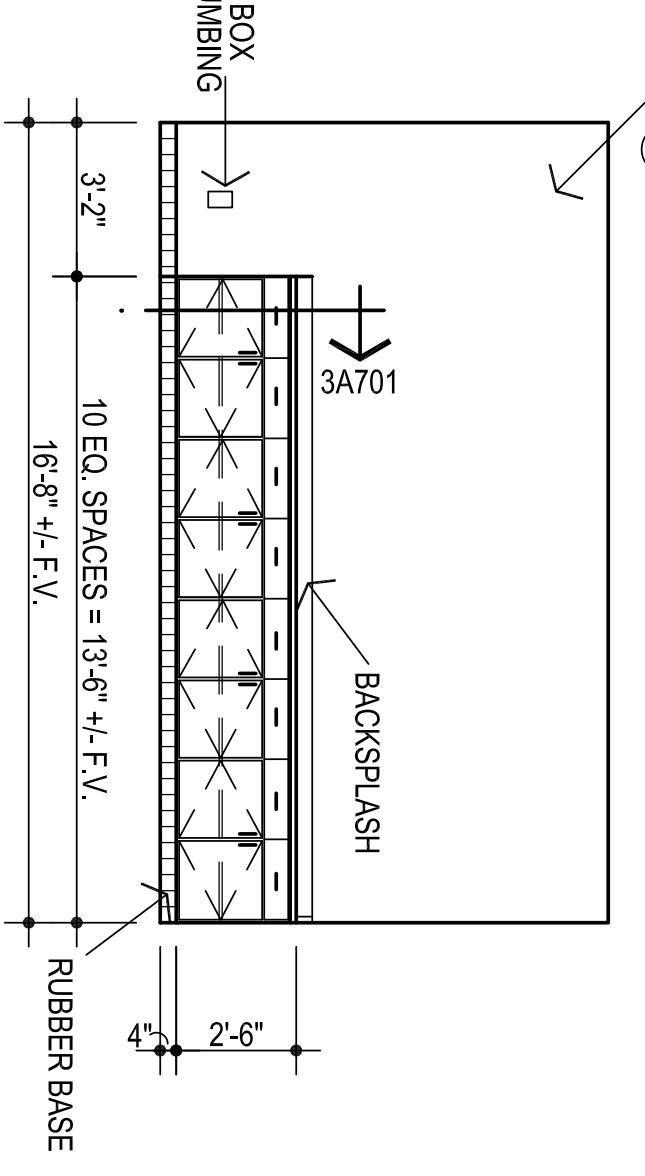
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TYP. CLASSROOM ELEVATION ROOM # 301, 302, 303 & 304
1/4" = 1'-0"



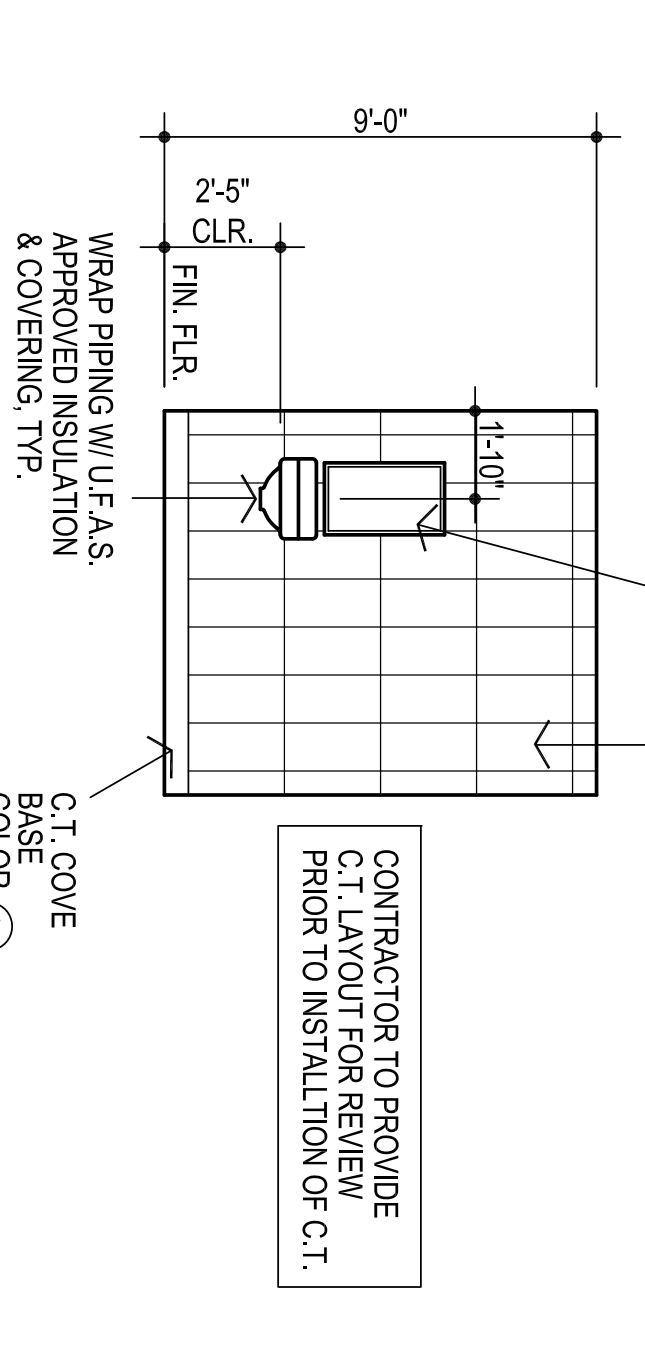
11
TYP. CLASSROOM ELEVATION ROOM # 305
1/4" = 1'-0"



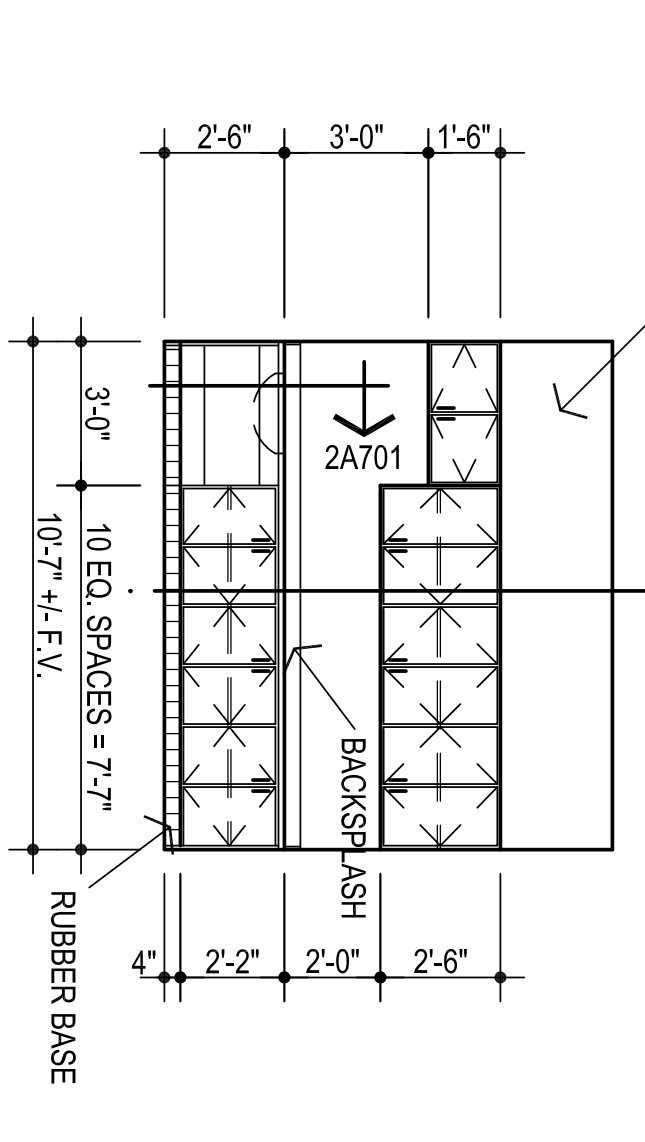
12
E. WALL ROOM # 409
1/4" = 1'-0"



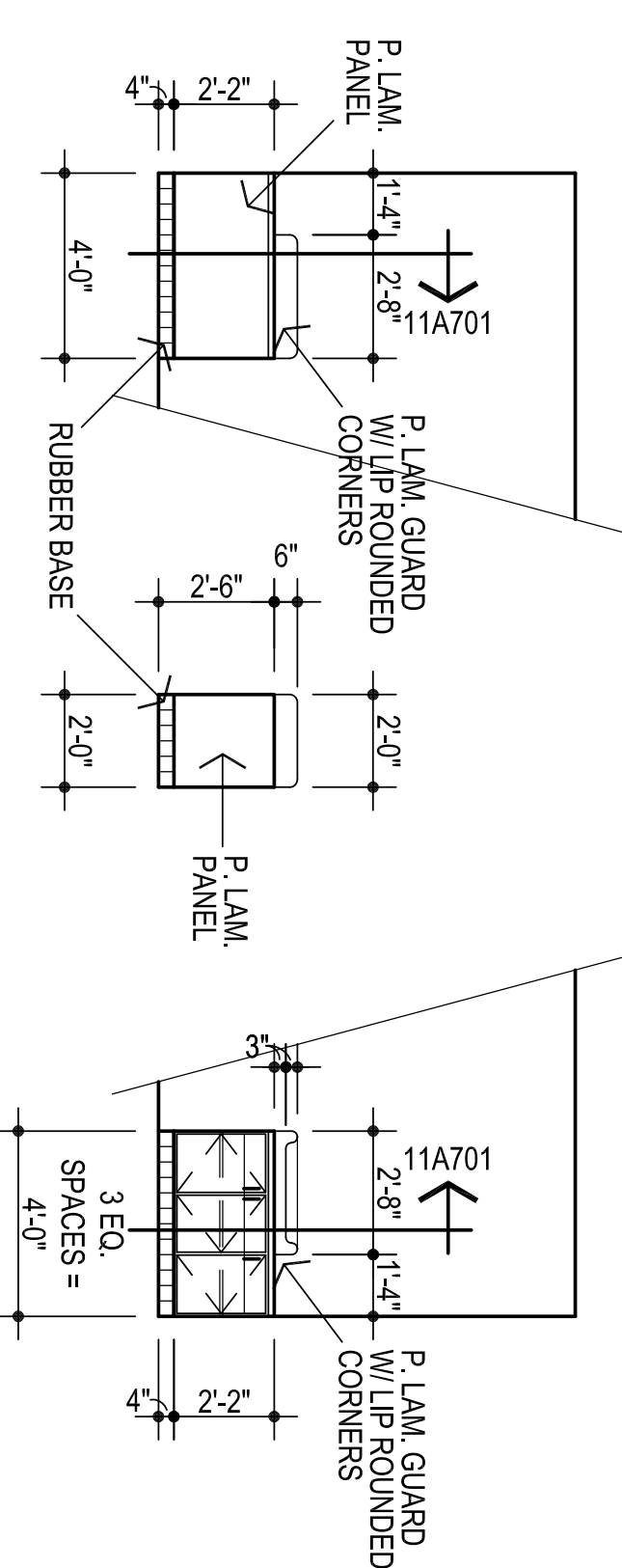
13
E. WALL ROOM # 410
1/4" = 1'-0"



14
TYPICAL DOUBLE TOILET
1/4" = 1'-0"



15
N. WALL ROOM # 436
1/4" = 1'-0"



16
TYP. DIAPER COUNTER
1/4" = 1'-0"



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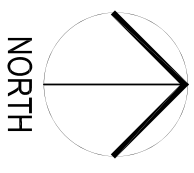
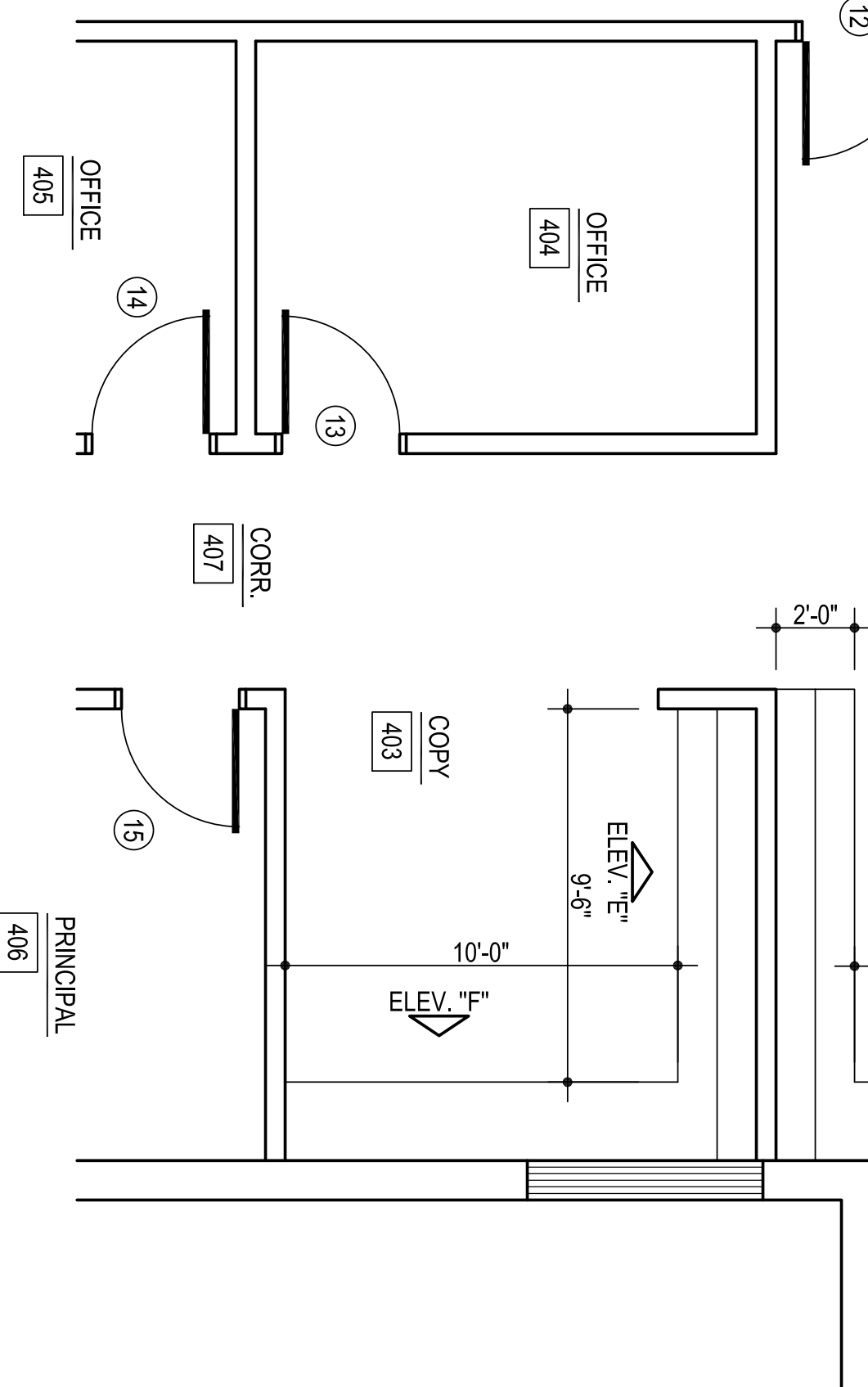
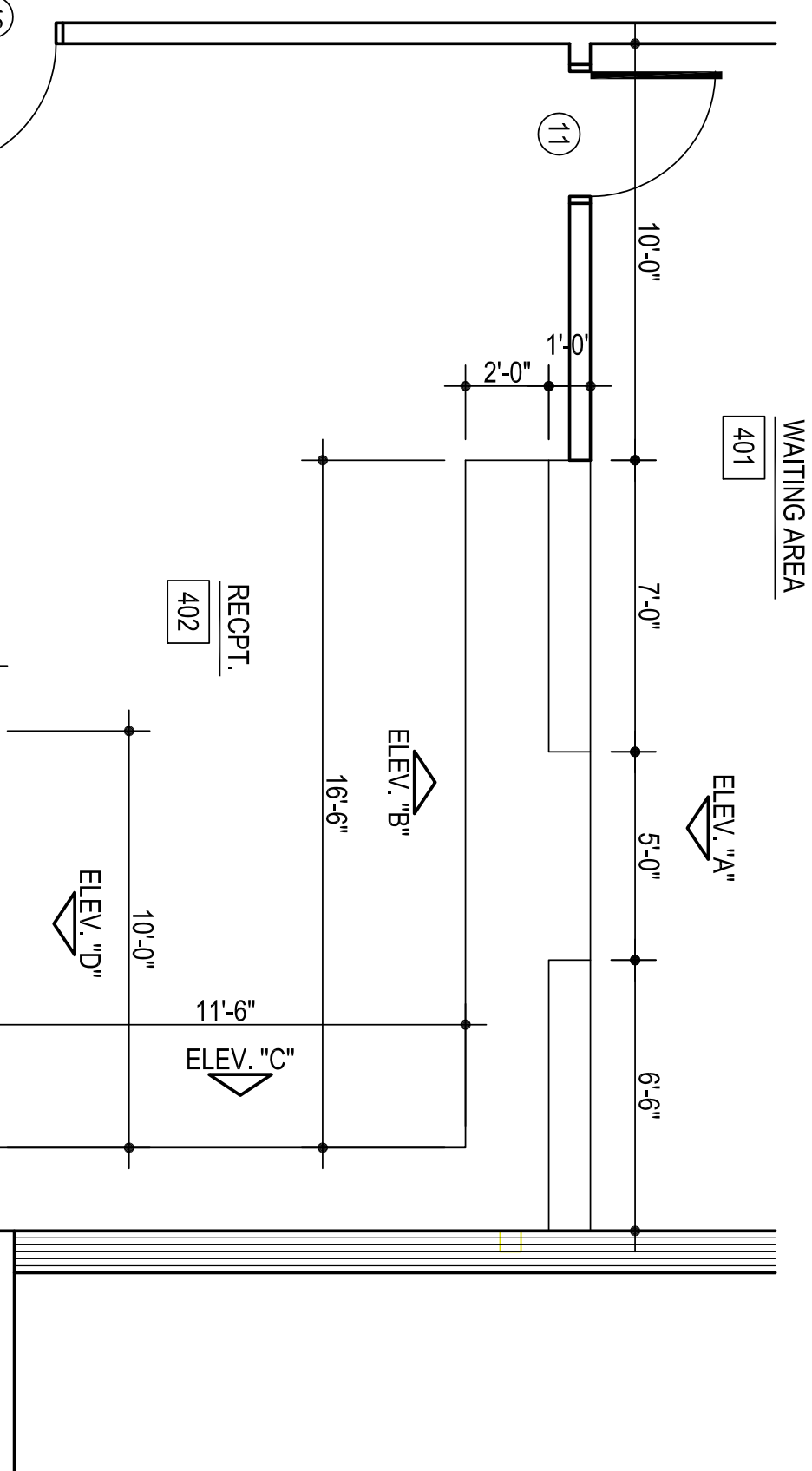


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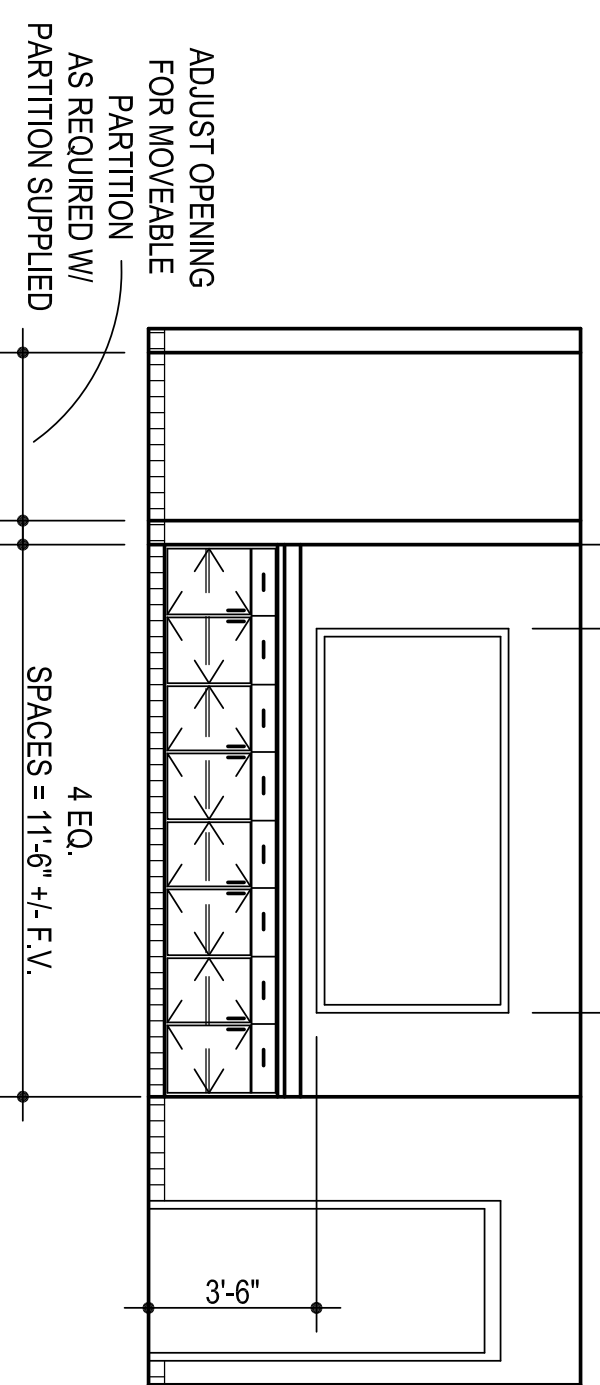
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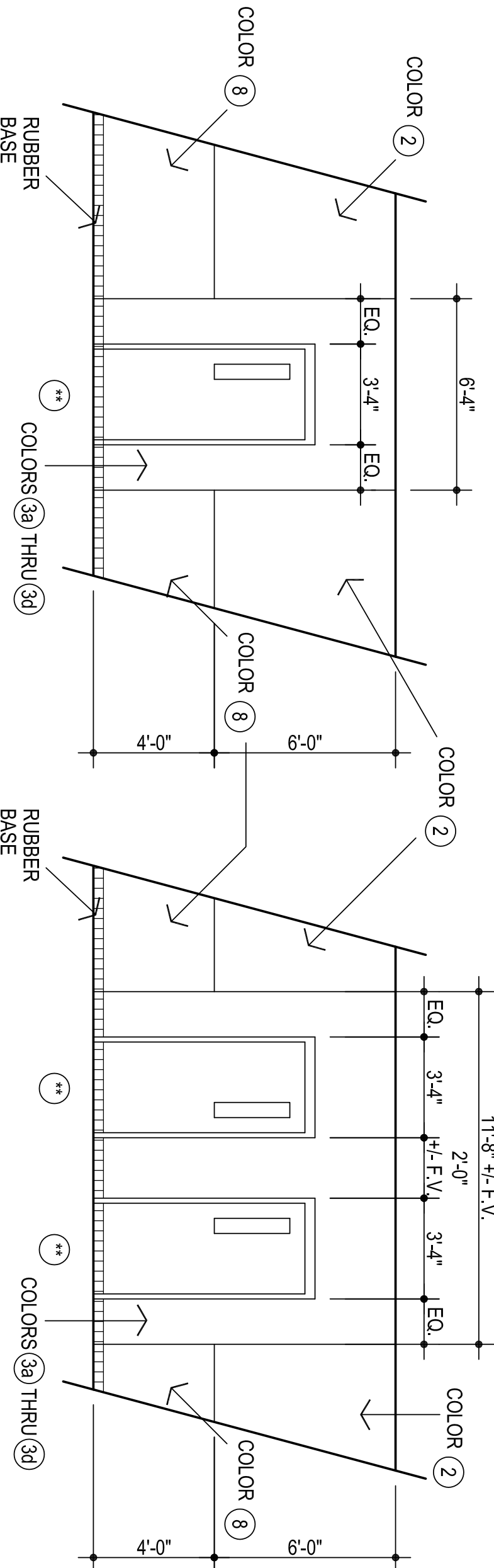
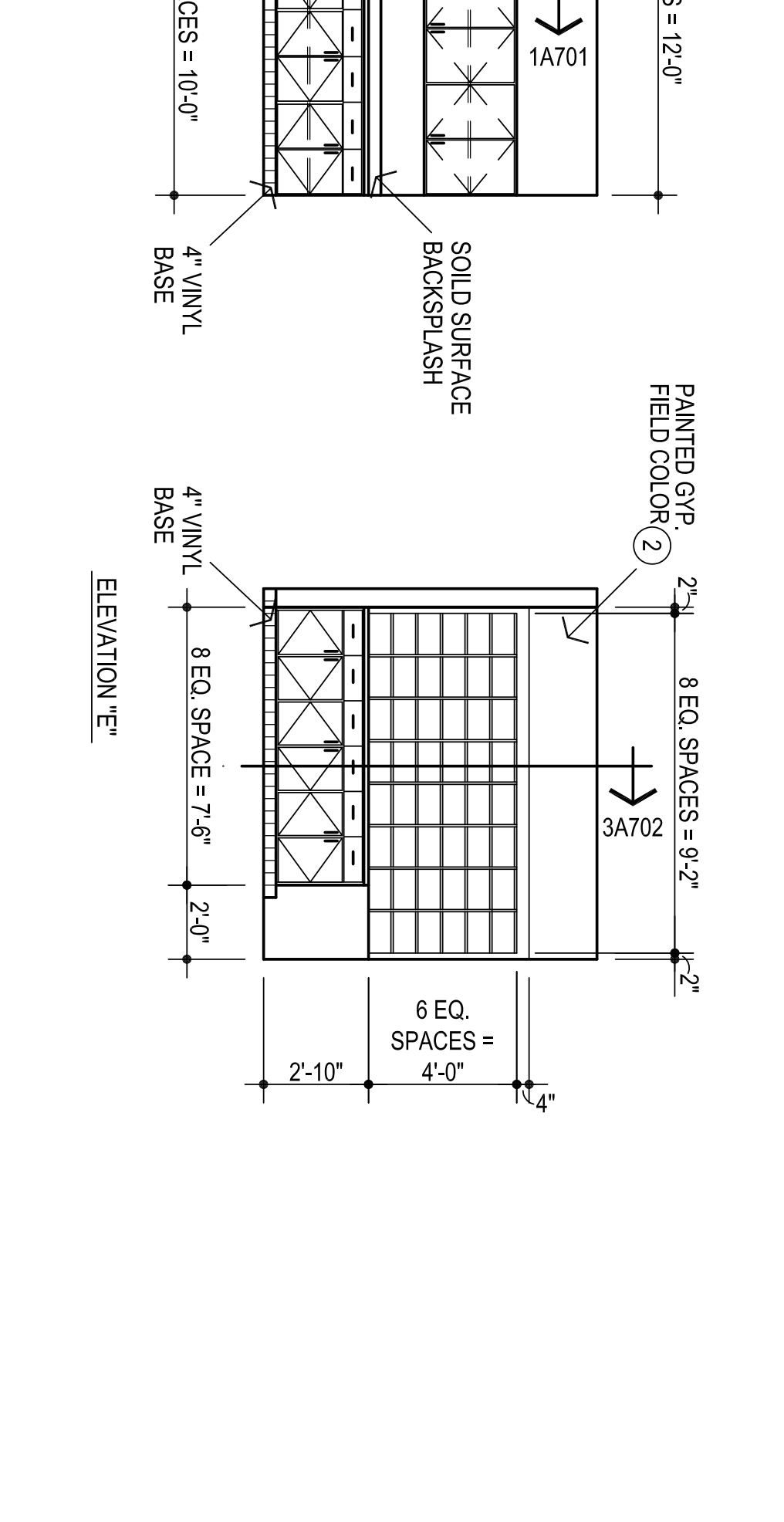
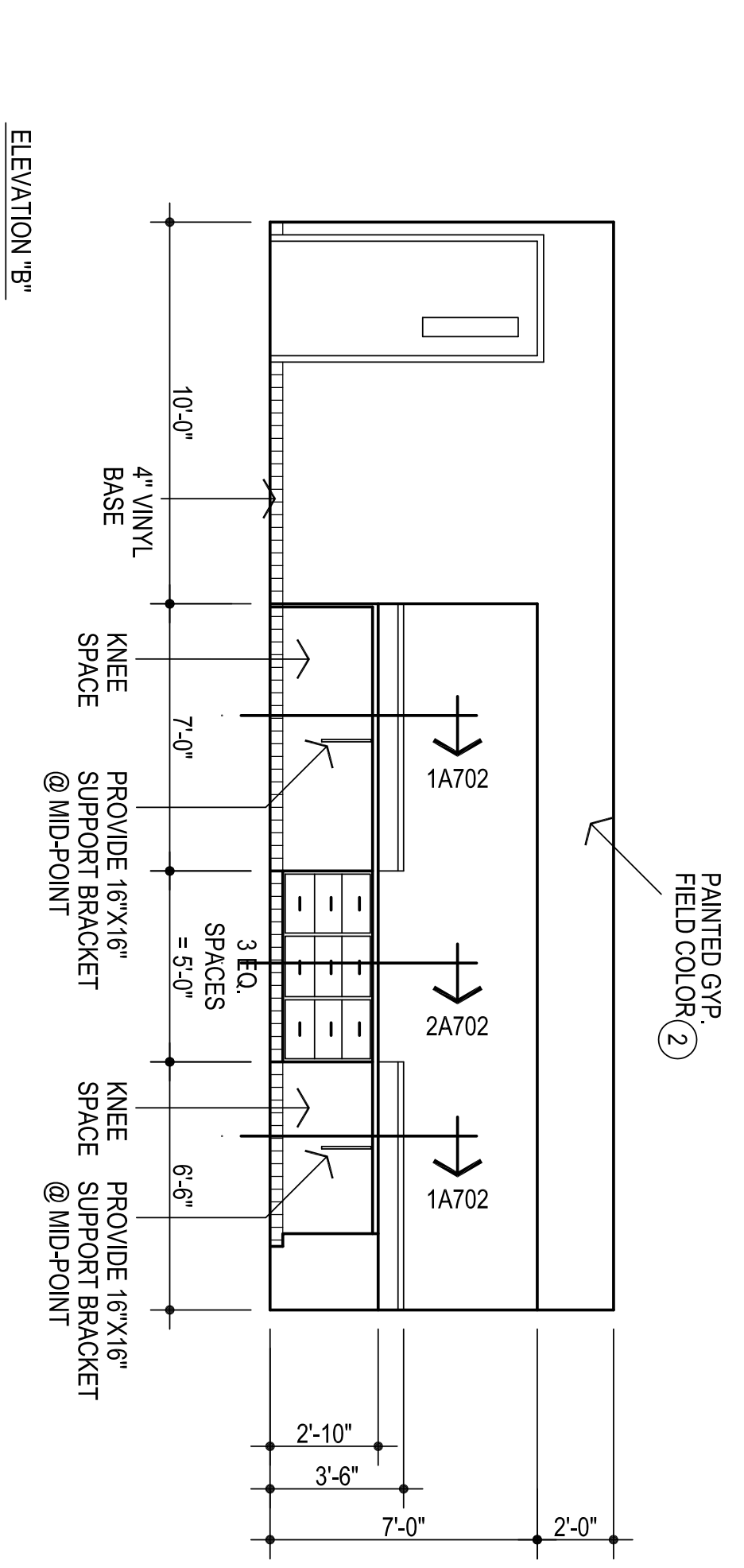
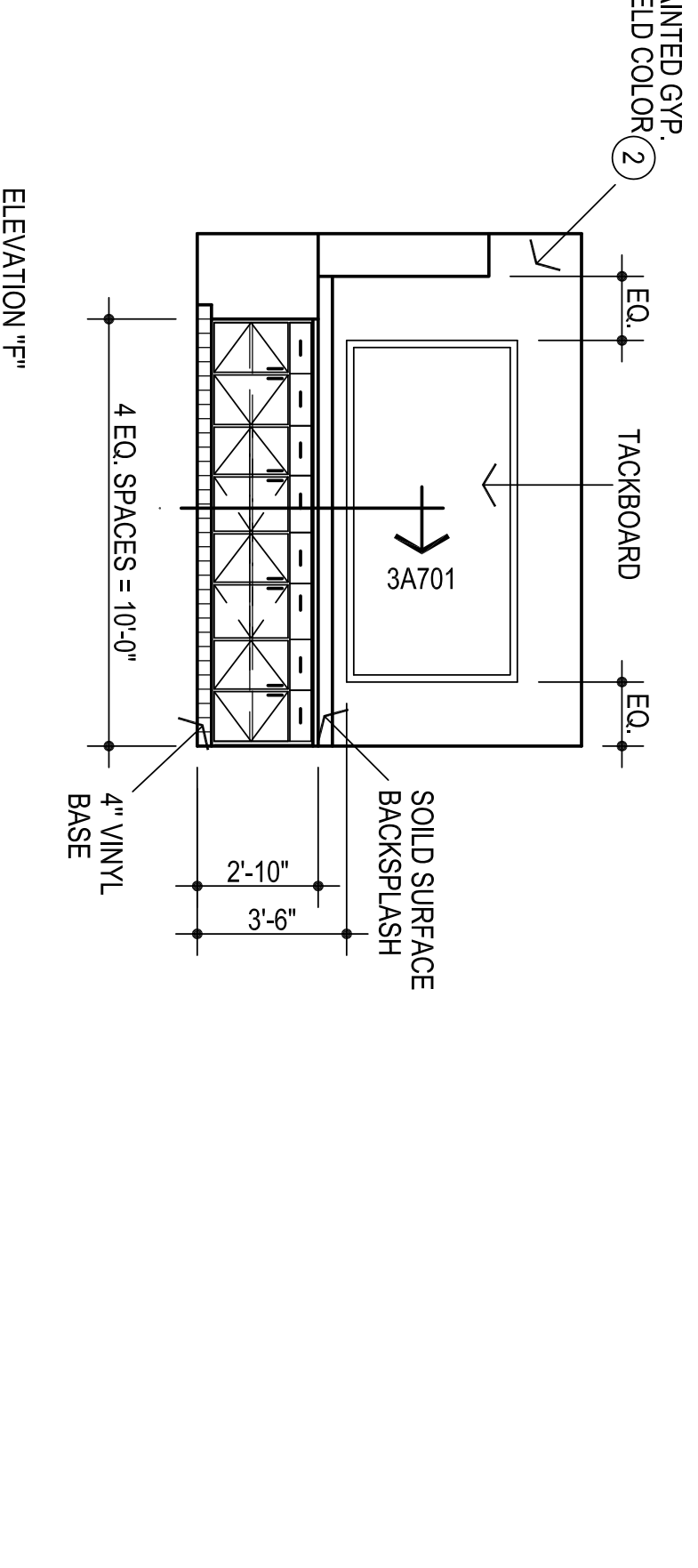
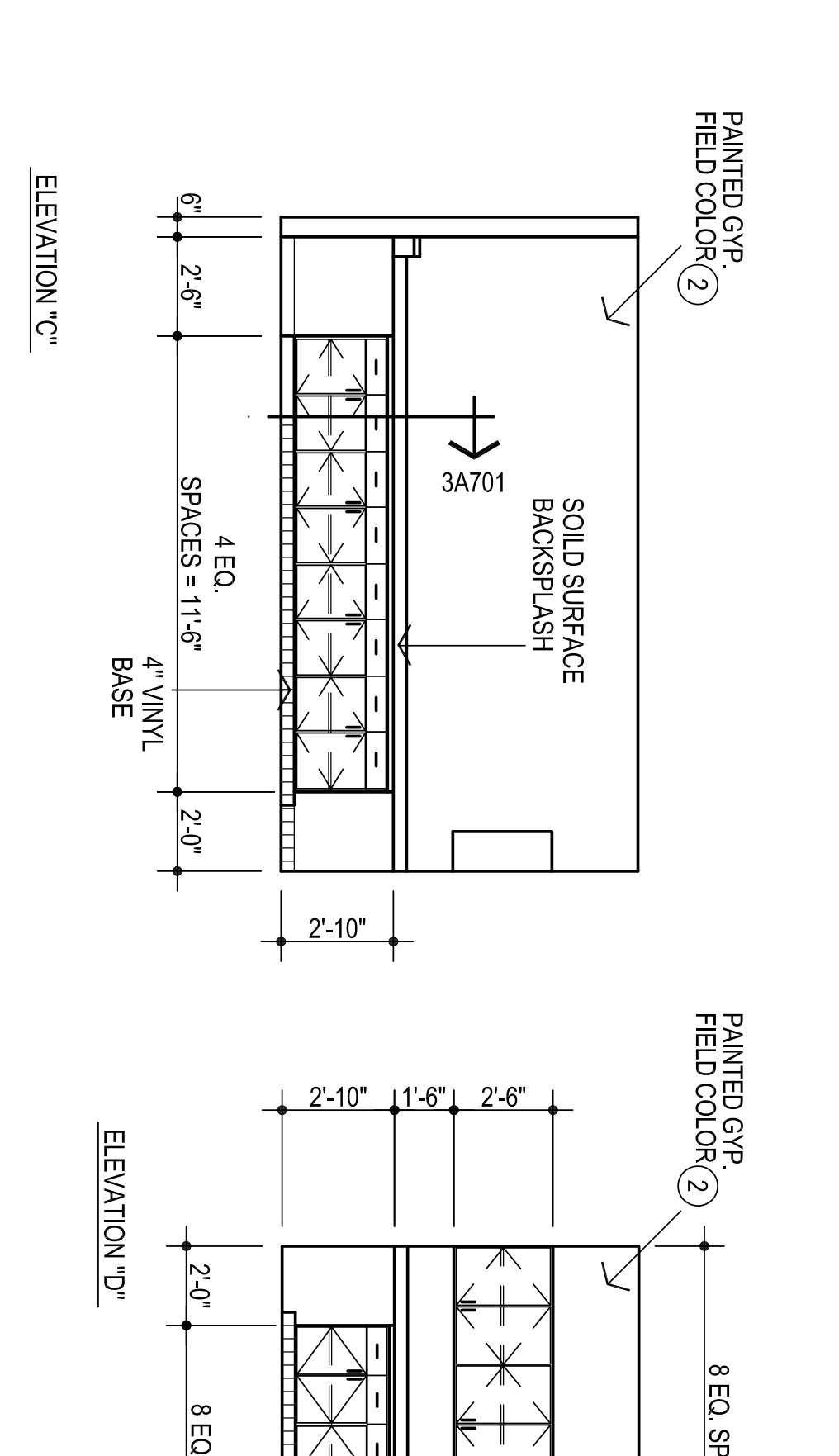
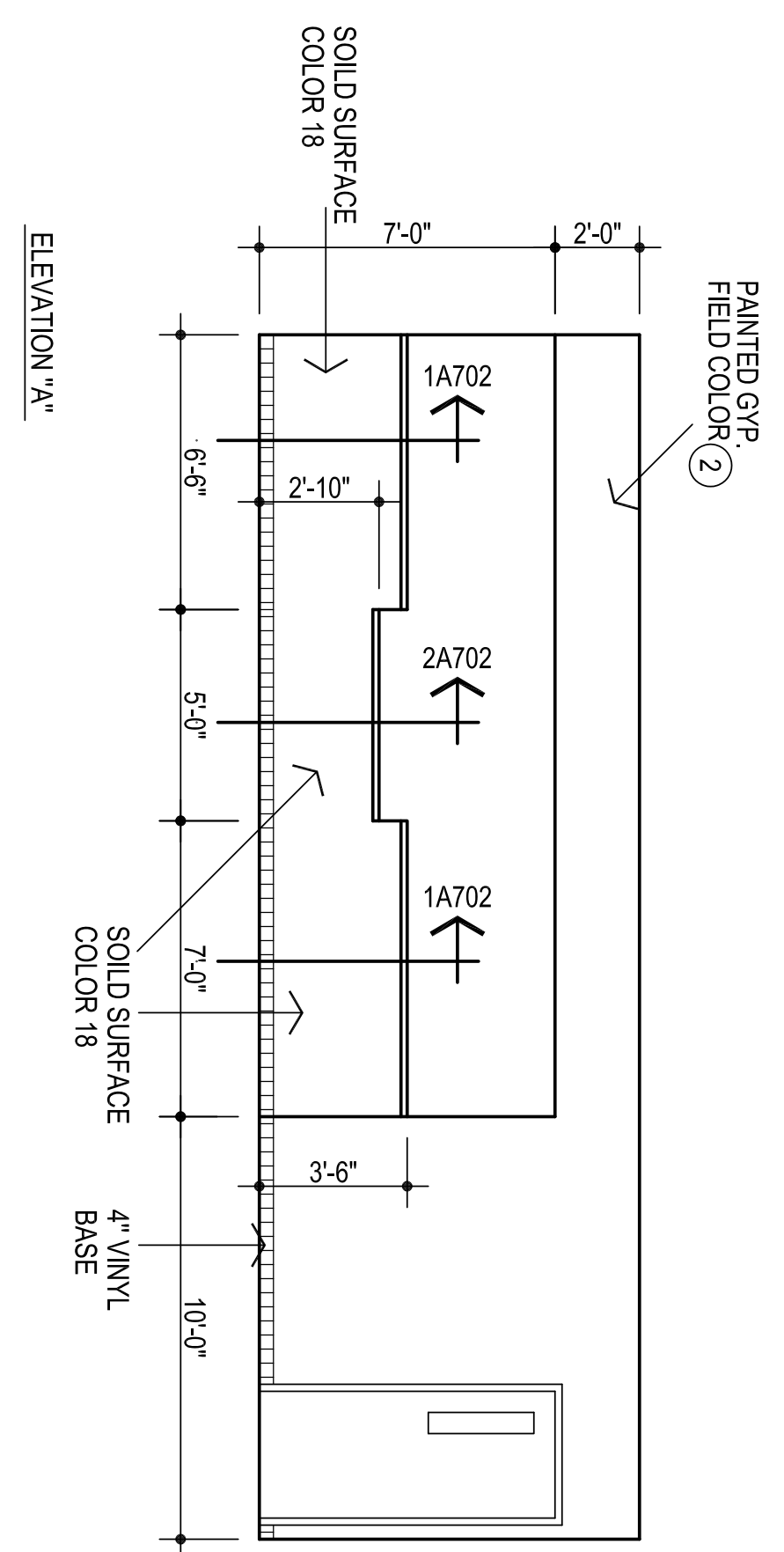


1
ENLARGED FLOOR PLAN ROOM #402, & 403
1/4" = 1'-0"

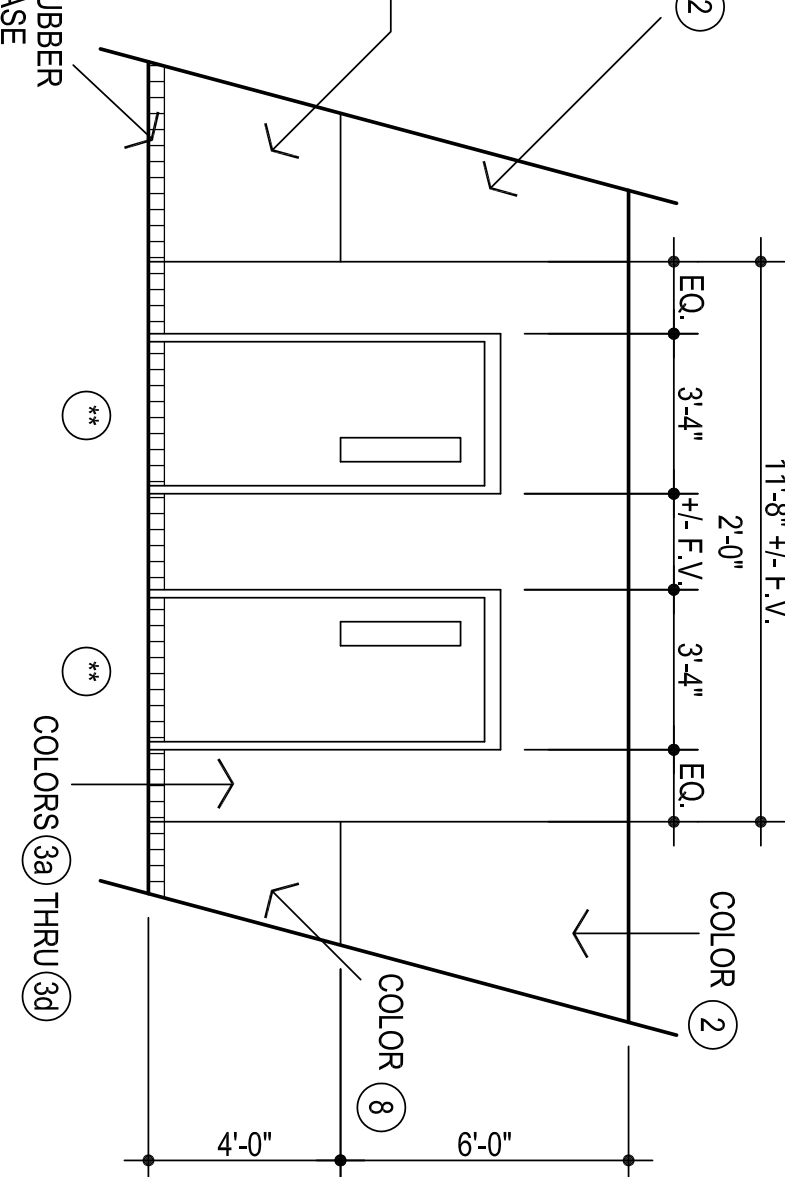
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2
E. WALL ROOM #429
1/4" = 1'-0"



3
SINGLE CLASSROOM
DOOR WALL ACCENTS
1/4" = 1'-0"



4
DOUBLE CLASSROOM
DOOR WALL ACCENTS
1/4" = 1'-0"

NOTE:
COORDINATE ACCENT WALL PAINT W/ ROOM
FINISH / COLOR SCHEDULES & ARCHITECT

313 S. E. 5th Street
MOORE, OK, 73160
ACGP@theACP.net
www.theACP.net

CEDAR CREEK
CIVIL

KFC ENGINEERING
STRUCTURAL

SALAS O'Brien
MECHANICAL/ELECTRICAL



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MA
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OCTOBER 2024
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CHILD CARE FACILITY
201 N. EASTERN AVE.

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PAINT:

- 1 GYP BOARD CEILINGS / EXPOSED STRUCTURE: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 2 WALLS - FIELD: SHERWIN-WILLIAMS - SW708 - ALABASTER
- 3 WALLS - @ SIDE & ABOVE DOORS WHERE INDICATED:
 - 3a) DOORS 22, 24, 30, 31 & 57 - SW6868 REAL RED
 - 3b) DOORS 26, 33, 34, 46 & 49 - SW6886 KNOCKOUT ORANGE
 - 3c) DOORS 44, 50, 57, 72 & 75 - SW6903 CHEERFULL
 - 3d) DOORS 62, 64, 68, 69 & 765 - SW6998 DYNAMIC BLUE
- 4 H.M. DOORS & FRAMES: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 5 MISCELLANEOUS METALS: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 6 WOOD DOORS & MILLWORK: ARCHITECTURAL WOOD DOORS - CLEAR CL07
- 7 EXPOSED STRUCTURE & UNDERSIDE OF DECK: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 8 ACCEENT @ CORRIDORS: SW7073 DORIAN GRAY
- 9 EXTERIOR COLUMN COLORS:
 - 9a) SW7006 EXTRA WHITE
 - 9b) SW6992 INKWEIL
 - 9c) SW6868 REAL RED
 - 9d) SW6924 DIRECT GREEN
 - 9e) SW6886 KNOCKOUT ORANGE
 - 9f) SW6958 DYNAMIC BLUE
 - 9g) SW6903 CHEERFULL
 - 9h) SW6982 AFRICAN VIOLET

PREFINISHED COLORS:

- 10 CARPET TILES: COLOR 'A': INTERFACE - COLOR 'B': INTERFACE -
- 11 RUBBER WALL BASE: ROPPE - 100 BLACK
- 12 LUXURY VINYL TILE COLOR: INTERFACE - A00702 PEWTER
- 13 LUXURY VINYL TILE ACCEENT COLOR:
 - 13a) INTERFACE - A00714 YELLOW
 - 13b) INTERFACE - A00721 ELECTRIC BLUE
 - 13c) INTERFACE - A00717 RED
 - 13d) INTERFACE - A00706 ORANGE
 - 13e) INTERFACE - A00701 SILVERLIGHT

2 COLOR SCHEDULE

DESCRIPTION	RM. NO.	FLOOR	BASE	CEILING	CLG. HT.	REMARKS	RM. NO.	WALLS	PAINT / COLOR SCHEDULE					
									WALLS					REMARKS
								N	E	S	W			
CLASSROOM	001	LUXURY VINYL TILE CARPET TILE CERAMIC TILE EPOXY FLOORING EXPOSED CONCRETE W/ HARDENER	CERAMIC TILE RUBBER NONE	2 X 2 ACOUST. LAY-IN (TEG) 2 X 2 ACOUST. LAY-IN (SQ) GYP. BOARD EXPOSED STRUCTURE	9'-0"			CERAMIC TILE GYP. BOARD EXISTING	1	2	2	2	2	(1)(2)(3)(9)(19)(26)(27)
TOILET	001a								1	15	15	15	15	14
TOILET	001b								1	15	15	15	15	14
TOILET	001c								1	15	15	15	15	14
TOILET	001d								1	15	15	15	15	14
TOILET	001e								1	15	15	15	15	14
CLASSROOM	002								1	23	2	2	2	2(38)
CLASSROOM	003								1	23	2	2	2	2(38)
CLASSROOM	004								1	23	2	2	2	2(38)
CLASSROOM	005								1	23	2	2	2	2(38)
CLASSROOM	101								1	23	2	2	2	2(38)
TOILET	101a								1	15	15	15	15	14
TOILET	101b								1	15	15	15	15	14
TOILET	101c								1	15	15	15	15	14
TOILET	101d								1	15	15	15	15	14
TOILET	101e								1	15	15	15	15	14
CLASSROOM	102								1	23	2	2	2	2(38)
CLASSROOM	103								1	23	2	2	2	2(38)
CLASSROOM	104								1	23	2	2	2	2(38)
CLASSROOM	105								1	23	2	2	2	2(38)
CLASSROOM	201								1	23	2	2	2	2(38)
TOILET	201a								1	15	15	15	15	14
TOILET	201b								1	15	15	15	15	14
TOILET	201c								1	15	15	15	15	14
TOILET	201d								1	15	15	15	15	14
TOILET	201e								1	15	15	15	15	14
CLASSROOM	202								1	23	2	2	2	2(38)
CLASSROOM	203								1	23	2	2	2	2(38)
CLASSROOM	204								1	23	2	2	2	2(38)
CLASSROOM	205								1	23	2	2	2	2(38)
CLASSROOM	301								1	23	2	2	2	2(38)
TOILET	301a								1	15	15	15	15	14
TOILET	301b								1	15	15	15	15	14
TOILET	301c								1	15	15	15	15	14
TOILET	301d								1	15	15	15	15	14
TOILET	301e								1	15	15	15	15	14
CLASSROOM	302								1	23	2	2	2	2(38)
CLASSROOM	303								1	23	2	2	2	2(38)
CLASSROOM	304								1	23	2	2	2	2(38)
CLASSROOM	305								1	23	2	2	2	2(38)
WAITING AREA	401								1	24	2	2	2	2
RECEPTIONIST	402								1	24	2	2	2	2
COPY	403								1	24	2	2	2	2
OFFICE	404								1	24	2	2	2	2
OFFICE	405								1	24	2	2	2	2
PRINCIPAL	406								1	24	2	2	2	2
CORRIDOR	407								1	24	2	2	2	2
CORRIDOR	408								1	24	2	2	2	2
CONFERENCE	409								1	24	2	2	2	2
BREAKROOM	410								1	23	2	2	2	2
VESTIBULE	411								1	21	2	2	2	2
CORRIDOR	412								1	21	2	2	2	2
TOILET	413								1	15	15	15	15	14
TOILET	414								1	15	15	15	15	14
STORAGE	415								1	2	2	2	2	2
CORRIDOR	416								1	24	2	2	2	2
INDOOR PLAY AREA	417								1	24	2	2	2	2
TOILET	417a								1	15	15	15	15	14
TOILET	417b								1	15	15	15	15	14
STORAGE	417c								1	2	2	2	2	2
VESTIBULE	418								1	2	2	2	2	2
CORRIDOR	419								1	24	2	2	2	2
CORRIDOR	420								1	24	2	2	2	2
VESTIBULE	421								1	24	2	2	2	2
OFFICE	422								1	23	2	2	2	2
LOCKER ROOM	423								1	15	15	15	15	14
RECEIVING	424								1	2	2	2	2	2
DRY STORAGE	425								1	2	2	2	2	2
KITCHEN	426								1	28	2	2	2	2
CORRIDOR	427								1	28	2	2	2	2
CLASSROOM	428								1	23	2	2	2	2
RECEIVING	429								1	23	2	2	2	2
ELEC.	430								1	2	2	2	2	2
L.T. ELEC.	431								1	2	2	2	2	2
CUSTOMIAN	432								1	2	2	2	2	2
MEP / STORAGE	433								1	2	2	2	2	2
VESTIBULE	434								1	2	2	2	2	2
NURSE	435								1	2	2	2	2	2
TOILET	436								1	2	2	2	2	2
STORAGE	436a								1	15	15	15	15	14
CORRIDOR	436b								1	2	2	2	2	2
CORRIDOR	437								1	24	2	2	2	2

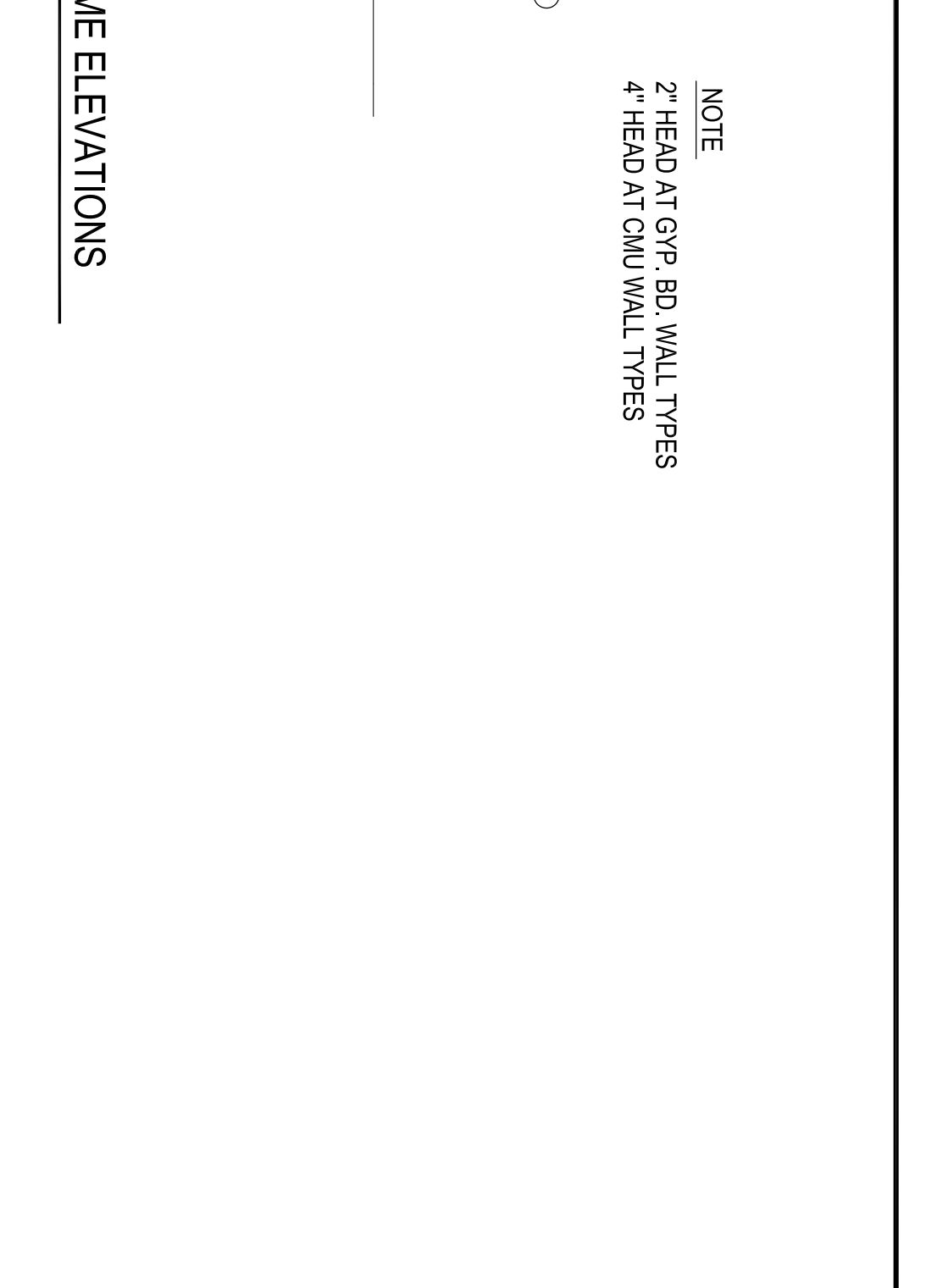
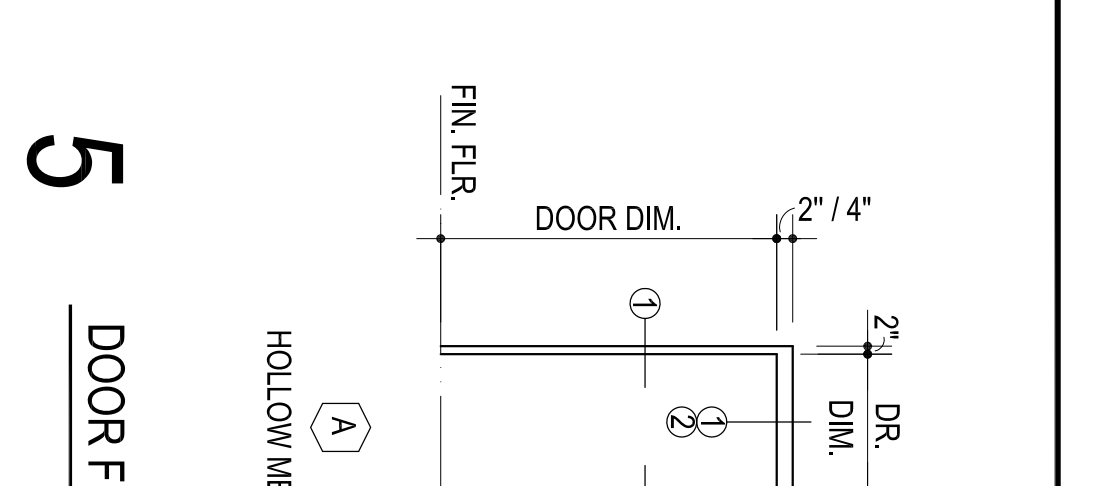
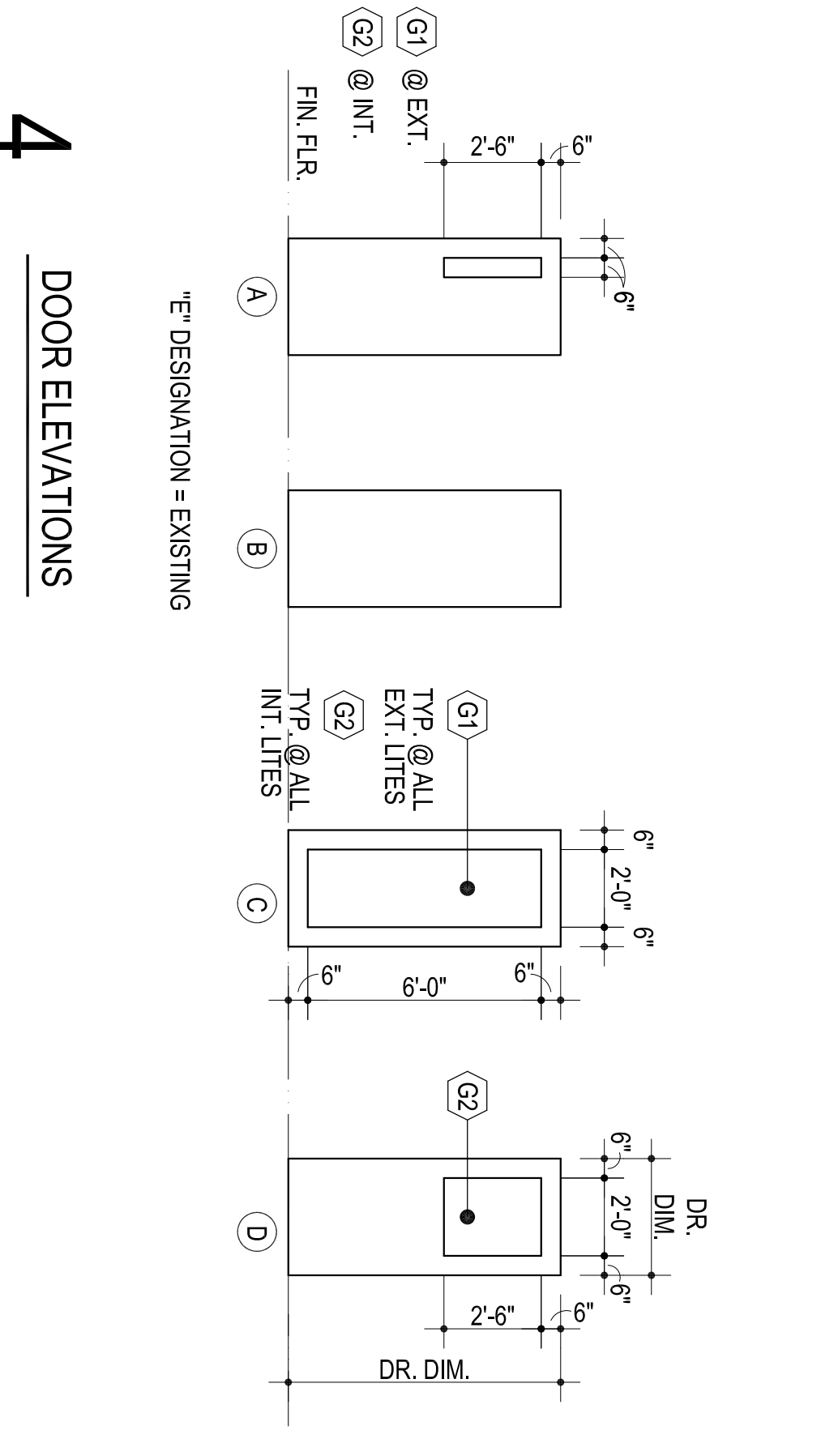
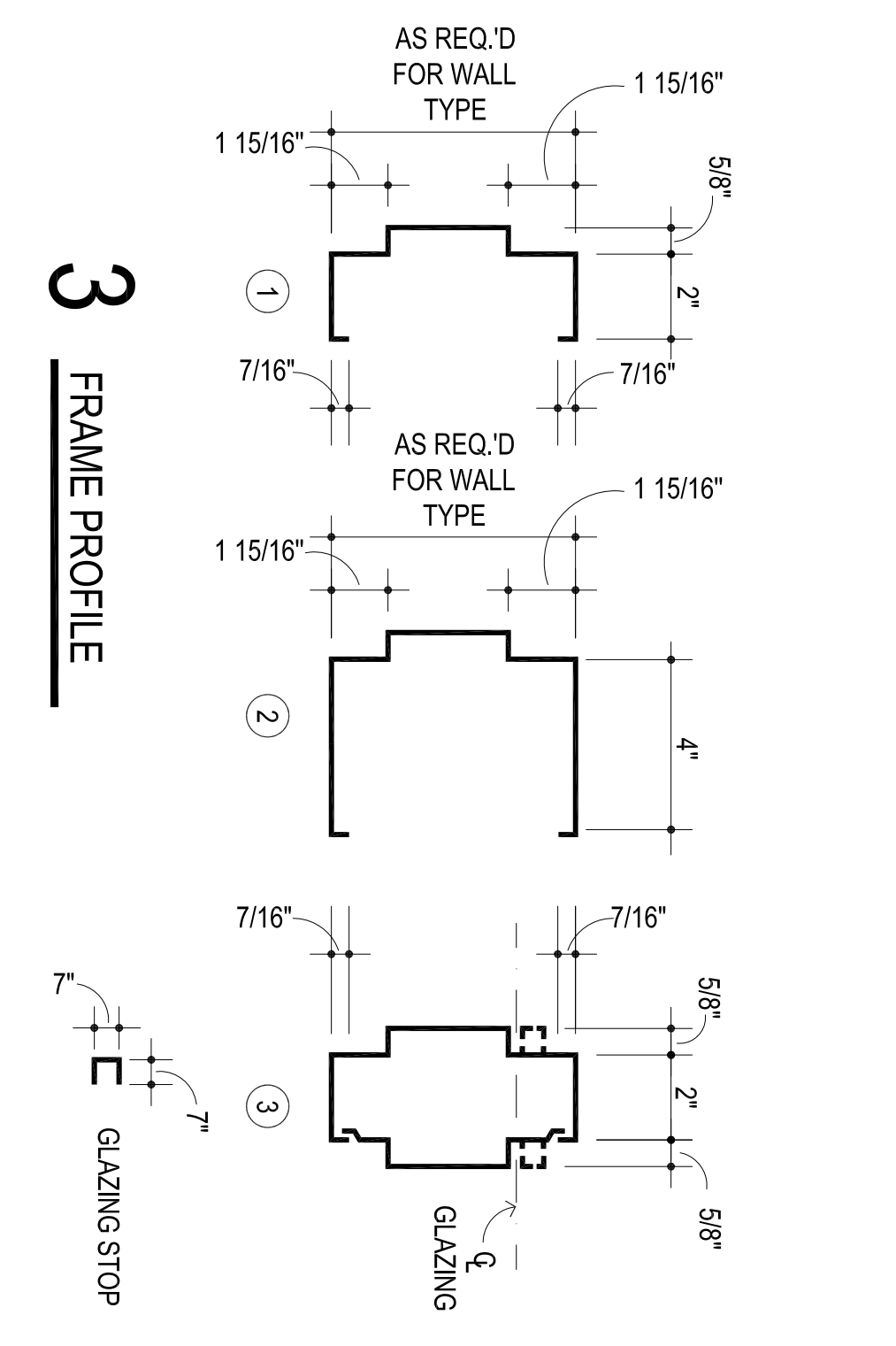
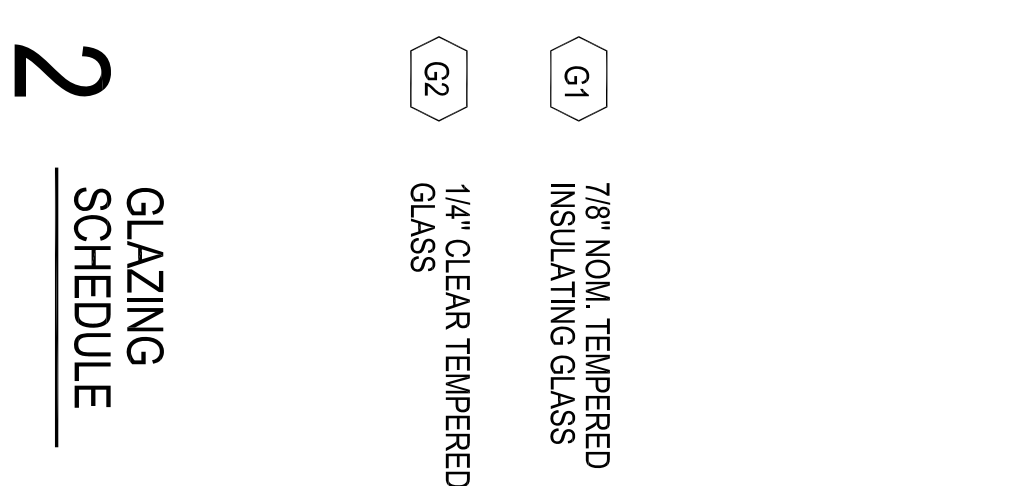
DESCRIPTION	RM. NO.	FLOOR	BASE	CEILING	CLG. HT.	REMARKS	RM. NO.	WALLS	PAINT / COLOR SCHEDULE					
									WALLS					REMARKS
								N	E	S	W			
CORRIDOR	438	LUXURY VINYL TILE CARPET TILE CERAMIC TILE EPOXY FLOORING EXPOSED CONCRETE W/ HARDENER	CERAMIC TILE RUBBER NONE	2 X 2 ACOUST. LAY-IN (TEG) 2 X 2 ACOUST. LAY-IN (SQ) GYP. BOARD EXPOSED STRUCTURE	10'-0"			CERAMIC TILE GYP. BOARD EXISTING	1	2	2	2	2	11
STORAGE	105f								1	2	2	2	2	11
L.T.	105g								1	2	2	2	2	11

1 ROOM FINISH SCHEDULE

SCHEDULE ORIENTED
 SAME AS PLAN
 INDICATES MATERIAL IN A GIVEN AREA
 MATERIAL ON ALL SURFACES
 MATERIAL ON EACH INDIVIDUAL SURFACE
 IF CIRCLE IS BLACKENED - SURFACE TO RECEIVE PAINTERS FINISH
 IF CIRCLE IS BLANK - SURFACE OR MATERIAL IS PREFINISHED OR NOT PAINTED

DOOR NO.	LOCATION		DOOR ELEV.	DOOR MATL.	DOOR SIZE			FRAME RELEV.	DOOR DETAILS			REMARKS	HWR. SET NO.	
	FROM	TO			WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			JAMB
1	401	EXT.	A	HM.	PR. 3'-0"	7'-0"	1 3/4"	A	16A501	16A501	29A501	29A501	20 MIN. DR & FRAME	
2	411	EXT.	C	<	<	<	<	<	4A501	16A501	11A501	11A501		
3	432	411	<	<	<	<	<	<	22A501	16A501	29A501	29A501		
4	436	EXT.							4A501	16A501	11A501	11A501		
5	428	435							22A501	15A501	29A501	29A501		
6	421	EXT.							4A501	16A501	11A501	11A501		
7	420	421							22A501	15A501	29A501	29A501		
8	418	EXT.							4A501	16A501	11A501	11A501		
9	419	418							4A501	16A501	11A501	11A501		
10	412	401							4A501	16A501	11A501	11A501		
11	402	401							3A501	10A501	10A501	10A501		
12	412	402							4A501	11A501	11A501	11A501		
13	407	404							4A501	11A501	11A501	11A501		
14	407	405							4A501	11A501	11A501	11A501		
15	407	406							4A501	11A501	11A501	11A501		
16	409	407							4A501	11A501	11A501	11A501		
17	412	408							4A501	11A501	11A501	11A501		
18	412	409							4A501	11A501	11A501	11A501		
19	412	410							4A501	11A501	11A501	11A501		
20	436	436a							3A501	10A501	10A501	10A501		
21	435	436							4A501	11A501	11A501	11A501		
22	435	001							4A501	11A501	11A501	11A501		
23	001	001a							3A501	10A501	10A501	10A501		
24	435	002							4A501	11A501	11A501	11A501		
25	002	001b							3A501	10A501	10A501	10A501		
26	435	101							4A501	11A501	11A501	11A501		
27	101	101a							3A501	10A501	10A501	10A501		
28	102	101b							3A501	10A501	10A501	10A501		
29	003	101c							3A501	10A501	10A501	10A501		
30	435	003							4A501	11A501	11A501	11A501		
31	435	004							4A501	11A501	11A501	11A501		
32	004	001d							3A501	10A501	10A501	10A501		
33	435	102							4A501	11A501	11A501	11A501		
34	435	103							4A501	11A501	11A501	11A501		
35	005	001e							3A501	10A501	10A501	10A501		
36	103	101c							3A501	10A501	10A501	10A501		
37	435	005							4A501	11A501	11A501	11A501		
38	428	434							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	
39	428	433							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	
40	428	432							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	
41	428	431							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	
42	429	428							4A501	11A501	11A501	11A501		
43	428	436							4A501	11A501	11A501	11A501		
44	436	203							4A501	11A501	11A501	11A501		
45	203	201c							3A501	10A501	10A501	10A501		
46	436	104							4A501	11A501	11A501	11A501		
47	104	201d							3A501	10A501	10A501	10A501		
48	105	201e							3A501	10A501	10A501	10A501		
49	436	105							4A501	11A501	11A501	11A501		
50	436	202							4A501	11A501	11A501	11A501		
51	202	201b							3A501	10A501	10A501	10A501		
52	436	416							20A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	
53	417	417a							4A501	11A501	11A501	11A501		
54	417	417b							4A501	11A501	11A501	11A501		
55	417	417c							4A501	11A501	11A501	11A501		
56	416	417							4A501	11A501	11A501	11A501		
57	416	201							4A501	11A501	11A501	11A501		
58	201	201a							3A501	10A501	10A501	10A501		
59	412	413							4A501	11A501	11A501	11A501		
60	412	414							4A501	11A501	11A501	11A501		
61	415	412							4A501	11A501	11A501	11A501		
62	412	305							4A501	11A501	11A501	11A501		
63	305	301e							3A501	10A501	10A501	10A501		
64	419	304							4A501	11A501	11A501	11A501		
65	304	301d							3A501	10A501	10A501	10A501		
66	303	301c							3A501	10A501	10A501	10A501		
67	419	417							4A501	11A501	11A501	11A501		
68	419	303							4A501	11A501	11A501	11A501		
69	419	302							4A501	11A501	11A501	11A501		
70	302	301b							3A501	10A501	10A501	10A501		
71	301	301a							3A501	10A501	10A501	10A501		
72	419	205							4A501	11A501	11A501	11A501		
73	205	201e							3A501	10A501	10A501	10A501		
74	204	201d							3A501	10A501	10A501	10A501		
75	419	204							4A501	11A501	11A501	11A501		
76	419	301							4A501	11A501	11A501	11A501		
77	419	425							4A501	11A501	11A501	11A501		
78	NUMBER NOT USED								NUMBER NOT USED					
79	425	424							4A501	11A501	11A501	11A501		
80	425	423							4A501	11A501	11A501	11A501		
81	425	422							4A501	11A501	11A501	11A501		
82	427	426							4A501	11A501	11A501	11A501		

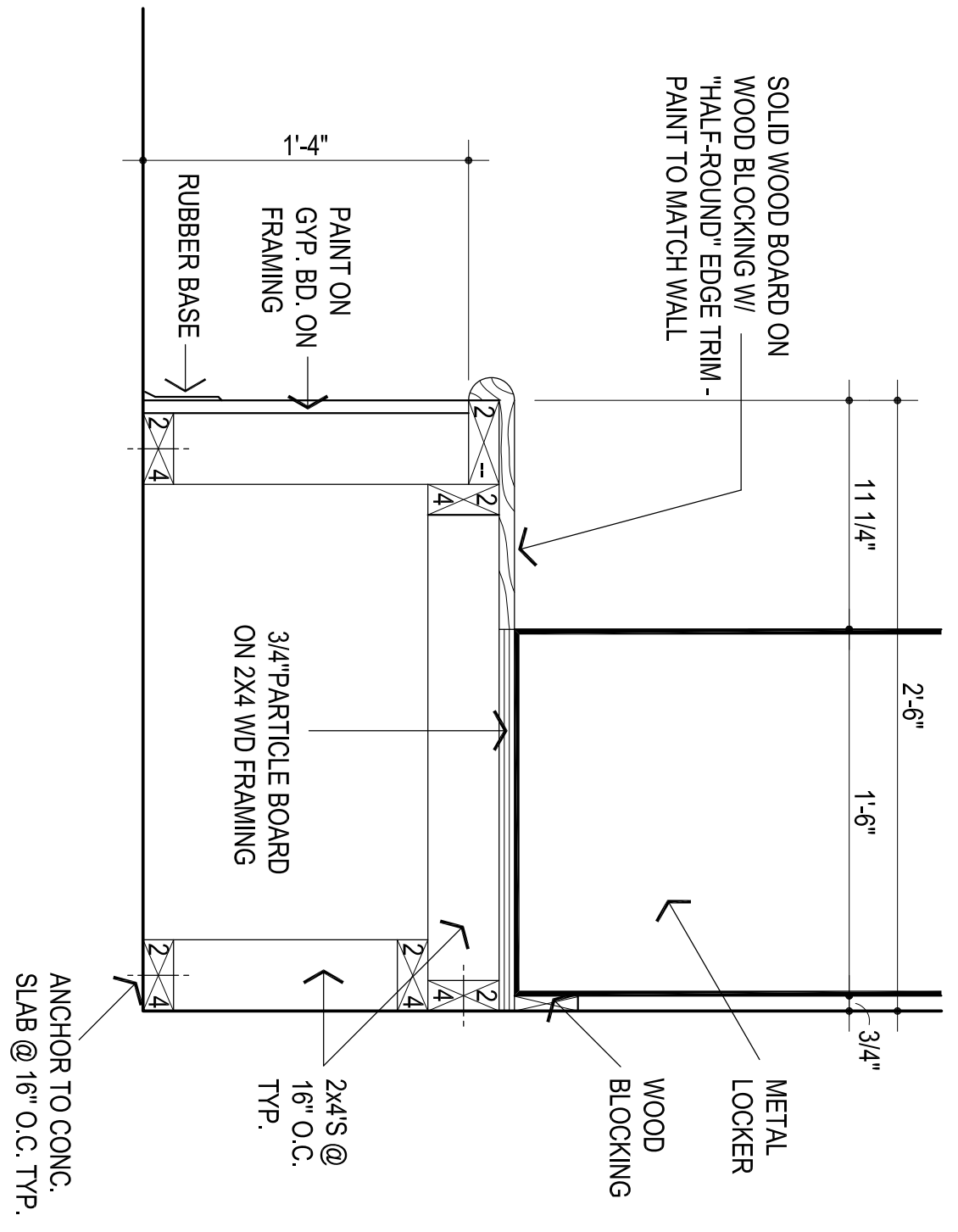
DOOR SCHEDULE



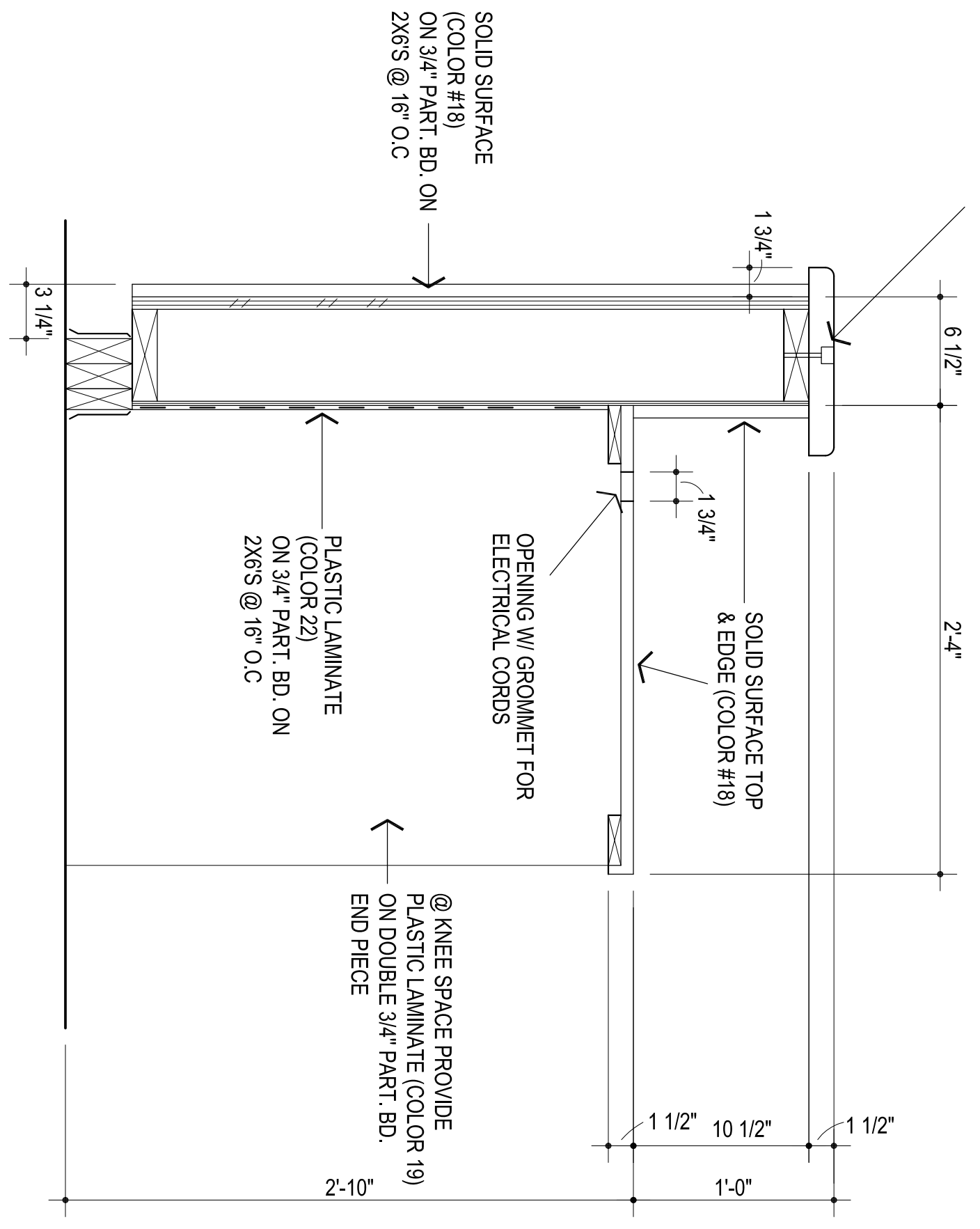
CS	drawn by
MA	checked by
	date
revisions	

**FRAMELESS
CABINET / EUROPEAN
CONSTRUCTION IS
ACCEPTABLE**

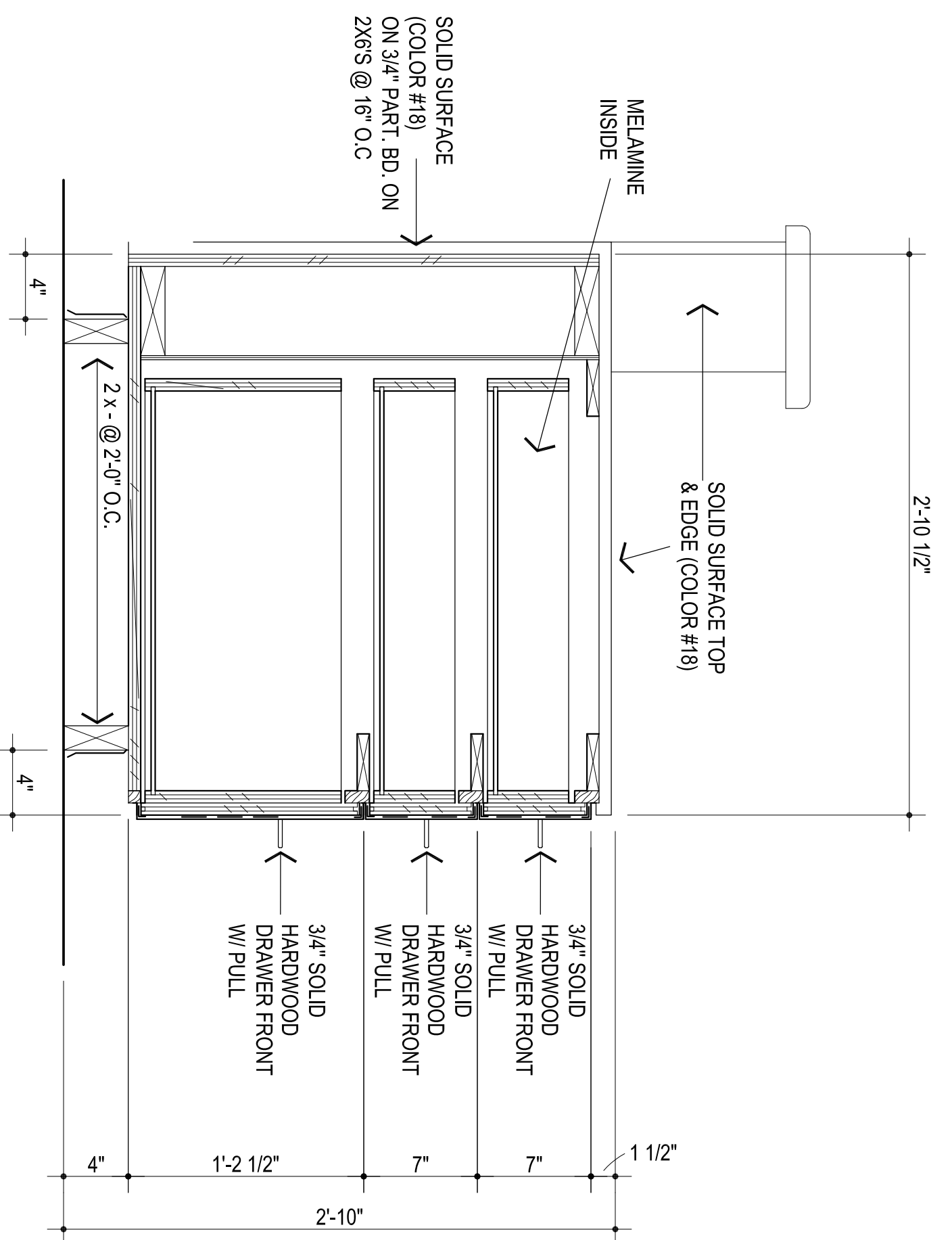
4 LOCKER SUPPORT / SEAT
1-1/2" = 1'-0"



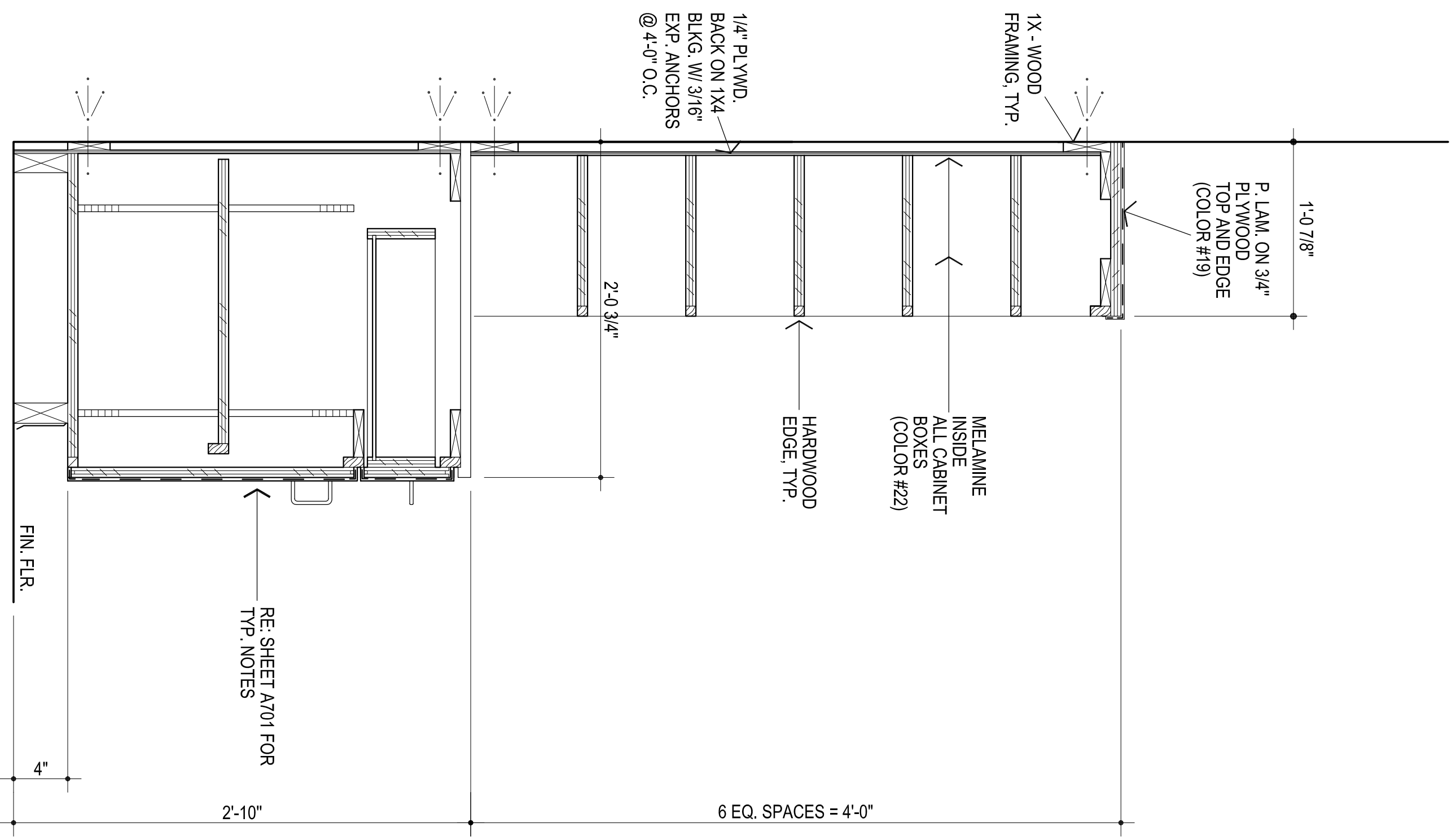
1x12 SOLID RED OAK CAP -
EASE ALL EXPOSED CORNERS
COUNTER SINK ANCHOR TO SUBFRAMING
& PLUG W/ MATCHING MATERIAL.
PROVIDE @ 16\"/>



1 SECTION COUNTER
1-1/2" = 1'-0"



2 SECTION @ COUNTER
1-1/2" = 1'-0"



3 SECTION COUNTER
1-1/2" = 1'-0"

6 EQ. SPACES = 4'-0"

INDEX TO DRAWINGS

MOORE PUBLIC SCHOOLS
BOARD OF EDUCATION



MOORE PUBLIC SCHOOLS DISTRICT NO. 1-2
CLEVELAND COUNTY MOORE, OKLAHOMA

CHILD CARE CENTER

201 NORTH EASTERN AVE.
MOORE, OK. 73160

AGP | the Abila Griffin
Partnership

313 SE. 5TH ST. MOORE, OK. 73160
405.735.3477 AGP@theAGP.net www.theAGP.net



CONSTRUCTION MANAGER



1909 S. EASTERN AVE.
MOORE, OK 73160

STRUCTURAL
KFC ENGINEERING

205 NW 63rd, SUITE 390
OKLAHOMA CITY, OK 73116

MECHANICAL/ELECTRICAL/PLUMBING
SALAS O'BRIEN

2900 S. TELEPHONE RD., SUITE 120
MOORE, OKLAHOMA 73160

CIVIL
CEDAR CREEK

11912 N. PENNSYLVANIA AVE., SUITE D4
OKLAHOMA CITY, OK 73120

KITCHEN CONSULTANT
STURM CONSULTING, INC.

5838 S. HUDSON PL.
TULSA, OK. 74135

SHEET NUMBER	DESCRIPTION	SHEET NUMBER	DESCRIPTION
C	COVER SHEET	F101	FIRE PROTECTION PLAN - SITE
--	TOPOGRAPHIC SURVEY - FOR INFORMATION ONLY	P000	GENERAL PLUMBING NOTES
G100	LEGENDS / MAPS / ETC.	P101	PLUMBING PLAN - BELOW GRADE
G101	SHELTER CALCULATION PLAN / SHELTER LOCATION PLAN	P110	PLUMBING PLAN - ABOVE GRADE
GEN-101	GENERATOR BUILDING FLOOR PLAN / ELEVATIONS / SECTIONS / DETAILS	P201	PLUMBING PLAN - ROOF
PUBLIC WATER PLANS		P301	PLUMBING ISOMETRIC WASTE & VENT
C0.00	COVER SHEET	P302	PLUMBING ISOMETRIC WATER SUPPLY
C1.00	UTILITY PLAN	P301	DETAILS
C2.00	WATERLINE 1 PLAN AND PROFILE	P302	DETAILS
C2.01	WATERLINE DETAILS	P401	DETAILS
C3.00	EROSION CONTROL PLAN	M000	MECHANICAL NOTES
C3.01	EROSION CONTROL DETAILS	M101	MECHANICAL PLAN
S100	GENERAL NOTES	M201	MECHANICAL ROOF PLAN
S101	GENERAL NOTES	M301	DETAILS
S102	GENERAL NOTES	M401	SCHEDULES
S103	SHELTER INFORMATION / SHELTER LOAD PLAN	T000	TECHNOLOGY LEGENDS / NOTES
S104	DETAILS	T101	TECHNOLOGY SITE PLAN
S105	DETAILS	T201	TECHNOLOGY PLAN
S106	SPECIAL INSPECTIONS	T301	DETAILS
S200	OVERALL FOUNDATION PLAN	T302	DETAILS
S201	FOUNDATION PLAN	T303	DETAILS
S300	OVERALL FRAMING PLAN	T304	DETAILS
S301	FRAMING PLAN	T401	SYSTEM SPECIFICATIONS
S501	FOUNDATION SECTIONS	T402	SYSTEM SPECIFICATIONS
S601	FRAMING SECTIONS	T403	SYSTEM SPECIFICATIONS
S602	FRAMING SECTIONS	E000	ELECTRICAL NOTES / SCHEDULES
S701	GENERATOR FOUNDATION PLAN / FRAMING PLAN / SECTIONS	E100	ELECTRICAL SITE PLAN
A100	OVERALL FLOOR PLAN	E101	ELECTRICAL LIGHTING PLAN
A100a	DIMENSION PLAN	E201	ELECTRICAL POWER PLAN
A100b	REFERENCE PLAN	E202	ELECTRICAL ROOF PLAN
A101	WALL TYPE PLAN	E203	ELECTRICAL KITCHEN PLAN
A102	LIFE SAFETY PLAN	E401	ELECTRICAL ONE-LINE DIAGRAM / SCHEDULE
A103	ENLARGED FLOOR PLANS	E301	DETAILS
A104	ENLARGED FLOOR PLANS	E502	DETAILS
A105	ENLARGED FLOOR PLANS	E601	SCHEDULES
A106	REFLECTED CEILING PLAN	E602	SCHEDULES
A107	ROOF PLAN - CLASSROOM AREA / ROOF PLAN - OFFICE AREA		
A107a	ROOF DETAILS		
A108	LVT DIM. / DESIGN PLAN		
A109	EQUIPMENT FLOOR PLAN		
A201	BUILDING ELEVATIONS		
A301	BUILDING SECTION		
A302	WALL SECTIONS / DETAILS		
A401	INTERIOR ELEVATIONS		
A402	INTERIOR ELEVATIONS		
A501	DETAILS		
A601	ROOM FINISH SCHEDULE / COLOR SCHEDULE		
A602	DOOR SCHEDULE / DOOR ELEVATIONS / FRAME ELEVATIONS		
A701	MILLWORK DETAILS		
A702	MILLWORK DETAILS		
FS101	FOODSERVICE EQUIPMENT ARRANGEMENT PLAN		

Revisions:

Sheet no:

C

date:

OCTOBER 2024

CHILD CARE CENTER
SET NO.

LIGHT FIXTURE SCHEDULE				
TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	REFERENCE CATALOG #
A1		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A1E		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2E		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3E		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A4		2X2 LED FLAT PANEL. 35W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X2 AL07 80CRI SSW7 SWL MVOLT
C		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING.	LITHONIA	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
CE		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITON	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
EX		LED EXIT SIGN, STAINLESS STEEL FACE WITH RED LETTERS, UNIVERSAL FACE AND MOUNTING, PROVIDE WITH UL924 DEVICE.	LIFE SAFETY LIGHTING	LSXDC 3 R A A EM SDT
P1		3" CIRCULAR LED PENDANT. 78W, 6500 LUMENS, 3500K CCT. 0-10V DIMMING.	DELRAY	UDC3 W35 SR D
P2		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING.	DELRAY	UDDC6 W35 SR D
P2E		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	DELRAY	UDDC6 W35 SR D
S		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
SE		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
T		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
TE		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
V		2" LED VANITY FIXTURE. 9W, 300 LUMENS/FT DIRECT AND INDIRECT, 3500K CCT. 0-10V DIMMING.	MARK LIGHTING	S2WID LLP 2FT MSL2 80CRI 35K 300LMF 180 I35K I300LMF AS SCT MIN10 FL MVOLT WHTT ZT
W1E		2400 LUMEN, 4000K CT, LED WALL PACK PROVIDE WITH UL924 DEVICE.	LITHONIA	WPX1 LED P2 40K MVOLT DBLXD
W2E		4" LED EXTERIOR FIXTURE 533 LUMENS/FT, 4000K CCT. MULLION MOUNT PROVIDE WITH UL924 DEVICE.	A-LIGHT	LIN 3 SP M4 LS 40 U HE M.5 X D ES

GENERAL NOTES:
EQUIVALENT ALTERNATE LIGHT FIXTURES MAY BE PROVIDED FOR BIDDING PURPOSES. THE ENGINEER DOES NOT TAKE RESPONSIBILITY FOR ENSURING ALTERNATE LIGHT FIXTURES USED FOR BIDDING ARE EQUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALTERNATE FIXTURES ARE EQUIVALENT TO THOSE SPECIFIED PRIOR TO BID. THE WINNING BID PACKAGE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH THE SPECIFICATIONS.

ELECTRICAL ABBREVIATIONS

AC	ABOVE COUNTERTOP	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCA	MINIMUM CIRCUIT AMPS
AFG	ABOVE FINISH GRADE	MCB	MAIN CIRCUIT BREAKER
ANNC	ANNUNCIATOR	MDP	MAIN DISTRIBUTION PANEL
CC	CONTROLS CONTRACTOR	MLO	MAIN LUG ONLY
DF	DRINKING FOUNTAIN	MTD	MOUNTED
EC	ELECTRICAL CONTRACTOR	NIC	NOT IN CONTRACT
EF	EXHAUST FAN	OCC	OCCUPANCY
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH	PC	PLUMBING CONTRACTOR
EX	EXISTING	PNL	PANEL
EXR	EXISTING RELOCATED	SPST	SINGLE POLE SINGLE THROW
GC	GENERAL CONTRACTOR	TIB	TELEPHONE TERMINAL BOARD
GF	GROUND FAULT INTERRUPT	TYP	TYPICAL
HP	HORSEPOWER	WG	WIRE GUARD
IBC	INTERNATIONAL BUILDING CODE	WP	WEATHER PROOF
IG	ISOLATED GROUND	20A	20 AMP
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, AND GROUND	Ø	PHASE
LV	LOW VOLTAGE	3W	3 WIRE
LVPR	LV RELAY PANEL	1P20A	SINGLE POLE 20 AMP

SWITCH LEGEND

SYMBOL	DESCRIPTION
\$	20A, SPST SWITCH
\$ _a	20A, LETTER INDICATES GROUP
\$ ₃	20A, 3-WAY
\$ ₄	20A, 4-WAY
\$ _D	DIMMER SWITCH
\$ _K	KEY OPERATED SWITCH
\$ _{OC}	OCCUPANCY SENSOR SWITCH

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

RECEPTACLE SCHEDULE

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE
	20A, 120V, 2P, 3W GROUNDING DUPLEX RECEPTACLE
	RECEPTACLE MTD. 6" ABOVE COUNTER OR HGT SHOWN
	GFCI RECEPTACLE
	GFCI RECEPTACLE, MTD. 6" ABOVE COUNTER OR HGT SHOWN
	20A, 120V, 2P, 3W GROUNDING DUPLEX GFCI RECEPTACLE - WEATHER PROOF (IN USE COVER)
	JUNCTION BOX, AS NOTED
	QUADPLEX RECEPTACLE

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

GENERAL ELECTRICAL NOTES

- CONTRACTOR TO VERIFY EXISTING ELECTRICAL CONDITIONS AND NOTIFY ARCHITECT/ENGINEER OF ANY ELECTRICAL OR CODE ISSUES PRIOR TO BID. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE AND OPERATIONAL CODE COMPLIANT SYSTEM.
- ALL WORK SHALL BE IN CONFORMANCE WITH NATIONAL, STATE, AND LOCAL CODES AND/OR ORDINANCES.
- ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER CONTRACTORS & LOCAL UTILITY. E.G. SHALL CONTACT LOCAL UTILITY FOR EXACT SERVICE REQUIREMENTS TO INCLUDE BUT NOT LIMITED TO TRANSFORMER, METERING AND CABLING. LOCAL UTILITY REQUIREMENTS SUPERSEDE DRAWINGS AND SPECIFICATIONS.
- SEE ARCHITECTURAL, MECHANICAL, & PLUMBING DRAWINGS FOR ADDITIONAL REQUIREMENTS.
- ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. THEY ARE INTENDED TO GIVE APPROXIMATE LOCATIONS AND OVERALL DESIGN INTENT. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCTS, MATERIALS, AND ELECTRICAL METHODS WHICH HAVE NOT BEEN SHOWN OR INDICATED BUT ARE REQUIRED FOR A COMPLETE SYSTEM TO THE STANDARDS OF THE INDUSTRY.
- INSTALL LIGHTING FIXTURES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE SUPPORTING DEVICES FOR ADEQUATE SUPPORT OF FIXTURES FROM STRUCTURE.
- UPON COMPLETION OF THE ELECTRICAL WORK, THE INSTALLATION SHALL BE TESTED FOR CONTINUITY, GROUNDS, AND SHORT CIRCUITS. THE ELECTRICAL CONTRACTOR SHALL DEMONSTRATE PROPER PERFORMANCE OF ALL SYSTEMS. ALL DEFECTIVE WORK OR MATERIALS SHALL BE REPLACED OR REPAIRED AS NECESSARY AND RETESTED.
- ELECTRICAL RACEWAYS THAT PENETRATE FIRE RATED ASSEMBLIES SHALL BE SLEEVED AND SEALED AS PER THE LOCAL BUILDING CODE.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE A TEMPORARY ELECTRICAL SYSTEM FOR THE PROJECT. AT LEAST ONE 120 VOLT SINGLE PHASE RECEPTACLE SHALL BE PROVIDED FOR EACH 500 SQUARE FEET OF FLOOR SPACE. SUFFICIENT TEMPORARY LIGHTING SHALL BE PROVIDED TO ALLOW ALL CONTRACTORS TO COMPLETE THEIR WORK. TEMPORARY ELECTRICAL CIRCUITS SHALL BE EQUIPPED WITH COMBINATION GROUND FAULT INTERRUPTER AND CIRCUIT BREAKER PER NEC. TEMPORARY ELECTRICAL SYSTEM SHALL BE INCLUDED IN THIS BID. USAGE CHARGES SHALL BE PAID FOR BY THE GENERAL CONTRACTOR.

ELECTRICAL LEGEND

	PANEL BOARD
	DISTRIBUTION PANEL BOARD
	TRANSFORMER
	UTILITY METER
	SEPARATE CIRCUIT BREAKER
	DISCONNECT
	FUSED DISCONNECT SWITCH
	EMERGENCY FUSED DISCONNECT SWITCH
	MOTOR STARTER/CONTRACTOR
	COMBINATION MOTOR STARTER
	PUSH BUTTON STATION AS NOTED
	PULL BOX, SIZE AS REQUIRED BY CODE
	ELECTRICAL CONNECTION
	MOTOR CONNECTION
	HOME RUN TO PANEL BOARD

ELECTRICAL SHEET INDEX

E000	ELECTRICAL TITLE SHEET
E100	ELECTRICAL SITE PLAN
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL POWER PLAN
E202	ELECTRICAL ROOF PLAN
E203	ELECTRICAL KITCHEN PLAN
E401	ELECTRICAL ONE-LINE DIAGRAM
ES01	ELECTRICAL DETAILS SHEET
ES02	ELECTRICAL DETAILS SHEET
E601	ELECTRICAL SCHEDULES
E602	ELECTRICAL SCHEDULES

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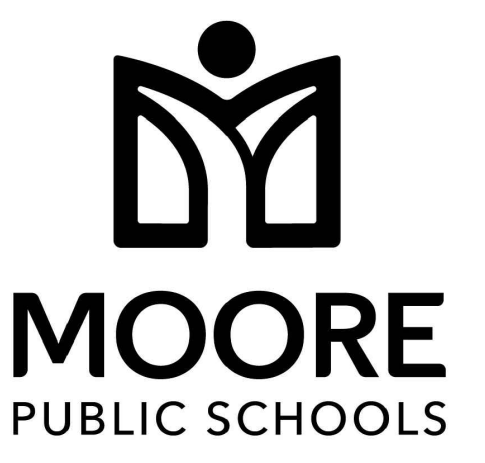


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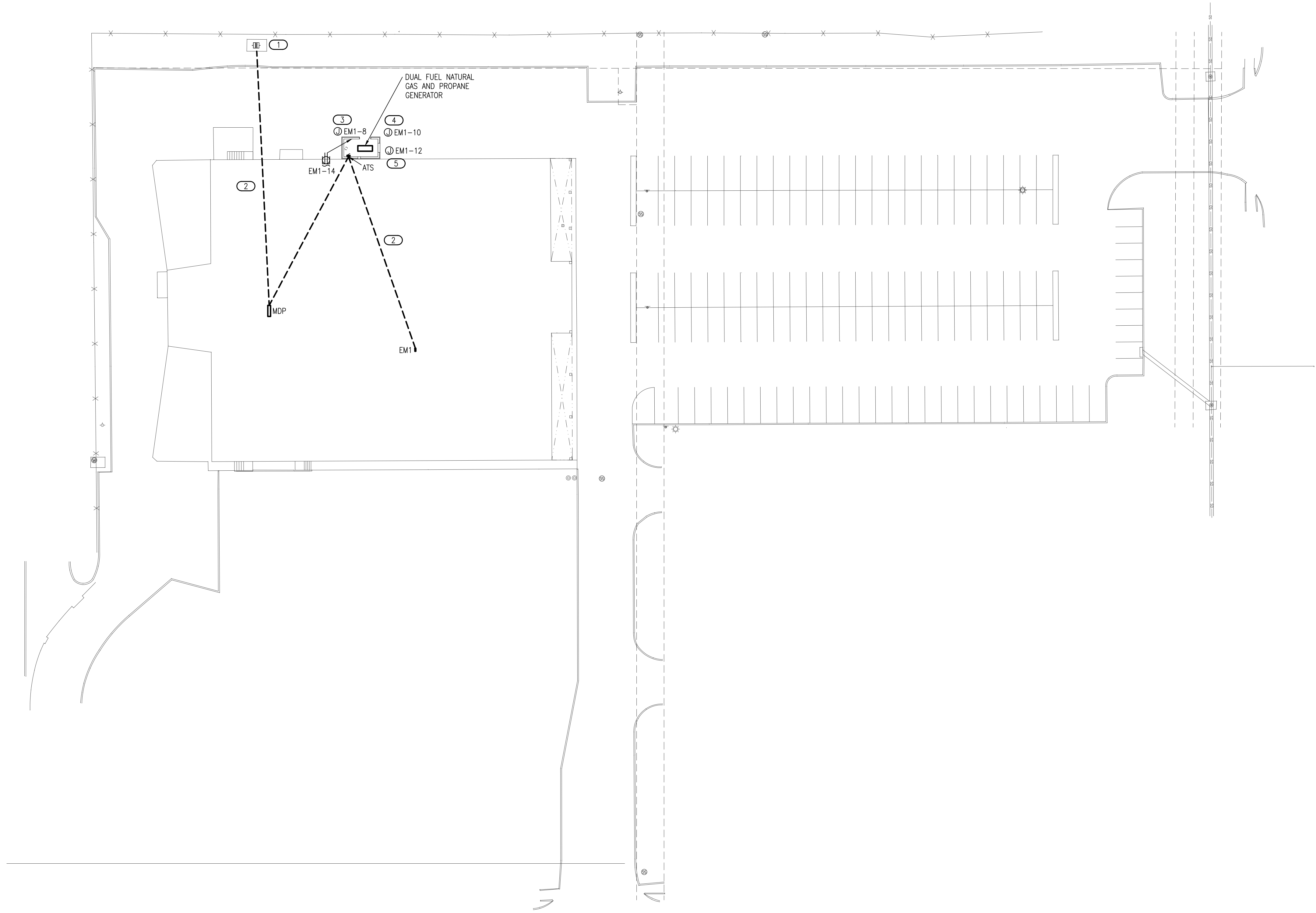
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SITE GENERAL NOTES

- COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT.
- PROVIDE (2) ELECTRONIC TIMERS WITH INTERGRAL ASTRONOMICAL TIMECLOCK AND PHOTOCELL INPUT. LOCATE PHOTOCELL WITH CLEAR VIEW OF NORTHERN SKY AND SHIELD FROM ARTIFICIAL LIGHT SOURCES. ONE TIMER SHALL CONTROL EXTERIOR WALL PACKS AND THE OTHER SHALL CONTROL THE PARKING LOT.
- THESE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC ONLY. CONSULT WITH GENERAL CONTRACTOR FOR DETAILS ON BIDDING; PROVIDE ALL PARTS AND LABOR FOR A COMPLETE AND CODE COMPLIANT FACILITY.
- ELECTRICAL CONTRACTOR TO SHOW ACTUAL ROUTING OF ALL BELOW-GRADE CONDUITS AND WIRING ON AS-BUILT DRAWINGS. ROUTES SHOWN ARE GENERAL IN NATURE AND ACTUAL ROUTE SHALL BE DETERMINED BY GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR ONSITE.
- PROVIDE GROUNDING AND BONDING AT EACH BUILDING IN ACCORDANCE WITH NEC 250.32.
- REFER TO SHEET "T-XXX" FOR ADDITIONAL CONDUIT LAYOUT INFORMATION.

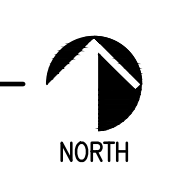
KEYED NOTES

- EXISTING 208/120V 3P UTILITY TRANSFORMER.
- PROPOSED CONDUIT ROUTE. SAW CUT CONCRETE AS NECESSARY TO ENSURE CONDUIT IS ROUTED UNDER THE EXISTING CONCRETE FOUNDATION.
- PROVIDE 120V GENERATOR BLOCK HEATER CONNECTION.
- PROVIDE 120V GENERATOR BATTERY HEATER CONNECTION.
- PROVIDE 120V GENERATOR BATTERY CHARGER CONNECTION.



1 ELECTRICAL SITE PLAN

SCALE: 1/32" = 1'-0"



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GENERAL NOTES

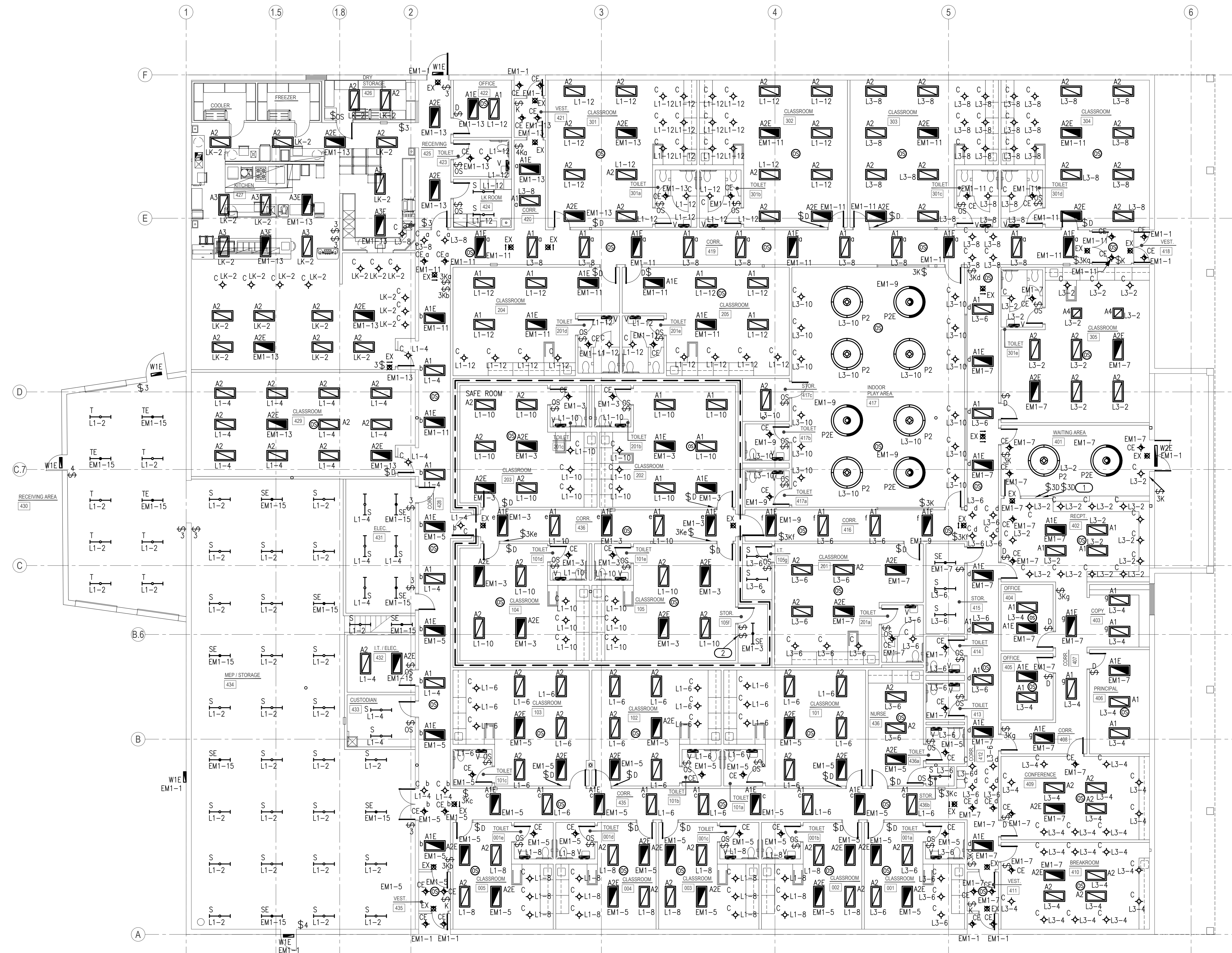
- OCCUPANCY SENSOR LOCATIONS SHOWN ARE FOR DESIGN INTENT ONLY. LOCATE OCCUPANCY SENSORS PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- CONNECT BATTERY PACKS TO UNSWITCHED HOT OF LOCAL LIGHTING CIRCUIT.
- COORDINATE WITH ALL ASSOCIATED TRADES FOR THE EXACT LOCATIONS OF LIGHT FIXTURES WITH HVAC EQUIPMENT AND OTHER DEVICES/EQUIPMENT.
- COORDINATE WITH THE ARCHITECT, OWNER, AND ASSOCIATED TRADES FOR THE EXACT HEIGHT/LOCATION OF EXTERIOR MOUNTED LIGHTING FIXTURES PRIOR TO ROUGH-IN.
- LABEL SWITCH PLATES AND J-BOXES WITH CIRCUIT PER SPECS.
- COORDINATE LIGHT SWITCHES WITH THERMOSTATS AND OTHER WALL MOUNT DEVICES.
- PROVIDE ELECTRONIC TIMER WITH INTEGRAL ASTRONOMICAL TIME CLOCK AND PHOTO CELL INPUT. LOCATE PHOTO CELL WITH CLEAR VIEW OF NORTHERN SKY AND SHIELD FROM ARTIFICIAL LIGHT SOURCES. TIMER SHALL CONTROL EXTERIOR LIGHTING.

SAFEROOM GENERAL NOTES

- PER ICC 500-2014, 309.1:
- PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
- 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
 - 2 1/16" IN DIAMETER
- SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- LIGHT SWITCH FOR 'WAITING AREA 401' LIGHT FIXTURES.
- SUPPLY VENTILATION FAN SWITCH. COORDINATE WITH MECHANICAL CONTRACTOR.



1 ELECTRICAL LIGHTING PLAN
SCALE: 3/32" = 1'-0"



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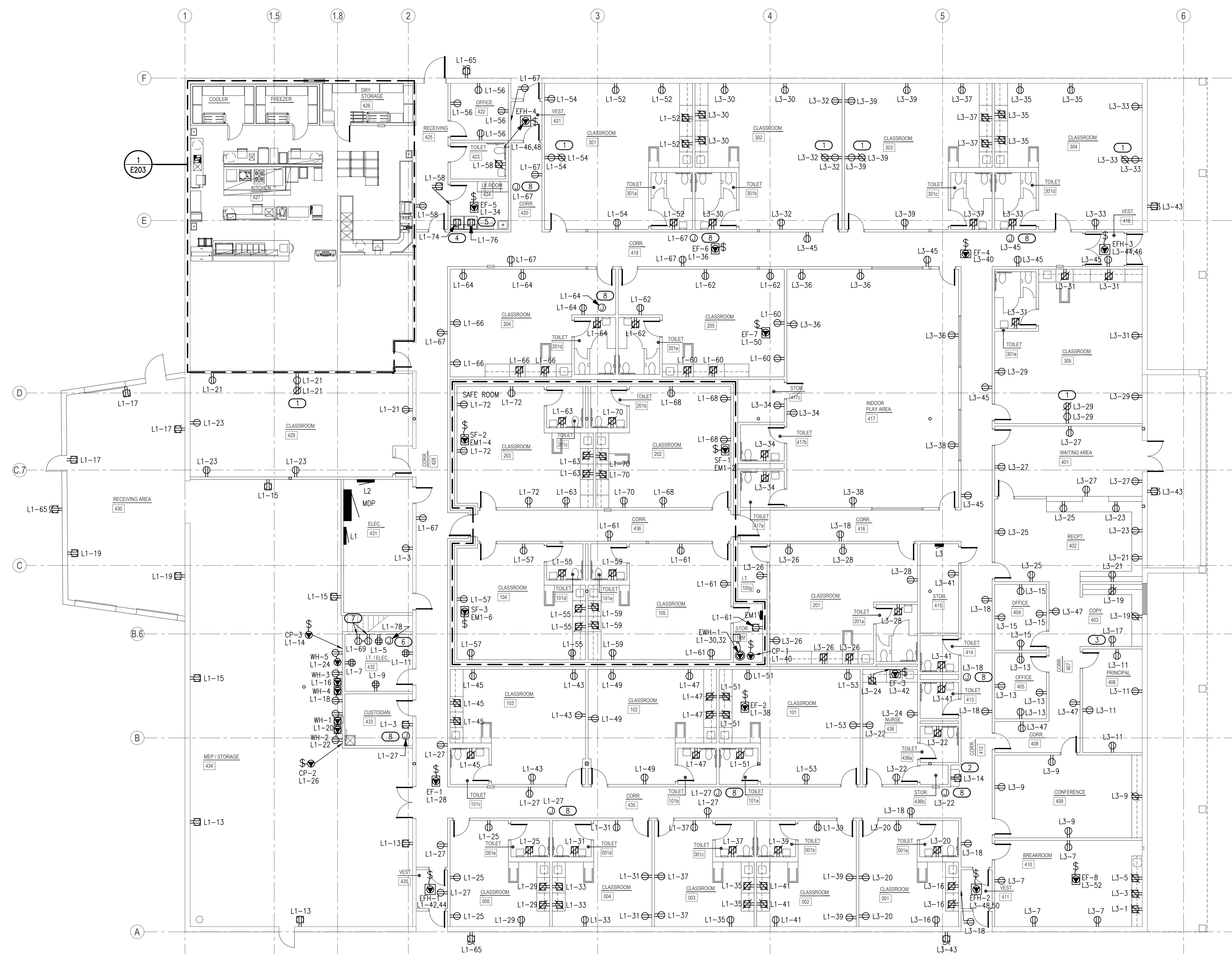
- COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT. COORDINATE EXACT LOCATION OF CEILING MOUNTED DEVICES WITH LIGHTS, HVAC EQUIPMENT, AND OTHER DEVICES.
- COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER CONTROL DEVICES.
- COORDINATE EXACT LOCATION OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR. REFER TO MECHANICAL PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- COORDINATE EXACT LOCATION OF PLUMBING EQUIPMENT WITH PLUMBING CONTRACTOR. REFER TO PLUMBING PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- ALL RECEPTACLES LOCATED AT COUNTERTOP HEIGHT SHALL BE ORIENTED HORIZONTALLY.
- FIRE STOP ALL PENETRATIONS IN FIRE AND SMOKE RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND ADDITIONAL INFORMATION

SAFEROOM GENERAL NOTES

- PER ICC 500-2014, 309.1:
PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
1. 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
2. 2 1/16" IN DIAMETER
SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- PROVIDE 120V CONNECTION FOR SMARTBOARD. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH IN. REFER TO DETAIL '9/E501' FOR ADDITIONAL INFORMATION.
- PROVIDE 120V WATER COOLER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V COPY MACHINE DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V GAS DRYER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V WASHER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V FIRE ALARM CONTROL PANEL. DEDICATED CONNECTION. COORDINATE RECEPTACLE TYPE AND LOCATION WITH FIRE ALARM CONTRACTOR.
- PROVIDE 120V TELECOM EQUIPMENT CONNECTION. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.



1 ELECTRICAL POWER PLAN
SCALE: 3/32" = 1'-0"



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GENERAL NOTES

1. COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT.
2. COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER DEVICES.
3. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR.
4. FIRMLY MOUNT WEATHERPROOF 120V CONVENIENCE OUTLET ON UNISTRUT/KINDORF. COORDINATE WITH OTHER TRADES PRIOR TO ROUGH-IN. REDUNDANT RECEPTACLES WHETHER STAND-ALONE OR INTEGRAL TO A UNIT, MAY BE OMITTED SO LONG AS ALL OF THE REQUIREMENTS OF NEC 210.63 ARE SATISFIED.

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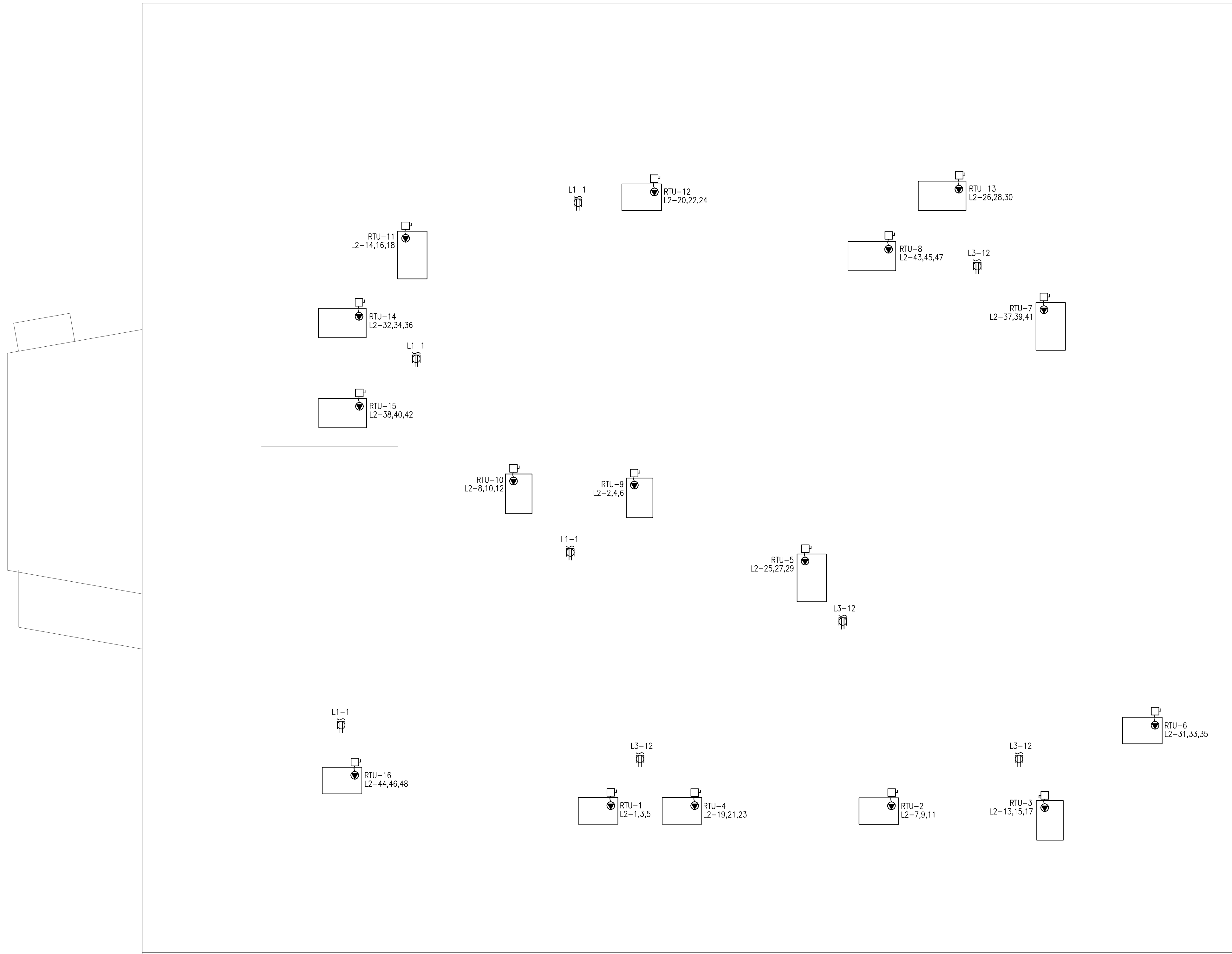
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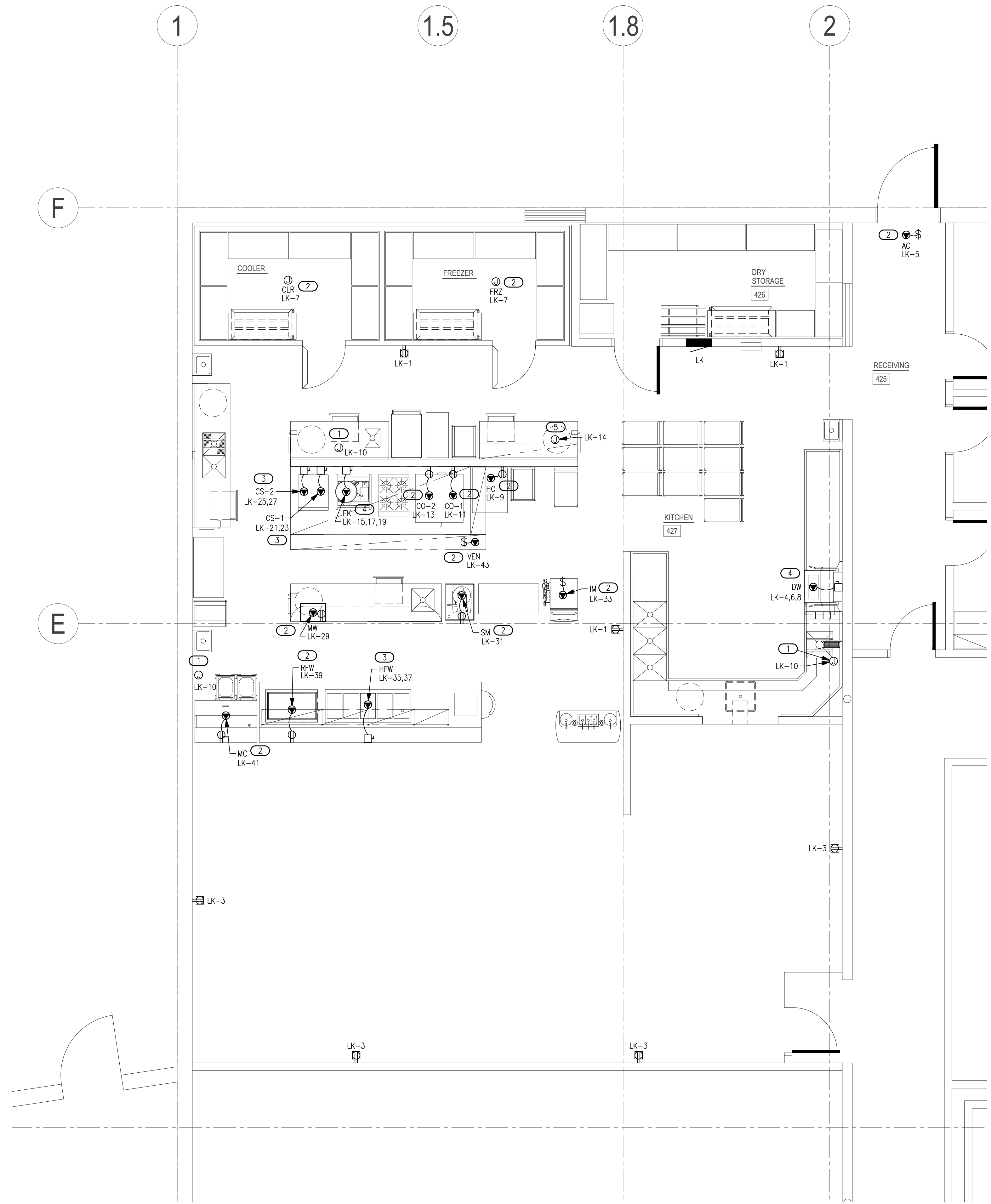
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1 ELECTRICAL ROOF PLAN

SCALE: 3/32" = 1'-0"





- ### KITCHEN GENERAL NOTES
- COORDINATE KITCHEN/FOODSERVICE EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MANUFACTURER, AND FOOD SERVICE CONTRACTOR PRIOR TO BEGINNING WORK. REFER TO FOOD SERVICE PLANS FOR ADDITIONAL INFORMATION.
 - COORDINATE KITCHEN HVAC EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MECHANICAL CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO MECHANICAL PLANS FOR ADDITIONAL INFORMATION.
 - COORDINATE KITCHEN PLUMBING EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION.
 - E.C. SHALL COORDINATE WITH OWNER, KITCHEN EQUIPMENT PROVIDER, AND OTHER TRADES PRIOR TO ROUGH IN TO ENSURE ALL ROUGH IN LOCATIONS ARE CONCEALED IN THE WALL AND STUBBED OUT IN THE PROPER LOCATIONS.
 - GFCI PROTECTION REQUIRED FOR ALL 120V 15 AND 20A RECEPTACLES, BY GFCI FUNCTION ON BREAKER OR RECEPTACLE, PER NEC 210.8 (B) (2).
 - HOOD STAND ALONE FIRE SUPPRESSION SYSTEM SHALL HAVE INPUT TO BUILDING FIRE ALARM SYSTEM.
 - PROVIDE A 20 A. MP, 1 HP, 120V POWER SUPPLY FOR KITCHEN EXHAUST FAN ANSUL SYSTEM. THE ACTIVATION OF THE FIRE SUPPRESSION SYSTEM SHALL AUTOMATICALLY SHUT DOWN THE FUEL AND ELECTRICAL POWER SUPPLY TO THE COOKING EQUIPMENT UNDER THE KITCHEN HOOD. THE FUEL AND ELECTRICAL POWER SUPPLY RESET SHALL BE MANUAL. SHUNT TRIP CIRCUIT BREAKERS SHALL BE USED FOR ELECTRICALLY SUPPLIED APPLIANCES LOCATED UNDER THE HOOD.

- ### KEYED NOTES
- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
 - PROVIDE 120V CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
 - PROVIDE 208V SINGLE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
 - PROVIDE 208V THREE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
 - PROVIDE 120V CONNECTION FOR GAS SOLENOID VALVE ON SHUNT TRIP BREAKER. INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION.

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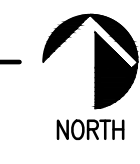
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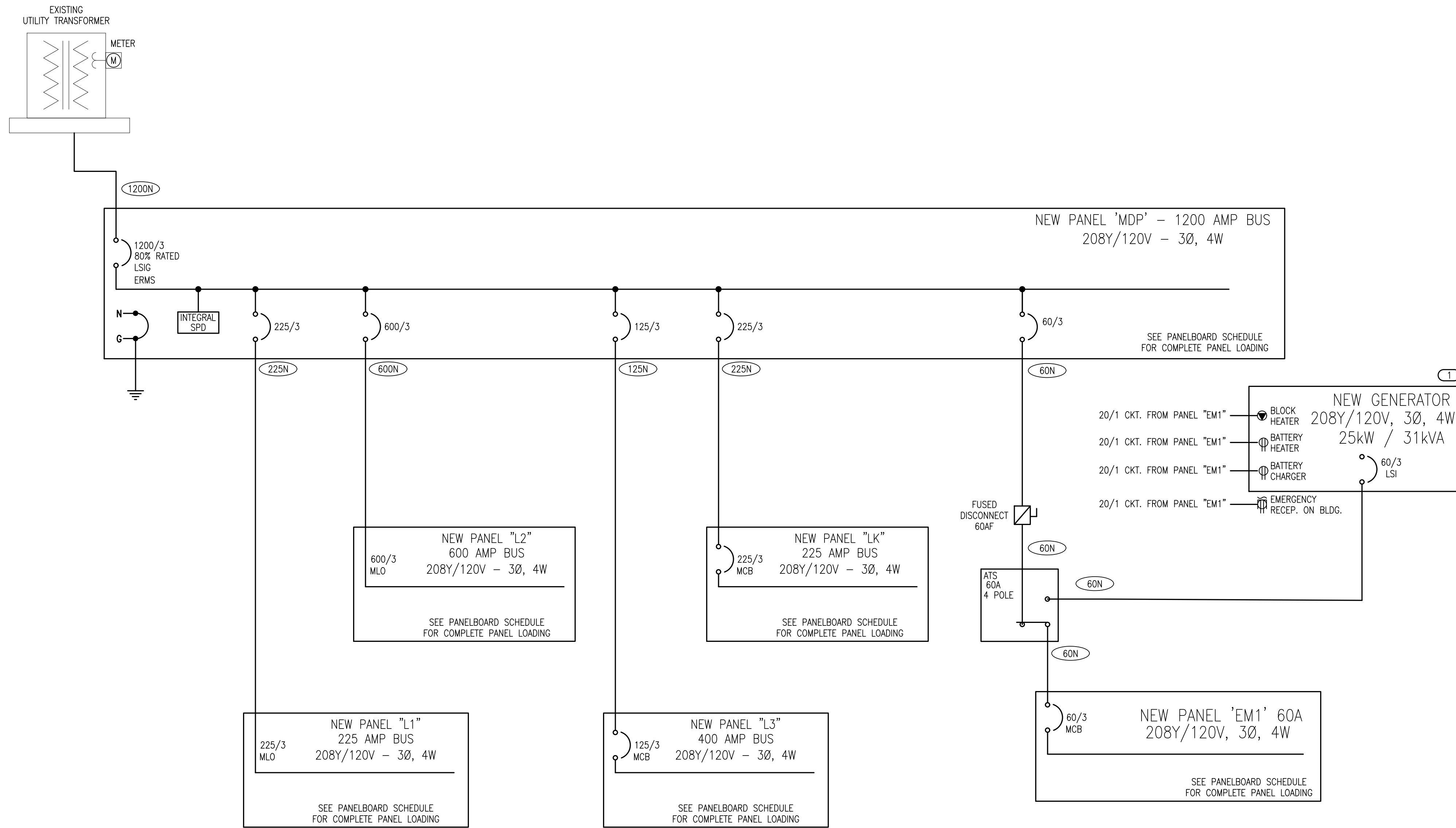
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1 ENLARGED ELECTRICAL KITCHEN PLAN
SCALE: 1/4" = 1'-0"



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1 ONE-LINE DIAGRAM
NO SCALE

FEEDER SCHEDULE				
AMPS	CONDUIT SIZE 4W	CONDUIT SIZE 3W	PHASE CONDUCTORS	EQUIPMENT GROUND CONDUCTOR
20	3/4"	3/4"	#12	#12
25	3/4"	3/4"	#10	#10
30	3/4"	3/4"	#10	#10
35	1"	3/4"	#8	#10
40	1"	3/4"	#8	#10
45	1"	1"	#6	#10
50	1"	1"	#6	#10
60	1 1/4"	1 1/4"	#4	#10
70	1 1/4"	1 1/4"	#4	#8
80	1 1/4"	1 1/4"	#3	#8
90	1 1/2"	1 1/4"	#2	#8
100	1 1/2"	1 1/4"	#2	#8
110	2"	1 1/2"	#1	#6
125	2"	1 1/2"	#1	#6
150	2"	1 1/2"	#1/0	#6
175	2"	2"	#2/0	#6
200	2"	2"	#3/0	#6
225	2 1/2"	2"	#4/0	#4
250	3"	2 1/2"	250 kcmil	#4
300	3"	3"	350 kcmil	#4
350	3 1/2"	3"	500 kcmil	#3
400	(2) 2"	(2) 2"	2 SETS OF #3/0	#3
450	(2) 2 1/2"	(2) 2"	2 SETS OF #4/0	#2
500	(2) 2 1/2"	(2) 2 1/2"	2 SETS OF 250 kcmil	#2
600	(2) 3"	(2) 3"	2 SETS OF 350 kcmil	#1
700	(2) 3 1/2"	(2) 3"	2 SETS OF 500 kcmil	#1/0
800	(3) 3"	(3) 2 1/2"	3 SETS OF 300 kcmil	#1/0
900	(3) 3 1/2"	(3) 3"	3 SETS OF 400 kcmil	#2/0
1000	(3) 3 1/2"	(3) 3"	3 SETS OF 500 kcmil	#2/0
1200	(4) 3"	(4) 3"	4 SETS OF 350 kcmil	#3/0
1600	(5) 3 1/2"	(5) 3"	5 SETS OF 500 kcmil	#4/0
1800	(6) 3 1/2"	(6) 3"	6 SETS OF 400 kcmil	250 kcmil
2000	(6) 3 1/2"	(6) 3"	6 SETS OF 500 kcmil	250 kcmil
2500	(7) 3 1/2"	(7) 3"	7 SETS OF 500 kcmil	350 kcmil

NOTES:
 1. FEEDER SIZES ARE ON THE PLAN WHERE 60 REFERS TO A 60A FEEDER WITHOUT NEUTRAL AND 60N REFERS TO A 60A FEEDER WITH NEUTRAL.
 2. SOME FEEDER SIZES DO NOT MATCH BREAKER SIZE DUE TO UP-SIZING OF THE FEEDER FOR VOLTAGE DROP.
 3. CONDUITS ARE SIZED PER NEC TABLES FOR THHN/THWN AND MAY BE UPSIZED FOR EASE OF PULLING OR DOWNSIZED AS ALLOWED PER NEC FOR CONDUIT TYPE(S) BEING INSTALLED.
 4. ALL CONDUCTORS 100A AND LESS ARE SIZED PER 60 DEGREE LUGS, EC MAY SIZE CONDUCTORS FOR ACTUAL RATING OF LUGS PER NEC.

GENERAL NOTES

- AIC RATINGS ARE ESTIMATED BASED ON AVAILABLE DATA DURING DESIGN. CONTRACTOR TO VERIFY AVAILABLE FAULT CURRENT WITH UTILITY.

KEYED NOTES

(1) GENERATOR SHALL BE DUAL FUEL - NATURAL GAS AND PROPANE. GENERATOR SHALL HAVE FUEL TYPE AUTOMATIC SWITCHOVER CAPABILITY. BASIS OF DESIGN - KOHLER MODEL 250CL 25/31 KW/KVA.

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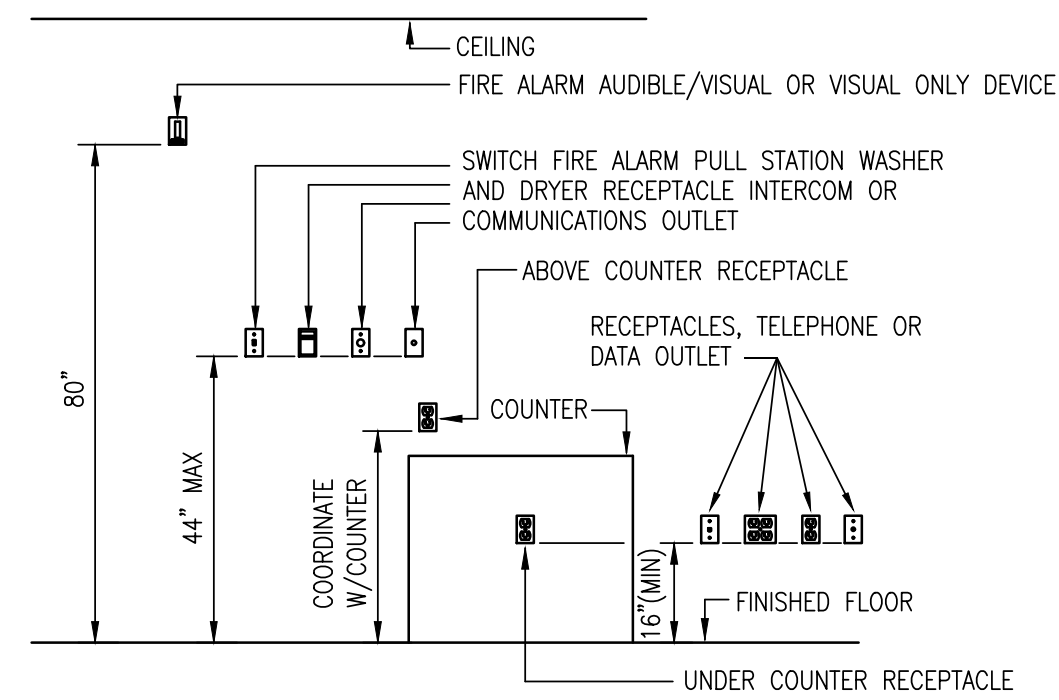


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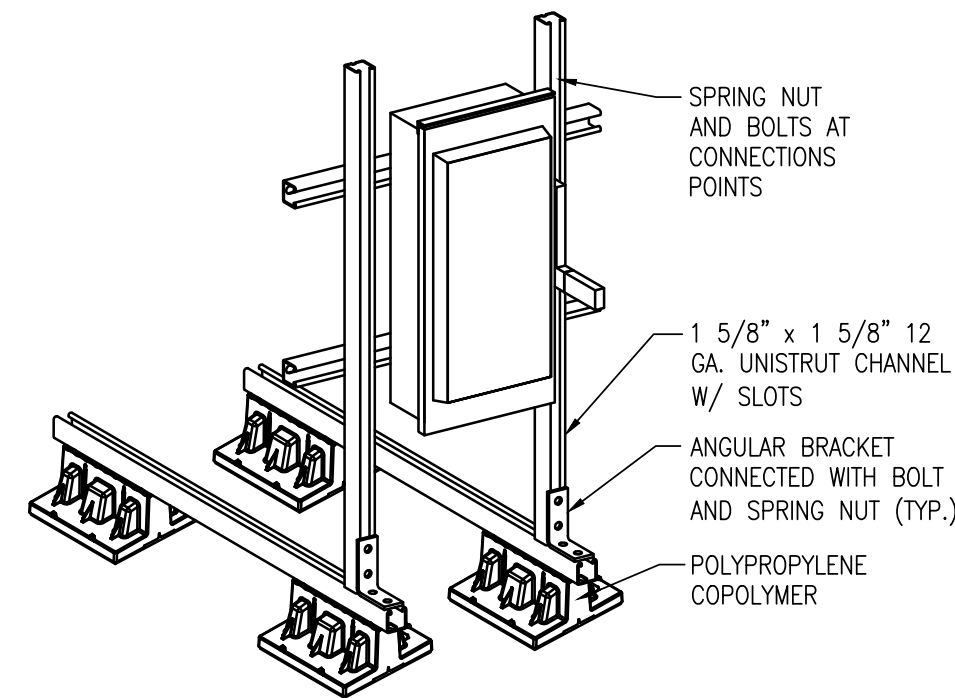
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 Salas O'Brien Project Number: 2450-70304-00

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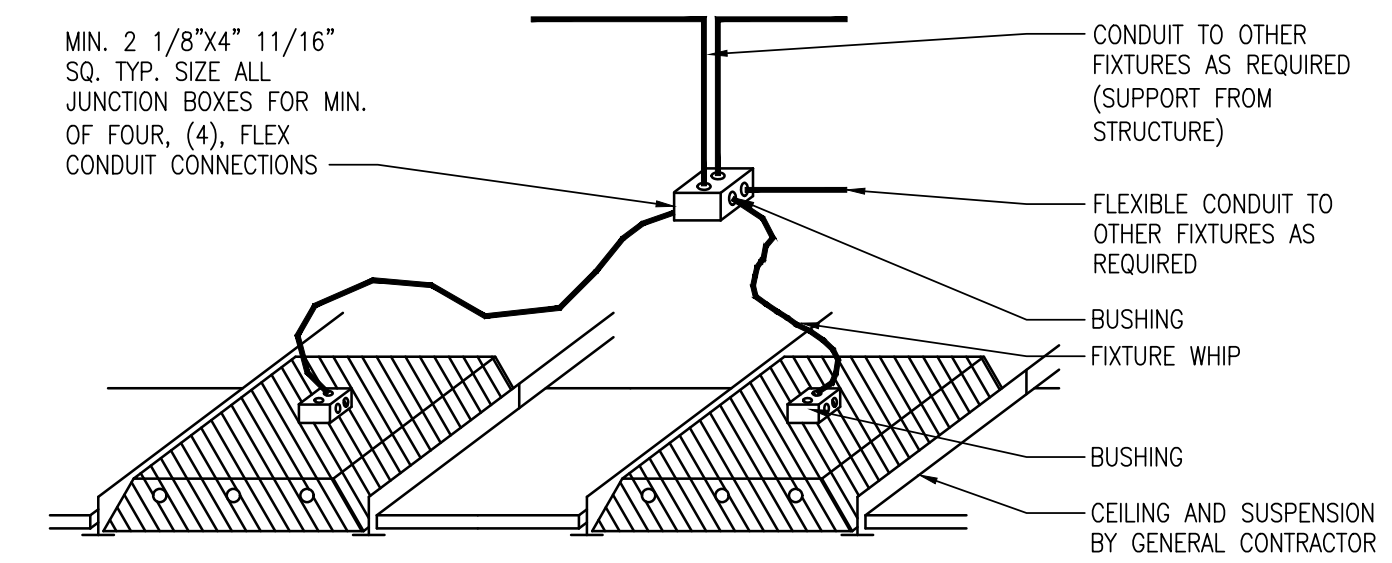
3 TYP. OUTLET MOUNTING DETAIL
NO SCALE



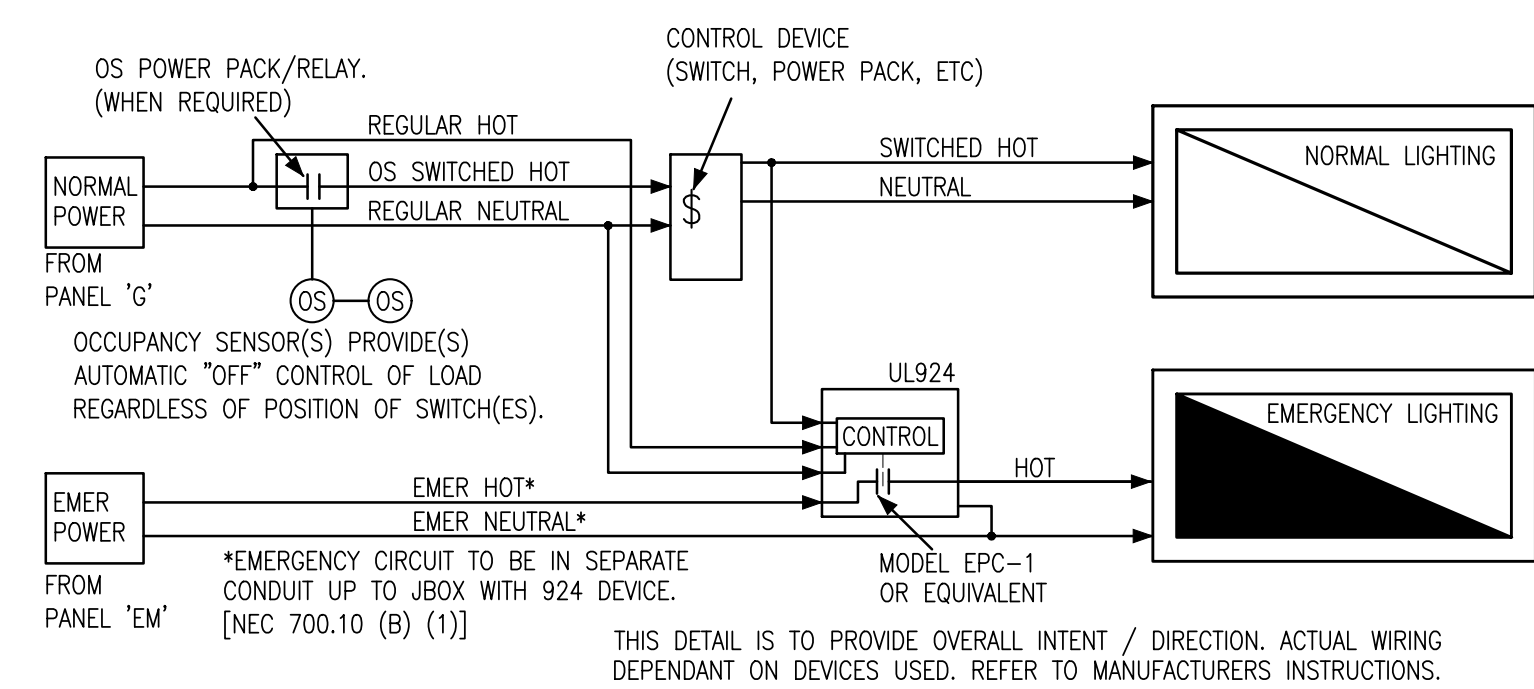
NOTE:

1. FREE STANDING DISCONNECT CONSTRUCTED BY EC
2. ALL METAL PARTS SHALL BE EITHER STAINLESS STEEL, HOT-DIPPED GALVANIZED OR PRE-GALVANIZED FOR OUTDOOR WEATHER PROTECTION.
3. BASE SHALL BE FROM MANUFACTURER ROOFTOP BLOX OR APPROVED EQUAL.

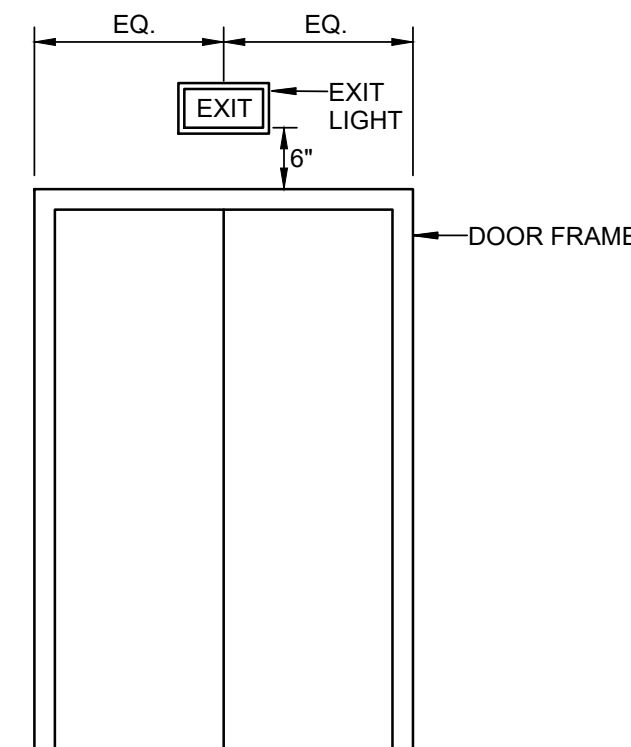
2 DISCONNECT ROOF MOUNTING DETAIL
NO SCALE



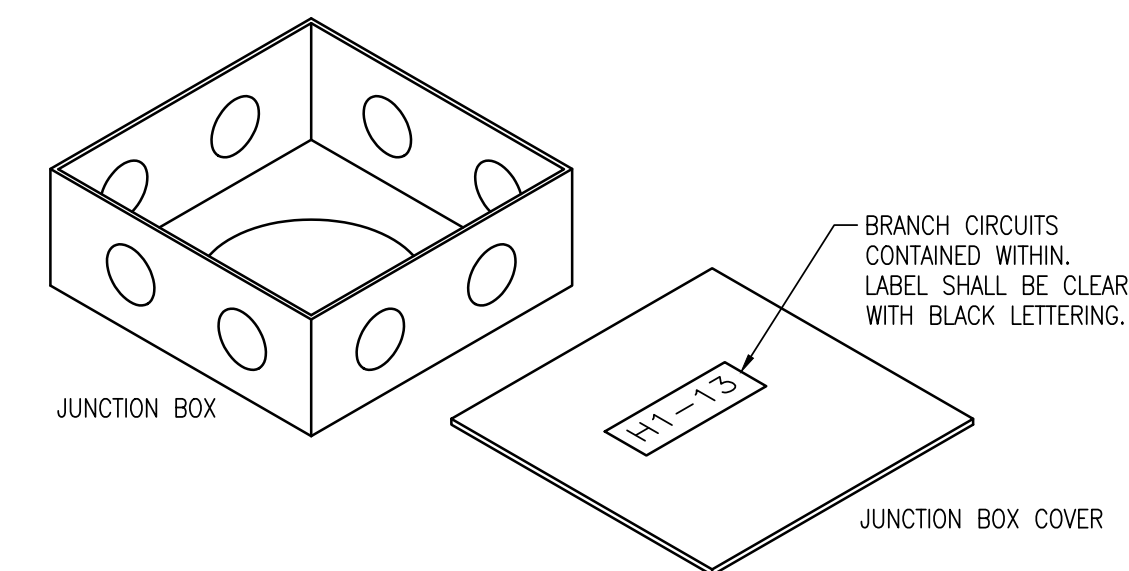
1 TYP. TROFFER POWER DETAIL
NO SCALE



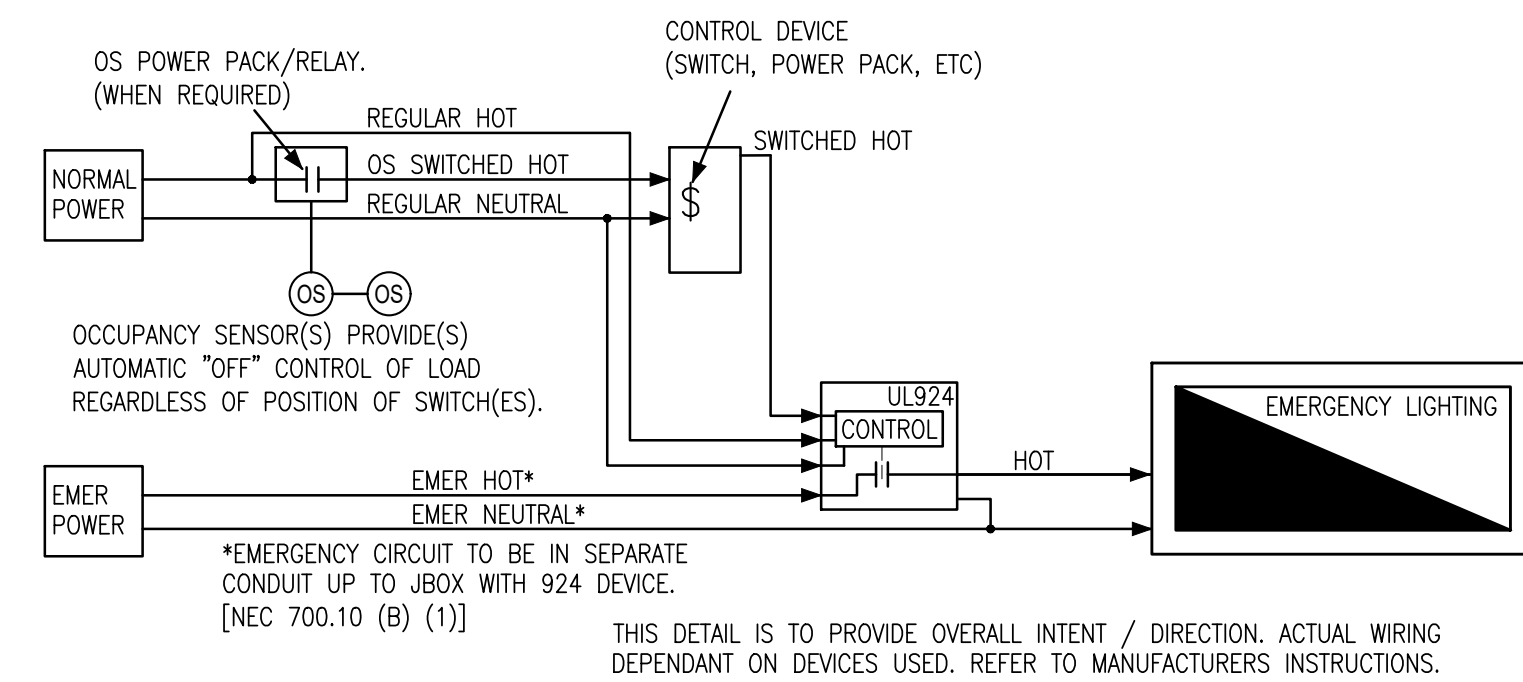
6 EMERGENCY LIGHTING CONTROL
NOT TO SCALE



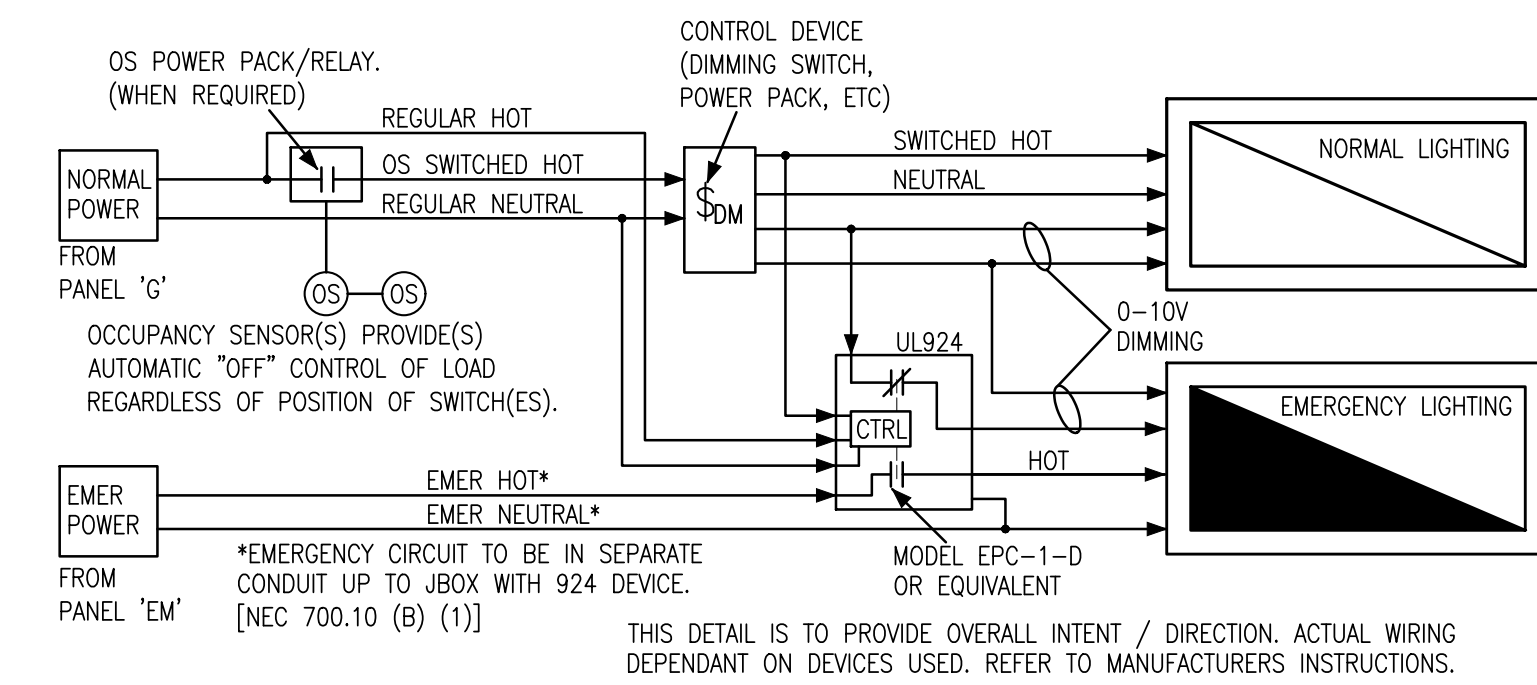
5 TYP. EXIT SIGN LOCATION DETAIL
NO SCALE



4 JUNCTION BOX LABELING DETAIL
NO SCALE



8 FIXTURES POWERED ONLY FROM EM POWER
EMERGENCY LIGHTING CONTROL
NOT TO SCALE

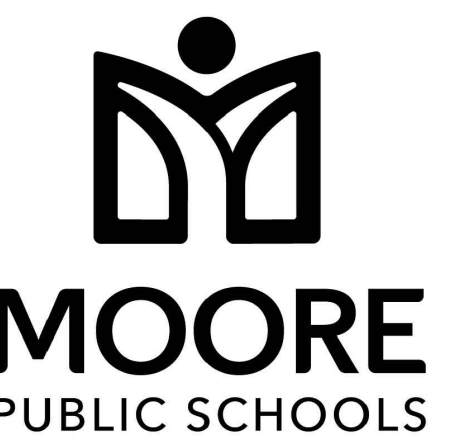


7 EMERGENCY LIGHTING CONTROL (WITH DIMMING)
NOT TO SCALE



DWG
drawn by
TVO
checked by
OCTOBER 2024
date

revisions



CHILD CARE FACILITY
201 N. EASTERN AVE.

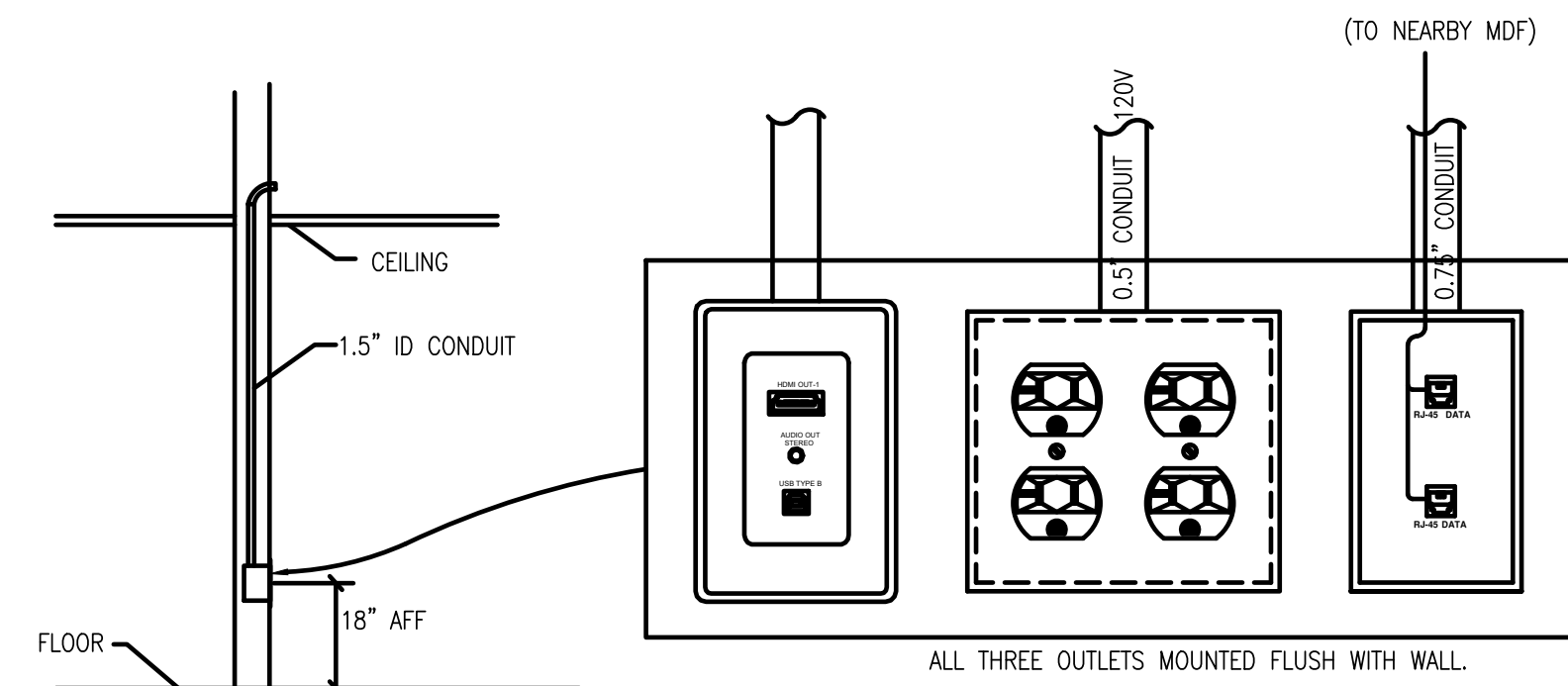
sheet no:

E501



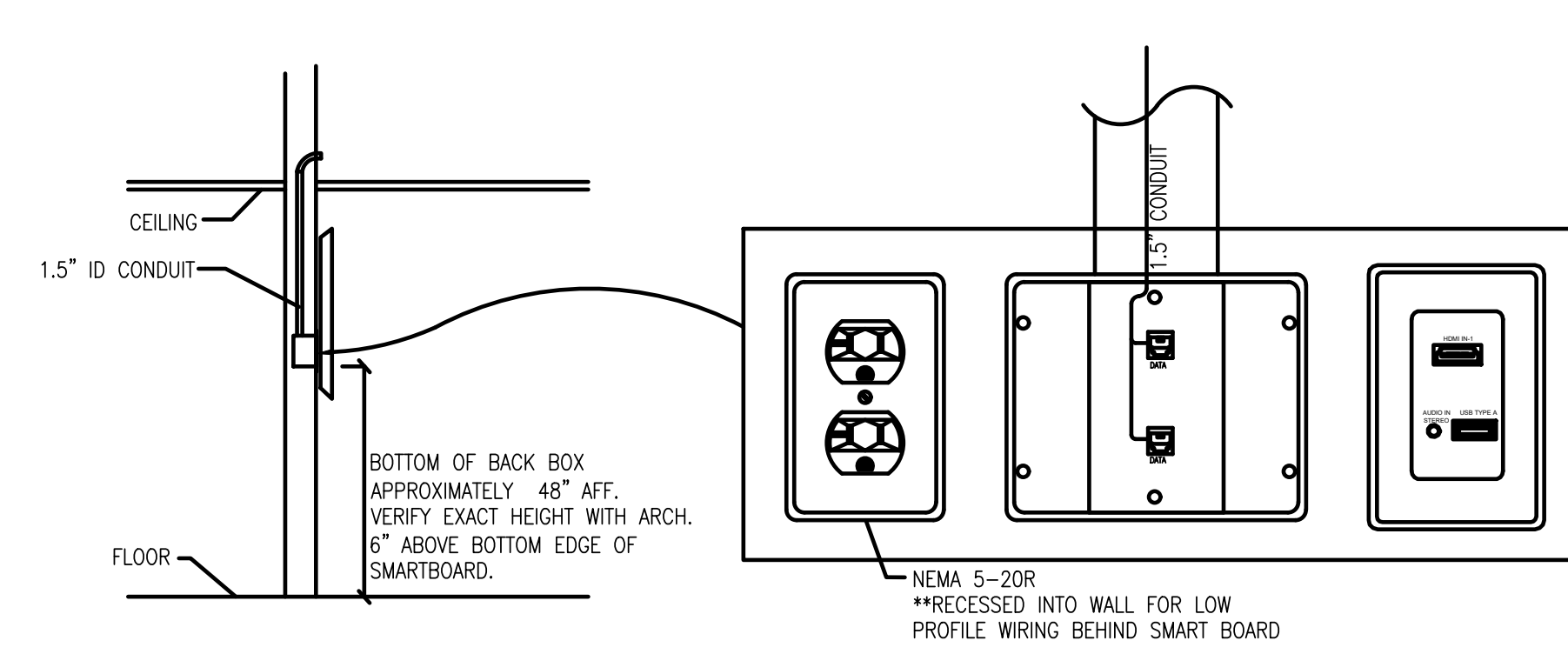
DWG	drawn by
TVO	checked by
OCTOBER 2024	date
revisions	

DATA & POWER OUTLET NEAR TEACHERS DESK

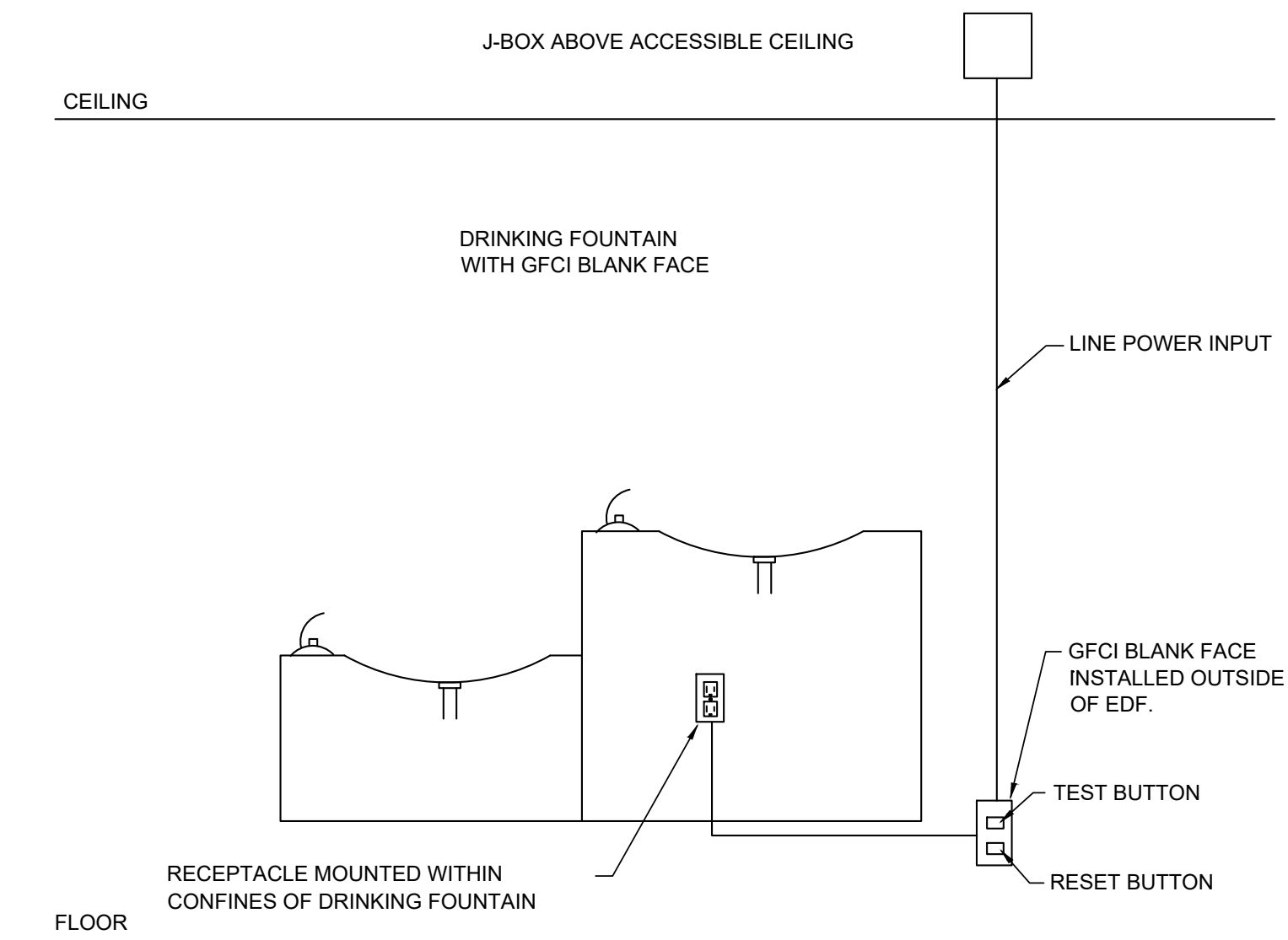


1 TEACHERS DESK & SMART BOARD WIRING DETAIL
NO SCALE

POWER OUTLET BEHIND SMARTBOARD



2 POWER OUTLET BEHIND SMARTBOARD
NO SCALE



2 TYP. ELECTRICAL DRINKING FOUNTAIN DETAIL
NO SCALE



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

E502

Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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Panel L2		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
NOTE		FED FROM MDP	BUS AMPS 600	MAIN BKR MLO				
NOTE		NEUTRAL 100%	LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	25/3	5.48	RTU-1	a	2	35/3	7.21	RTU-9
3				b	4			
5				c	6			
7	40/3	7.49	RTU-2	a	8	40/3	7.49	RTU-10
9				b	10			
11				c	12			
13	25/3	5.48	RTU-3	a	14	50/3	13.3	RTU-11
15				b	16			
17				c	18			
19	40/3	7.49	RTU-4	a	20	35/3	7.21	RTU-12
21				b	22			
23				c	24			
25	50/3	13.3	RTU-5	a	26	50/3	13.3	RTU-13
27				b	28			
29				c	30			
31	25/3	5.48	RTU-6	a	32	25/3	7.21	RTU-14
33				b	34			
35				c	36			
37	50/3	13.3	RTU-7	a	38	25/3	5.48	RTU-15
39				b	40			
41				c	42			
43	50/3	13.8	RTU-8	a	44	25/3	5.48	RTU-16
45				b	46			
47				c	48			
49	20/1	0	SPACE	a	50	20/1	0	SPACE
51	20/1	0	SPACE	b	52	20/1	0	SPACE
53	20/1	0	SPACE	c	54	20/1	0	SPACE
55	20/1	0	SPACE	a	56	20/1	0	SPACE
57	20/1	0	SPACE	b	58	20/1	0	SPACE
59	20/1	0	SPACE	c	60	20/1	0	SPACE

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LARGEST MOTOR	13.8	3.46 (25%)	TOTAL LOAD	142	
MOTORS	138	138 (100%)	BALANCED 3-PHASE LOAD	394 A	
			PHASE A	100%	
			PHASE B	100%	
			PHASE C	100%	

Panel EM1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
NOTE		FED FROM ATS	BUS AMPS 60	MAIN BKR 60				
NOTE		NEUTRAL 100%	LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.196	LIGHTING	a	2	15/1	1.18	SF-1
3	20/1	0.441	LIGHTING	b	4	15/1	0.696	SF-2
5	20/1	1	LIGHTING	c	6	15/1	0.696	SF-3
7	20/1	0.929	LIGHTING	a	8	20/1	0.5	BLOCK HEATER
9	20/1	0.55	LIGHTING	b	10	20/1	0.5	BATTERY HEATER
11	20/1	0.647	LIGHTING	c	12	20/1	0.5	BATTERY CHARGER
13	20/1	0.572	LIGHTING	a	14	20/1	0.18	RECEPTACLE
15	20/1	0.477	LIGHTING	b	16	20/1	0	SPACE
17	20/1	0	SPACE	c	18	20/1	0	SPACE
19	20/1	0	SPACE	a	20	20/1	0	SPACE
21	20/1	0	SPACE	b	22	20/1	0	SPACE
23	20/1	0	SPACE	c	24	20/1	0	SPACE
25	20/1	0	SPACE	a	26	20/1	0	SPACE
27	20/1	0	SPACE	b	28	20/1	0	SPACE
29	20/1	0	SPACE	c	30	20/1	0	SPACE

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	4.81	6.02 (125%)	MOTORS	2.57	2.57 (100%)
LARGEST MOTOR	1.18	0.294 (25%)	RECEPTACLES	1.68	1.68 (50%>10)
			TOTAL LOAD	10.6	
			BALANCED 3-PHASE LOAD	29.3 A	
			PHASE A	118%	
			PHASE B	88.2%	
			PHASE C	94.2%	

Panel L1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
NOTE		FED FROM MDP	BUS AMPS 225	MAIN BKR MLO				
NOTE		NEUTRAL 100%	LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.72	ROOFTOP RECEPTACLE	a	2	20/1	1.28	LIGHTING
3	20/1	0.36	RM 431 RECEPTACLE, RM 433 RECEPTACLE	b	4	20/1	0.793	LIGHTING
5	20/1	0.36	I.T. RECEPTACLE	c	6	20/1	0.706	LIGHTING
7	20/1	0.36	I.T. RECEPTACLE	a	8	20/1	0.48	LIGHTING
9	20/1	0.36	I.T. RECEPTACLE	b	10	20/1	0.636	LIGHTING
11	20/1	0.36	I.T. RECEPTACLE	c	12	20/1	1.06	LIGHTING
13	20/1	0.54	RM 434 RECEPTACLE	a	14	20/1	0.528	CP-3
15	20/1	0.54	RM 434 RECEPTACLE	b	16	20/1	0.1	WH-3
17	20/1	0.54	RM 430 RECEPTACLE	c	18	20/1	0.1	WH-4
19	20/1	0.36	RM 430 RECEPTACLE	a	20	20/1	0.1	WH-1
21	20/1	0.72	RM 429 RECEPTACLE, SMARTBOARD	b	22	20/1	0.1	WH-2
23	20/1	0.54	RM 429 RECEPTACLE	c	24	20/1	0.1	WH-5
25	20/1	0.72	RM 1E RECEPTACLE, RM 5 RECEPTACLE	a	26	20/1	0.528	CP-2
27	20/1	0.93	CORRIDOR 428 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 435 RECEPTACLE, TRAP PRIMER	b	28	15/1	0.696	EF-1
29	20/1	0.54	RM 5 RECEPTACLE	c	30	30/2	4.5	EW-1
31	20/1	0.72	RM 1D RECEPTACLE, RM 4 RECEPTACLE	a	32			
33	20/1	0.54	RM 4 RECEPTACLE	b	34	15/1	0.696	EF-5
35	20/1	0.54	RM 3 RECEPTACLE	c	36	15/1	0.696	EF-6
37	20/1	0.72	RM 1C RECEPTACLE, RM 3 RECEPTACLE	a	38	15/1	0.696	EF-2
39	20/1	0.72	RM 1B RECEPTACLE, RM 2 RECEPTACLE	b	40	20/1	0.528	CP-1
41	20/1	0.54	RM 2 RECEPTACLE	c	42	20/2	2	EFH-1
43	20/1	0.54	RM 103 RECEPTACLE	a	44			
45	20/1	0.72	RM 101C RECEPTACLE, RM 103 RECEPTACLE	b	46	20/2	2	EFH-4
47	20/1	0.72	RM 101B RECEPTACLE, RM 102 RECEPTACLE	c	48			
49	20/1	0.54	RM 102 RECEPTACLE	a	50	15/1	0.696	EF-7
51	20/1	0.72	RM 101A RECEPTACLE, RM 101 RECEPTACLE	b	52	20/1	0.9	RM 301A RECEPTACLE, RM 301 RECEPTACLE, RM 303 RECEPTACLE
53	20/1	0.54	RM 101 RECEPTACLE	c	54	20/1	0.72	RM 301 RECEPTACLE, SMARTBOARD
55	20/1	0.72	RM 101D RECEPTACLE, RM 104 RECEPTACLE	a	56	20/1	0.72	RM 422 RECEPTACLE
57	20/1	0.54	RM 104 RECEPTACLE	b	58	20/1	0.54	RM 423 RECEPTACLE, RM 424 RECEPTACLE, RM 425 RECEPTACLE
59	20/1	0.72	RM 101E RECEPTACLE, RM 105 RECEPTACLE	c	60	20/1	0.72	RM 205 RECEPTACLE
61	20/1	0.9	CORRIDOR 436 RECEPTACLE, RM 105F RECEPTACLE, RM 105 RECEPTACLE	a	62	20/1	0.72	RM 201E RECEPTACLE, RM 205 RECEPTACLE
63	20/1	0.72	RM 201C RECEPTACLE, RM 203 RECEPTACLE	b	64	20/1	0.73	RM 201D RECEPTACLE, RM 204 RECEPTACLE, TRAP PRIMER
65	20/1	0.54	EXTERIOR RECEPTACLE	c	66	20/1	0.72	RM 204 RECEPTACLE
67	20/1	1.1	CORRIDOR 419 RECEPTACLE, CORRIDOR 420 RECEPTACLE, CORRIDOR 428 RECEPTACLE, RM 421 RECEPTACLE, TRAP PRIMER	a	68	20/1	0.72	RM 202 RECEPTACLE
69	20/1	0.36	TELECOM EQ	b	70	20/1	0.72	RM 201B RECEPTACLE, RM 202 RECEPTACLE
71	20/1	0	SPACE	c	72	20/1	0.72	RM 203 RECEPTACLE
73	20/1	0	SPACE	a	74	20/1	0.35	DRYER
75	20/1	0	SPACE	b	76	20/1	0.84	WASHER
77	20/1	0	SPACE	c	78	20/1	0.18	FACP
79	20/1	0	SPACE	a	80	20/1	0	SPACE
81	20/1	0	SPACE	b	82	20/1	0	SPACE
83	20/1	0	SPACE	c	84	20/1	0	SPACE

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	4.96	6.2 (125%)	MOTORS	5.56	5.56 (100%)
LARGEST MOTOR	0.696	0.174 (25%)	RECEPTACLES	30.4	20.2 (50%>10)
			HEATING	8.5	8.5 (100%)
			TOTAL LOAD	40.6	
			BALANCED 3-PHASE LOAD	113 A	
			PHASE A	110%	
			PHASE B	93.8%	
			PHASE C	96.6%	

Panel MDP		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
NOTE		FED FROM UTILITY	BUS AMPS 1200	MAIN BKR 1200				
NOTE		NEUTRAL 100%	LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	225/3	49.4	PANEL L1	a	2	600/3	138	PANEL L2
3				b	4			
5				c	6			
7	125/3	34.4	PANEL L3	a	8	225/3	61.9	PANEL LK
9				b	10			
11				c	12			
13	20/1	0	SPACE	a	14	60/3	9.06	TRANSFER SWITCH ATS
15	20/1	0	SPACE	b	16			
17	20/1	0	SPACE	c	18			
19	20/1	0	SPACE	a	20	20/1	0	SPACE
21	20/1	0	SPACE	b	22	20/1	0	SPACE
23	20/1	0	SPACE	c	24	20/1	0	SPACE
25	20/1	0	SPACE	a	26	20/1	0	SPACE
27	20/1	0	SPACE	b	28	20/1	0	SPACE
29	20/1	0	SPACE	c	30	20/1	0	SPACE

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	14.6	18.2 (125%)	MOTORS	205	205 (100%)
LARGEST MOTOR	18	4.5 (25%)	RECEPTACLES	57.8	33.9 (50%>10)
			HEATING	15.3	15.3 (100%)
			TOTAL LOAD	277	
			BALANCED 3-PHASE LOAD	770 A	
			PHASE A	102%	
			PHASE B	100%	
			PHASE C	97.3%	

Panel L3		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
NOTE		FED FROM MDP	BUS AMPS 125	MAIN BKR 125				
NOTE		NEUTRAL 100%	LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.18	RM 410 RECEPTACLE	a	2	20/1	0.678	LIGHTING
3	20/1	0.18	RM 410 RECEPTACLE	b	4	20/1	0.619	LIGHTING
5	20/1	0.18	RM 410 RECEPTACLE	c	6	20/1	0.838	LIGHTING
7	20/1	0.72	RM 410 RECEPTACLE	a	8	20/1	0.931	LIGHTING
9	20/1	0.72	RM 409 RECEPTACLE	b	10	20/1	0.99	LIGHTING
11	20/1	0.72	RM 406 RECEPTACLE	c	12	20/1	0.72	ROOFTOP RECEPTACLE
13	20/1	0.72	RM 405 RECEPTACLE	a	14	20/1	0.37	WATER COOLER RECEPTACLE
15	20/1	0.72	RM 404 RECEPTACLE	b	16	20/1	0.54	RM 1 RECEPTACLE
17	20/1	1.2	COPY MACHINE	c	18	20/1	1.09	CORRIDOR 412 RECEPTACLE, CORRIDOR 416 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 411 RECEPTACLE, TRAP PRIMER
19	20/1	0.36	RM 403 RECEPTACLE	a	20	20/1	0.72	RM 1A RECEPTACLE, RM 1 RECEPTACLE
21	20/1	0.36	RM 402 RECEPTACLE	b	22	20/1	0.55	RM 436A RECEPTACLE, RM 436 RECEPTACLE, TRAP PRIMER
23	20/1	0.36	RM 402 RECEPTACLE	c	24	20/1	0.36	RM 436 RECEPTACLE
25	20/1	0.54	RM 402 RE					

MECHANICAL EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
CP-1	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-40	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
CP-2	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-26	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
CP-3	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-14	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-1	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-28	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-38	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-42	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-4	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-40	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-5	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-34	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-6	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-36	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-7	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-50	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-8	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-52	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EFH-1	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-42,44	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-2	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-48,50	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-3	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-44,46	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-4	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-46,48	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EW-1	ELECTRIC WATER HEATER	208V 2P 2W		4.5			L1-30,32	3/4"C,2#10,1#10G	NON-FUSED	EC	EC
RTU-1	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-1,3,5	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-2	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-7,9,11	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-3	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-13,15,17	3/4"C,3#8,1#10G	NON-FUSED	MC	MC
RTU-4	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-19,21,23	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-5	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-25,27,29	3/4"C,3#6,1#10G	NON-FUSED	MC	MC
RTU-6	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-31,33,35	3/4"C,3#8,1#10G	NON-FUSED	MC	MC
RTU-7	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-37,39,41	1"C,3#4,1#10G	NON-FUSED	MC	MC
RTU-8	ROOF TOP UNIT	208V 3P 3W		13.83	48	50	L2-43,45,47	1"C,3#4,1#10G	NON-FUSED	MC	MC
RTU-9	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-2,4,6	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-10	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-8,10,12	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-11	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-14,16,18	3/4"C,3#6,1#10G	NON-FUSED	MC	MC
RTU-12	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-20,22,24	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-13	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-26,28,30	1"C,3#4,1#10G	NON-FUSED	MC	MC
RTU-14	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-32,34,36	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-15	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-38,40,42	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
RTU-16	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-44,46,48	3/4"C,3#10,1#10G	NON-FUSED	MC	MC
SF-1	EXHAUST FAN	120V 1P 2W	1/2 HP	1.18	2	15	EM1-2	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
SF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-4	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
SF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-6	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
WH-1	WATER HEATER	120V 1P 2W	F HP	0.1			L1-20	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-2	WATER HEATER	120V 1P 2W	F HP	0.1			L1-22	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-3	WATER HEATER	120V 1P 2W	F HP	0.1			L1-16	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-4	WATER HEATER	120V 1P 2W	F HP	0.1			L1-18	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-5	WATER HEATER	120V 1P 2W	F HP	0.1			L1-24	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC

KITCHEN EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
AC	AIR CURTAIN	120V 1P 2W	1 HP	1.92			LK-5	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
CLR	COOLER	120V 1P 2W		0.3			LK-7	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
CO-1	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-11	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
CO-2	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-13	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
CS-1	CONVECTION STEAMER	208V 2P 2W		6			LK-21,23	3/4"C,2#6,1#10G	NON-FUSED	EC	EC
CS-2	CONVECTION STEAMER	208V 2P 2W		8			LK-25,27	3/4"C,2#6,1#10G	NON-FUSED	EC	EC
DW	DISHWASHER	208V 3P 3W		18			LK-4,6,8	1"C,3#4,1#8G	NON-FUSED	EC	EC
EK	ELECTRIC KETTLE	208V 3P 3W		10.8			LK-15,17,19	3/4"C,3#8,1#10G	NON-FUSED	EC	EC
FRZ	FREEZER	120V 1P 2W		0.3			LK-7	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
HC	HOT CABINET	120V 1P 2W		1.92			LK-9	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
HFW	HOT FOOD WELL	208V 2P 2W		2.81			LK-35,37	3/4"C,2#12,1#12G	NON-FUSED	EC	EC
IM	ICE MAKER	120V 1P 2W		1.62			LK-33	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
MC	MILK COOLER	120V 1P 2W		0.33			LK-41	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
MW	MICROWAVE	120V 1P 2W		1.5			LK-29	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
RFW	REFRIGERATED FOOD WELL	120V 1P 2W		0.84			LK-39	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
SM	STAND MIXER	120V 1P 2W	1/2 HP	1.18			LK-31	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
VEN	VENTILATOR	120V 1P 2W		1.8			LK-43	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC

Panel		ROOM	VOLTS	208Y/120V 3P 4W	AIC	65,000			
LK		MOUNTING	BUS AMPS	225	MAIN BKR	225			
		RECESSED	NEUTRAL	100%	LUGS	STANDARD			
		FED FROM	NOTE	SHUNT TRIP MAIN BREAKER					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION		
1	20/1	0.54	RECEPTACLE	a 2	20/1	0.752	LIGHTING		
3	20/1	0.72	RECEPTACLE	b 4	70/3	18	DW		
5	20/1	1.92	AC	c 6					
7	20/1	0.6	CLR, FRZ	d 8					
9	20/1	1.92	HC	e 10	20/1	0.03	TRAP PRIMER		
11	20/1	1.18	CO-1	f 12	20/1	0	SHUNT TRIP		
13	20/1	1.18	CO-2	g 14	20/1	0.18	GAS VALVE		
15	40/3	10.8	EK	h 16	20/1	0	SPACE		
17				i 18	20/1	0	SPACE		
19				j 20	20/1	0	SPACE		
21	40/2	6	CS-1	k 22	20/1	0	SPACE		
23				l 24	20/1	0	SPACE		
25	50/2	8	CS-2	m 26	20/1	0	SPACE		
27				n 28	20/1	0	SPACE		
29	20/1	1.5	MW	o 30	20/1	0	SPACE		
31	20/1	1.18	SM	p 32	20/1	0	SPACE		
33	20/1	1.62	IM	q 34	20/1	0	SPACE		
35	20/2	2.81	HFW	r 36	20/1	0	SPACE		
37				s 38	20/1	0	SPACE		
39	20/1	0.84	RFW	t 40	20/1	0	SPACE		
41	20/1	0.325	MC	u 42	20/1	0	SPACE		
43	20/1	1.8	VEN	v 44	20/1	0	SPACE		
45	20/1	0	SPACE	w 46	20/1	0	SPACE		
47	20/1	0	SPACE	x 48	20/1	0	SPACE		
49	20/1	0	SPACE	y 50	20/1	0	SPACE		
51	20/1	0	SPACE	z 52	20/1	0	SPACE		
53	20/1	0	SPACE	aa 54	20/1	0	SPACE		
55	20/1	0	SPACE	ab 56	20/1	0	SPACE		
57	20/1	0	SPACE	ac 58	20/1	0	SPACE		
59	20/1	0	SPACE	ad 60	20/1	0	SPACE		
		CONN KVA	CALC KVA			CONN KVA	CALC KVA		
LIGHTING		0.752	0.94	(125%)		MOTORS	56.9	56.9	(100%)
LARGEST MOTOR		18	4.5	(25%)		RECEPTACLES	1.47	1.47	(50%>10)
						HEATING	2.81	2.81	(100%)
						TOTAL LOAD		66.6	
						BALANCED 3-PHASE LOAD		185 A	
						PHASE A		103%	
						PHASE B		105%	
						PHASE C		91.7%	

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KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL



DWG
drawn by
TVO
checked by
OCTOBER 2024
date
revisions



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

E602

Salas O'Brien
2800 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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FIRE PROTECTION ABBREVIATIONS			
AG	ABOVE GRADE	FT	FOOT (FEET)
ADD	ADDENDUM	GAL	GALLON
ADJL	ADJUSTABLE	GC	GENERAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	GPM	GALLONS PER MINUTE
AFG	ABOVE FINISH GRADE	MC	MECHANICAL CONTRACTOR
ALT	ALTERNATE	MECH	MECHANICAL
BG	BELOW GRADE	MIN	MINIMUM
BI	BELOW FINISH GRADE	NTS	NOT TO SCALE
CI	CAST IRON	PC	PLUMBING CONTRACTOR
COL	COLUMN	PLBG	PLUMBING
CW	COLD WATER	QTY	QUANTITY
DN	DOWN	SCH	SCHEDULE
EC	ELECTRICAL CONTRACTOR	SPEC	SPECIFICATIONS
FD	FLOOR DRAIN	SS	STAINLESS STEEL
FDC	FIRE DEPARTMENT CONNECTION	TEMP	TEMPERATURE
FLR	FLOOR	TYP	TYPICAL
FP	FIRE PROTECTION	W/	WITH

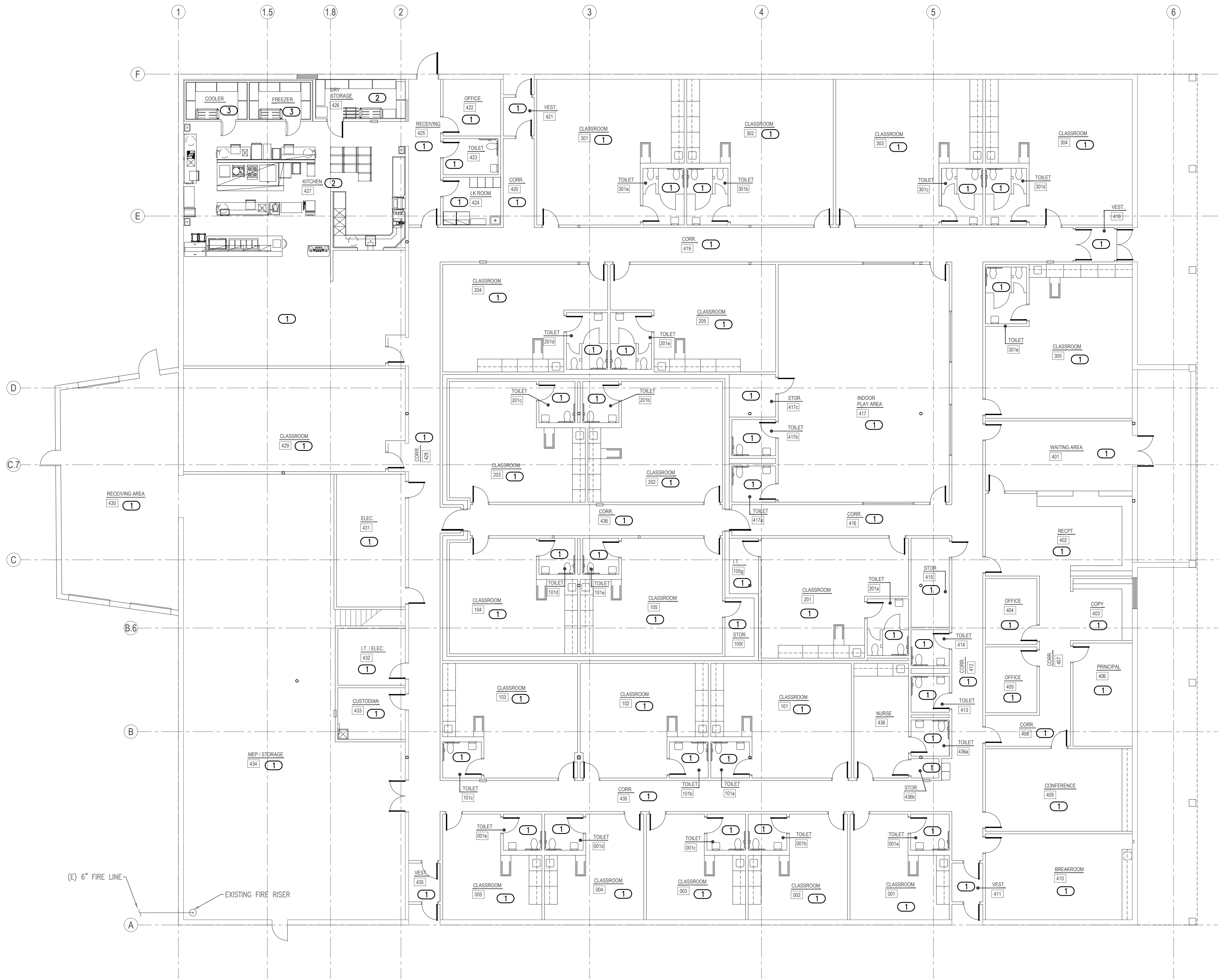
FIRE PROTECTION SYMBOL LEGEND	
	SHUTOFF VALVE
	CHECK VALVE
	DOUBLE CHECK VALVE
	END CAP
	FIRE DEPARTMENT CONNECTION (FDC)
	BELL

FIRE PROTECTION PIPING LINETYPES	
LINETYPE	DESCRIPTION
	NEW - ABOVE GRADE
	NEW - BELOW GRADE

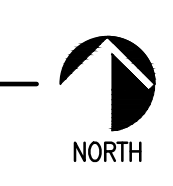
- ### FIRE PROTECTION GENERAL NOTES
- CONTRACTOR SHALL PROVIDE DESIGN FOR SPRINKLER SYSTEM FOR REMODELED EXISTING SPACE.
 - COORDINATE INSTALLATION OF SPRINKLER PIPING AND ALL COMPONENTS WITH OTHER TRADES, OWNER, AND GENERAL CONTRACTOR.
 - FIRE PROTECTION SYSTEM TO COMPLY WITH NFPA 13, INSURANCE CARRIER AND ALL APPLICABLE STATE AND LOCAL CODES.
 - CUTTING OF STRUCTURAL AND/OR ARCHITECTURAL MEMBERS TO BE DONE ONLY WITH THE WRITTEN APPROVAL OF THE ARCHITECT AND STRUCTURAL ENGINEER.
 - PROVIDE MINIMUM 5 PSI SAFETY FACTOR.
 - WORKING DRAWINGS INDICATING SPRINKLER HEAD LOCATIONS AND EXPOSED AND CONCEALED PIPING ROUTING SHALL BE PROVIDED TO THE ARCHITECT/ENGINEER PRIOR TO INSTALLATION FOR APPROVAL.
 - FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ORGANIZING A COORDINATION MEETING WITH OTHER TRADES AND OWNER PRIOR TO INSTALLATION.
 - SYSTEM PIPING LOCATION: WET SYSTEM PIPING SHALL BE INSTALLED AT HIGHEST ELEVATION POSSIBLE. PIPING SHALL BE INSTALLED ABOVE ALL MECHANICAL EQUIPMENT, DUCTWORK, AND ALL PLUMBING SYSTEM PIPING. PROVIDE ADEQUATE CLEARANCE TO MECHANICAL UNITS. FIRE PROTECTION CONTRACTOR SHALL COORDINATE FIRE PROTECTION PIPING PRIOR TO INSTALLATION.
 - PROPERLY TORQUE MECHANICAL TEES TO MANUFACTURER'S RECOMMENDATIONS.
 - FIRE PROTECTION PLANS ARE FOR REFERENCE ONLY. OCCUPANCIES AND AREAS OF PROTECTION NOTED ON THE PLANS SHALL BE CONFIRMED WITH NFPA 13 AND AUTHORITIES HAVING JURISDICTION. THIS CONTRACTOR SHALL COMPLY WITH ANY CODE REQUIREMENTS AS REQUIRED.

FIRE PROTECTION SHEET INDEX	
F101	FIRE PROTECTION PLAN

KEYED NOTES	
	1 LIGHT HAZARD AREA - REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE AND HEIGHT.
	2 ORDINARY HAZARD GROUP 1. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE AND HEIGHT.
	3 ORDINARY HAZARD GROUP 1. COORDINATE WITH FREEZER/COOLER SUPPLIER OR MANUFACTURER FOR SPRINKLER HEAD INSTALLATION. PROVIDE DRY SPRINKLER HEADS IN FREEZER/COOLER.



1 FIRE PROTECTION PLAN
SCALE: 3/32" = 1'-0"



Salas O'Brien
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ABBREVIATIONS

ABV	ABOVE	HDWD	HARDWOOD
ACUST	ACOUSTICAL	HDWR	HARDWARE
ADJ	ADJUSTABLE	HOHZ	HORIZONTAL
ANCH	ANCHOR	HT	HEIGHT
APPROX	APPROXIMATE	INSUL	INSULATION
BD	BOARD	JOINT	JOINT
BLKG	BLOCKING	LAV	LAVATORY
BM	BEAM	MATL	MATERIAL
BOT	BOTTOM	MAX	MAXIMUM
Q	CENTERLINE	MECH	MECHANICAL
CLG	CEILING	MFG	MANUFACTURING
CONC	CONCRETE	MFR	MISCELLANEOUS
CMU	CONCRETE MASONRY UNIT	MNI	MINIMUM
COL	COLUIMN	MISC	MISCELLANEOUS
CONT	CONTINUOUS	MTL	METAL
D.F.	DRINKING FOUNTAIN	N.L.C.	NOT IN CONTRACT
DM	DIMENSION	NO./#	NUMBER
DR	DOOR	N.T.S.	NOT TO SCALE
DWG	DRAWING	O.C.	ON CENTER
OPVG	OPENING	OPVG	OPPOSITE
DOVEL	DOVEL	OPP	OPPOSITE
EACH	EACH	PP	POWER POLE
ELECT	ELECTRICAL	PREFN	PREFINISHED
ELEV	ELEVATION	P.T.	PAPER TOWEL
EQ	EQUAL	P.W./P.Y. WD.	PLYWOOD
E.I.	EXPANSION JOINT	RE	REQUIRED
EW	EACH WAY	REOD	REQUIRED
EXIST	EXISTING	RM	ROOM
EXP	EXPANSION	S.B.	SPLASH BLOCK
EXT	EXTERIOR	SCHED	SCHEDULE
FD	FLOOR DRAIN	STD	STANDARD
FE	FIRE EXTINGUISHER	STL	STEEL
FEC	FIRE EXTINGUISHER CABINET	S.T.C.	SAWJOINT
FL	FIRE FLOOR LINE	S.J.	TOP OF CURB
FIN	FINISH	T.P.H.	TYPICAL
FRMG	FRAMING	TYP	UNLESS NOTED OTHERWISE
GA	GALVANIZED	U.N.O.	UNTYPED
G.B.	GRAB BAR	VTR	VENT THROUGH ROOF
GALV	GALVANIZED	W	WITH
GYP	GYP BOARD	WC	WATERCLOSET
H.C.	HANDICAP	WD	WOOD
		WVF	WELDED WIRE FABRIC

MATERIALS LEGEND

FOR PLANS AND DETAILS

	MASONRY VENEER
	C.M.U.
	CONCRETE
	FRAME PARTITION, METAL STUDS
	Gypsum Board
	Particle Board
	Rigid Insulation
	WOOD BLOCKING / FRAMING, CONTINUOUS
	WOOD BLOCKING, DISCONTINUOUS
	FINISH WOOD
	SMALL SCALE STRUCTURAL STEEL / MISCELLANEOUS METAL
	LARGE SCALE STRUCTURAL STEEL
	BATT INSULATION
	ACOUSTICAL CEILING TILE
	EARTH FILL

SYMBOLS LEGEND

	EXISTING SPOT ELEVATION
	FINISH SPOT ELEVATION
	EXISTING GRADE CONTOUR
	FINISH GRADE CONTOUR
	EXISTING TREE TO BE PROTECTED
	EXISTING TREE TO BE REMOVED
	PROJECT LIMITS
	CHAINLINK FENCE
	BARBED WIRE FENCE
	CONCRETE PAVING
	ASPHALT PAVING
	CONCRETE SIDEWALK
	EXISTING PAVING/SIDEWALK TO REMAIN
	EXISTING PAVING TO BE REMOVED
	NEW BUILDING
	EXISTING BUILDING - NO WORK
	ROOM NUMBER
	ROOM NUMBER/LARGE SCALE PLAN REFERENCE
	ROOM NUMBER/INTERIOR ELEVATION REFERENCE
	2/17 WALL SECTION/DETAIL CUT MARK
	2/17 LARGE SCALE DETAIL MARK
	1/15 STRUCTURAL GRID COORDINATES
	1/14 BUILDING SECTION CUT MARK
	6 DOOR NUMBER
	6 WINDOW MARK
	6 FRAME MARK
	62 GLAZING MATERIAL MARK
	4 EQUIPMENT MARK
	4/18 EXTERIOR ELEVATION MARK
	#4 TEST HOLE
	11'2 ELEV. BENCH MARK/BUILDING ELEVATION (SECTION)

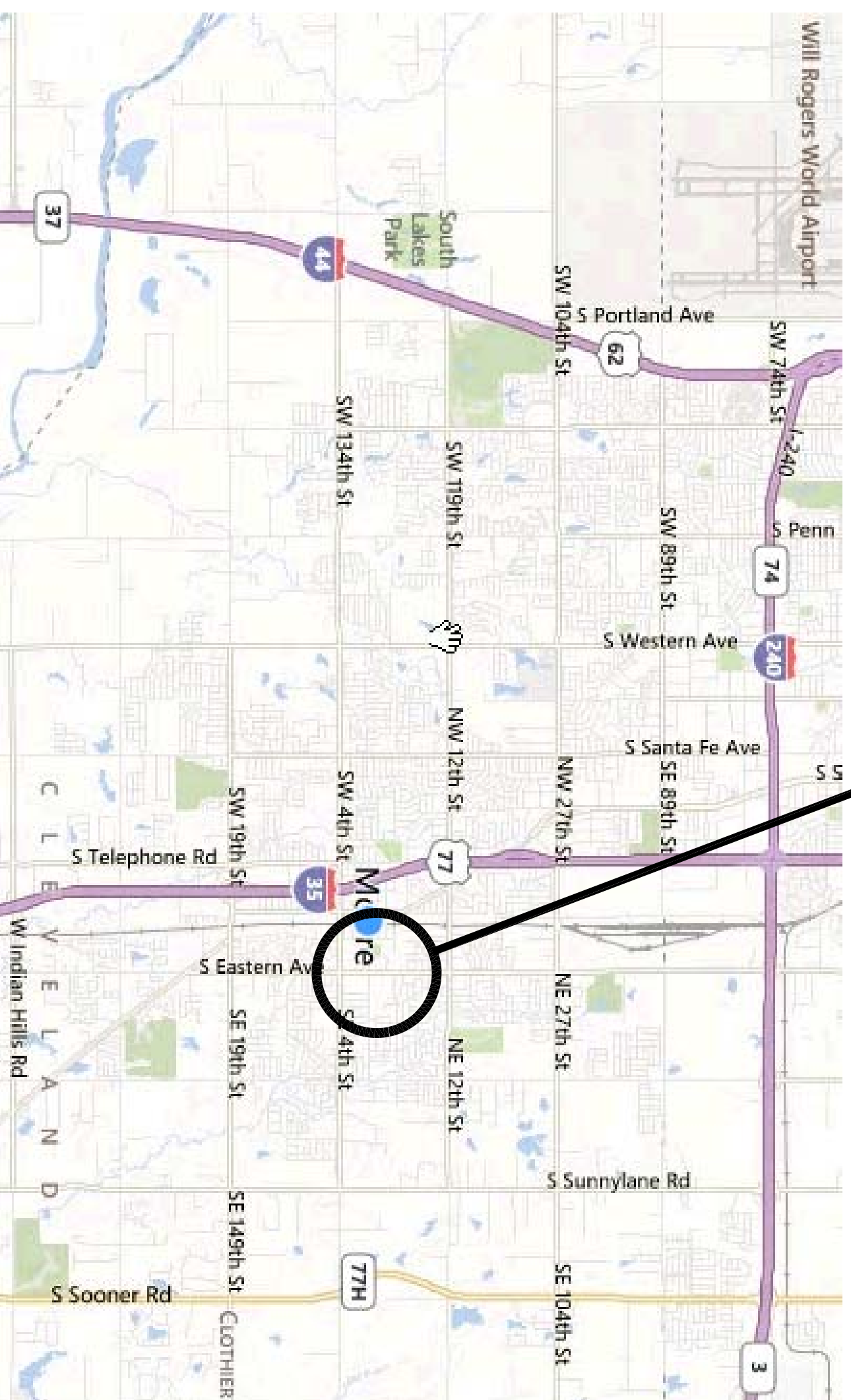
GENERAL NOTES:

1. ALL REQUIRED HANDICAP ACCESSIBLE ITEMS TO COMPLY WITH AMERICANS WITH DISABILITIES ACT AND ARCHITECTURAL BARRIERS ACT ACCESSIBILITY GUIDELINES.
2. THE CONTRACTOR SHALL NOT USE ANY LEAD-BASED PAINT OR ASBESTOS CONTAINING MATERIAL ON THIS PROJECT.
3. THESE CONTRACT DOCUMENTS INCLUDING BUT NOT LIMITED TO THE DRAWINGS, PROJECT MANUAL, AND ANY SUBSEQUENT ADDENDA ARE ISSUED AS A "WHOLE" AND SHALL BE BID AS SUCH. EACH DISCIPLINE / SUBCONTRACTOR SHALL REVIEW THE ENTIRE SET OF CONTRACT DOCUMENTS AND INCLUDE APPLICABLE WORK IN THEIR BID REGARDLESS OF LOCATION WITHIN THE CONTRACT DOCUMENTS. REVIEWING ONLY PORTION OF THE CONTRACT DOCUMENTS SHALL NOT ABSOLVE THE CONTRACTOR OR SUBCONTRACTOR OF THE REQUIREMENT TO PERFORM THE WORK OR THEIR RESPECTIVE DISCIPLINES.
4. LOCATIONS OF EXISTING BUILDINGS, SITE FEATURES, & UNDERGROUND UTILITIES HAVE BEEN OBTAINED FROM EXISTING AVAILABLE SOURCES. THE CONTRACTOR IS TO FIELD VERIFY EXISTING LOCATIONS PRIOR TO STARTING CONSTRUCTION AND NOTIFY THE ARCHITECT IMMEDIATELY IF ANY EXISTING BUILDING OR SITE FEATURE CONFLICTS WITH THE NEW CONSTRUCTION.
5. THE CONTRACTOR SHALL VERIFY ALL EXISTING SITE UTILITIES AND PROTECT DURING CONSTRUCTION. COORDINATE NEW UTILITY REQUIREMENTS WITH APPLICABLE UTILITY COMPANIES (WATER, GAS, ELECTRICITY, SANITARY SEWER, TELEPHONE, CABLE, SITE DAMAGE AND OTHERS AS REQUIRED). COMPLY WITH ALL APPLICABLE REGULATIONS. INCLUDE ALL CONNECTION FEES AND OTHER CHARGES IN BID.
6. REFER TO CIVIL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR UTILITY INFORMATION.
7. REFER TO CIVIL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL REQUIREMENTS AND CONCRETE TO BE PROVIDED BY CONTRACTOR.
8. GENERAL CONTRACTOR TO VERIFY LOCATIONS OF EASEMENTS, ENCUMBRANCES AND SET BACKS PRIOR TO STARTING CONSTRUCTION.
9. CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO ARCHITECT'S ATTENTION. FAILURE TO BID ITEM(S) NOTED ON DRAWINGS AND OMITTED FROM SPECIFICATIONS DOES NOT REMOVE RESPONSIBILITY TO PROVIDE AND INSTALL SUCH.

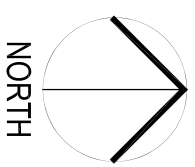
GENERAL NOTES (CONT):

10. CONSTRUCTION STAGING AREA & VEHICLE ACCESS SHALL BE CONFIRMED WITH OWNER, AND CONSTRUCTION MANAGER IF APPLICABLE. PRIOR TO CONSTRUCTION, DRAINAGE AWAY FROM NEW AND/OR EXISTING BUILDING(S).
11. FINISH GRADE AT BUILDING PERIMETERS SHALL BE 6" BELOW FINISH FLOOR UNLESS SPECIFICALLY NOTED OTHERWISE ON CIVIL DRAWINGS. DEVELOP POSITIVE DRAINAGE AWAY FROM NEW AND/OR EXISTING BUILDING(S).
12. ALL GRID LINES IDENTIFIED BY A LETTER OR NUMBER ARE PARALLEL UNLESS OTHERWISE NOTED.
13. SIZES OF HOUSEKEEPING PADS AND BASIS FOR MECHANICAL EQUIPMENT ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATION AND REQUIRED SIZE OF ALL CONCRETE PADS AND BASIS WITH EQUIPMENT MANUFACTURERS BEFORE POURING. ALL PADS (& ASSOCIATED BOLLARDS @ EXTERIOR LOCATIONS) TO BE PROVIDED BY THE CONTRACTOR.
14. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE VARIOUS TRADE ITEMS WITHIN THE SPACE ABOVE THE CEILING(S) INCLUDING, BUT NOT LIMITED TO STRUCTURAL MEMBERS AND SPRAY ON INSULATION OR FIREPROOFING, MECHANICAL DUCTS AND BATT INSULATION, CONDITTS, RACEWAY, SPRINKLER SYSTEMS, LIGHT FIXTURES, CEILING SYSTEMS, AND ANY SPECIAL STRUCTURAL SUPPORTS (REQUIRED) AND SHALL BE RESPONSIBLE FOR MAINTAINING THE FINISH CEILING HEIGHT ABOVE THE FINISH FLOOR INDICATED IN THE DRAWINGS AND FINISH SCHEDULE.
15. ALL METAL STUDS WALLS WHERE PLUMBING OCCURS OR STRUCTURAL COLUMNS ARE LOCATED SHALL BE MINIMUM 6" METAL STUDS. NOTIFY ARCHITECT OF ANY DISCREPANCIES OR CONFLICTS.
16. PROVIDE AND INSTALL ACCESS PANELS, WHERE REQUIRED BY BUILDING CODE OR FOR THE PROPER OPERATION OF MECHANICAL OR ELECTRICAL EQUIPMENT, AND AS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL COORDINATE SIZE, LOCATION, AND TYPE OF ACCESS PANEL WITH OTHER CONTRACTORS' WORK AND RECEIVE APPROVAL OF THE ARCHITECT. ACCESS PANEL SHALL BE AS SPECIFIED.
17. 3/4" FIRE-RETARDANT TREATED PLYWOOD BACKING 8'-0" HIGH SHALL BE PROVIDED AND INSTALLED ON ALL WALLS OF TELEPHONE AND ELECTRICAL ROOMS UNLESS SPECIFICALLY SHOWN OTHERWISE ON ELECTRICAL DRAWINGS.
18. ALL WOOD WITHIN THIS PROJECT (IE. PLYWOOD, BLOCKING, ETC.) SHALL BE FIRE-RETARDANT TREATED.
19. FOR ILLUSTRATION AND DEFINITION OF TYPICAL SYMBOLS USED ON THE ARCHITECTURAL DRAWINGS, SEE 'SYMBOLS AND ABBREVIATIONS' SHEET. ADDITIONAL SYMBOLS NOT SHOWN OR DEFINED THERE MAY OCCUR AND ARE DEFINED ON OTHER DRAWINGS.
20. REFER TO SPECIFICATIONS FOR ADDITIONAL PAINT ITEMS NOT SHOWN ON ROOM FINISH SCHEDULE.
21. THE SPECIFICATIONS AND ALL CONSULTANT DRAWINGS ARE SUPPLEMENTAL TO THE ARCHITECTURAL DRAWINGS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE ARCHITECTURAL DRAWINGS BEFORE THE INSTALLATION OF ANY OF THE CONSULTANTS' WORK AND TO BRING ANY DISCREPANCIES OR CONFLICTS TO THE ARCHITECT'S ATTENTION FOR CLARIFICATION. IMPROPERLY INSTALLED WORK SHALL BE CORRECTED BY THE CONTRACTOR AT NO EXPENSE TO THE ARCHITECT, HIS CONSULTANTS, OR THE OWNER.
22. THE ARCHITECTURAL DRAWINGS ARE A PART OF A LARGER SET OF DRAWINGS WHICH, WHEN COMPLETE, CONSISTS OF ALL DRAWINGS LISTED BY THE INDEX OF DRAWINGS. THE WORK DESCRIBED BY THE DRAWINGS OF ANY ONE DISCIPLINE MAY BE AFFECTED BY THE WORK DESCRIBED ON DRAWINGS OF ANOTHER DISCIPLINE AND MAY REQUIRE REFERENCE TO DRAWINGS OF ANOTHER DISCIPLINE. PARTIAL SETS OF DRAWINGS SHALL NOT BE DISTRIBUTED AND UTILIZED BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW AND COORDINATE THE WORK OF ALL SUBCONTRACTORS, TRADES, AND SUPPLIERS WITH THE REQUIREMENTS OF THE CONTRACT BEFORE COMMENCING CONSTRUCTION AND TO ASSURE THAT ALL PARTIES ARE AWARE OF ALL REQUIREMENTS, REGARDLESS OF WHERE THE REQUIREMENTS OCCUR IN THE CONTRACT DOCUMENTS.
23. THE ARCHITECTURAL DRAWINGS ESTABLISH AND COORDINATE THE FINISHED APPEARANCE AND EXACT LOCATIONS OF ALL EXPOSED ELEMENTS OF THE WORK, INCLUDING THAT WORK WHICH IS ILLUSTRATED PRIMARILY ON DRAWINGS OF OTHER DISCIPLINES. LOCATIONS SHOWN ON OTHER DRAWINGS ARE SCHEMATIC. UNLESS OTHERWISE NOTED ON THE ARCHITECTURAL DRAWINGS, THE ARCHITECTURAL DRAWINGS TAKE PRECEDENCE FOR THE FINISHED APPEARANCE AND EXACT LOCATION OF ALL PARTS OF THE WORK. EXCEPTIONS: DIMENSIONED LOCATIONS SHOWN ON DRAWINGS OF OTHER DISCIPLINES SHALL GOVERN ONLY WHERE: (A) SPECIFICALLY AND INDIVIDUALLY INDICATED BY SYMBOL, KENED NOTE, OR NOTATION ON THE ARCHITECTURAL DRAWINGS, (B) OCCURRING WITHIN A ROOM OR OTHER IDENTIFIED SPACE FOR WHICH ARCHITECTURAL SHEET OR SCHEDULE NOTES INDICATE THAT DIMENSIONS PROVIDED ELSEWHERE SHALL GOVERN, AND (C) OCCURRING WITHIN A ROOM OR OTHER IDENTIFIED SPACE FOR WHICH ARCHITECTURAL SHEET OR SCHEDULE NOTES INDICATE THAT DIMENSIONS PROVIDED ELSEWHERE SHALL GOVERN.
24. WORK NOT SPECIFICALLY INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY IMPLIED TO BE SIMILAR TO WORK SHOWN ON THE DRAWINGS IN CORRESPONDING AND OTHER PLACES SHALL BE CONSTRUCTED SIMILARLY.
25. PROVIDE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2A WITHIN 75 FOOT TRAVEL DISTANCE TO ALL PORTIONS OF THE BUILDING. PROVIDE PORTABLE FIRE EXTINGUISHERS AS THE BUILDING IS CONSTRUCTED.
26. FOR THIS PROJECT, THE TERM "CONTRACTOR" SHALL BE UNDERSTOOD TO REFER TO THE "CONSTRUCTION MANAGER /MANAGEMENT COMPANY"
27. CONTRACTOR SHALL COORDINATE SCHEDULE ALL CONSTRUCTION WITH THE OWNERS REQUIREMENTS FOR ALL SPORTS TO REMAIN ACTIVE DURING CONSTRUCTION.

PROJECT LOCATION



VICINITY MAP



MOORE PUBLIC SCHOOLS
CHILD CARE CENTER
201 N. EASTERN AVE.
MOORE, OKLAHOMA 73160

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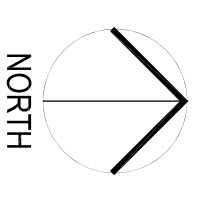
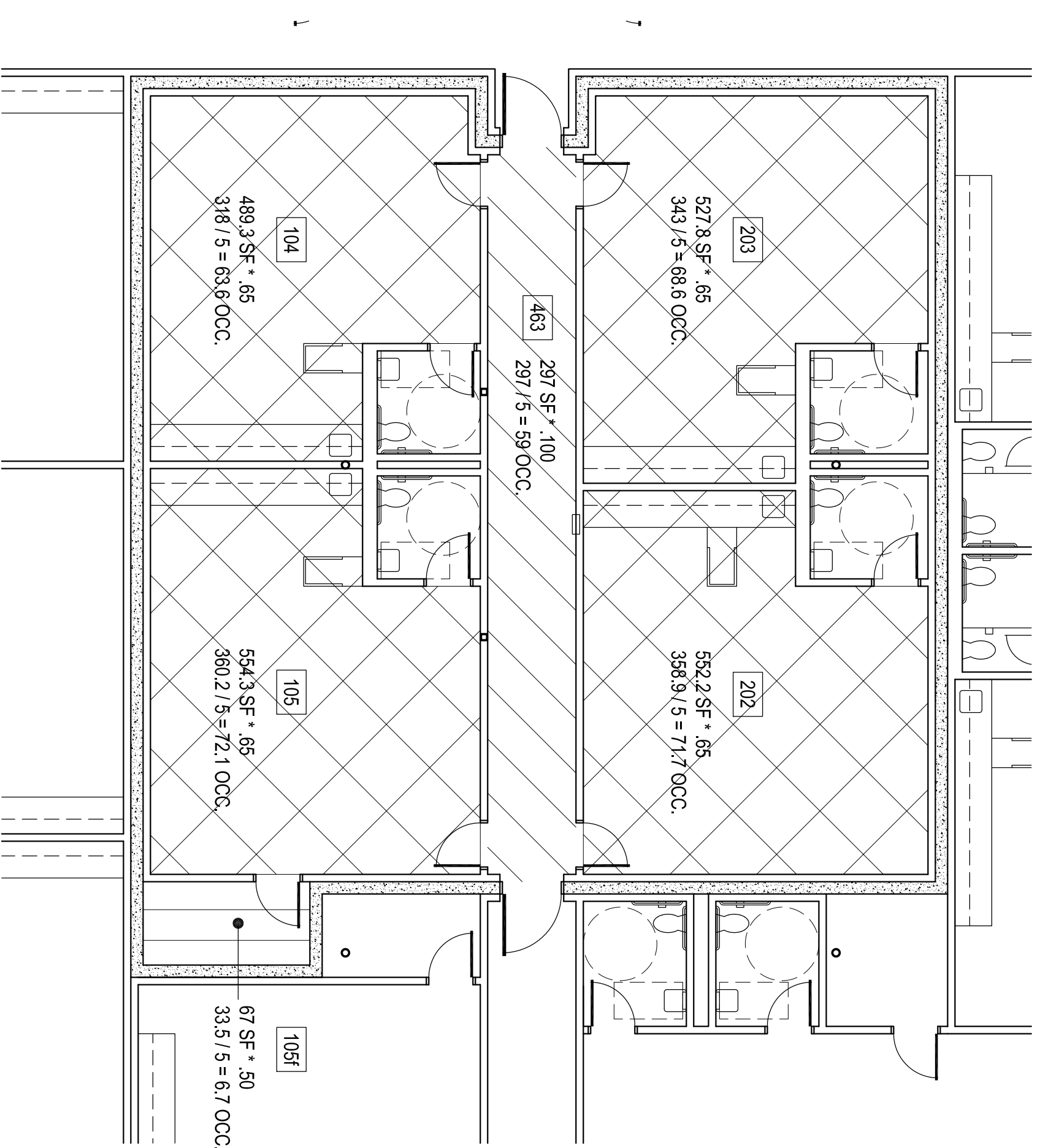
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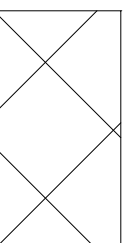
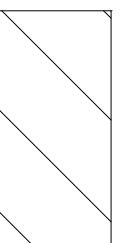
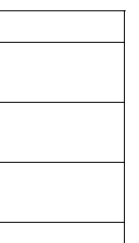
10/22/24

CEDAR CREEK
CIVIL
KFC ENGINEERING
STRUCTURAL
SALAS O'BRIEN
MECHANICAL/ELECTRICAL



1 SHELTER CALCULATION PLAN
1/8" = 1'-0"

GENERAL NOTES:

-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 65% X 2,122 S.F. = 1,379.3 S.F.
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 100% X 297 S.F. = 297 S.F.
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 50% X 67 S.F. = 33.5 S.F.

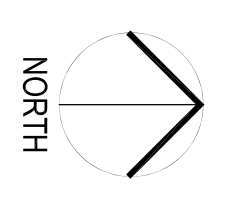
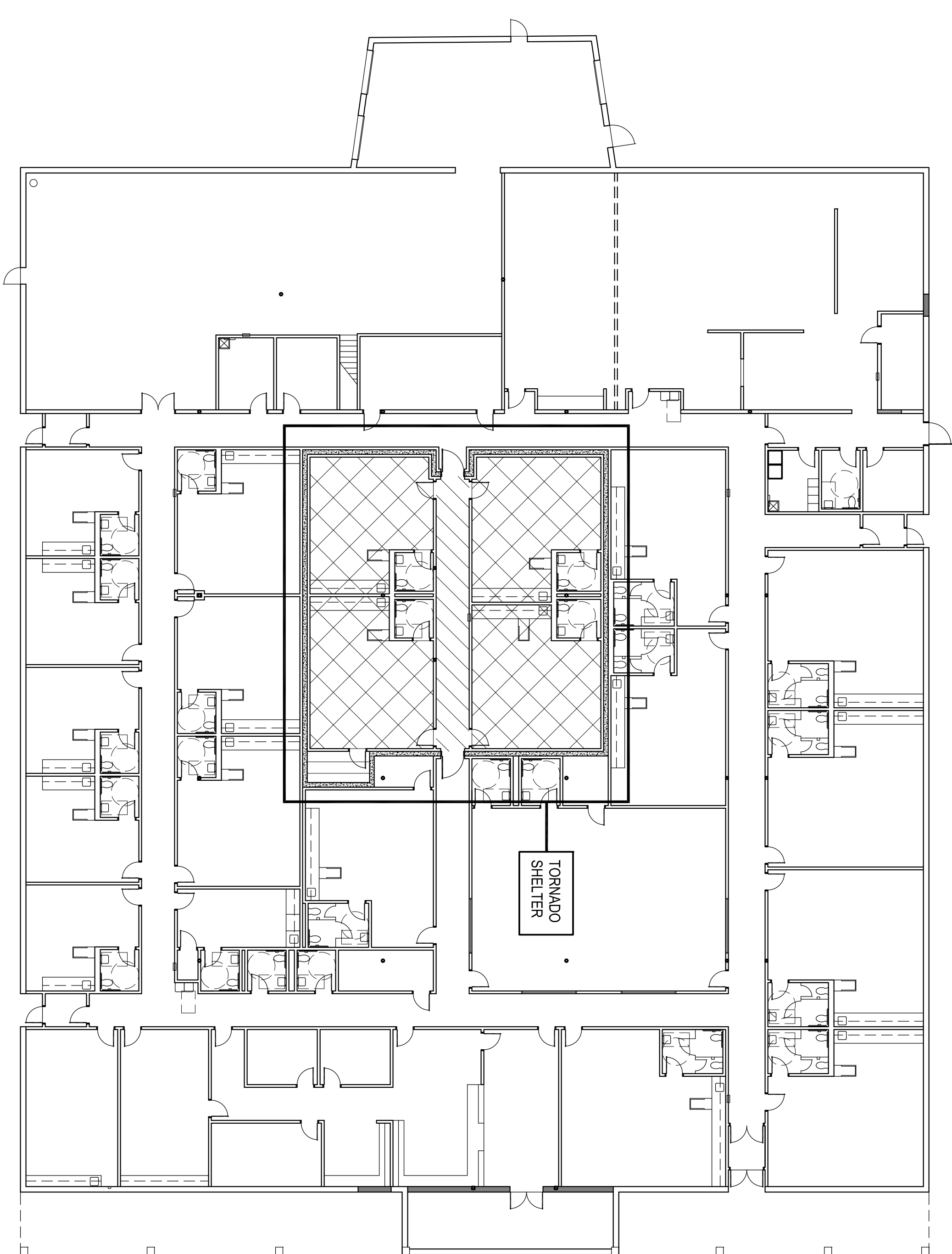
TOTAL CALCULATION OF USABLE FLOOR AREA (ADJUSTED TO INCL. H.C.) = 1,709.5 S.F. / 5 = 339 OCCUPANTS + 2 H.C. = 341 TOTAL OCCUPANTS

PLUMBING FIXTURE REQUIREMENTS FOR ICC 500 2014 ARE EXCEEDED BY
IBC 2009 PLUMBING FIXTURE REQUIREMENTS

PLUMBING FIXTURES SHELTER CALCULATIONS:
TOTAL OCCUPANT LOAD = 341

TOTAL REQUIRED: WATER CLOSETS = 2
LAVATORIES = 2

TOTAL PROVIDED: WATER CLOSETS = 4
LAVATORIES = 4

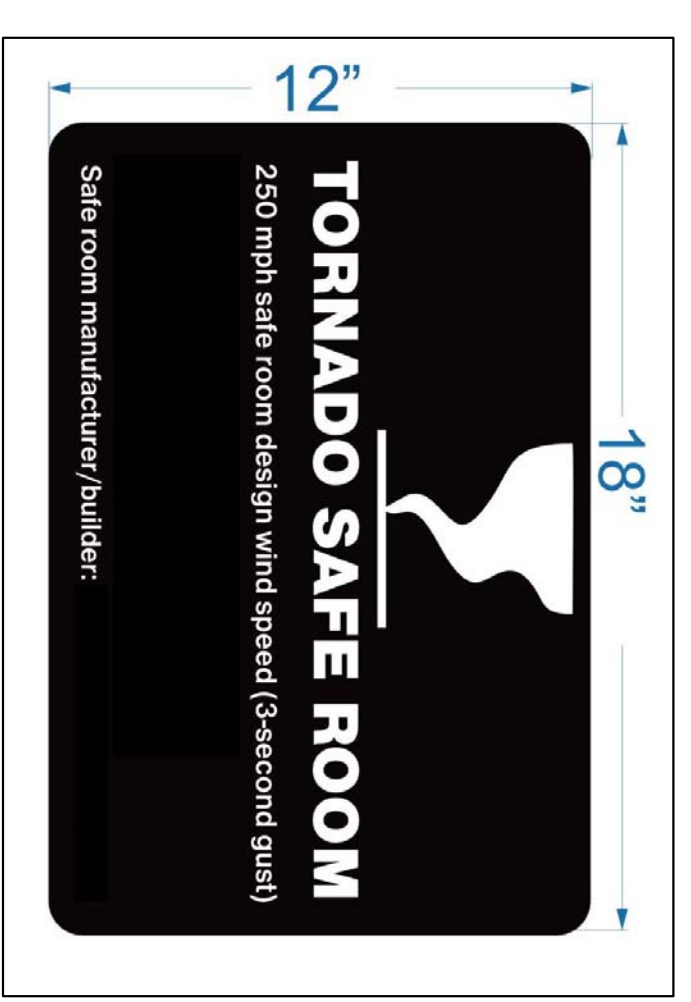


2 SHELTER LOCATION PLAN
NO SCALE

Tornado Storm Shelter Construction:
Storm shelter has been designed and engineered to meet all applicable codes and standards including the following:

1. ICC 500-2014 (International Code Council), ICC / NSSA Standard for the Design and Construction of Storm Shelters, American National Standard.
 2. All construction shall comply with the above standards and guidelines including ICC-500 Section 107.2.1:
 3. Tornado - Community
 4. Re: Structural
 5. Re: Structural
 6. Re: Structural
 7. Re: Structural
 8. The storm shelter is not located within an area susceptible to flooding.
 9. Not applicable
 10. components meet pressure & missile impact test requirements.
 11. **refer specifications, structural drawings & mechanical drawings
 12. Re: Sheet G101
 13. Re: Sheet A301
 14. Finish floor elevation - Re: Sheet C300
 15. occupant load of shelter = 339 + 2 handicap
 16. useable shelter floor area = 1,709.5 s.f.
 17. Re: mechanical drawings
 18. Re: sheet G101
 19. Re: Structural
 20. Not applicable
 21. Not applicable
 22. Not applicable
- First aid kit shall be provided by owner & stored in the shelter & accessible by occupants

PROVIDE ONE (1) SIGN WITH THE NAME OF THE MANUFACTURER OR CONTRACTOR OF THE SHELTER AND THE STORM TYPE AND RESPECTIVE DESIGN WIND SPEED. THE SIGN SHALL REMAIN LEGIBLE AND VISIBLE - LOCATE AS PER ARCHITECTS INSTRUCTIONS.



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CEDAR CREEK
CIVIL
KFC ENGINEERING
STRUCTURAL
SALAS OBIEN
MECHANICAL / ELECTRICAL

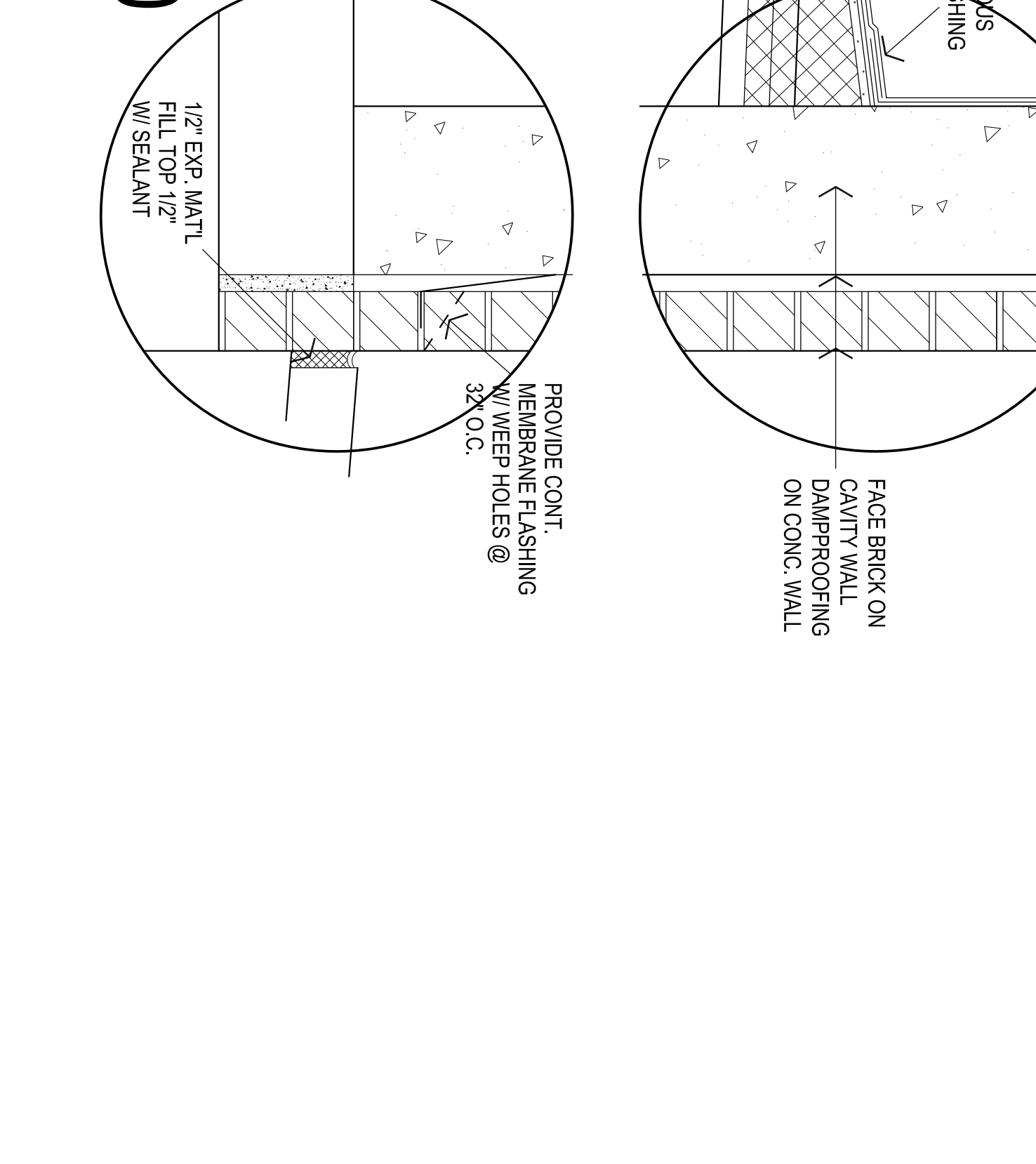
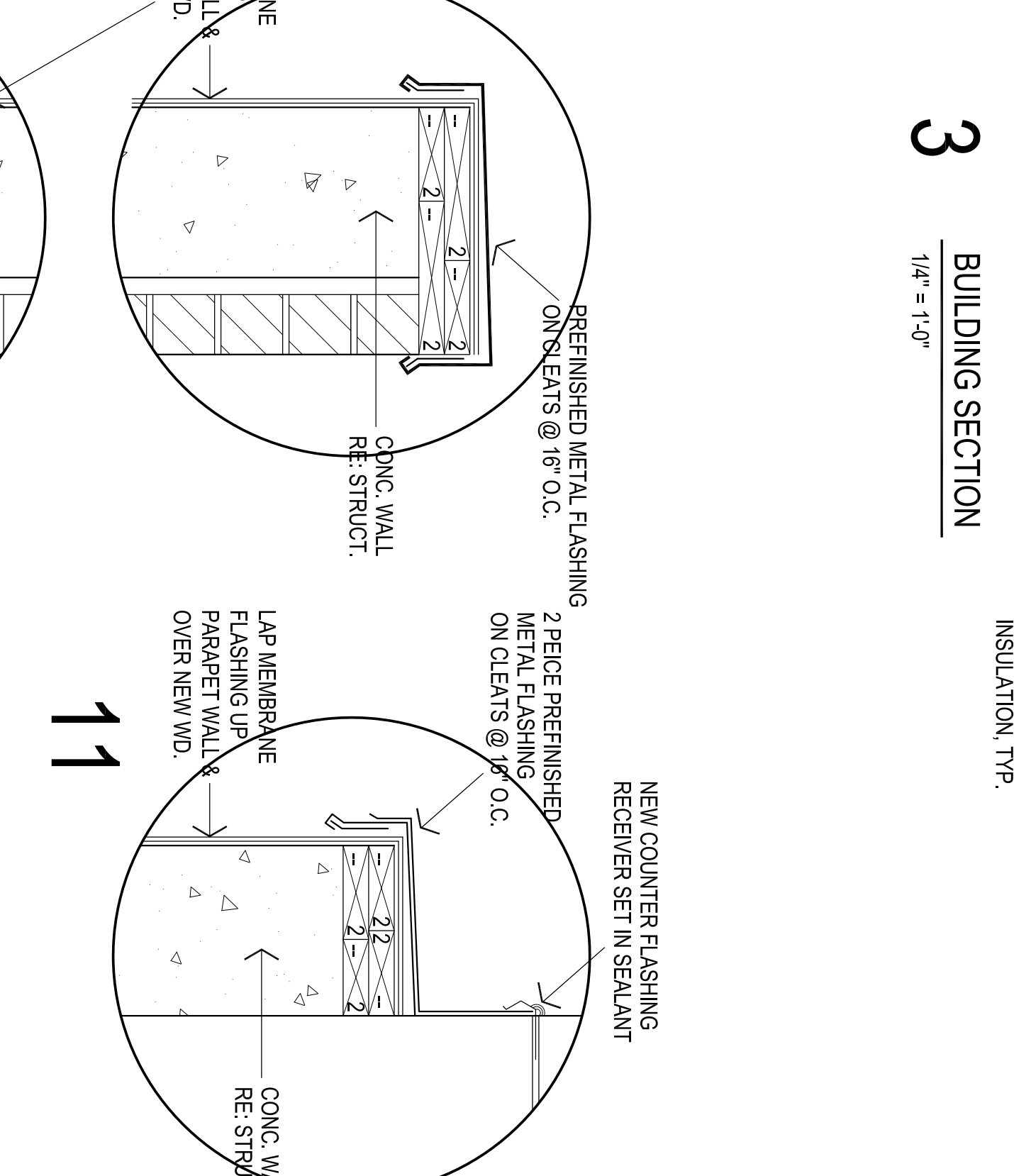
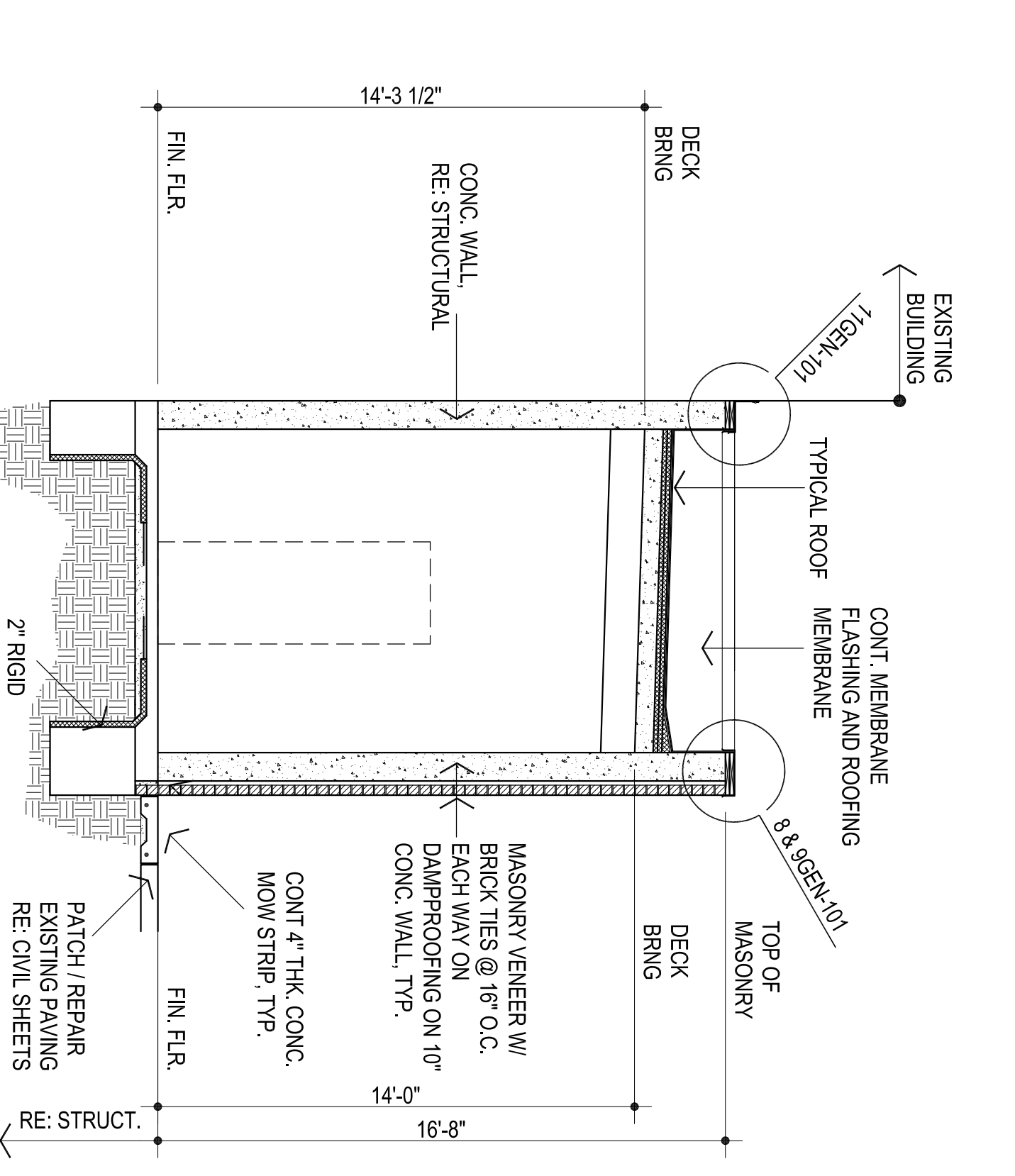
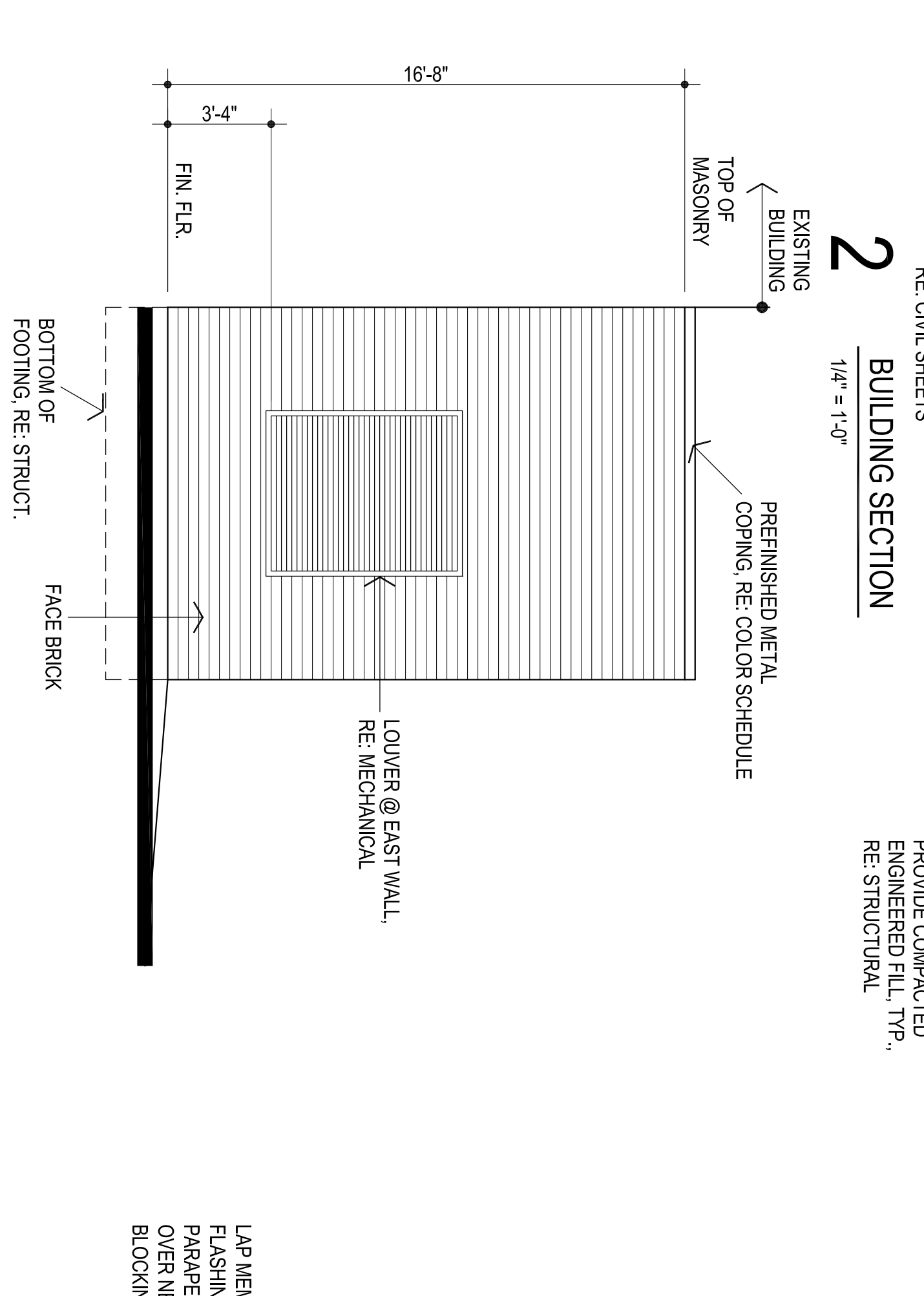
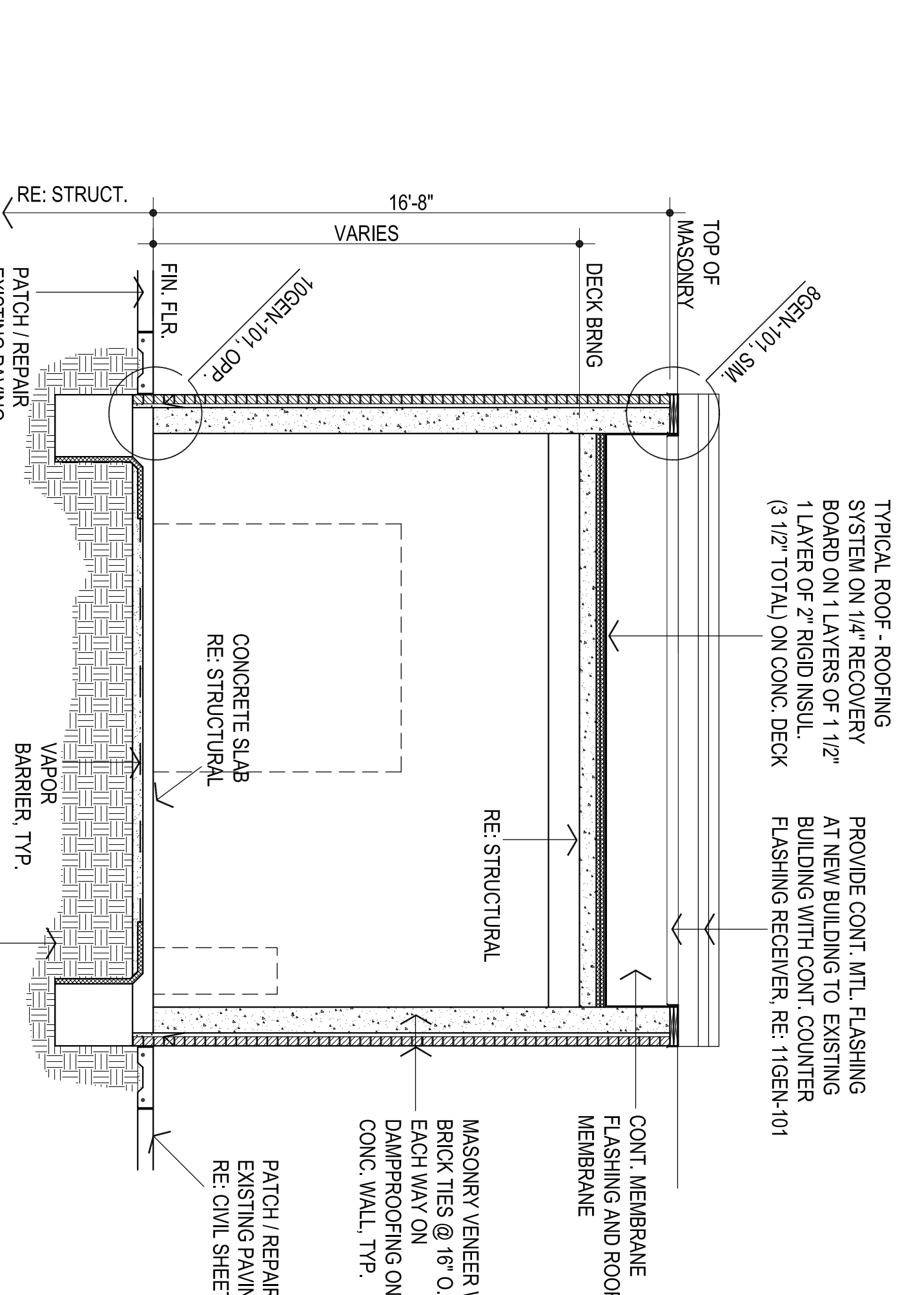
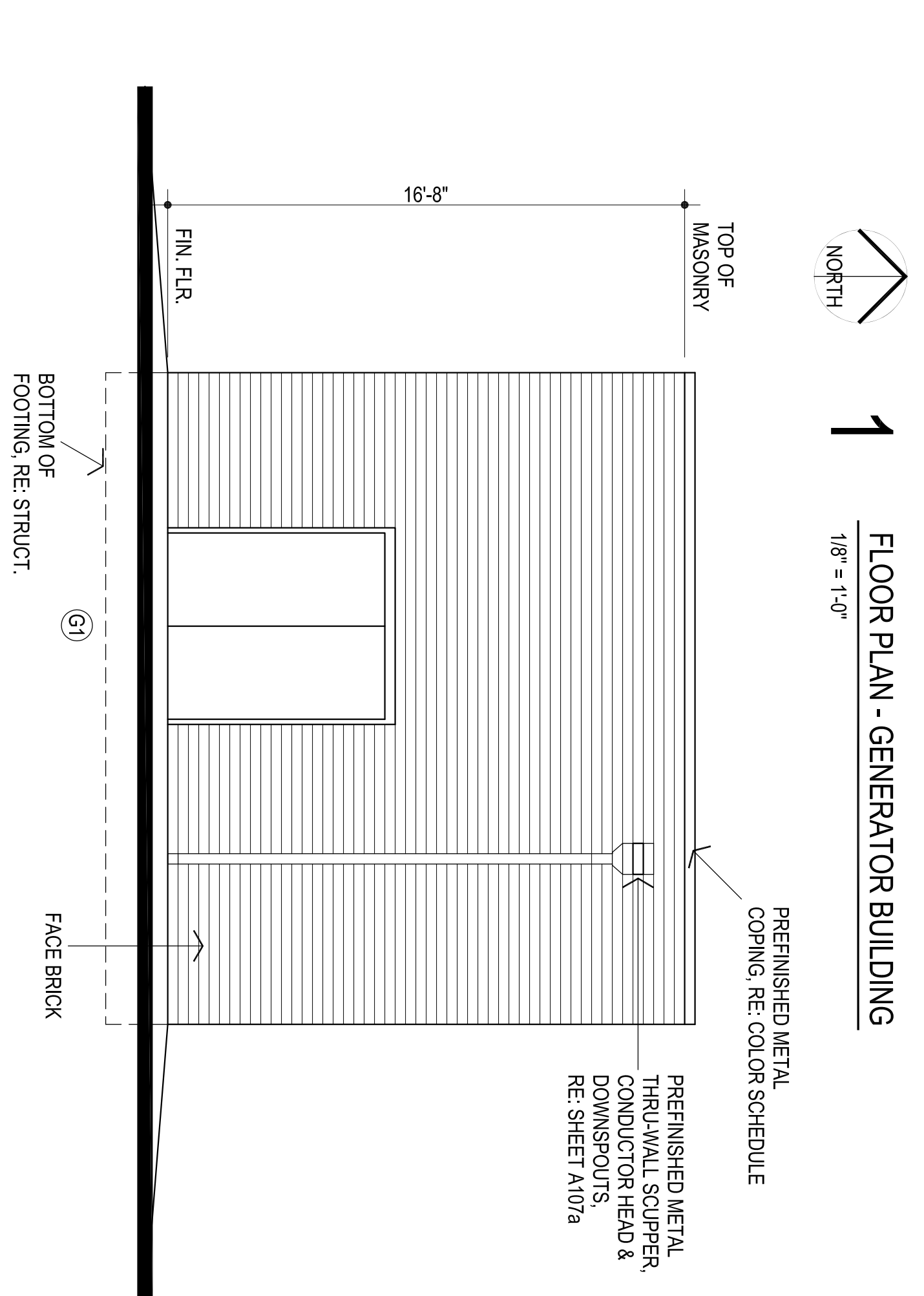
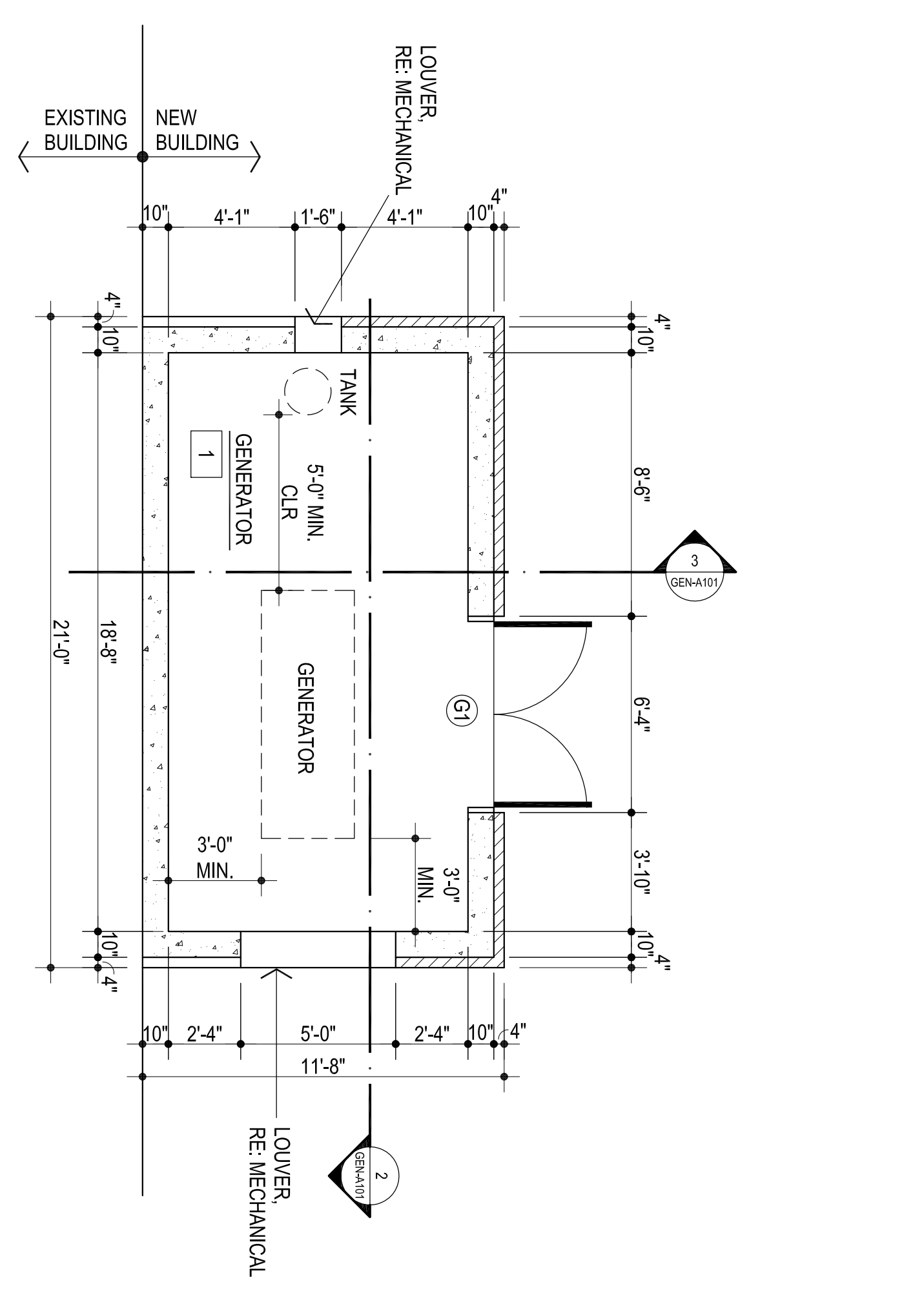
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MA
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TYPICAL ROOF - ROOFING SYSTEM ON 1/4" RECOVERY BOARD ON 1 LAYERS OF 1 1/2" 1 LAYER OF 2" RIGID INSUL. (3 1/2" TOTAL) ON CONC. DECK
PROVIDE CONT. MTL. FLASHING AT NEW BUILDING TO EXISTING BUILDING WITH CONT. FLASHING RECEIVER RE: 11GEN-101
CONT. MEMBRANE FLASHING AND ROOFING MEMBRANE
CONC. WALL RE: STRUCTURAL
MASONRY VENEER W/ BRICK TIES @ 16" O.C. EACH WAY ON DAMPROOFING ON 10" CONC. WALL, TYP.
PATCH / REPAIR EXISTING PAVING RE: CIVIL SHEETS
VAPOR BARRIER, TYP.
PROVIDE COMPACTED ENGINEERED FILL, TYP., RE: STRUCTURAL

EXISTING BUILDING
TYPICAL ROOF FLASHING AND ROOFING
CONT. MEMBRANE FLASHING AND ROOFING MEMBRANE
TOP OF MASONRY
DECK BRNG
CONC. WALL RE: STRUCTURAL
MASONRY VENEER W/ BRICK TIES @ 16" O.C. EACH WAY ON DAMPROOFING ON 10" CONC. WALL, TYP.
CONT # THK CONC. MOW STRIP, TYP.
PATCH / REPAIR EXISTING PAVING RE: CIVIL SHEETS
2" RIGID INSULATION, TYP.
FIN. FLR.
RE: STRUCT.



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CHILD CARE FACILITY
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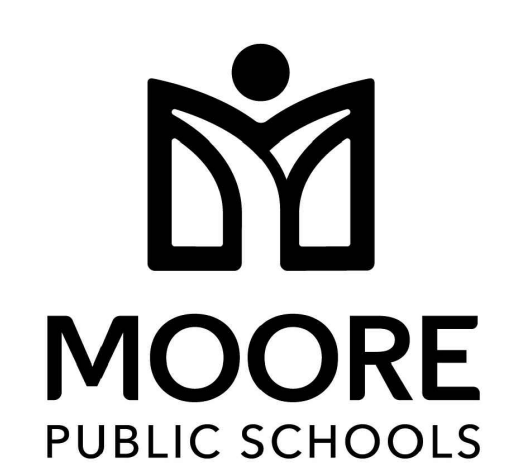
Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

GENERAL MECHANICAL NOTES	
1. ALL WORK SHALL BE IN COMPLIANCE WITH STATE AND LOCAL CODES.	14. DUCT MATERIAL SHALL BE GALVANIZED OR ALUMINUM CONSTRUCTION IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARD 2005 FOR THE PRESSURE AND SEAL CLASS LISTED IN DUCTWORK/INSULATION SCHEDULE.
2. THE CONTRACTOR SHALL PAY FOR ALL FEES, PERMITS, LICENSES, ETC., NECESSARY FOR PROPER COMPLETION OF THE WORK.	15. DUCT SIZES LISTED ON PLANS ARE THE REQUIRED CLEAR INTERIOR DIMENSIONS.
3. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.	16. SUPPLY AND RETURN BRANCH DUCTS MAY BE INSULATED FLEX DUCT IF THE RUN IS LESS THAN 5 FEET IN LENGTH, ANY LENGTHS OVER 5 FEET SHALL BE RIGID DUCTWORK. DUCT SHALL BE THE SAME SIZE AS THE LISTED DIFFUSER THROAT UNLESS NOTED OTHERWISE.
4. VERIFY ALL EXISTING CONDITIONS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN CONTRACT DRAWINGS AND ACTUAL CONDITIONS.	17. PROVIDE VOLUME CONTROL DAMPERS WHERE INDICATED AND AT ALL TAKEOFFS, BOTH SUPPLY AND RETURN SYSTEMS, AND MAJOR DUCT RUNS. DAMPERS SHALL BE FACTORY-FABRICATED WITH ZINC-PLATED, DIE-CAST CONTROL HARDWARE. CONTROL HARDWARE SHALL INCLUDE HEAVY GAUGE DIAL AND HANDLE WITH ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.
5. EXISTING UTILITIES TO BE ABANDONED SHALL BE PROPERLY DISCONNECTED AND CAPPED AS REQUIRED BY CODE OR LOCAL ORDINANCE.	18. PROVIDE TURNING VANES IN ALL RECTANGULAR ELBOWS CONFORMING TO SMACNA DUCT CONSTRUCTION STANDARD 2005 FIG. 4-2 TYPE RE-3 WITH STANDARD RADIUS. WHERE SPACE PERMITS, PROVIDE RADIUS ELBOWS IN ACCORDANCE WITH FIGURES 4-2, TYPE RE-1.
6. THESE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. ADDITIONAL DATA SHALL BE FROM THE ENGINEER THROUGH WRITTEN CLARIFICATION ONLY. VERIFY ALL EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS BEFORE PROCEEDING WITH ANY PORTION OF ANY WORK. THE CONTRACTOR SHALL PROVIDE ALL OFFSETS AND TRANSITIONS REQUIRED TO MEET EXISTING CONDITIONS.	19. ALL RECTANGULAR MAIN TO RECTANGULAR BRANCH CONNECTIONS, BOTH CONVERGING AND DIVERGING CONFIGURATIONS, SHALL HAVE A 45 DEG. ENTRY TAP CONSTRUCTED IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARD 2005 FIG. 4-6.
7. THE CONTRACTOR SHALL PERFORM WORK IN A SKILLED AND PROFESSIONAL MANNER.	20. DIFFUSER PATTERN 4-WAY UNLESS OTHERWISE INDICATED. PROVIDE FIBERGLASS DUCT INSULATION WITH VAPOR BARRIER AS SCHEDULED UNLESS NOTED OTHERWISE.
8. ALL CONTRACTORS ARE RESPONSIBLE TO FIELD COORDINATE WORK SCHEDULE WITH OWNER REPRESENTATIVE.	21. MECHANICAL CONTRACTOR TO REPAIR ANY DAMAGE DONE TO THE FIRE PROOFING WHILE INSTALLING THE MECHANICAL TRUNKS. SEAL ALL PENETRATIONS THROUGH RATED STRUCTURES WITH UL LISTED FIRE SEAL DESIGNED FOR THE SPECIFIED APPLICATION.
9. THE CONTRACTOR SHALL WORK AND COORDINATE WITH THE OTHER TRADES.	22. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE PUBLIC AND ADJACENT PROPERTIES FROM DAMAGE THROUGHOUT CONSTRUCTION.
10. ALL EQUIPMENT SHALL BE NEW AND IN UNDAMAGED CONDITION. ANY EQUIPMENT FOUND DEFECTIVE SHALL BE IMMEDIATELY REMOVED FROM THE PROJECT.	23. THE CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OR AS OTHERWISE REQUIRED IN THE SPECIFICATIONS.
11. PROVIDE 3 COPIES OF AN OPERATION AND MAINTENANCE MANUAL FOR ALL MAJOR EQUIPMENT REQUIRING SERVICE. MAJOR EQUIPMENT INCLUDES BUT IS NOT LIMITED TO COILS, FANS, AND CONTROL WIRING DIAGRAMS. EACH PIECE OF EQUIPMENT SHALL STATE THE CONTRACT DATE AND THE NAME, ADDRESS AND PHONE NUMBER FOR THE FRAME CONTRACTOR, SUBCONTRACTOR PERFORMING THE INSTALLATION, AND THE LOCAL VENDOR FOR SPARE PARTS. THE MANUALS SHALL CONTAIN MAINTENANCE INSTRUCTIONS REQUIRED FOR THE INSTALLED EQUIPMENT. MANUALS SHALL BE BOUND IN A THREE RING HARD COVER BINDER. O & M MANUALS SHALL BE SUBMITTED TO THE OWNER PRIOR TO FINAL WALK THROUGH OF THE PROJECT.	24. MECHANICAL CONTRACTOR TO INCLUDE THE TEST AND BALANCE, AND ANY PERMIT FEES IN THEIR BID.
12. PROVIDE 8 HOURS OF OWNER TRAINING FOR THE INSTALLED EQUIPMENT. TRAINING SHALL BE HELD ONLY AFTER ALL OF THE EQUIPMENT IS INSTALLED AND PROPER OPERATION IS VERIFIED.	25. MECHANICAL CONTRACTOR SHALL VERIFY ALL ROOFTOP EQUIPMENT WEIGHTS, SIZES, LOCATIONS AND OPENINGS REQUIRED AND SHALL COORDINATE ANY CHANGES WITH THE ARCHITECT.
13. CONTRACTOR SHALL SUBMIT A CERTIFIED REPORT INDICATING SYSTEM PERFORMANCE INCLUDING, BUT NOT LIMITED TO, VOLTAGE AND AMPERAGE MEASUREMENTS OF ALL EQUIPMENT GREATER THAN 1/3 H.P. AIR BALANCE MEASUREMENTS OF OUTSIDE AIR DELIVERY, AIR HANDLING UNIT SUPPLY, SUPPLY DIFFUSERS, EXHAUST AND RETURN GRILLES. AIR BALANCE SHALL BE WITHIN 10% OF DESIGN CONDITIONS. THE REPORT CERTIFICATION SHALL BE AS FOLLOWS: I (name) of (company) CERTIFY THAT ALL MEASUREMENTS, FIGURES AND STATEMENTS INDICATED IN THIS REPORT WERE TAKEN BY ME OR UNDER MY SUPERVISION AND ARE ACCURATE AS OF (date). DESIGN FLOWS WERE BASED UPON PLANS DATED (xx/xx/xx).	26. UPON PROJECT COMPLETION, RECORD (AS-BUILT) DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR TO THE BUILDING OWNER. ALL CHANGES MADE TO EQUIPMENT, DUCTWORK, AND GENERAL DESIGN SHALL BE NOTED ON THE DRAWINGS. PROVIDE IN PDF FORMAT OR PRINTED SET AT THE OWNER'S REQUEST.

ABBREVIATIONS	
A AMP	IN INCH
ADD ADDENDUM	LAT LEAVING AIR TEMPERATURE
ADJ ADJUSTABLE	LB POUND
AFF ABOVE FINISH FLOOR	LWT LEAVING WATER TEMPERATURE
AHU AIR HANDLER UNIT	MAX MAXIMUM
AI ANALOG INPUT	MWH 1000 BTU PER HOUR
ALT ALTERNATE	MC MECHANICAL CONTRACTOR
AO ANALOG OUTPUT	MCA MINIMUM CIRCUIT AMPS
APPRX APPROXIMATE	MECH MECHANICAL
ARCH ARCHITECT, ARCHITECTURAL	MEN MINIMUM
BDD BACK DRAFT DAMPER	MFR MANUFACTURER
BLDG BUILDING	NTS NOT TO SCALE
BTUH BRITISH THERMAL UNIT PER HOUR	OA OUTSIDE AIR
C CENTER	OC ON CENTER
CD CEILING DIFFUSER	P PUMP
CFM CUBIC FEET PER MINUTE	PC PLUMBING CONTRACTOR
CO CLEAN OUT	PLBG PLUMBING
COND CONDENSATE	PSF POUNDS PER SQUARE INCH
CONT CONTINUOUS	QTY QUANTITY
COP COEFFICIENT OF PERFORMANCE	RA RETURN AIR
DB DRY BULB	REQD REQUIRED
DET DETAIL	REV REVERSE OR REVISION
DG DOOR GRILLE	RG RETURN AIR GRILLE
DI DIGITAL INPUT	RPM REVOLUTIONS PER MINUTE
DIA OR Ø DIAMETER	RTU ROOF TOP UNIT
DM DIMENSION	SA SUPPLY AIR
DN DOWN	SQFT SQUARE FEET
DO DIGITAL OUTPUT	SG SUPPLY GRILLE
DWG DRAWING	SP STATIC PRESSURE
EA EXHAUST AIR	SPEC SPECIFICATIONS
EAT ENTERING AIR TEMPERATURE	SS STAINLESS STEEL
EC ELECTRICAL CONTRACTOR	T&B TEST AND BALANCE
EER ENERGY EFFICIENCY RATIO	TEMP TEMPERATURE OR TEMPORARY
EF EXHAUST FAN	TC TRANSFER GRILLE
EG EXHAUST GRILLE	TYP TYPICAL
ELEC ELECTRICAL	V VOLT
ELEV ENERGY RECOVERY VENTILATOR	VAR VARIABLE OR VARIES
ESP EXTERNAL STATIC PRESSURE	VEL VELOCITY
EXT ENTERING WATER TEMPERATURE	VFD VARIABLE FREQUENCY DRIVE
EXIST EXISTING	VTR VENT THRU ROOF
FA FRESH AIR	W/ WITH
FFM FEET PER MINUTE	W/N WITHIN
FT FOOT (FEET)	W/O WITH OUT
GA GAUGE/GAGE	WB WET BULB
GALV GALVANIZED	WC WATER COLUMN (INCHES OF)
GC GENERAL CONTRACTOR	WT WEIGHT
GPM GALLONS PER MINUTE	
GYP GYPSUM	
HORIZ HORIZONTAL	
HP HORSEPOWER	
HT HEIGHT	
I/O INPUT/OUTPUT	

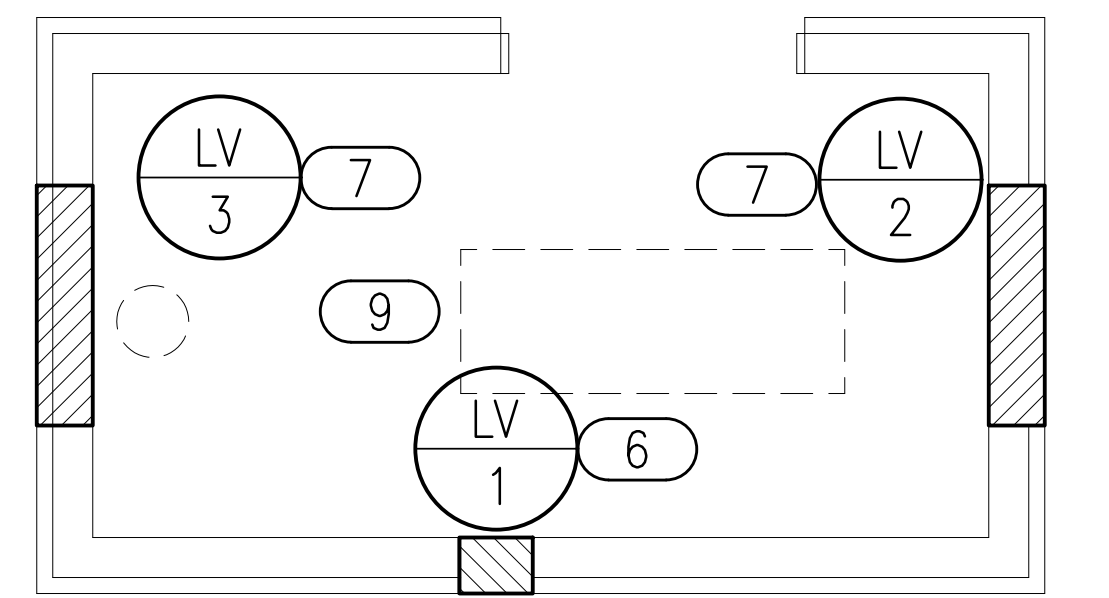
MECHANICAL HVAC LEGEND		
EXHAUST AIR DUCT (DOWN)		EXHAUST AIR DUCT (UP)
RETURN AIR DUCT (DOWN)		RETURN AIR DUCT (UP)
OUTSIDE OR SUPPLY AIR DUCT (DOWN)		OUTSIDE OR SUPPLY AIR DUCT (UP)
DUCT SIZE		NEW DUCTWORK
FLEX DUCT		EXISTING DUCTWORK
DEMOLITION LINETYPE		SUPPLY AIR CEILING DIFFUSER
RETURN AIR GRILLE		EXHAUST AIR GRILLE
DIFFUSER, GRILLE, AND REGISTER CALL-OUTS		SCHEDULED EQUIPMENT TAG
MANUAL BALANCING DAMPER		PIPE PENETRATION THROUGH FIRE RATED WALL
FIRE DAMPER		SMOKE DAMPER
MOTORIZED DAMPER		FIRE/SMOKE DAMPER
THERMOSTAT		HUMIDISTAT
REMOTE SENSOR		CARBON DIOXIDE SENSOR
DUCT SMOKE DETECTOR		CARBON MONOXIDE SENSOR

MECHANICAL SHEET INDEX	
M000	MECHANICAL LEGEND AND NOTES
M101	MECHANICAL FLOORPLAN
M201	MECHANICAL ROOF PLAN
M501	MECHANICAL DETAILS
M601	MECHANICAL SCHEDULES

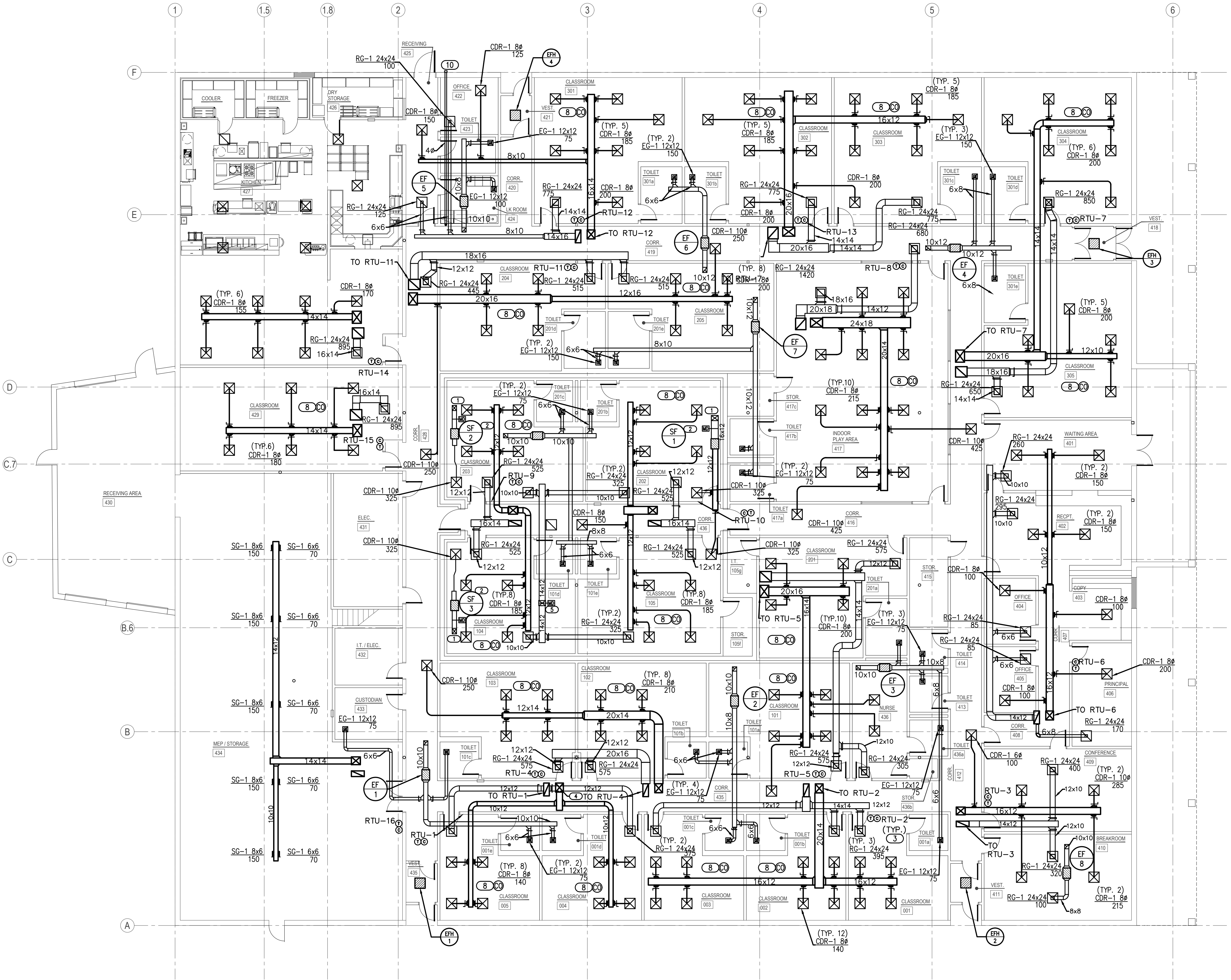


- ### GENERAL NOTES
- COORDINATE INSTALLATION OF EQUIPMENT AND DUCTWORK WITH ALL TRADES.
 - COORDINATE LOCATION OF THERMOSTATS WITH E.C. ROUGH-IN BY E.C.
 - ALL PENETRATIONS OVER 3 1/2" SQUARE INCHES OR 2 1/16" INCHES IN DIAMETER IN/OUT OF SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
 - M.C. IS RESPONSIBLE TO ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
 - E.C. TO PROVIDE, LOCATE, AND INSTALL SWITCH FOR EMERGENCY VENTILATION FAN. M.C. SHALL PROVIDE CALL OUT LETTERING "EMERGENCY VENTILATION" ON PLACARD ABOVE SWITCH WITH 3/4" LETTERING FOR INSTALLATION BY GC. COORDINATE WITH GC AND EC.

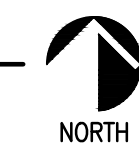
- ### KEYED NOTES
- ROOF HOOD IS PART OF EMERGENCY VENTILATION SYSTEM. DUCT UP 16X12 TO TRANSITION INTO ROOF HOOD OPENING 18X16.
 - MOTORIZED DAMPER TO BE 120V CONNECTED TO EMERGENCY POWER. DAMPER SHALL OPEN WHEN SUPPLY FAN TURNS ON.
 - PROVIDE LOCKABLE COVER FOR THERMOSTAT.
 - DUCT 18X20 SUPPLY AND 12X28 RETURN UP TO RTU.
 - ROOF HOOD PART OF THE EMERGENCY VENTILATION SYSTEM TO PROVIDE RELIEF AIR. MOTORIZED DAMPER SHALL OPERATE ON INVERTER. INTERLOCK WITH SF-1. DUCT DOWN TO 16X12.
 - MOUNT BOTTOM OF LOUVER 8'-0" AFF.
 - MOUNT BOTTOM OF LOUVER MINIMUM 18" AFF.
 - CARBON MONOXIDE DETECTOR TO BE INSTALLED ACCORDING TO ALL APPLICABLE CODES. DETECTOR SHALL BE INSTALLED CENTRALLY ON CEILING. ALSO INCLUDE BATTERY BACKUP IN EVENT PRIMARY POWER IS INTERRUPTED. ALARM SIGNAL SHALL BE ROUTED TO ADMINISTRATION OFFICE. COORDINATE WITH E.C. WITH PRIMARY POWER CONNECTION AND SYSTEM CONNECTION.
 - PROVIDE EXHAUST DUCT TO GENERATOR RADIATOR CONNECTION. COORDINATE DUCT SIZE WITH GENERATOR MANUFACTURER DRAWINGS.
 - PROVIDE DRYER VENT EXHAUST HOOD TERMINATION AT EXTERIOR WALL IN ACCORDANCE WITH DRYER MANUFACTURER'S REQUIREMENTS. PROVIDE WALL CAP WITH BIRD FILTER.



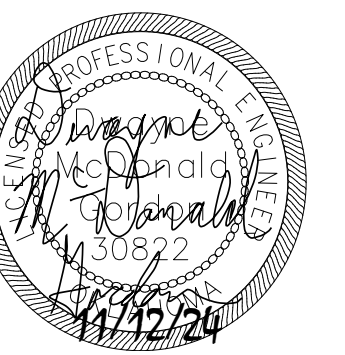
2 MECHANICAL GENERATOR PLAN
SCALE: 1/4" = 1'-0"



1 MECHANICAL FLOOR PLAN
SCALE: 3/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



KF	_____
drawn by	_____
DG	_____
checked by	_____
OCTOBER 2024	_____
date	_____
revisions	_____



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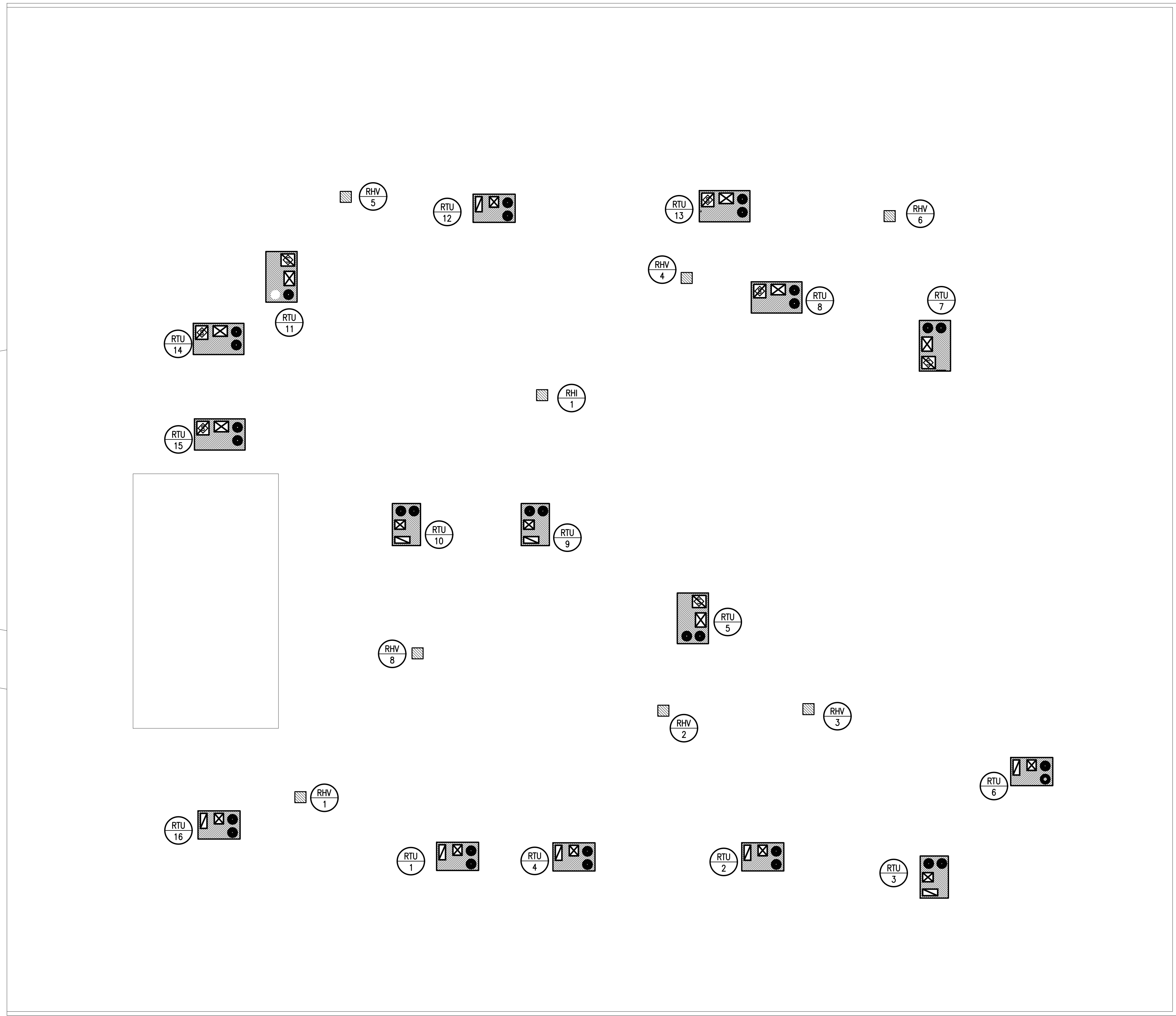
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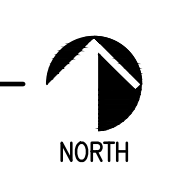
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GENERAL NOTES

1. ALL ROOF TOP EQUIPMENT TO BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ROOF EDGE.
2. MAINTAIN A MINIMUM OF 10'-0" HORIZONTAL CLEARANCE BETWEEN ALL EXHAUST OUTLETS AND ANY FRESH AIR INTAKES.
3. MOUNT ROOF CURBS LEVEL ON PITCHED ROOF.
4. ALL ROOF SUPPORT SYSTEMS ARE TO BE MANUFACTURED FOR THE ROOF MATERIAL/SYSTEM TO BE INSTALLED. REFER TO ARCH PLANS FOR THE ROOF SYSTEM. CURB INSTALLATION TO BE WARRANTIED BY ROOFING CONTRACTOR.
5. ALL PENETRATIONS OVER 3 1/2 SQUARE INCHES OR 2 1/16 INCHES IN DIAMETER IN/OUT OF THE SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
6. MC IS RESPONSIBLE FOR ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
7. MC SHALL PROVIDE COPPER PIPING FOR CONDENSATE LINE PAINTED BLACK. ROUTE ALL CONDENSATE TO NEAREST ROOF DRAIN.



1 MECHANICAL ROOF PLAN
SCALE: 3/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



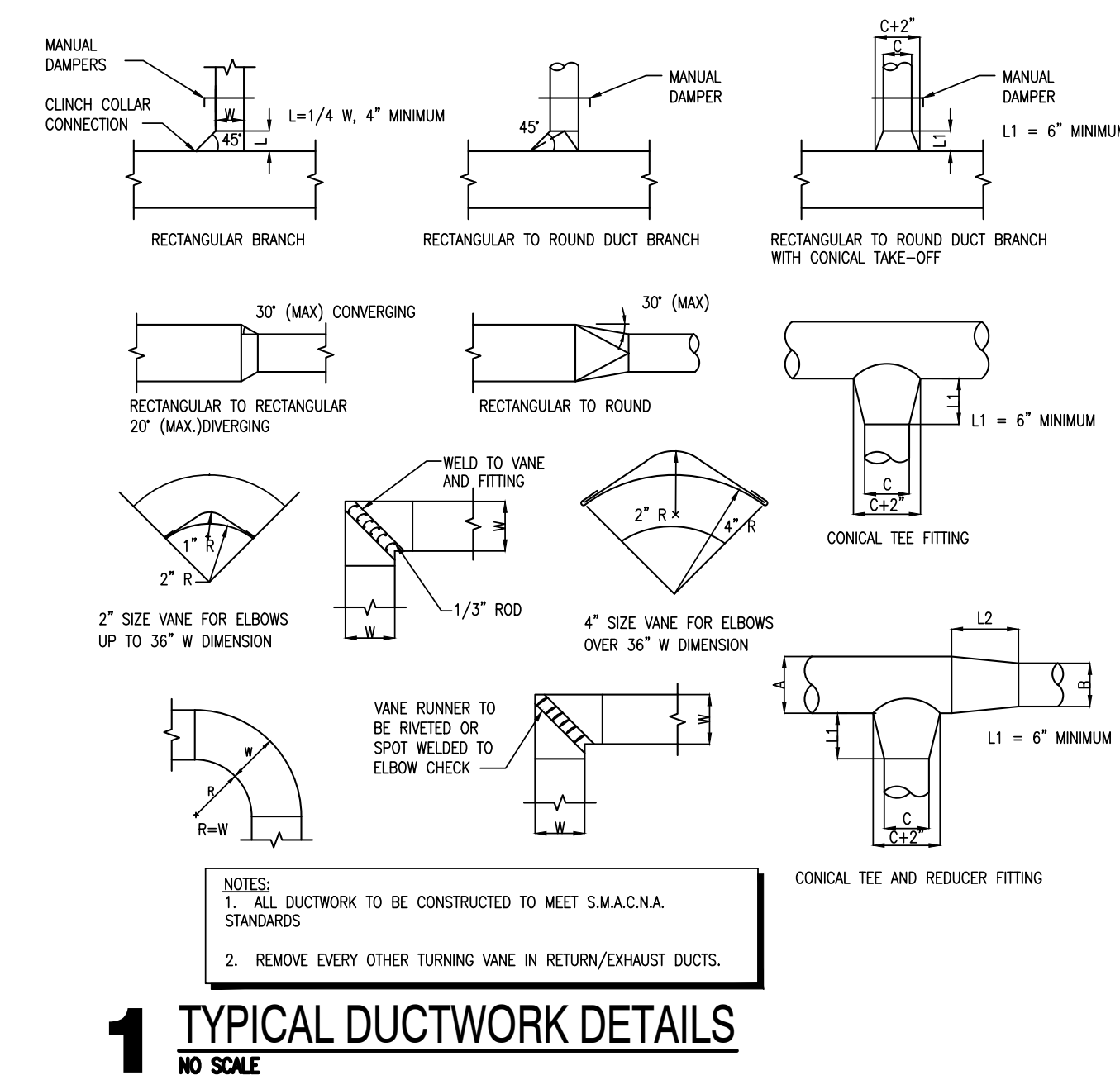
KF	drawn by
DG	checked by
OCTOBER 2024	date
	revisions

sheet no:

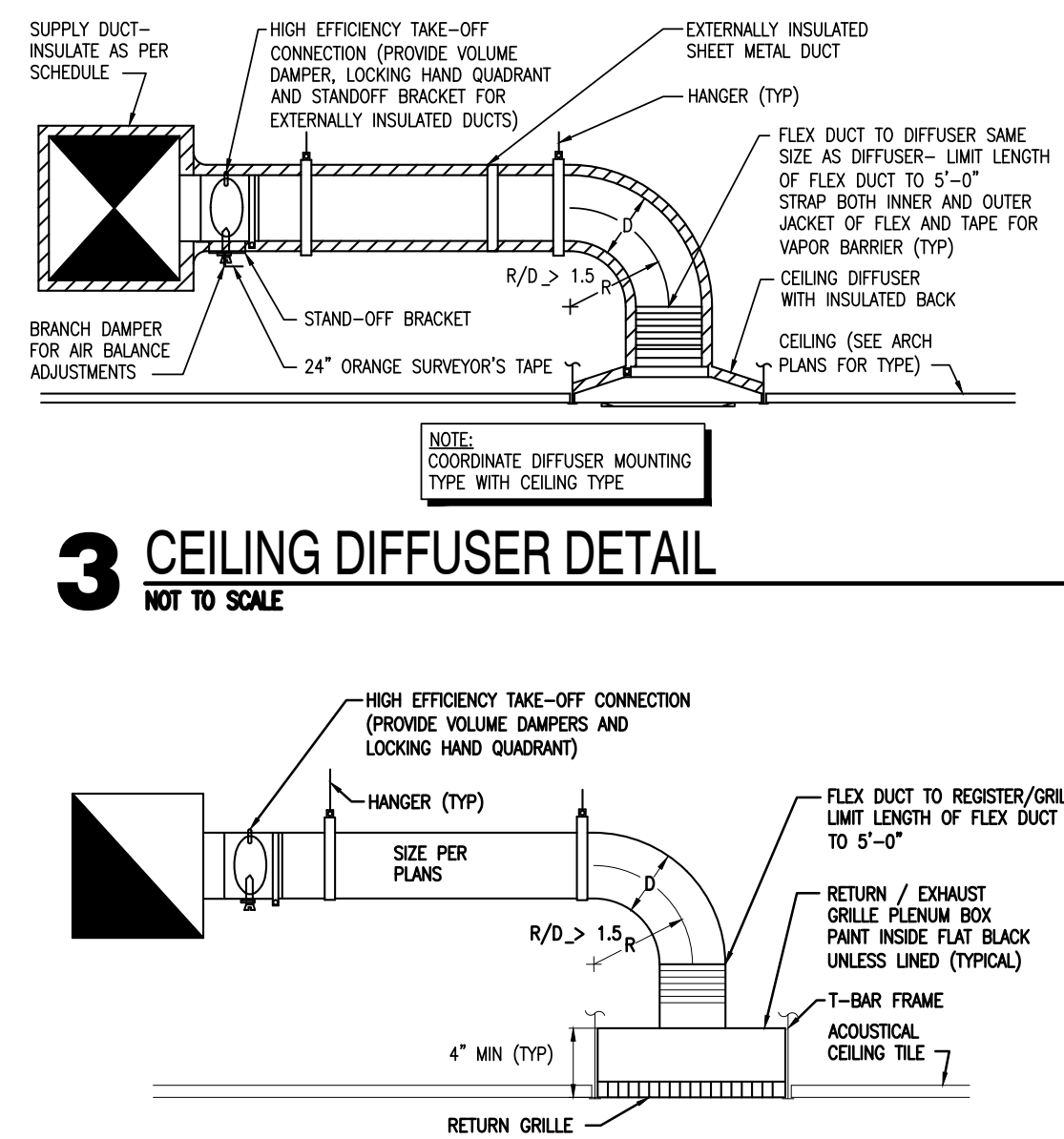
M501

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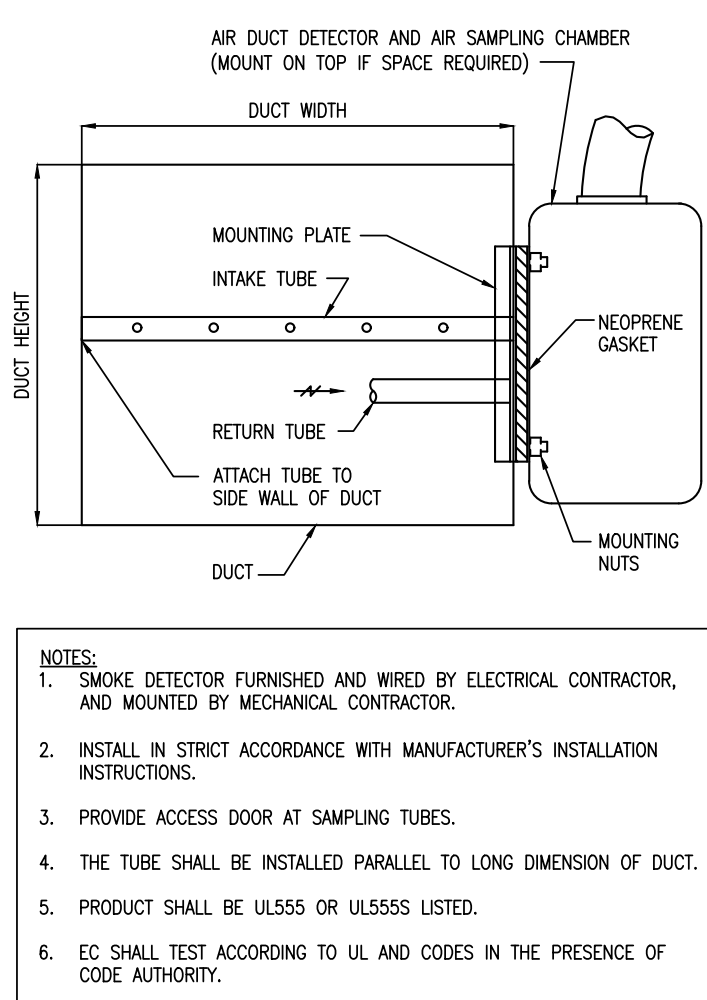
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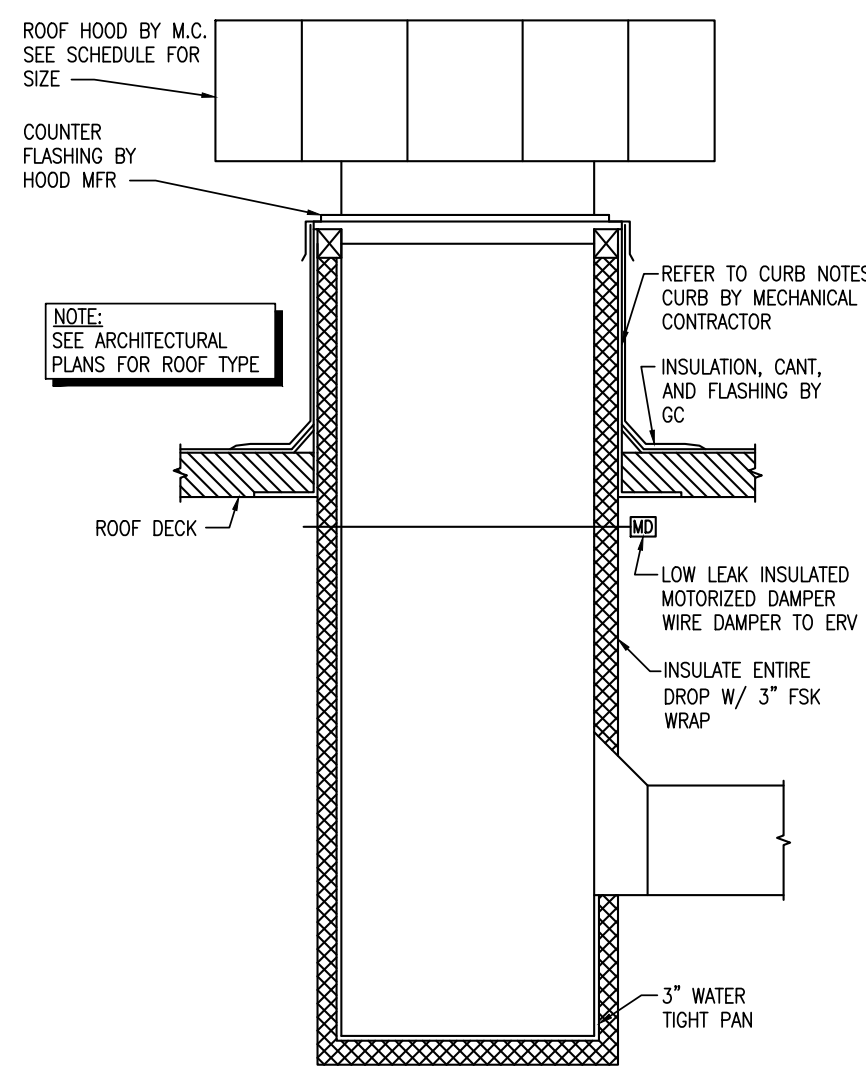
1 TYPICAL DUCTWORK DETAILS
NOT TO SCALE



2 RETURN / EXHAUST AIR GRILLE PLENUM BOX
NOT TO SCALE

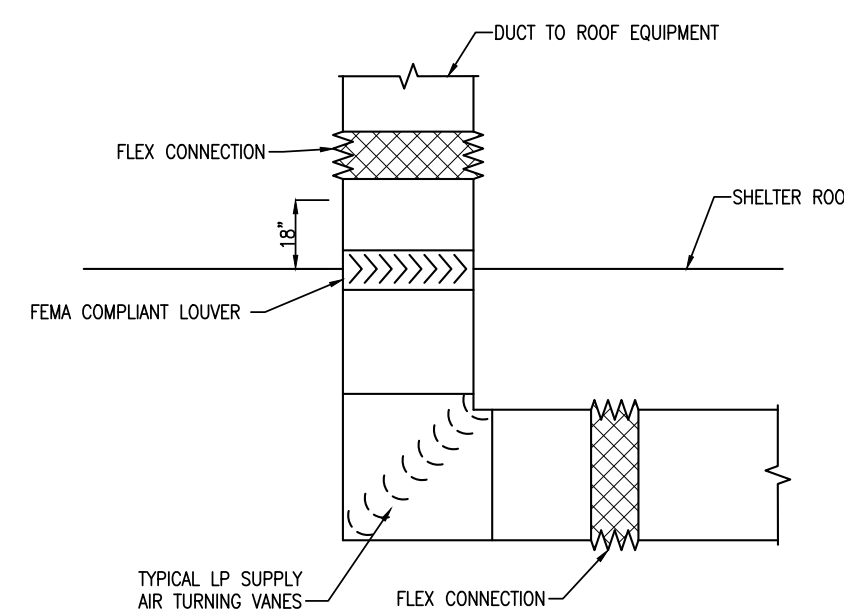


3 CEILING DIFFUSER DETAIL
NOT TO SCALE

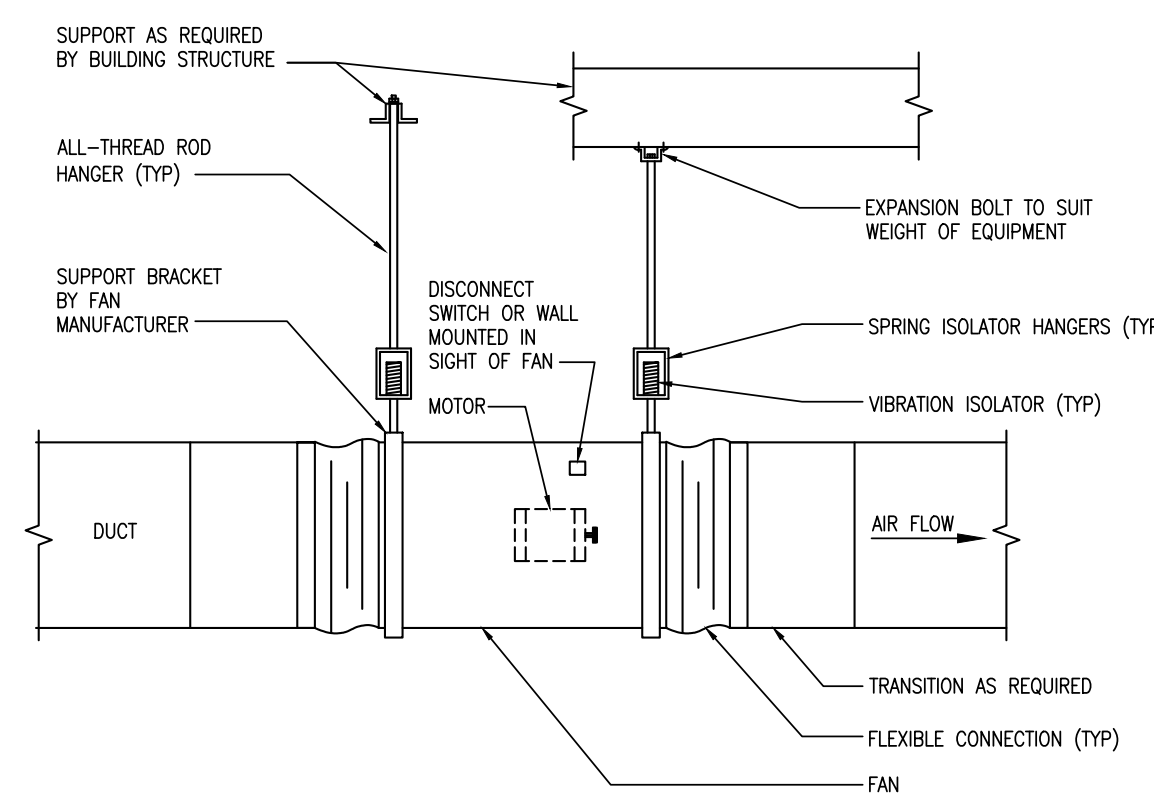


4 SMOKE DETECTOR MOUNTING DETAIL
NOT TO SCALE

5 ROOF HOOD DETAIL
NOT TO SCALE

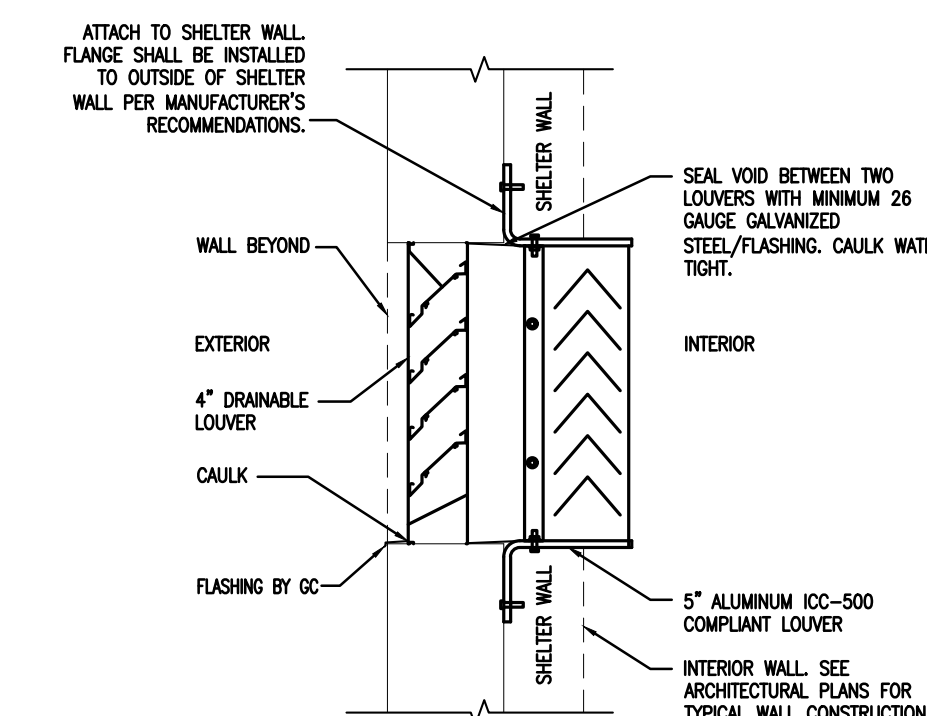


6 TYPICAL ROOF TOP UNIT DETAIL
NOT TO SCALE



7 INLINE FAN DETAIL
NOT TO SCALE

8 SAFEROOM DUCT PENETRATION DETAIL
NOT TO SCALE



9 GENERATOR DETAIL
NOT TO SCALE

10 LOUVER GENERATOR BUILDING
NOT TO SCALE



ROOF HOOD SCHEDULE							
RTU	THROAT SIZE DIMENSION (IN)	THROAT AREA (SQ FT)	DAMPER BDD OR MOD	CONSTRUCTION	MANUFACTURER & MODEL NO.	COMMENTS	NOTES
RHV-1	14X14	1.36	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-1	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-4	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-5	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-6	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-7	14X14	1.36	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
 1. M.C. TO PROVIDE ROOF HOOD WITH ALUMINUM BROSSCREEN.
 2. M.C. SHALL PROVIDE ROOF CURB, CURB INSTALLATION BY G.C.
 3. M.C. SHALL PROVIDE LOW VOLTAGE MOTORIZED DAMPER.

LOUVER SCHEDULE									
RTU	CONNECTED TO	SIZE (IN)	MINIMUM FREE AREA (SQ FT)	FLANGE	CONSTRUCTION	INCLUDE MOD	MANUFACTURER AND MODEL NUMBER	COMMENTS	NOTES
1	GEN ENCLOSURE	18X18	0.71	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
2	GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	-	GREENHECK AFL-501	3" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
3	GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	-	GREENHECK AFL-501	3" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
 1. PROVIDE PAINTED KYNAR FINISH COLOR BY ARCHITECT.
 2. PROVIDE BIRD SCREEN.

PACKAGED ROOFTOP GAS/ELECTRIC UNIT SCHEDULE															
RTU	LOCATION	INPUT MBH	OUTPUT MBH	COOLING NOMINAL TONS	MIN. EER	CAPACITY STAGES	TOTAL CFM	MIN. F.A. CFM	ELEC. CHGR	MCA	MOCOP	ESP (IN)	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES
1	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	350	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
2	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1680	520	208 / 3	26	40	1.0	905	LENNOX LGM4805E	1,2,4-12
3	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	280	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
4	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM4805E	1,2,4-12
5	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2100	645	208 / 3	46	50	1.0	1500	LENNOX LGM9205E	1-12
6	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
7	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2200	700	208 / 3	46	50	1.0	1500	LENNOX LGM9205E	1-12
8	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	3000	900	208 / 3	46	50	1.0	1500	LENNOX LGM10205E	1-12
9	ROOF-SEE PLANS	108	87	4	13.2	2(H)/1(C)	1500	450	208 / 3	25	35	1.0	905	LENNOX LGM4805E	1,2,4-12
10	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM4805E	1,2,4-12
11	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2100	625	208 / 3	46	50	1.0	1500	LENNOX LGM9205E	1-12
12	ROOF-SEE PLANS	108	87	4	13.2	2(H)/1(C)	1400	400	208 / 3	25	35	1.0	905	LENNOX LGM4805E	1,2,4-12
13	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2200	710	208 / 3	46	50	1.0	1500	LENNOX LGM9205E	1-12
14	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
15	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
16	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
 1. PROVIDE CONDENSER COIL HAL GUARD.
 2. PROVIDE FACTORY-INSTALLED UNIT DISCONNECT SWITCH.
 3. PROVIDE FACTORY-INSTALLED RETURN DUCT SMOKE DETECTOR WITH REMOTE TEST STATION TO BE LOCATED IN OCCUPIED SPACE. INSTALLATION OF REMOTE TEST STATION AND CONNECTION TO FIRE ALARM SYSTEM BY E.C.
 4. PROVIDE FACTORY-INSTALLED 120V GFCI CONVENIENCE OUTLET. GFCI POWERED FROM UNIT. RECEPTACLE SHALL BE COMPLIANT WITH NEC 210.63.
 5. PROVIDE ANTI-SHORT CYCLE TIMER AND LOW AMBIENT CONTROLS.
 6. PROVIDE FACTORY ROOF CURB SO THAT THE BOTTOM OF THE ROOFTOP UNIT IS A MINIMUM OF 14" ABOVE FINISHED ROOF. MOUNT LEVEL ON SLOPED ROOF.
 7. PROVIDE HINGED AND TOOL-LESS ACCESS DOORS.
 8. PROVIDE PHASE MONITOR.
 9. PROVIDE FULL ENTHALPY ECONOMIZER WITH POWERED EXHAUST.
 10. PROVIDE DIGITAL, Wi-Fi ACCESSIBLE 7-DAY PROGRAMMABLE THERMOSTAT WITH OCCUPIED/OCCUPIED SETTINGS CAPABLE OF CONTROLLING THE 1/3 STAGES OF SPECIFIED UNIT.
 11. PROVIDE UNIT WITH HDRH.
 12. MODULATE OUTSIDE AIR BASED ON DEMAND REPORTED BY CO2 SENSOR.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE					
PLAN SYMBOL	DESCRIPTION	MANUFACTURER & MODEL NO.	MATERIAL	FINISH	NOISE CRITERIA
GR-1	SQUARE FACE, ROUND NECK, 4-WAY DEFLECTION CEILING DIFFUSER, SPRING LOCK INNER CORE, FOR LAY-IN CEILING INSTALLATION.	PRICE SCD (4C)	STEEL	WHITE	-
SG-1	DOUBLE DEFLECTION SIDEWALL GRILLE, ADJUSTABLE DEFLECTION BLADES, 3/4" O.C. FLAT FRAME WITH 1 1/4" MARGIN, HORIZONTAL FRONT.	PRICE 520	STEEL	COLOR BY ARCHITECT	-
RG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	-
RG-2	SQUARE PATTERN GRILLE, ZERO DEGREE DEFLECTION, FLAT STEEL FRAME WITH 1 1/4" BORDER, FOR SURFACE MOUNT INSTALLATION.	PRICE 80	STEEL	WHITE	-
EG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	-

NOTES:
 SEE PLANS FOR QUANTITY AND SIZES.
 M.C. TO FIELD VERIFY CEILING TYPE FOR ALL GRD BEFORE PURCHASING EQUIPMENT. PROVIDE REQUIRED MOUNTING.

DUCTWORK/INSULATION SCHEDULE											
SYSTEM	MAX. PRES.	LOW PRESSURE			MED. PRESS.	HIGH PRESS.	INSULATION			NOTES	
		SEAL	A	B			C	INTERNAL THICKNESS	EXTERNAL THICKNESS		
SUPPLY AIR WITHIN 10' OF UNIT	2"	X	-	-	-	-	-	YES	1"	NO	-
SUPPLY AIR BEYOND 10' OF UNIT	2"	X	-	-	-	-	-	NO	-	YES	2" FSK
RETURN AIR WITHIN 10' OF UNIT	2"	-	X	-	-	-	-	YES	1"	NO	-
RETURN AIR BEYOND 10' OF UNIT	2"	-	X	-	-	-	-	NO	-	YES	2" FSK
OUTSIDE AIR/MIXED AIR	2"	-	X	-	-	-	-	NO	-	YES	3" FSK
EXHAUST AIR	2"	-	X	-	-	-	-	NO	-	YES	2" FSK

NOTES:

FAN SCHEDULE															
	CFM	SP	FAN RPM	ELECTRICAL				DAMPER BDD OR MOD	DRIVE	FAN TYPE	INTERLOCK/CONTROL	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES	
				VOLTAGE & PHASE	H.P.	FLA/AMPS	MCA								MOCOP
EF-1	225	0.5	1253	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	1,2,3
EF-2	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	1,2,3
EF-3	375	0.5	1435	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	1,2,3
EF-4	450	0.5	1532	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-99-VG	1,2,3
EF-5	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	1,2,3
EF-6	175	0.5	1489	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-97-VG	1,2,3
EF-7	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	1,2,3
EF-8	100	0.3	1670	115/1	0.07	1.3	2	15	BDD	DIRECT	INLINE	SWITCH	30	GREENHECK SG-60-VG	1,2,3
SF-1	750	0.5	1089	115/1	0.5	6.4	8	15	MOD	DIRECT	INLINE	SWITCH	65	GREENHECK SG-120-VG	4-7
SF-2	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	4-7
SF-3	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SG-98-VG	4-7

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
 1. PROVIDE ELECTRONIC SPEED CONTROL MOUNTED ABOVE ACCESSIBLE CEILING.
 2. M.C. SHALL PROVIDE AND INSTALL LOW VOLTAGE MOTORIZED DAMPER.
 3. OPERATION OF DEVICE ON OCCUPIED MODE OF RTU OR SWITCH WITH LIGHTS. SEE INTERLOCK/CONTROL COLUMN FOR TYPE.
 4. PROVIDE UNIT MOUNTED DISCONNECT.
 5. FAN AND MOTORIZED DAMPER ARE PART OF EMERGENCY POWER SYSTEM. COORDINATE ALL CIRCUITS WITH EC.
 6. ALL WIRING TO FAN AND DAMPER SHALL BE BY EC.
 7. PROVIDE 120 V DAMPER.

ELECTRIC FAN FORCED HEATER SCHEDULE												
EFH	ROOM NO.	CFM	WALL OR CEILING	KW	MOUNTING	ELECTRICAL CHGR	AMPS	SPEEDS	CONTROL	RPM	MANUFACTURER & MODEL NUMBER	NOTES
1	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
2	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
3	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
4	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
 1. PROVIDE INTERNAL THERMOSTAT.
 2. RECESSED MOUNTED UNIT. PROVIDE RECESSED MOUNTING KIT.
 3. PROVIDE BUILT-IN DISCONNECT.

1) GENERAL INFORMATION

- A. GOVERNING BUILDING CODE: IBC-2018 "INTERNATIONAL BUILDING CODE".
B. BUILDING RISK CATEGORY: THE NON-SHELTER BUILDING RISK CATEGORY ACCORDING TO IBC-2018 TABLE 1604.5 AND ASCE 7-16 TABLE 1.5-1 IS CATEGORY II.
C. ELEVATIONS: REFERENCE FINISHED FLOOR ELEVATIONS OF 100'-0" EQUALS ACTUAL EXISTING FINISH FLOOR ELEVATION OF 1246.09'.
D. CONTRACT DOCUMENTS:
1) THE CONTRACT DOCUMENTS CONSIST OF THE AGREEMENT BETWEEN THE OWNER AND CONTRACTOR...
2) THE GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND DISSEMINATING ALL CONTRACT DOCUMENTS...
3) CORRELATION OF THE CONTRACT DOCUMENTS: THE CONTRACT DOCUMENTS ARE COMPLEMENTARY...
4) THE GENERAL CONTRACTOR SHALL COMPARE THE ARCHITECTURAL AND STRUCTURAL DRAWINGS...
5) GENERAL CONTRACTOR SHALL COORDINATE SIZES AND LOCATIONS OF OPENINGS...
6) ALTHOUGH NOT NECESSARILY SPECIFICALLY REFERENCED IN THE CONTRACT DOCUMENTS...
7) THE USE OF ELECTRONIC FILES OR REPRODUCTION OF CONTRACT DOCUMENTS BY ANY TRADE OR MATERIAL SUPPLIER...

2) NON-SHELTER DESIGN LOADS

- A. GOVERNING STANDARD FOR DESIGN LOADS: ASCE 7-16 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"
B. DEAD LOAD: SELF WEIGHT OF MATERIALS, UNLESS NOTED OTHERWISE
C. UNIFORM LIVE LOADS:
1) ROOF LIVE LOAD (REDUCIBLE).....20 PSF
D. CONCENTRATED LIVE LOADS:
1) ALL FLOORS (ON AN AREA 2.5 FT. X 2.5 FT.).....2,000 LBS
2) ROOFS (ON AN AREA 2.5 FT. X 2.5 FT.).....300 LBS
E. WIND LOADS:
1) RISK CATEGORY:.....II
2) EXPOSURE CATEGORY:.....C
3) ENCLASURE CLASSIFICATION:.....ENCLOSED
4) INTERNAL PRESSURE COEFFICIENT, GCPI:.....+/-0.18
5) TOPOGRAPHIC FACTOR, KZT:.....1.0
6) DIRECTIONALITY FACTOR, Kd:.....0.85
7) ULTIMATE DESIGN WIND SPEED, Vult:.....109 MPH
8) NOMINAL DESIGN WIND SPEED, Vasd:.....90 MPH
F. SNOW LOADS:
1) SNOW IMPORTANCE FACTOR, Is:.....1.0
2) GROUND SNOW LOAD, Pg:.....10 PSF
3) EXPOSURE OF ROOF:.....PARTIALLY EXPOSED
4) SURFACE ROUGHNESS CATEGORY:.....C
5) EXPOSURE FACTOR, Ce:.....1.0
6) THERMAL FACTOR, Ct:.....1.0
7) ROOF SLOPE FACTOR, Cs:.....1.0
8) CALCULATED FLAT ROOF SNOW LOAD, Pf:.....7.0 PSF
9) MINIMUM FLAT ROOF SNOW LOAD, I'Pg:.....10 PSF
10) RAIN ON SNOW SURCHARGE LOAD:......5 PSF
G. RAIN LOADS:
1) 15-MINUTE RAIN INTENSITY:.....7.85 INCHES/HOUR
2) 60-MINUTE RAIN INTENSITY:.....3.98 INCHES/HOUR
3) DEPTH OF WATER ON THE UNDEFLECTED ROOF UP TO THE INLET OF THE SECONDARY DRAINAGE SYSTEM WHEN THE PRIMARY DRAINAGE SYSTEM IS BLOCKED (I.E., THE STATIC HEAD), ds:.....4.0 INCHES
4) ADDITIONAL DEPTH OF WATER ON THE UNDEFLECTED ROOF ABOVE THE INLET OF THE SECONDARY DRAINAGE SYSTEM AT ITS DESIGN FLOW (I.E., THE HYDRAULIC HEAD), dh:.....2.0 INCHES
H. SEISMIC DESIGN CRITERIA:
1) RISK CATEGORY:.....II
2) SEISMIC IMPORTANCE FACTOR, Is:.....1.00
3) SOIL SITE CLASSIFICATION:.....C (ASSUMED)
4) 0.2 SEC. MAPPED SPECTRAL ACCELERATION, Ss:.....0.328
5) 1.0 SEC. MAPPED SPECTRAL ACCELERATION, S1:.....0.083
6) SITE COEFFICIENT, 0.2 SEC. PERIOD, Fa:.....1.30
7) SITE COEFFICIENT, 1.0 SEC. PERIOD, Fv:.....1.50
8) 0.2 SEC. DESIGN SPECTRAL ACCELERATION, Sds:.....0.284
9) 1.0 SEC. DESIGN SPECTRAL ACCELERATION, Sd1:.....0.083
10) SEISMIC DESIGN CATEGORY:.....B

3) MATERIAL DESIGN VALUES

- A. CONCRETE (MIN COMPRESSIVE STRENGTH AT 28 DAYS, NORMAL WEIGHT U.N.O.)
1) FOUNDATIONS:.....3,500 PSI
2) WALLS:.....4,000 PSI
3) SLABS-ON-GRADE:.....4,000 PSI
4) ELEVATED SLABS ON METAL DECK:.....4,000 PSI
5) ALL OTHER STRUCTURAL CONCRETE, U.N.O.:.....4,000 PSI
B. CONCRETE REINFORCEMENT (MINIMUM YIELD STRENGTH)
1) ALL PLAIN AND DEFORMED BARS (ASTM A615, GRADE 60).....FY = 60 KSI
2) WELDED PLAIN WIRE REINFORCEMENT (ASTM A1064).....FY = 65 KSI
3) WELDED DEFORMED WIRE REINFORCEMENT (ASTM A1064).....FY = 70 KSI
4) WELDABLE REINFORCING BARS (ASTM A706).....FY = 60 KSI
C. STRUCTURAL STEEL (MINIMUM YIELD STRENGTH)
1) ALL WIDE FLANGE SHAPES (ASTM A992).....FY = 50 KSI
2) SQUARE AND RECTANGULAR HSS (ASTM A500, GRADE C).....FY = 50 KSI
3) ANCHOR RODS (ASTM F1554, GRADE 55, SUPPLEMENTARY REQUIREMENT S1, WELDABLE).....FY = 55 KSI

- 4) DEFORMED BAR ANCHORS (AWS D1.1 TYPE C, ASTM A1064).....FY = 70 KSI
5) HEADED STUD ANCHORS (AWS D1.1 TYPE B, ASTM A29, GRADES 1010 THROUGH 1020).....FY = 51 KSI
6) ALL OTHER SHAPES AND PLATES UNLESS NOTED (ASTM A36).....FY = 36 KSI (FABRICATOR MAY OPTIONALLY USE ASTM A572-50 PLATE MATERIAL)
D. COLD FORMED STEEL (MINIMUM YIELD STRENGTH)
1) COMPOSITE FLOOR DECK (ASTM A653, SS GRADE 40, G-60 GALVANIZED).....FY = 40 KSI
2) COLD FORMED METAL STUDS, 43 MIL AND LIGHTER (ASTM A1003/A, GRADE ST33H, G-60 GALVANIZED).....FY = 33 KSI
3) COLD FORMED METAL STUDS, 54 MIL AND HEAVIER (ASTM A1003/A, GRADE ST50H, G-60 GALVANIZED).....FY = 50 KSI
4) COLD FORMED METAL CLIPS (ASTM A653, SS GRADE 50,G-90 GALVANIZED).....FY = 50 KSI

4) CONSTRUCTION LOADS AND STABILITY

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL TEMPORARY CONSTRUCTION LOADS CAN BE SAFELY SUPPORTED BY THE STRUCTURE DURING CONSTRUCTION.
B. THE STRUCTURAL FRAMING SYSTEM AND FOUNDATIONS HAVE BEEN DESIGNED AS A COMPLETE STRUCTURAL SYSTEM FOR SUPPORT OF THE LOADS INDICATED IN THE CONSTRUCTION DOCUMENTS. THE STRUCTURE HAS NOT BEEN DESIGNED OR CHECKED FOR TEMPORARY CONSTRUCTION LOADS NOR HAS IT BEEN DESIGNED OR CHECKED FOR ADEQUACY OR STABILITY AS A PARTIALLY ERECTED STRUCTURE.
C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE ABILITY OF THE PARTIALLY COMPLETED OR FULLY COMPLETED STRUCTURE TO RESIST ALL CONSTRUCTION LOADS INCLUDING BUT ARE NOT NECESSARILY LIMITED TO MATERIAL STAGING, PERSONNEL, AND EQUIPMENT.
D. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORES, GUYS, BRACES, AND OTHER SUPPORTS DURING CONSTRUCTION TO KEEP STRUCTURAL FRAMING COMPONENTS SECURE, PLUMB, AND IN ALIGNMENT AGAINST TEMPORARY CONSTRUCTION LOADS AND LOADS EQUAL IN INTENSITY TO DESIGN LOADS. THE TEMPORARY SUPPORTS SHALL BE SUFFICIENT TO SECURE THE PARTIALLY ERECTED STRUCTURE OR ANY PORTION THEREOF AGAINST LOADS THAT ARE LIKELY TO BE ENCOUNTERED DURING CONSTRUCTION, INCLUDING THOSE DUE TO WIND AND THOSE THAT RESULT FROM CONSTRUCTION OPERATIONS.
E. THE CONTRACTOR SHALL NOT REMOVE TEMPORARY SUPPORTS UNTIL THE INSTALLATION OF ALL STRUCTURAL ELEMENTS IS COMPLETE AND HAS BEEN ACCEPTED AS COMPLETE BY THE ENGINEER. FOR THE PURPOSES OF THIS PARAGRAPH, "ALL STRUCTURAL ELEMENTS" INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, THE FOLLOWING STRUCTURAL ELEMENTS:
1) FOUNDATIONS
2) CAST-IN-PLACE CONCRETE COLUMNS, BEAMS WALLS AND ELEVATED SLABS
3) STRUCTURAL STEEL FRAMING WITH COMPLETED STEEL CONNECTIONS, INCLUDING PERMANENT VERTICAL AND/OR HORIZONTAL BRACING
4) FLOOR DECKING
5) CONCRETE SLABS ON METAL DECK

5) EXISTING CONSTRUCTION

- A. ALL VERTICAL AND HORIZONTAL DIMENSIONS, FINISHED FLOOR AND ROOF ELEVATIONS, PLUMBNESS, AND DETAILS FOR THE EXISTING STRUCTURE SHALL BE VERIFIED IN THE FIELD PRIOR TO PROCEEDING WITH ANY DEMOLITION OR INSTALLATION OF NEW WORK.
B. PRIOR TO DEMOLITION OR INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL MAKE WRITTEN DOCUMENTATION IF UNFORESEEN CONDITIONS OCCUR IN THE EXISTING CONSTRUCTION. THESE UNFORESEEN CONDITIONS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR REVIEW AND A WRITTEN RESPONSE BEFORE PROCEEDING WITH THE WORK.
C. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL SHORING, PROPS, AND GUYS REQUIRED FOR THE TEMPORARY SUPPORT OF THE EXISTING STRUCTURE, UTILITIES, ETC. AS MAY BE NECESSARY TO SAFELY COMPLETE DEMOLITION OR NEW WORK.
D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UTILITIES, BOTH CHARTED AND UNCHARTED BEFORE COMMENCING WITH ANY EXCAVATION OR DEMOLITION WORK. DEPTH OF CONCRETE SAW SHALL BE SET SO AS NOT TO CUT ANY LOCAL EMBEDDED OR UNDER-FLOOR PIPING OR WIRING WHICH IS TO REMAIN.
E. ALL DRILLING, CUTTING, DEMOLITION OR OTHER MODIFICATIONS TO EXISTING CONSTRUCTION SHALL BE PERFORMED IN A MANNER THAT WILL NOT REDUCE THE STABILITY OR STRUCTURAL INTEGRITY OF THE EXISTING CONSTRUCTION. WHEN SAW CUTTING, SPECIAL CARE SHALL BE TAKEN TO NOT OVER CUT INTO AN EXISTING AREA OF STRUCTURE THAT WILL REMAIN.
F. CORING FOR PIPING OR CONDUIT THROUGH EXISTING STRUCTURAL MEMBERS IS NOT ALLOWED UNLESS SPECIFICALLY SHOWN IN THE CONTRACT DOCUMENTS OR SPECIFICALLY ALLOWED BY THE STRUCTURAL ENGINEER IN WRITING.
G. DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE OR OTHER EXISTING BUILDING COMPONENTS CAUSED BY DEMOLITION OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND TO A LEVEL ACCEPTABLE TO THE OWNER'S REPRESENTATIVE.
H. WHEN EXISTING FOUNDATIONS ARE TO BE DEMOLISHED, EXCAVATION DEPTHS EXCEEDING 4 FEET SHALL BE BACKFILLED WITH PROPERLY COMPACTED CRUSHED STONE OR FLOWABLE FILL TO WITHIN 4 FEET OF THE REQUIRED FINISHED BACKFILL ELEVATION. THE REMAINING DEPTH OF BACKFILL SHALL BE COMPLETED WITH PROPERLY COMPACTED STRUCTURAL FILL AS OUTLINED IN THE FOUNDATION NOTES.
I. THE PROJECT AREA SHALL BE MAINTAINED AS CLEAN AS POSSIBLE WITH DUST BEING LIMITED AS MUCH AS PRACTICAL.

6) DEFERRED SUBMITTALS

- A. SOME STRUCTURAL AND/OR OTHER BUILDING ELEMENTS ARE DESIGNATED AS VENDOR-DESIGNED IN THE CONSTRUCTION DOCUMENTS. THESE ELEMENTS HAVE NOT BEEN INCLUDED IN THE BUILDING PERMIT ISSUED BY THE BUILDING OFFICIAL AND REQUIRE THEIR DESIGN BE SUBSTANTIATED BY DEFERRED SUBMITTALS.
B. DEFERRED DESIGN SUBMITTALS ARE TO BE SUBMITTED TO THE OWNER'S REPRESENTATIVE AND SHALL INCLUDE BOTH SHOP DRAWINGS AND SIGNED AND SEALED CALCULATIONS PERFORMED BY AN ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED AND EXPERIENCED IN THE DESIGN OF THE SPECIFIC BUILDING ELEMENT BEING SUBMITTED. THE FOLLOWING ITEMS ARE CONSIDERED DEFERRED SUBMITTALS:
1) FORMWORK SHORING AND RESHORING
2) STRUCTURAL STEEL CONNECTIONS
3) ROOF MOUNTED EQUIPMENT AND ASSOCIATED ANCHORAGES
4) ANALYSIS OF CONCRETE SLABS FOR SUPPORT OF PROPOSED LIFT EQUIPMENT (FOR KFC FILE ONLY, WILL NOT BE REVIEWED AND RETURNED)
5) EXTERIOR WINDOW AND/OR CURTAIN WALL SYSTEMS
6) ERECTION BRACING AND STABILITY SEQUENCING AND CALCULATIONS
C. DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING.
D. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY BOTH THE OWNER'S REPRESENTATIVE AND THE BUILDING OFFICIAL.
E. ADDITIONAL ITEMS IMPACTING STRUCTURAL DESIGN, INCLUDING BUT NOT LIMITED TO, ELEVATORS AND MECHANICAL EQUIPMENT WEIGHTS, SHALL BE SUBMITTED TO OWNER'S REPRESENTATIVE FOR EVALUATION

7) FOUNDATION NOTES

- A. GEOTECHNICAL REPORT: FOUNDATION BEARING PRESSURES ARE BASED UPON PRESUMPTIVE VALUES FOR NON-EXPANSIVE CLAY SOILS DEFINED IN TABLE 1806.2 OF IBC 2018. THE OWNER OR CONTRACTOR SHALL RETAIN A GEOTECHNICAL ENGINEER TO CONFIRM ON-SITE SOILS ARE SUITABLE FOR PROPOSED BEARING PER SECTION 1803.2 UNLESS AN EXCEPTION IS ALLOWED PER THE BUILDING OFFICIAL.
A. SITE SUB-GRADE PREPARATION:
1) STRIPPING: SITE PREPARATION FOR THE BUILDING PAD SHALL INCLUDE REMOVING ANY SOFT OR UNSUITABLE MATERIALS ENCOUNTERED DURING CONSTRUCTION. VEGETATION ROOTS, PAVEMENTS, UTILITIES, GRAVEL, EXISTING FOOTINGS, EXISTING SLABS AND ANY TOPSOIL WILL REQUIRE REMOVAL DURING INITIAL SITE STRIPPING. REMOVAL DEPTHS SHALL BE DETERMINED BY A GEOTECHNICAL ENGINEER.
2) PROOF-ROLLING: AFTER MAKING ANY REQUIRED CUTS, THE BUILDING PAD SHALL BE PROOF-ROLLED (UNDER OBSERVATION OF A GEOTECHNICAL ENGINEER) WITH A TWENTY FIVE (25) TON LOADED, TANDEN AXLE DUMP TRUCK TO LOCATE ANY SOFT OR UNSTABLE AREAS. THE PROOF-ROLLING SHALL BE PERFORMED WITH OVERLAPPING PASSES IN MUTUALLY PERPENDICULAR DIRECTIONS. SOILS IN AREAS WHERE RUTTING (DEFLECTIONS GREATER THAN 1 INCH) OR PUMPING OCCURS DURING PROOF-ROLLING SHALL BE OVER-EXCAVATED, MOISTURE CONDITIONED AND REPLACED WITH PROPERLY COMPACTED LOW VOLUME CHANGE SOILS AS DIRECTED BY A GEOTECHNICAL ENGINEER.
3) SCARIFICATION: AFTER STRIPPING, EXCAVATING AND PROOF-ROLLING, THE EXPOSED SOILS SHALL BE SCARIFIED TO A DEPTH OF 12 INCHES AND THEN ADJUSTED TO WITHIN 2% POINTS OF THE SOILS OPTIMUM VALUE PRIOR TO BEING COMPACTED TO AT LEAST 95 PERCENT OF THE SOILS MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST METHOD (ASTM D-698) .
4) ACCEPTABLE FILL: STRUCTURAL FILL MATERIALS SHALL BE FREE OF ORGANIC OR OTHER DELETERIOUS MATTER AND BE A LOW VOLUME CHANGE SOIL OF COHESIVE MATERIALS HAVING A LIQUID LIMIT OF LESS THAN 35 AND A PLASTICITY INDEX BETWEEN 5 AND 15 WITH AT LEAST 60% PASSING THE #200 U.S. STANDARD SIEVE.
5) FILL PLACEMENT: AFTER IN-SITU SOIL PREPARATION AND INSPECTION IS COMPLETE, FILL PLACEMENT TO ESTABLISH SITE DESIGN GRADES MAY BEGIN. THE ZONE OF FILL COMPACTED TO MEET THESE CRITERIA SHALL EXTEND BEYOND THE BUILDING FOOTPRINT AT LEAST 1 FOOT Laterally FOR EACH FOOT OF FILL REQUIRED TO DEVELOP DESIGN GRADE, BUT UNDER NO CIRCUMSTANCE SHALL IT BE LESS THAN 5 FEET. THE FILL SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF 8 INCHES, ADJUSTED TO 1% POINT BELOW TO 2% POINTS ABOVE OF ITS OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95 PERCENT OF THE SOIL'S STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698.
6) FILL PLACEMENT TESTING: EACH LIFT OF COMPACTED FILL SHALL BE TESTED BY A GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF SUBSEQUENT LIFTS. FIELD DENSITY TESTS SHALL BE TAKEN AT A MINIMUM OF ONE PER EVERY 2500 SF, BUT AT LEAST TWO SETS OF DENSITY TESTS SHALL BE TAKEN FOR EACH LIFT.
7) SITE DRAINAGE: THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM THE AREAS OF EXCAVATION DURING CONSTRUCTION TO PREVENT PONDING UNDER FUTURE FLOOR SLABS AND FOOTINGS. THE CONTRACTOR SHALL PROVIDE POSITIVE CUTOFF IN UTILITY TRENCHES AS REQUIRED TO PREVENT WATER MIGRATION INTO AREAS OF EXCAVATIONS AND FUTURE FLOOR SLABS AND FOOTINGS.
8) MAINTENANCE OF SOIL MOISTURE: SOIL MOISTURE SHALL BE MAINTAINED UP UNTIL CONCRETE PLACEMENT TO PREVENT SHRINKAGE AND SUBSEQUENT POST-CONSTRUCTION SWELL OF SUBGRADE SOILS.
B. SHALLOW FOUNDATIONS:
1) FOOTING DESIGN PARAMETERS: THE PROPOSED BUILDING SHALL BE SUPPORTED ON CONVENTIONAL SHALLOW SPREAD FOOTINGS BASED ON THE FOLLOWING DESIGN PARAMETERS:
A) BEARING MATERIAL: NON-EXPANSIVE CLAY TYPE SOIL
B) ALLOWABLE BEARING PRESSURE FOR FOOTINGS: 1,500PSF
2) OBSERVATION OF BEARING CONDITIONS: A GEOTECHNICAL ENGINEER REPRESENTATIVE SHALL OBSERVE THE FOUNDATION EXCAVATIONS PRIOR TO STEEL OR CONCRETE PLACEMENT TO DETERMINE IF THE FOUNDATION MATERIALS ARE CAPABLE OF SUPPORTING THE DESIGN LOADS AND ARE CONSISTENT WITH THE MATERIALS DISCUSSED ABOVE.
3) IMPROVEMENT OF BEARING CONDITIONS: SOFT OR LOOSE SOIL ZONES ENCOUNTERED AT THE BOTTOM OF THE FOOTING EXCAVATIONS SHALL BE REMOVED TO THE LEVEL OF STIFF OR DENSE SOIL AS DIRECTED BY THE GEOTECHNICAL ENGINEER. CAVITIES FORMED AS A RESULT OF EXCAVATION OF SOFT OR LOOSE SOIL ZONES SHALL BE BACKFILLED WITH ENGINEERED FILL, LEAN CONCRETE OR FLOWABLE FILL, AS DETERMINED BY THE GEOTECHNICAL ENGINEER. CARE SHALL BE TAKEN TO PREVENT WETTING OR DRYING OF THE BEARING MATERIALS DURING CONSTRUCTION. ANY EXTREMELY WET OR DRY MATERIAL, OR ANY LOOSE OR DISTURBED MATERIAL IN THE BOTTOM OF THE FOOTING EXCAVATIONS SHALL BE REMOVED PRIOR TO PLACING CONCRETE.
4) TRENCHED FOOTINGS: EARTH-FORMED TRENCHED FOOTINGS ARE PERMITTED, EXCEPT WHERE BRICK LEDGES OR EXPOSED SURFACES REQUIRE FORMING AND/OR WHERE SOIL SIDE WALLS SLOUGH INTO THE TRENCH. IN ORDER TO ACHIEVE 3" MINIMUM CONCRETE COVER OVER STEEL REINFORCING ON SIDEWALLS, EARTH FORMED TRENCHES SHALL BE A MINIMUM OF 2" WIDER THAN THE FORMED DIMENSIONS SHOWN IN ALL SECTIONS AND DETAILS.
5) PIPE PENETRATIONS: ALL HORIZONTAL PIPE OR SIMILAR PENETRATIONS OR SLEEVES THROUGH FOOTINGS SHALL PREFERABLY OCCUR WITHIN THE MIDDLE 1/3 OF THE FOOTING DEPTH AND SHALL HAVE A MAXIMUM OPENING DIAMETER OF ONE-FOURTH THE FOOTING DEPTH. AT PENETRATIONS, PROVIDE (4) #5 DIAGONAL BARS AT EACH FOOTING FACE (3" CLEAR BETWEEN BAR AND PENETRATION AND 3" CLEAR FROM FOOTING BEARING). IF PENETRATION MUST OCCUR NEAR THE BOTTOM OF FOOTING, REFER TYPICAL DETAILS FOR STANDARD DETAIL TO TRANSITION & THICKEN FOOTING TO ACCOMMODATE PENETRATION.
C. SLAB-ON-GRADE CONSTRUCTION
1) SLAB THICKNESS AND REINFORCING: SLABS-ON-GRADE SHALL BE 4" THICK CONCRETE REINFORCED WITH #3 BARS AT 15" ON CENTER EACH WAY. REINFORCING BARS SHALL BE PLACED 1 1/2" CLEAR FROM TOP OF SLAB USING CHAIRS OR SLAB BOLSTERS COMPLYING WITH CRSI'S "MANUAL OF STANDARD PRACTICE".
2) SLAB SUBGRADE: IF EXPANSIVE SOILS, AS DEFINED IN SECTION 1805.3 OF IBC 2018, ARE FOUND ON SITE, THE FLOOR SLAB MAY NEED TO BE SUPPORTED ON A DEPTH OF PROPERLY COMPACTED ENGINEERED FILL AS OUTLINED IN THE SITE SUB-GRADE PREPARATION NOTES ABOVE. THIS DEPTH (IF ANY) IS DEPENDENT UPON THE CHARACTERISTICS OF THE SOIL ON SITE AND SHALL BE DETERMINED FROM THE GEOTECHNICAL ENGINEER REPRESENTATIVE.
3) CONSTRUCTION MONITORING: CONSTRUCTION ACTIVITY MAY CAUSE DAMAGE AND DETEIORATION TO THE PREPARED SUBGRADE. A FIELD REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHALL OBSERVE THE FINAL SUBGRADE PRIOR TO PLACEMENT OF THE SLAB ON GRADE. PERFORM FURTHER TESTING AS NECESSARY, AND DETERMINE IF ANY REMEDIAL MEASURES ARE NECESSARY PRIOR TO SLAB PLACEMENT.
4) AGGREGATE BASE COURSE: A 4-INCH THICK, FREE-DRAINING AGGREGATE BASE COURSE SHALL BE PLACED BENEATH THE FLOOR SLAB TO ENHANCE DRAINAGE AND PROVIDE INCREASED SUBGRADE STRENGTH. AT THE TIME OF THE SLAB PLACEMENT, THE GRANULAR BASE COURSE SHALL BE MOIST, BUT FREE OF ANY STANDING OR SELF-DRAINING WATER. THE AGGREGATE BASE COURSE MATERIAL SHALL MEET THE FOLLOWING CRITERIA:
A) 100 PERCENT SHALL PASS THE 1/2" SIEVE
B) LESS THAN 5 PERCENT SHALL PASS THE #8 SIEVE
C) PLASTICITY INDEX, PI, SHALL BE LESS THAN OR EQUAL TO 6

D) COMPACTED TO 98% STANDARD PROCTOR MAXIMUM DRY DENSITY.

- 5) VAPOR RETARDER: A 15 MIL VAPOR RETARDER SHALL BE PLACED IMMEDIATELY BELOW THE CONCRETE SLAB. VAPOR RETARDER SHALL BE SEALED AT ALL LAPS AND SEALED TO PREVIOUSLY PLACED CONCRETE AS RECOMMENDED BY VAPOR RETARDER MANUFACTURER. BEFORE PLACING CONCRETE, PATCH AND SEAL ANY RIPS, TEARS OR HOLES IN VAPOR RETARDER INCURRED DURING CONSTRUCTION.
6) MOIST CURING OF SLAB: SLABS-ON-GRADE SHALL BE WATER CURED FOR A MINIMUM OF 7 DAYS BY FONDING, SPRAYING, SPRINKLING OR BY USE OF SATURATED COVERINGS. CURING COMPOUNDS ARE EXPRESSLY PROHIBITED.
7) ISOLATION JOINTS: PROVIDE SLAB ISOLATION AROUND COLUMNS PENETRATING THE SLAB-ON-GRADE. PROVIDE 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL AROUND PERIMETER OF ISOLATION JOINTS. REFER TO TYPICAL DETAILS AND ADDITIONAL INFORMATION.
8) SLAB JOINTS: SLAB JOINTS SHALL BE PROVIDED AS SHOWN ON THE PLANS AND TYPICAL DETAILS AND AS DESCRIBED FURTHER IN THE SLAB-ON-GRADE SCHEDULE. THE FOLLOWING JOINT TYPES ARE SHOWN ON THE DRAWINGS:
A) CJ = CONSTRUCTION JOINT
B) SJ = SAWS CONTRACTION JOINT
D. FOUNDATION MISCELLANEOUS
1) GROUNDWATER CONDITIONS: GROUNDWATER MAY BE ENCOUNTERED IN SOME OF THE BUILDINGS AT THE TIME OF DRILLING. ALSO, IT IS POSSIBLE THAT TRANSIENT OVER-SATURATED GROUND CONDITIONS COULD DEVELOP AT SHALLOWER DEPTHS AT A LATER TIME DUE TO PERIODS OF HEAVY PRECIPITATION, LANDSCAPE WATERING, LEAKING WATER LINES, OR OTHER UNFORESEEN CAUSES. THE CONTRACTOR SHALL DETERMINE THE ACTUAL GROUNDWATER LEVELS AT TIME OF CONSTRUCTION. IF GROUNDWATER ISSUES ARE ENCOUNTERED DURING CONSTRUCTION, THE GEOTECHNICAL ENGINEER SHALL BE CONTACTED AND REQUESTED TO ASSESS THE POSSIBLE NEED FOR REMEDIAL MEASURES.
2) DRAINAGE CONSIDERATIONS DURING CONSTRUCTION: DUE TO ADVERSE EFFECT ON STRUCTURES, WATER SHALL NOT BE ALLOWED TO COLLECT IN THE FOUNDATION EXCAVATION OR ON PREPARED SUBGRADE OF THE CONSTRUCTION AREA EITHER DURING OR AFTER CONSTRUCTION. UNDERCUT OR EXCAVATED AREAS SHALL BE SLOPED TOWARD ONE CORNER TO FACILITATE REMOVAL OF ANY COLLECTED RAINWATER, OR POSITIVE RUNOFF SHALL BE PROVIDED. THE CONTRACTOR SHALL EXERCISE CARE IN CREATING DRAINAGE PATHS FOR WATER DURING THE CONSTRUCTION PHASE OF THE PROJECT. TO REDUCE INFILTRATION OF SURFACE WATER AROUND THE PERIMETER OF THE BUILDING AND BENEATH THE FLOOR SLABS, POSITIVE DRAINAGE SHALL BE PROVIDED DURING ALL PHASES OF CONSTRUCTION.
3) FINAL SITE GRADING: PER SECTION 1804.4 OF IBC, THE GROUND IMMEDIATELY ADJACENT TO THE FOUNDATION SHALL BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF NOT LESS THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE) FOR A MINIMUM DISTANCE OF 10 FEET PERPENDICULAR TO THE FACE OF THE WALL. IF PHYSICAL OBSTRUCTIONS OR LOT LINES PROHIBIT 10 FEET OF HORIZONTAL DISTANCE, A 5-PERCENT SLOPE SHALL BE PROVIDED TO AN APPROVED ALTERNATIVE METHOD OF DIVERTING WATER AWAY FROM THE FOUNDATION. SWALES USED FOR THIS PURPOSE SHALL BE SLOPED A MINIMUM OF 2-PERCENT WHERE LOCATED WITHIN 10 FEET OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 10 FEET OF THE BUILDING SHALL BE SLOPED A MINIMUM OF 2-PERCENT AWAY FROM THE BUILDING.
4) EXCAVATION AND TEMPORARY SLOPES: THE CONTRACTOR, DESIGNATED AS "RESPONSIBLE PERSON" IN OSHA CONSTRUCTION STANDARDS FOR EXCAVATIONS, 29 CFR PART 1926, IS SOLELY RESPONSIBLE FOR PLANNING AND IMPLEMENTING ALL SAFETY PROCEDURES DURING CONSTRUCTION. ALL EXCAVATION HEIGHT, SLOPE, AND DEPTH MUST ADHERE TO ALL SPECIFICATIONS OUTLINED IN LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. THE STRUCTURAL ENGINEER DOES NOT ASSUME ANY RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY OR ANY PARTY'S, INCLUDING THE CONTRACTOR'S, COMPLIANCE WITH THE APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS OR ANY OTHER APPLICABLE REGULATIONS.
5) TRENCH BACKFILL: ALL REQUIRED TRENCH BACKFILL SHALL BE ACCEPTABLE FILL MATERIAL AS DEFINED ABOVE AND SHALL BE MECHANICALLY COMPACTED IN LAYERS TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698. SOME SETTLEMENT OF THE BACKFILL MAY BE EXPECTED AND ANY UTILITIES WITHIN THE TRENCHES SHALL BE CONSTRUCTED TO ALLOW THESE DIFFERENTIAL MOVEMENTS. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
6) CONSTRUCTION MONITORING: A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO PROVIDE OBSERVATIONS AND TESTING OF SOILS EXPOSED DURING PROJECT CONSTRUCTION IN ORDER TO VERIFY THAT SOIL CONDITIONS ARE AS ANTICIPATED. CONSTRUCTION ACTIVITIES PERTAINING TO EARTHWORK AND OTHER RELATED ACTIVITIES SHALL ALSO BE OBSERVED BY THE GEOTECHNICAL ENGINEER AS OUTLINED ABOVE.

- 8) CONCRETE CONSTRUCTION NOTES
A. GOVERNING CODES AND STANDARDS: IN ADDITION TO THE REQUIREMENTS OF THE GOVERNING INTERNATIONAL BUILDING CODE, ALL CONCRETE SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS AND AS SUPPLEMENTED BY THESE GENERAL NOTES AND THE PROJECT DRAWINGS AND SPECIFICATIONS:
1) ACI 117-10 "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
2) ACI 301-10 "SPECIFICATIONS FOR STRUCTURAL CONCRETE"
3) ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
4) ACI 347-04 "GUIDE TO FORMWORK FOR CONCRETE"
5) ACI SP-66(04) "ACI DETAILING MANUAL"
6) AWS D1.4-2011 "STRUCTURAL WELDING CODE - REINFORCING STEEL".
7) CRSI MSP-2018 "CRSI MANUAL OF STANDARD PRACTICE"
B. CONCRETE MIXTURES:
1) CEMENTITIOUS MATERIALS
A) OPTION 1 - ORDINARY PORTLAND CEMENT (OPC): ASTM C150 TYPE I OR II UNLESS SPECIFICALLY NOTED OTHERWISE.
B) OPTION 2 - PORTLAND LESTONE CEMENT (PLC): ASTM C595 TYPE 1L UNLESS SPECIFICALLY NOTED OTHERWISE.
C) FLY ASH: ASTM C618 CLASS C OR F. THE MAXIMUM PERCENTAGE OF FLY ASH SHALL NOT EXCEED 25 PERCENT OF THE TOTAL CEMENTITIOUS MATERIAL.
2) ALL CONCRETE MIXES SHALL BE COMPRISED OF NORMAL WEIGHT AGGREGATES CONFORMING TO ASTM C33, EXCEPT WHERE SPECIFICALLY INDICATED AS LIGHTWEIGHT, IN WHICH CASE AGGREGATES SHALL CONFORM TO ASTM C330.
3) MIXING WATER SHALL CONFORM TO ASTM C1062. MIXING WATER, INCLUDING THAT PORTION OF MIXING WATER CONTRIBUTED IN THE FORM OF FREE MOISTURE ON AGGREGATES, SHALL NOT CONTAIN DELETERIOUS AMOUNTS OF CHLORIDE IONS.
4) ADMIXTURES, IF USED, SHALL CONFORM TO THE FOLLOWING:
A) WATER REDUCTION AND SETTING TIME MODIFICATION: ASTM C494.
B) PRODUCING FLOWING CONCRETE: ASTM C1017.
C) AIR ENTRAINMENT: ASTM C260.
D) INHIBITING CHLORIDE INDUCED CORROSION: ASTM C1582.
E) MOISTURE VAPOR REDUCING ADMIXTURE, MVRA: ASTM C494
5) MIX DESIGNS SHALL BE PROPORTIONED BASED ON THE FOLLOWING MIX CHARACTERISTICS:
A) FOUNDATIONS
1) FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS FO
2) SULFATE EXPOSURE CATEGORY (S): CLASS SO
3) WATER EXPOSURE CATEGORY (W): CLASS W0
4) CORROSION PROTECTION CATEGORY (C): CLASS C1



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CIVIL KFC ENGINEERING STRUCTURAL SALAS O'BRIEN MECHANICAL/ELECTRICAL



CJC drawn by BJB checked by SEPTEMBER 2024 date revisions

MOORE PUBLIC SCHOOLS BOARD OF EDUCATION MOORE, OKLAHOMA



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BWB	checked by
SEPTEMBER 2024	date
	revisions



D) A DRILLED ANCHOR HOLE SHALL BE RE-CLEANED JUST PRIOR TO ADHESIVE INJECTION IF, IN THE OPINION OF THE ENGINEER, INSPECTOR, OR OWNER'S REPRESENTATIVE, THE HOLE HAS BECOME CONTAMINATED AFTER INITIAL CLEANING.

6) INSTALLATION OF ADHESIVE ANCHORS:

A) ADHESIVE ANCHORS WITH DIAMETER GREATER THAN 3/8-INCH INSTALLED IN ORIENTATIONS FROM HORIZONTAL TO VERTICAL SHALL EMPLOY A PISTON PLUG FOR THE ADHESIVE INJECTION.

B) ADHESIVE SHALL BE INJECTED IN ACCORDANCE WITH THE MPII USING EQUIPMENT AND PROCEDURES AS SPECIFIED THEREIN FOR THE SPECIFIC CONDITIONS ASSOCIATED WITH THE INJECTION. THIS SHALL BE CLEARLY SPECIFIED IN THE MPII. IF NOT, ANOTHER PRODUCT SHALL BE PROPOSED FOR USE.

C) ANCHOR ELEMENTS TO BE INSTALLED IN THE ADHESIVE SHALL BE CLEAN, OIL-FREE, AND FREE OF LOOSE RUST, PAINT, OR OTHER COATINGS.

D) THREADS ON THE PROJECTING PORTION OF THE ANCHOR ELEMENT SHALL BE PROTECTED FROM ADHESIVE CONTAMINATION.

E) UNLESS SPECIFICALLY SHOWN OTHERWISE ON THE DRAWINGS, ANCHORS SHALL BE INSTALLED PERPENDICULAR TO THE CONCRETE SURFACE.

F) INSTALLED ADHESIVE ANCHORS SHALL BE SECURELY FIXED IN-PLACE TO PREVENT DISPLACEMENT WHILE THE ADHESIVE CURES. ANCHORS DISPLACED BEFORE FULL ADHESIVE CURE SHALL BE CONSIDERED DAMAGED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

7) POST-INSTALLED ANCHORS AND DOWELS SHALL NOT BE BENT AFTER BEING INSTALLED UNLESS PERMITTED BY THE ENGINEER IN WRITING.

6. SPECIAL INSPECTION REQUIREMENTS

1) CONTINUOUS INSPECTIONS: ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS SHALL BE CONTINUOUSLY INSPECTED DURING INSTALLATION BY A CERTIFIED INSPECTOR SPECIFICALLY APPROVED FOR THAT PURPOSE BY THE BUILDING OFFICIAL.

2) PERIODIC INSPECTIONS: PERIODIC SPECIAL INSPECTIONS SHALL BE PROVIDED FOR ALL OTHER POST-INSTALLED ANCHORS NOT INCLUDED IN THE CONTINUOUS INSPECTIONS REQUIRED ABOVE.

3) REPORTING REQUIREMENTS: THE SPECIAL INSPECTOR SHALL FURNISH A REPORT TO THE ENGINEER AND BUILDING OFFICIAL THAT THE WORK COVERED BY THE REPORT HAS BEEN PERFORMED AND THAT THE MATERIALS AND INSTALLATION PROCEDURES USED CONFORM WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII).

10) STEEL CONSTRUCTION NOTES

A. GOVERNING CODES AND STANDARDS: IN ADDITION TO THE REQUIREMENTS OF THE GOVERNING INTERNATIONAL BUILDING CODE, ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND AS SUPPLEMENTED BY THESE GENERAL NOTES AND THE PROJECT DRAWINGS AND SPECIFICATIONS.

- AISC 303-16 "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
- AISC 341-16 "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS"
- AISC 360-16 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
- AWS D1.1-2015 "STRUCTURAL WELDING CODE - STEEL"
- RCS-2014 "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS"

B. CONNECTIONS:

1) CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE FACTORED END REACTIONS SHOWN ON THE DRAWINGS. WHERE END REACTIONS ARE NOT SHOWN OR OTHERWISE SPECIFIED, CONNECTIONS SHALL BE DESIGNED TO SUPPORT A FACTORED END SHEAR OF THE GREATER OF 10 KIPS OR 50% OF THE TOTAL FACTORED UNIFORM LOAD CAPACITY SHOWN IN THE MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN SHAPE, SPAN AND THE SPECIFIED STEEL.

2) ALL CONNECTION PLATES, STIFFENERS AND BOLTS SHOWN ON THE DRAWINGS ARE SCHEMATIC ONLY. FABRICATOR SHALL DESIGN ALL CONNECTIONS, SPLICES, PLATES, GUSSET PLATES, STIFFENERS, BOLTS AND WELDS FOR FORCES INDICATED ON DRAWINGS IN ADDITION TO THE REQUIREMENTS OF THE AISC DESIGN SPECIFICATION (LRFD PROVISIONS). IN ALL CASES, A MINIMUM 3/8" PLATE AND A MINIMUM OF (2) 3/4" DIAMETER A325 BOLTS SHALL BE PROVIDED.

3) FULL-DEPTH STIFFENER PLATES IN COLUMNS OR BEAMS SHALL MATCH THE YIELD STRENGTH OF THE BASE MEMBER.

C. STRUCTURAL BOLTS, ANCHOR RODS & BASE PLATES:

1) STEEL CONTRACTOR SHALL FURNISH ERECTION BOLTS AS REQUIRED FOR FIELD CONNECTIONS.

2) ALL BOLTS SHALL BE 3/4 IN. DIAMETER ASTM A325 WITH SUITABLE WASHERS AND NUTS UNLESS OTHERWISE SHOWN IN THE CONSTRUCTION DOCUMENTS OR APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.

3) ALL BOLTS SHALL BE TIGHTENED TO THE SNUG-TIGHTENED JOINT REQUIREMENTS OF RSC-10 EXCEPT AT SLIP-CRITICAL JOINTS OR WHERE NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS OR IN FABRICATOR'S CONNECTION DESIGN.

4) UNLESS OTHERWISE INDICATED IN THE DRAWINGS, ALL ANCHOR RODS SHALL CONFORM TO THE SPECIFIED MATERIAL GRADE SHALL BE A MINIMUM 3/4 INCH DIAMETER WITH A MINIMUM FOUNDATION EMBEDMENT AS INDICATED IN STRUCTURAL DETAILS. THE EMBEDDED END SHALL HAVE EITHER A STANDARD BOLT HEAD, A HEAVY HEX NUT WITH THE THREADS SPOTLED ABOVE AND BELOW THE NUT, OR JAMMED DOUBLE NUTS.

5) PRIOR TO PLACING CONCRETE, STEEL PLATE TEMPLATES SHALL BE PROVIDED TO FACILITATE PLACEMENT OF ANCHOR RODS IN DETAILED PLAN POSITIONS AND ELEVATIONS.

6) BASE PLATES SHALL BE LEVELED WITH LEVELING NUTS AND OVERSIZED WASHER PLATES OR WITH SHIM PACKS AT THE ERECTOR'S OPTION.

7) AFTER FINAL BASE PLATE POSITIONING, ANCHOR ROD NUTS SHALL BE INSTALLED TO A SNUG-TIGHT CONDITION AND WASHER PLATES SHALL BE FIELD WELDED AS INDICATED IN THE CONSTRUCTION DOCUMENTS.

D. STEEL FABRICATION & FINISH:

1) SHOP DRAWINGS SHALL BE SUBMITTED TO AND REVIEWED BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCING FABRICATION. ANY FABRICATION INITIATED PRIOR TO APPROVAL OF SHOP DRAWINGS WILL BE AT THE SOLE RISK OF THE FABRICATOR.

2) ALL SHOP AND FIELD WELDS SHALL BE MADE IN ACCORDANCE WITH AWS D1.1. ALL WELDING SHALL USE LOW HYDROGEN PROCESSES.

3) ALL BEAMS THAT ARE REQUIRED TO HAVE CAMBER SHALL BE FABRICATED WITH CAMBER UPWARD. BEAMS WITHOUT SPECIFIED CAMBER SHALL BE FABRICATED SUCH THAT AFTER ERECTION, ANY NATURAL CAMBER DUE TO ROLLING OR SHOP FABRICATION IS UPWARD.

4) CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.

D. APPROVED ANCHORING PRODUCTS: THE ANCHORING SYSTEMS SHOWN BELOW HAVE BEEN USED IN THE ANCHOR DESIGNS SHOWN IN THE CONSTRUCTION DOCUMENTS. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERFORMANCE VALUES OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ICC ESR SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE FOR SEISMIC USES, LOAD RESISTANCE, INSTALLATION CATEGORY, AND AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS. ADHESIVE ANCHOR EVALUATION WILL ALSO CONSIDER CREEP, IN-SERVICE TEMPERATURE, AND INSTALLATION TEMPERATURE.

1) ANCHORAGE TO CONCRETE

A) ADHESIVE ANCHORS:

- HILTI HIT-HY 200 SYSTEM WITH HILTI HIT-Z ROD OR HAS-E THREADED ROD [ICC ESR-3187].
- HILTI HIT-RE 500 V3 SYSTEM WITH HILTI HAS-E THREADED ROD [ICC ESR-3814].

B) MEDIUM DUTY MECHANICAL ANCHORS:

- HILTI KWIK HUS-EZ AND KWIK HUS-EZ I SCREW ANCHORS [ICC ESR-3027]
- HILTI KWIK BOLT-TZ EXPANSION ANCHORS [ICC ESR-1917].
- HILTI KWIK BOLT 3 EXPANSION ANCHORS (UNCRACKED CONCRETE ONLY) [ICC ESR-2302]

C) HEAVY DUTY MECHANICAL ANCHORS:

- HILTI HDA UNDERCUT ANCHORS [ICC ESR-1546]
- HILTI HSL-3 EXPANSION ANCHORS [ICC ESR-1545]

2) REBAR DOWELING INTO CONCRETE

A) ADHESIVE ANCHORS:

- HILTI HIT-HY 200 SYSTEM WITH CONTINUOUSLY DEFORMED REBAR [ICC ESR-3187].
- HILTI HIT-RE 500 V3 SYSTEM WITH CONTINUOUSLY DEFORMED REBAR [ICC ESR-3814].

3) ANCHORAGE TO SOLID GROUTED MASONRY

A) ADHESIVE ANCHORS:

- HILTI HIT-HY 270 MASONRY ADHESIVE ANCHORING SYSTEM WITH HILTI HAS-E CONTINUOUSLY THREADED ROD OR CONTINUOUSLY DEFORMED STEEL REBAR [ICC ESR-4143].

B) MECHANICAL ANCHORS:

- HILTI KWIK BOLT-3 EXPANSION ANCHORS [ICC ESR-1385].

4) ANCHORAGE TO HOLLOW / MULTI-WYTHE MASONRY

A) ADHESIVE ANCHORS:

- HILTI HIT-HY 270 MASONRY ADHESIVE ANCHORING SYSTEM WITH HILTI HAS-E CONTINUOUSLY THREADED ROD OR CONTINUOUSLY DEFORMED STEEL REBAR [ICC ESR-4143].
- THE APPROPRIATE SIZE SCREEN TUBE SHALL BE USED PER ADHESIVE MANUFACTURER'S RECOMMENDATION.

E. PREPARATION PRIOR TO INSTALLATION

1) CURING OF BASE MATERIAL: DO NOT DRILL OR CORE HOLES INTO SUPPORTING CONCRETE OR MASONRY MATERIALS UNTIL THE CONCRETE, MORTAR AND/OR GROUT HAVE BEEN ADEQUATELY CURED TO ACHIEVE FULL DESIGN STRENGTH. IN NO CASE SHALL ANCHORS BE INSTALLED PRIOR TO THE CONCRETE HAVING AN AGE OF LESS THAN 21 DAYS.

2) TEMPERATURE OF BASE MATERIAL: THE CONCRETE TEMPERATURE AT THE TIME OF ADHESIVE ANCHOR INSTALLATION SHALL BE AT LEAST 50°F (10°C) UNLESS TESTING HAS BEEN CONDUCTED IN ACCORDANCE WITH RECOGNIZED CRITERIA TO VERIFY PERFORMANCE IN CONCRETE AT LOWER TEMPERATURES.

3) AVOIDANCE OF EMBEDDED ITEMS: PRIOR TO DRILLING OR CORING OPERATIONS, THE CONTRACTOR SHALL LOCATE AND MARK ALL POTENTIALLY CONFLICTING REINFORCING BARS, UTILITIES AND OTHER EMBEDDED ITEMS BY INDUCTION SCANNING, GROUND PENETRATING RADAR, X-RAY, OR OTHER APPROVED NON-DESTRUCTIVE METHOD. CONTRACTOR SHALL AVOID DRILLING OR CORING HOLES THAT MAY DAMAGE THESE EMBEDDED ITEMS. NOTIFY THE ENGINEER IF CONFLICTING EMBEDDED ITEMS DO NOT ALLOW INSTALLATION OF POST-INSTALLED ANCHORS IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND/OR APPROVED SHOP DRAWINGS.

4) CARTRIDGE STORAGE: ADHESIVE CARTRIDGES SHALL BE STORED UNDER CONDITIONS IN COMPLIANCE WITH MANUFACTURER RECOMMENDATIONS REGARDING TEMPERATURE, EXPOSURE TO SUNLIGHT, ETC. AND EVIDENCE OF COMPLIANCE SHALL BE MADE AVAILABLE UPON REQUEST. THE USE OF EXPIRED ADHESIVE, AS INDICATED BY THE EXPIRATION DATE ON THE CARTRIDGE, IS PROHIBITED.

5) INSTALLATION EQUIPMENT: THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT REQUIRED TO INSTALL THE EXPANSION AND/OR ADHESIVE ANCHOR INCLUDING, BUT NOT LIMITED TO, DRILLS, SETTING TOOLS, CLEAN-OUT BRUSHES, BLOWOUT BULBS, OIL-FREE COMPRESSED AIR, VACUUMS, WRENCHES, ETC.

F. INSTALLATION

1) ALL DRILLING AND CORING EQUIPMENT AND ALL METHODS FOR INSTALLATION OF POST-INSTALLED ANCHORS AND DOWELS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII).

2) UNLESS OTHERWISE SPECIFIED, ANCHORS SHALL BE INSTALLED IN HOLES DRILLED WITH A ROTARY IMPACT HAMMER DRILL OR, WHERE NOT OTHERWISE PROSCRIBED, A ROCK DRILL. IN ALL CASES, THE BIT DIAMETER SHALL BE IN ACCORDANCE WITH THE MPII.

3) EMBEDMENT DEPTH AND MINIMUM ANCHOR PROJECTION OF THE ANCHOR ELEMENT FROM THE CONCRETE SURFACE SHALL BE AS SHOWN ON THE DRAWING OR DETAIL FOR THE PARTICULAR ANCHOR OR GROUP OF ANCHORS BEING INSTALLED.

4) ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGES OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS. ANCHOR SPACING AND EDGE DISTANCE VALUES SHALL NOT BE LESS THAN RECOMMENDED BY THE ANCHOR MANUFACTURER.

5) HOLES FOR POST-INSTALLED ANCHORS:

A) UNLESS SPECIFICALLY SHOWN OTHERWISE, ALL HOLES SHALL BE INSTALLED PERPENDICULAR TO THE CONCRETE OR MASONRY SURFACE.

B) ANCHOR HOLES SHALL BE THOROUGHLY CLEANED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN THE MPII PRIOR TO ADHESIVE INJECTION. AT A MINIMUM, THIS SHALL CONSIST OF CLEANING WITH OIL-FREE AND MOISTURE-FREE COMPRESSED AIR, USING A NOZZLE EXTENDED TO THE BOTTOM HOLE; SUPPLEMENTED WITH A BRUSH OR OTHER TOOL CLEANING TO REMOVE ALL CONCRETE DUST AND LOOSE MATERIAL; AND FOLLOWED BY A SECOND COMPRESSED AIR CLEANING. THIS IS COMMONLY KNOWN AS BLOW-BRUSH-BLOW OR BBB. SOME ANCHOR MANUFACTURERS HAVE DEVELOPED VACUUM SYSTEMS THAT REPLACE THE TRADITIONAL BBB APPROACH.

C) DRILLED AND CLEANED ANCHOR HOLES SHALL BE PROTECTED FROM CONTAMINATION AND WATER (E.G. RAIN) UNTIL THE ADHESIVE IS INSTALLED.

2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, FABRICATION, INSTALLATION, AND REMOVAL OF FORMWORK. FORMWORK DESIGN SHALL CONSIDER THE FOLLOWING:

- METHOD OF CONCRETE PLACEMENT.
- RATE OF CONCRETE PLACEMENT.
- CONSTRUCTION LOADS, INCLUDING VERTICAL, HORIZONTAL AND IMPACT.
- AVOIDANCE OF DAMAGE TO PREVIOUSLY CONSTRUCTED MEMBERS.

3) FORMWORK FABRICATION AND INSTALLATION SHALL RESULT IN A FINAL STRUCTURE THAT CONFORMS TO SHAPES, LINES, AND DIMENSIONS OF THE MEMBERS AS REQUIRED BY THE CONSTRUCTION DOCUMENTS.

4) FORMWORK SHALL BE SUFFICIENTLY TIGHT TO INHIBIT LEAKAGE OF PASTE AND MORTAR.

5) FORMWORK SHALL BE BRACED OR TIED TOGETHER TO MAINTAIN SAFETY, POSITION AND SHAPE.

6) REMOVAL OF FORMWORK

A) BEFORE STARTING CONSTRUCTION, THE CONTRACTOR SHALL DEVELOP A PROCEDURE AND SCHEDULE FOR REMOVAL OF FORMWORK AND INSTALLATION OF RESHORES, AND SHALL CALCULATE THE LOADS TRANSFERRED TO THE STRUCTURE DURING THIS PROCESS.

B) STRUCTURAL ANALYSIS AND CONCRETE STRENGTH REQUIREMENTS USED IN PLANNING AND IMPLEMENTING THE FORMWORK REMOVAL AND RESHORE INSTALLATION SHALL BE FURNISHED BY THE CONTRACTOR TO THE LICENSED DESIGN PROFESSIONAL AND TO THE BUILDING OFFICIAL.

C) NO CONSTRUCTION LOADS SHALL BE PLACED ON, NOR ANY FORMWORK REMOVED FROM, ANY PART OF THE STRUCTURE UNDER CONSTRUCTION EXCEPT WHEN THAT PORTION OF THE STRUCTURE IN COMBINATION WITH REMAINING FORMWORK HAS SUFFICIENT STRENGTH TO SUPPORT SAFELY ITS WEIGHT AND LOADS PLACED THEREON AND WITHOUT IMPAIRING SERVICEABILITY.

D) SUFFICIENT STRENGTH SHALL BE DEMONSTRATED BY STRUCTURAL ANALYSIS CONSIDERING ANTICIPATED LOADS, STRENGTH OF FORMWORK, AND AN ESTIMATE OF IN-PLACE CONCRETE STRENGTH.

E) THE ESTIMATE OF IN-PLACE CONCRETE STRENGTH SHALL BE BASED ON TESTS OF FIELD-CURED CYLINDERS OR ON OTHER PROCEDURES TO EVALUATE CONCRETE STRENGTH APPROVED BY THE LICENSED DESIGN PROFESSIONAL AND, WHEN REQUESTED, APPROVED BY THE BUILDING OFFICIAL.

F) FORMWORK SHALL BE REMOVED IN SUCH A MANNER NOT TO IMPAIR SAFETY AND SERVICEABILITY OF THE STRUCTURE.

G) CONCRETE EXPOSED BY FORMWORK REMOVAL SHALL HAVE SUFFICIENT STRENGTH NOT TO BE DAMAGED BY THE REMOVAL.

H) FORMWORK SUPPORTS FOR POST-TENSIONED MEMBERS SHALL NOT BE REMOVED UNTIL SUFFICIENT POST-TENSIONING HAS BEEN APPLIED TO ENABLE POST-TENSIONED MEMBERS TO SUPPORT THEIR DEAD LOAD AND ANTICIPATED CONSTRUCTION LOADS.

I) NO CONSTRUCTION LOADS EXCEEDING THE COMBINATION OF SUPERIMPOSED DEAD LOAD PLUS LIVE LOAD INCLUDING REDUCTION SHALL BE PLACED ON ANY UNSHORED PORTION OF THE STRUCTURE UNDER CONSTRUCTION, UNLESS ANALYSIS INDICATES ADEQUATE STRENGTH TO SUPPORT SUCH ADDITIONAL LOADS AND WITHOUT IMPAIRING SERVICEABILITY.

G. CONCRETE MISCELLANEOUS:

1) WATERSTOPS AND WATERPROOFING: ALL CONSTRUCTION JOINTS (VERTICAL AND HORIZONTAL) IN BELOW-GRADE CONCRETE WALLS, TRENCHES AND PITS SHALL BE KEYS AND HAVE BENTONITE WATERSTOPS INSTALLED UNLESS NOTED OTHERWISE. ALL BELOW-GRADES, PITS AND TRENCHES SHALL BE WATERPROOFED AS SHOWN IN ARCHITECTURAL DRAWINGS, UNLESS NOTED OTHERWISE.

2) EQUIPMENT PADS: PROVIDE CONCRETE EQUIPMENT PADS OF SIZE REQUIRED FOR EQUIPMENT FURNISHED. SEE MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL DRAWINGS FOR NUMBER, SIZE, AND LOCATION OF SUCH PADS. UNLESS OTHERWISE SHOWN, MINIMUM PAD THICKNESS SHALL BE 4" AND SHALL EXTEND A MINIMUM OF 6" BEYOND THE FACE OF THE EQUIPMENT. MINIMUM REINFORCING SHALL BE #4 BARS AT 12" O.C. EACH WAY. TOOLED OR CHAMFERED EDGES SHALL BE PROVIDED AT ALL EQUIPMENT PADS. ANCHORAGE TO SUPPORTING SLAB SHALL BE MADE. REFER TO TYPICAL DETAILS.

3) CHAMFERED EDGES: UNLESS NOTED OTHERWISE ON ARCHITECTURAL DRAWINGS, PROVIDE 3/4" CHAMFER ON ALL EXPOSED CONCRETE EDGES.

4) SURFACE FINISH: ALL HORIZONTAL CONCRETE SURFACES SHALL HAVE A TROWELED FINISH UNLESS NOTED OTHERWISE IN ARCHITECTURAL DRAWINGS OR FLOORING SPECIFICATIONS. AT STAIR TREAD PLACEMENTS PROVIDE A FINE BROOM FINISH TRANSVERSE TO THE RISERS UNLESS NOTED OTHERWISE.

5) MOIST CURING OF SLABS: SLABS-ON-GRADE AND SLABS-ON-DECK SHALL BE WATER CURED FOR A MINIMUM OF 7 DAYS BY PONDING, SPRAYING, SPRINKLING OR BY USE OF SATURATED COVERINGS. CURING COMPOUNDS ARE EXPRESSLY PROHIBITED.

6) VAPOR EMISSION LIMITS: IT IS THE CONTRACTOR'S RESPONSIBILITY TO PLAN AND DETERMINE THE MEANS AND METHODS NECESSARY FOR LIMITING VAPOR EMISSIONS TO AN ACCEPTABLE RANGE AS REQUIRED BY FLOOR FINISH MANUFACTURERS.

9) POST-INSTALLED ANCHORS AND DOWELS

A. GOVERNING CODES AND STANDARDS: IN ADDITION TO THE REQUIREMENTS OF THE GOVERNING INTERNATIONAL BUILDING CODE, ALL POST-INSTALLED ANCHORS AND DOWELS SHALL BE DETAILED, FABRICATED, AND INSTALLED IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS AND AS SUPPLEMENTED BY THESE GENERAL NOTES AND THE PROJECT DRAWINGS AND SPECIFICATIONS.

- ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
- ACI 355.2-07 "QUALIFICATION OF POST-INSTALLED MECHANICAL ANCHORS IN CONCRETE."
- ACI 355.4-11 "QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE."

B. QUALIFICATION REQUIREMENTS FOR INSTALLERS

1) CONTRACTOR SHALL REQUEST, SCHEDULE AND FACILITATE THE ANCHOR AND/OR ADHESIVE MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL THE MANUFACTURER'S SPECIFIED ANCHORING PRODUCTS. THE ENGINEER MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTOR'S ANCHOR INSTALLATION PERSONNEL ARE TRAINED PRIOR TO COMMENCEMENT OF ANCHOR INSTALLATION OPERATIONS.

2) INSTALLATION OF ADHESIVE ANCHORS HORIZONTALLY OR UPWARDLY INCLINED SHALL BE PERFORMED BY PERSONNEL CERTIFIED BY AN APPLICABLE CERTIFICATION PROGRAM. CERTIFICATION SHALL INCLUDE WRITTEN AND PERFORMANCE TESTS IN ACCORDANCE WITH THE ACI/CRSI ADHESIVE ANCHOR INSTALLER (AAI) CERTIFICATION PROGRAM, OR EQUIVALENT. WHEN APPLICABLE, SOME DOWN-HOLE INSTALLATIONS SHOWN ON DRAWINGS SUPPORTING SUSTAINED TENSION LOADS ARE DESIGNATED WITH A (CERT) AFTER THE ANCHOR CALLOUT AND SHALL ALSO REQUIRE INSTALLER CERTIFICATION AS OUTLINED ABOVE.

C. QUALIFICATION REQUIREMENTS FOR PRODUCTS

1) POST-INSTALLED EXPANSION AND UNDERCUT ANCHORS SHALL MEET THE ASSESSMENT CRITERIA OF ACI 355.2.

2) POST-INSTALLED ADHESIVE ANCHORS SHALL MEET THE ASSESSMENT CRITERIA OF ACI 355.4.

- 28-DAY COMPRESSIVE STRENGTH: 3,500 PSI
- MAXIMUM WATER/CEMENT RATIO: 0.55
- MAXIMUM AGGREGATE SIZE: 1 1/2 INCHES
- TARGET AIR CONTENT: 4.5 PERCENT PLUS OR MINUS 1.5 PERCENT
- MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENTITIOUS MATERIALS: 0.30

B) WALLS

- FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F2
- SULFATE EXPOSURE CATEGORY (S): CLASS S0
- WATER EXPOSURE CATEGORY (W): CLASS W0
- CORROSION PROTECTION CATEGORY (C): CLASS C1
- 28-DAY COMPRESSIVE STRENGTH: 4,000 PSI
- MAXIMUM WATER/CEMENT RATIO: 0.45
- MAXIMUM AGGREGATE SIZE: 1 1/2 INCHES
- TARGET AIR CONTENT: 5.5 PERCENT PLUS OR MINUS 1.5 PERCENT
- MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENTITIOUS MATERIALS: 0.30

C) SLABS-ON-GRADE

- FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F0
- SULFATE EXPOSURE CATEGORY (S): CLASS S0
- WATER EXPOSURE CATEGORY (W): CLASS W0
- CORROSION PROTECTION CATEGORY (C): CLASS C0
- 28-DAY COMPRESSIVE STRENGTH: 4,000 PSI
- MAXIMUM WATER/CEMENT RATIO: 0.45
- MAXIMUM AGGREGATE SIZE: 1 1/2-INCHES
- TARGET AIR CONTENT: DO NOT ALLOW AIR CONTENT OF TROWEL-FINISHED FLOORS TO EXCEED 3 PERCENT
- MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENTITIOUS MATERIALS: 1.00
- MVRA REQUIRED IN ALL SLABS-ON-GRADE.

D) ELEVATED SLABS ON METAL DECK

- FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F0
- SULFATE EXPOSURE CATEGORY (S): CLASS S0
- WATER EXPOSURE CATEGORY (W): CLASS W0
- CORROSION PROTECTION CATEGORY (C): CLASS C0
- 28-DAY COMPRESSIVE STRENGTH: 4,000 PSI
- MAXIMUM WATER/CEMENT RATIO: 0.45
- MAXIMUM AGGREGATE SIZE: 3/4-INCHES
- TARGET AIR CONTENT: DO NOT ALLOW AIR CONTENT OF TROWEL-FINISHED FLOORS TO EXCEED 3 PERCENT
- MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENTITIOUS MATERIALS: 1.00

6) CONCRETE MIX PROPORTIONS SHALL BE ESTABLISHED IN ACCORDANCE WITH ARTICLE 4.2.3 OF ACI 301 SO THAT THE CONCRETE SATISFIES THE FOLLOWING THREE REQUIREMENTS:

- THE CONCRETE CAN BE PLACED READILY WITHOUT SEGREGATION INTO FORMS AND AROUND REINFORCEMENT UNDER ANTICIPATED PLACEMENT CONDITIONS. THE CONCRETE PRODUCER SHALL DETERMINE WHETHER ADMIXTURES ARE NECESSARY FOR WATER REDUCTION, SET TIME, OR SLUMP REQUIREMENTS.
- THE CONCRETE SHALL MEET REQUIREMENTS FOR THE ASSIGNED EXPOSURE CLASSES OUTLINED HEREIN.
- THE CONCRETE SHALL CONFORM TO STRENGTH TEST REQUIREMENTS FOR STANDARD-CURED SPECIMENS.

7) DOCUMENTATION OF CONCRETE MIXTURE CHARACTERISTICS SHALL BE SUBMITTED FOR REVIEW BEFORE THE MIXTURE IS USED. EVIDENCE OF THE ABILITY OF THE PROPOSED MIXTURE TO COMPLY WITH THE CONCRETE MIXTURE REQUIREMENTS IN THE CONSTRUCTION DOCUMENTS SHALL BE INCLUDED IN THE SUBMITTAL. THE EVIDENCE SHALL BE BASED ON FIELD TEST RECORDS OR LABORATORY TRIAL BATCHES.

C. CONCRETE REINFORCING:

1) ALL DETAILING, FABRICATION, AND PLACING OF REINFORCING STEEL, UNLESS OTHERWISE NOTED, SHALL FOLLOW ALL SECTIONS OF ACI 318-14, ACI 308, AND THE CRSI MSP.

2) UNLESS OTHERWISE NOTED, LAP SPLICES OF DEFORMED REINFORCING BARS SHALL CONFORM TO ACI REQUIREMENTS FOR CLASS B TENSION SPLICES. REFER TO LAP LENGTH SCHEDULES FOR TYPICAL LAP REQUIREMENTS.

3) PLACEMENT OF WELDED WIRE REINFORCEMENT SHALL BE CONTINUOUS, SHALL NOT BE INTERRUPTED BY BEAMS AND GIRDDERS, AND SHALL BE LAPPED A MINIMUM OF 8-INCHES UNLESS SHOWN OTHERWISE IN DETAILS.

4) PROVIDE CORNER BARS IN BOTH FACES OF ALL CONTINUOUS GRADE BEAMS, FOOTINGS AND WALLS. NUMBER, SIZE, AND SPACING OF CORNER BARS SHALL BE EQUAL TO NUMBER, SIZE AND SPACING OF HORIZONTAL REINFORCING WITH WHICH THEY LAP AND SHALL HAVE CLASS B TENSION LAP SPLICES IN EACH DIRECTION. REFER TO TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

5) AT INTERSECTING FOUNDATIONS, EXTEND ALL HORIZONTAL REINFORCING OF THE INTERSECTING MEMBERS BEYOND THE POINT OF INTERSECTION TO THE OPPOSITE FACE. BEND TO A STANDARD 90 DEGREE HOOK OR PROVIDE BENT DOWELS OF EQUAL SIZE AND SPACING AND LAP AS REQUIRED FOR A CLASS B TENSION SPLICE (BUT NOT LESS THAN 12") IN EACH DIRECTION. REFER TO TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

6) PROVIDE TIES COMPLYING WITH ACI 318 IN ALL CONCRETE COLUMNS AND PILASTERS. EVERY CORNER AND ALTERNATING LONGITUDINAL BAR SHALL HAVE A LATERAL SUPPORT PROVIDED BY THE CORNER OF A TIE WITH AN INCLUDED ANGLE ON NOT MORE THAN 135-DEGREES. NO UNSUPPORTED LONGITUDINAL BAR SHALL BE FARTHER THAN 6-IN. CLEAR ON EACH SIDE ALONG THE TIE FROM A Laterally SUPPORTED BAR.

- 5) THE FABRICATOR SHALL BE RESPONSIBLE FOR ALL ERECTION AIDS. ANY SUCH ERECTION AIDS SHALL BE REMOVED FROM THE COMPLETED STRUCTURE IF DIRECTED BY THE OWNER'S REPRESENTATIVE.
- 6) ALL EXTENSION BARS, RUN-OFF PLATES, AND BACKING BARS USED IN WELDED CONNECTIONS SHALL BE REMOVED AND THE JOINTS SHALL BE GROUND SMOOTH WHERE SUCH CONNECTION IS PERMANENTLY EXPOSED TO VIEW OR IS DESIGNATED AS ARCHITECTURALLY EXPOSED STRUCTURAL STEEL.
- 7) HEADED STUDS AND DEFORMED BAR ANCHORS
- A) ALL HEADED STUDS AND DEFORMED BAR ANCHORS SHALL BE INSTALLED USING AUTOMATIC END-WELDING EQUIPMENT RECOMMENDED BY THE STUD OR ANCHOR MANUFACTURER. MANUAL WELDING OF HEADED STUDS OR DEFORMED BAR ANCHORS WILL NOT BE ALLOWED.
- B) IF A VISUAL INSPECTION REVEALS ANY STUD THAT DOES NOT SHOW A FULL 360-DEGREE FLASH OR ANY STUD THAT HAS BEEN REPAIRED BY MANUAL WELDING, SUCH STUD SHALL BE BENT TO AN ANGLE APPROXIMATELY 15 DEGREES FROM ITS ORIGINAL AXIS. THE DIRECTION OF BENDING FOR STUDS WITH LESS THAN A 360-DEGREE FLASH SHALL BE OPPOSITE TO THE MISSING PORTION OF THE FLASH.
- C) HEADED STUDS AND DEFORMED BAR ANCHORS THAT HAVE SUCCESSFULLY PASSED THE BEND TEST WITHOUT SIGN OF FAILURE SHALL BE ACCEPTABLE FOR USE AND LEFT IN THE BENT POSITION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
- D) WELDED STUDS NOT CONFORMING TO THE REQUIREMENTS OF AWS D1.1 SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR. THE CONTRACTOR SHALL REVISE THE WELDING PROCEDURE AS NECESSARY TO ENSURE THAT SUBSEQUENT STUD WELDING WILL MEET AWS D1.1 REQUIREMENTS.
- 8) STEEL EMBEDMENTS IN CONCRETE:
- A) ALL STEEL COMPONENTS TO BE EMBEDDED IN CONCRETE SHALL HAVE COATINGS AS DEFINED IN THE TABLE BELOW.

COATINGS FOR STEEL EMBEDMENTS IN CONCRETE		
EXPOSURE	FIELD WELDING	FINISH
EXTERIOR	EITHER	GALVANIZED
INTERIOR	YES	UNPAINTED
	NO	GALVANIZED

FOOTNOTES:

1. ALL WELDING TO PREVIOUSLY GALVANIZED COMPONENTS WILL REQUIRE REMOVAL OF THE GALVANIZING WITH GRINDING FOR AT LEAST 3-INCHES FROM EITHER SIDE OF THE INTENDED WELD AND ON BOTH SIDES OF THE WORKPIECE.
2. FIELD WELDED AREAS AND OTHER AREAS WITH REMOVAL OF, OR DAMAGE TO, THE GALVANIZED COATING SHALL HAVE THEIR COATING RESTORED IN ACCORDANCE TO ASTM A780, USING PAINT CONTAINING ZINC DUST OR SIMILAR PERMITTED PRODUCTS CAPABLE OF PROVIDING A MINIMUM ZINC-RICH COATING THICKNESS OF 2.0 MILS IN A SINGLE APPLICATION.

- B) IN ORDER TO REDUCE THE RISK OF HEAT-INDUCED CONCRETE SPALLING AT FIELD-WELDED EMBED PLATES:
- i) ALLOW SUPPORTING CONCRETE TO CURE FOR A MINIMUM OF 14-DAYS PRIOR TO FIELD WELDING.
- ii) PROVIDE THE WELD SIZE SHOWN IN DETAILS AND DO NOT OVER-WELD.
- 9) SHOP PRIMER
- A) ALL STEEL EXPOSED TO EXTERIOR WEATHER OR AN UNCONTROLLED ENVIRONMENT SHALL BE BLAST CLEANED AND PRIMED WITH A SUBMITTED AND APPROVED ZINC-RICH PRIMER.
- B) INTERIOR STEEL SHALL BE SHOP PRIMED WITH THE FABRICATORS STANDARD SHOP PRIMER.
- C) SHOP PRIMER SHALL NOT BE APPLIED TO THE FOLLOWING AREAS:
- i) SURFACES EMBEDDED IN CONCRETE OR MORTAR. EXTEND PRIMING OF PARTIALLY EMBEDDED MEMBERS TO A DEPTH OF 2 INCHES.
- ii) SURFACES TO BE FIELD WELDED.
- iii) SURFACES TO BE HIGH-STRENGTH BOLTED WITH SLIP-CRITICAL CONNECTIONS.
- iv) SURFACES TO RECEIVE SPRAYED FIRE-RESISTIVE MATERIALS.
- v) GALVANIZED SURFACES.

E. STEEL MISCELLANEOUS:

- 1) ALL EDGE ANGLES SUPPORTING ROOF OR FLOOR DECK SHALL BE CONTINUOUS BUTT-SPLICE WELDED OVER SUPPORTS.
- 2) ALL ELEVATED MECHANICAL EQUIPMENT SHALL BE SUPPORTED BY STEEL FRAMING. IF SPECIFIC FRAMING SIZES ARE NOT PROVIDED ON THE FRAMING PLAN, REFER TYPICAL DETAILS FOR ROOF AND FLOOR OPENING FRAME DETAILS.
- 3) SUBSTITUTION OF POST-INSTALLED ANCHORS FOR EMBEDDED ANCHORS SHOWN ON THE DRAWINGS WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.
- 4) WHERE POST-INSTALLED ANCHORS ARE USED IN CONTINUOUS ANGLES, FABRICATE ANGLE WITH OPTIONAL HOLE LOCATIONS TO ALLOW REMEDIATION OF CASES WHERE ANCHORS FOUL WITH REBAR. AS AN EXAMPLE, FOR A CONTINUOUS ANGLE WITH ANCHORS AT 24" ON CENTER, PROVIDE HOLES AT 6" ON CENTER.
- 5) GALVANIZED LOOSE LEDGE ANGLES SHALL BE PROVIDED OVER ALL MASONRY VENEER OPENINGS OR RECESSES DEEPER THAN 1". LINTELS SHALL HAVE 1" OF BEARING AT EACH END FOR EVERY FOOT OF SPAN, WITH A MINIMUM OF 4" AND SIZED AS FOLLOWS UNLESS SHOWN OTHERWISE IN THE DRAWINGS.
- A) UP TO 4'-0" L3-1/2 x 3-1/2 x 3/8
- B) 4'-1" to 5'-0" L4 x 3-1/2 x 3/8 (LLV)
- C) 5'-1" to 6'-6" L5 x 3-1/2 x 3/8 (LLV)
- D) 6'-7" to 8'-0" L6 x 3-1/2 x 3/8 (LLV)

- H) $S_n = 0.504 \text{ IN}^3/\text{FT}$
- I) $F_y = 50 \text{ KSI}$
- J) SIDE LAPS: OVERLAPPED
- K) UNIT WEIGHT OF NORMAL WEIGHT CONCRETE FILL: 145 PCF

- 3) NON-COMPOSITE STRENGTH REQUIRED: THE COMPOSITE DECK SHALL BE CAPABLE OF SAFELY AND NON-COMPOSITELY SUPPORTING THE WET WEIGHT OF CONCRETE, INCLUDING AN ADDITIONAL CONCRETE PONDING WEIGHT OF 6 PSF DUE TO DEFLECTION OF DECK AND SUPPORTING STEEL FRAMING, PLUS TEMPORARY CONSTRUCTION LOADS WITHOUT REQUIRING SHORING. THE DECK SUPPLIER SHALL INFORM OWNER'S REPRESENTATIVE IF ANY PROJECT SPAN CONDITIONS DO NOT COMPLY WITH THIS REQUIREMENT AND SHALL RECOMMEND AREAS THAT MUST BE TEMPORARILY SHORED UNTIL CONCRETE HAS CURED FOR A MINIMUM OF 7 DAYS.
- 4) DECK ORIENTATION: COMPOSITE ROOF DECK SHALL BE PLACED WITH RIBS PERPENDICULAR TO SUPPORTING STEEL FRAMING EXCEPT AT SKEWED FRAMING MEMBERS.
- 5) SUPPORT FASTENERS: ENDS OF COMPOSITE METAL DECKING SHALL BE BUTTED AND CONNECTED TO SUPPORTS WITH MINIMUM 5/8" DIAMETER PUDDLE WELDS AT MAXIMUM 12" SPACING. (EACH SIDE OF BUTTED JOINT)
- 6) SIDE LAP FASTENERS: PROVIDE BUTTON PUNCHED SIDE LAPS 12" ON CENTER. SIDE LAP CONNECTIONS ARE DECK TO DECK CONNECTIONS.
- 7) MINIMUM BEARING LENGTH: MINIMUM EXTERIOR AND INTERIOR BEARING LENGTHS SHALL BE AS RECOMMENDED BY THE DECK MANUFACTURER FOR THE SPECIFIC DECK TYPE, GAGE AND SLAB THICKNESS USED.

- C. SUPPORTS FOR DECKING ARE DEFINED AS MEMBERS PROVIDING DIRECT TRANSVERSE SUPPORT AS WELL AS CONTINUOUS PARALLEL EDGE SUPPORT.

- D. ALL DECKING SHALL BE PLACED WITH RIBS PERPENDICULAR TO SUPPORTING ROOF OR FLOOR MEMBERS AND SHALL SPAN A MINIMUM OF 3 SPANS UNLESS SHOWN OTHERWISE IN STRUCTURAL DRAWINGS.

- E. METAL DECKING SHALL NOT BE USED TO SUPPORT ANY HANGING LOADS INCLUDING, BUT NOT LIMITED TO, SUSPENDED MECHANICAL, ELECTRICAL, OR PLUMBING EQUIPMENT, CABLE TRAYS OR RACEWAYS, CEILING FINISHES OR CEILING FRAMING.

- F. ALL DECK OPENINGS GREATER THAN 2-IN. SHALL BE SUPPORTED BY AN ANGLE FRAME. IF SPECIFIC FRAMING SIZES ARE NOT PROVIDED ON THE FRAMING PLAN, REFER TYPICAL DETAILS FOR ROOF OPENING FRAME DETAIL.

- G. PROVIDE SHEET STEEL COLUMN CLOSURES, Z-CLOSURES, CELL CLOSURES, POUR STOPS AND GIRDER FILLERS OF SAME MATERIAL AND FINISH AS DECK WITH THICKNESS AND PROFILE RECOMMENDED IN SDI FLOOR DECK DESIGN MANUAL, SECOND EDITION (JUNE 2020). WELD TO SUPPORTING STRUCTURE ACCORDING TO SDI RECOMMENDATIONS AND AS CONCEPTUALLY SHOWN IN TYPICAL FLOOR DECK CLOSURE DETAILS.

- H. ALL ROOF DECK EDGES SHALL BE SUPPORTED WITH POUR STOPS OR BENT PLATES. IF BENT PLATES ARE NOT SHOWN IN THE STRUCTURAL DRAWINGS, PROVIDE GAGE METAL POUR STOPS COMPLYING WITH SDI FLOOR DECK DESIGN MANUAL, SECOND EDITION (JUNE 2020), SECTION 5, TABLE 11 AND AS SHOWN IN TYPICAL DETAILS.

11) METAL DECK NOTES

- A. GOVERNING CODES AND STANDARDS: IN ADDITION TO THE REQUIREMENTS OF THE GOVERNING INTERNATIONAL BUILDING CODE, ALL STEEL DECK AND ASSOCIATED MATERIALS SHALL BE DETAILED, FABRICATED, AND ERRECTED IN ACCORDANCE WITH THE FOLLOWING STEEL DECK INSTITUTE (SDI) STANDARDS AND AS SUPPLEMENTED BY THESE GENERAL NOTES AND THE PROJECT DRAWINGS AND SPECIFICATIONS.
- 1) SDI NC-2017 "STANDARD FOR NONCOMPOSITE STEEL FLOOR DECK"
- 2) SDI RD-2017 "STANDARD FOR STEEL ROOF DECK"
- 3) SDI-C-2017 "STANDARD FOR COMPOSITE STEEL FLOOR DECK SLABS"
- 4) SDI-QA/QC-2017 "STANDARD FOR QUALITY CONTROL AND QUALITY ASSURANCE FOR INSTALLATION OF STEEL DECK"
- B. SHELTER COMPOSITE ROOF DECK:
- 1) COMPOSITE ROOF SYSTEM: COMPOSITE ROOF SYSTEM SHALL BE AS NOTED ON PLAN DRAWINGS AND AS SHOWN IN TYPICAL DETAILS.
- 2) BASIS OF DESIGN: VULCRAFT TYPE 3VLI COMPOSITE METAL DECK WITH THE CHARACTERISTICS AND STRUCTURAL PROPERTIES OUTLINED BELOW. COMPOSITE DECKS OF OTHER MANUFACTURERS ARE ACCEPTABLE IF THEY PROVIDE SIMILAR LOAD-CARRYING CAPACITY FOR THE DECK SPANS APPLICABLE TO THIS PROJECT.
- A) SDI DECK TYPE: COMPOSITE
- B) DEPTH: 2 IN.
- C) THICKNESS: 18 GAGE
- D) FINISH: GALVANIZED
- E) $I_p = 0.559 \text{ IN}^4/\text{FT}$
- F) $I_n = 0.558 \text{ IN}^4/\text{FT}$
- G) $S_p = 0.495 \text{ IN}^3/\text{FT}$

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revisions

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1. SHELTER GENERAL INFORMATION

- A. TYPE OF SHELTER: TORNADO.
- B. SHELTER WIND DESIGN GUIDELINES: ICC/NSSA STANDARD FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS - 2014 (ICC 500-2014).
- C. ROOF SYSTEMS HAVE BEEN SELECTED IN ACCORDANCE WITH DEBRIS IMPACT TESTING IN ACCORDANCE WITH ASTM E 1886 AT TEXAS TECH UNIVERSITY (REFER SUMMARY REPORT DATED JUNE 2003 PREPARED BY WIND SCIENCE AND ENGINEERING RESEARCH CENTER). REFER SECTION A1 4" THICK CONCRETE-#4 REBAR REINFORCEMENT 12 INCHES ON CENTER EACH WAY (TESTED FOR 162 MPH)-67 MPH REQUIRED.
- D. WALL SYSTEMS HAVE BEEN SELECTED IN ACCORDANCE WITH DEBRIS IMPACT TESTING IN ACCORDANCE WITH ASTM E 1886 AT TEXAS TECH UNIVERSITY (REFER SUMMARY REPORT DATED JUNE 2003 PREPARED BY WIND SCIENCE AND ENGINEERING RESEARCH CENTER). REFER SECTION A1 8" REINFORCED CONCRETE WALLS (TESTED FOR 135 MPH) - 100 MPH REQUIRED.
- E. REFERENCE ELEVATION OF 100'-0" EQUALS DATUM FINISHED FLOOR ELEVATION OF 1246.09' FOR THE STORM SHELTER.
- F. BASED ON THE FLOOD INSURANCE RATE MAPS (FIRM) FOR CLEVELAND COUNTY (MAP NUMBER 40027C0160J) THE FINISHED FLOOR ELEVATIONS OF 1246.09' FOR THE STORM SHELTER IS GREATER THAN THE HIGHEST FLOOD ELEVATION OF 1239.0' WHICH HAS A 0.2-PERCENT ANNUAL CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR. THE SHELTER IS NOT LOCATED IN AN AREA SUSCEPTIBLE TO FLOODING.
- G. REFER MECHANICAL DRAWINGS FOR LOCATIONS OF SHELTER VENTILATION.
- H. FURNISH LOOSE CONNECTION HARDWARE AND ANCHORAGE ITEMS TO BE EMBEDDED OR ATTACHED TO OTHER CONSTRUCTION BEFORE STARTING THAT WORK. PROVIDE LOCATIONS, SETTING DIAGRAMS, TEMPLATES, INSTRUCTIONS, AND DIRECTIONS, AS REQUIRED, FOR INSTALLATION.
- I. MISSILE CRITERIA (ICC-500 2014 TABLE 305.1.1)
 - 1) 15-LB SAWN LUMBER 2x4 MISSILE
 - 2) 100 MPH MISSILE SPEED FOR VERTICAL SURFACES
 - 3) 67 MPH MISSILE SPEED FOR HORIZONTAL SURFACES
- J. AFFIXED OPENING PROTECTIVE DEVICES HAVE BEEN DESIGNED USING 3/4" STEEL PLATE SELECTED IN ACCORDANCE WITH DEBRIS IMPACT TESTING IN ACCORDANCE WITH ASTM E 1886 AT TEXAS TECH UNIVERSITY (REFER REPORT NUMBER 20131123C - PROTOCOL 4 TESTING PROVIDED ON AN 11 GAGE STEEL PANEL PERFORMED ON 12/13/2013 AND 01/10/2014).
- K. SHELTER DOORS AND WINDOWS SHALL BE RATED FOR A MINIMUM DESIGN PRESSURE OF 246 PSF AND HAVE BEEN TESTED TO MEET THE IMPACT CRITERIA LISTED ABOVE. MANUFACTURER SHALL SUBMIT TESTING REPORTS AND INSTALLATION DETAILS TO ARCHITECT/ENGINEER FOR APPROVAL. THIS INCLUDES ANCHORAGE TYPES AND MINIMUM SETBACK DIMENSIONS FROM CONCRETE FACE.
- L. DOOR UNDERCUT SHALL NOT EXCEED 3/4" INCH.
- M. JOINTS, GAPS OR VOIDS IN THE SHELTER ENVELOPE THAT OPEN INTO THE PROTECTED OCCUPANT AREA INCLUDING MASONRY JOINTS, EXPANSION JOINTS, OPENING JOINTS SHALL BE A MAXIMUM OF 3/8" UNLESS NOTED OTHERWISE.

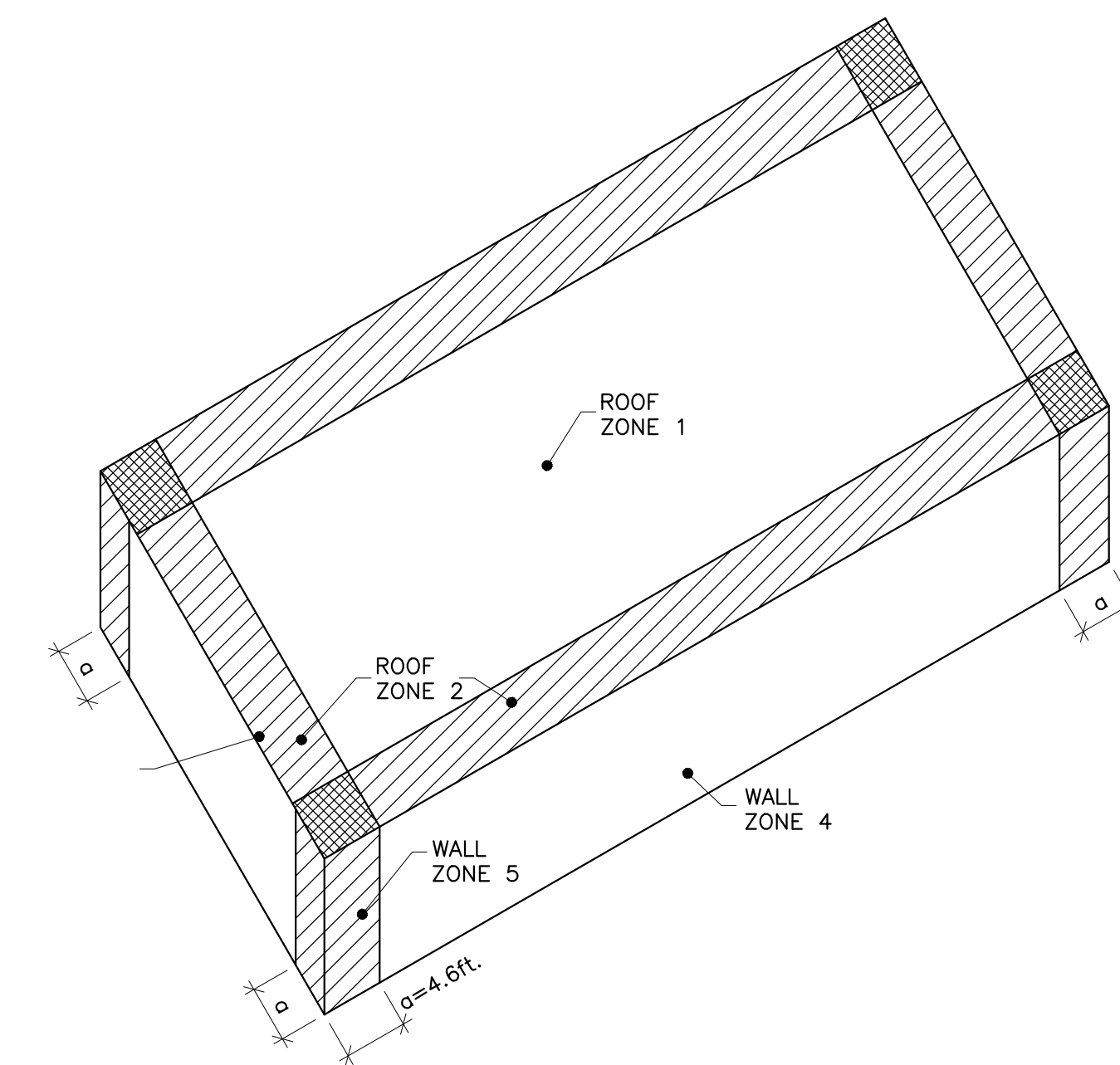
2. SHELTER DESIGN LOADS

- A. DEAD LOAD: SELF WEIGHT OF MATERIALS, UNLESS NOTED OTHERWISE
- B. ROOF DEAD LOAD:
 - 1) CONCRETE DECK (4" NW CONC. ON 2" COMP. - 6" TOTAL).....63 PSF
 - 2) STEEL BEAMS.....7 PSF
 - 3) MISC (LIGHTING, DUCTWORK, PIPING, ETC.).....5 PSF
 - 4) TOTAL.....75 PSF
- C. LIVE LOADS:
 - 1) ROOF LIVE LOAD (SHELTER).....100 PSF
- D. SHELTER WIND PARAMETERS:
 - 1) GOVERNING CODE:.....ICC 500-2014
 - 2) IMPORTANCE FACTOR, Iw:.....1.0
 - 3) EXPOSURE CATEGORY:.....C
 - 4) INTERNAL PRESSURE COEFFICIENTS, PARTIALLY ENCLOSED, GCPI:.....+/-0.55
 - 5) TOPOGRAPHIC FACTOR, Kzt:.....1.0
 - 6) DIRECTIONALITY FACTOR, Kd:.....1.0
 - 7) WIND VELOCITY, V:.....250 MPH
- E. EXTREME WIND PRESSURES-MAIN WIND FORCE RESISTING SYSTEM:
 - 1) -GCFI
 - A) WINDWARD WALL:.....167 PSF IN
 - B) LEEWARD WALL:.....19 PSF OUT
 - C) SIDE WALL:.....6 PSF OUT
 - 2) +GCFI
 - A) WINDWARD WALL:.....18 PSF IN
 - B) LEEWARD WALL:.....132 PSF IN
 - C) SIDE WALL:.....156 PSF OUT
 - 3) ROOF 0'-0" TO 12'-6" FROM LEADING EDGE:.....179 PSF OUT
 - 4) ROOF 12'-6" TO 25'-0" FROM LEADING EDGE:.....132 PSF OUT
 - 5) ROOF BEYOND 25'-0" FROM LEADING EDGE:.....109 PSF OUT
 - 6) ROOF:.....54 PSF IN
- F. SNOW LOADS:
 - 1) GOVERNING CODE:.....ASCE 7-16
 - 2) IMPORTANCE FACTOR, Is:.....1.10
 - 3) GROUND SNOW LOAD, Pg:.....10 PSF
 - 4) EXPOSURE FACTOR, Ce:.....1.0
 - 5) THERMAL FACTOR, Ct:.....1.0
 - 6) ROOF SLOPE FACTOR, Cs:.....1.0
 - 7) CALCULATED FLAT ROOF SNOW LOAD, Pf:.....7.7 PSF
 - 8) MINIMUM FLAT ROOF SNOW LOAD, I*Pf:.....11 PSF
 - 9) RAIN ON SNOW SURCHARGE LOAD (3/8" PER FT > W/50):.....5 PSF
 - 10) DRIFT LOADS:.....ASCE 7-16
- G. SEISMIC DESIGN CRITERIA:
 - 1) GOVERNING CODE:.....ASCE 7-16
 - 2) IMPORTANCE FACTOR, Ie:.....1.25
 - 3) SOIL SITE CLASSIFICATION:.....C
 - 4) 0.2 SEC. MAPPED SPECTRAL ACCELERATION, Ss:.....0.328
 - 5) 1.0 SEC. MAPPED SPECTRAL ACCELERATION, S1:.....0.083
 - 6) SITE COEFFICIENT, 0.2 SEC. PERIOD, Fa:.....1.3
 - 7) SITE COEFFICIENT, 1.0 SEC. PERIOD, Fv:.....1.5
 - 8) 0.2 SEC. DESIGN SPECTRAL ACCELERATION, Sds:.....0.284
 - 9) 1.0 SEC. DESIGN SPECTRAL ACCELERATION, Sd1:.....0.083
 - 10) SEISMIC DESIGN CATEGORY:.....B
 - 11) SEISMIC PARAMETERS:
 - A) SEISMIC FORCE RESISTING SYSTEM: ORDINARY REINFORCED CONCRETE SHEAR WALLS
 - B) RESPONSE MODIFICATION COEFFICIENT, R:.....4.00
 - C) SYSTEM OVERSTRENGTH FACTOR, O:.....2.50
 - D) DEFLECTION AMPLIFICATION FACTOR, Cd:.....4.00
 - E) ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE METHOD.
 - F) SEISMIC RESPONSE COEFFICIENT, Cs:.....0.0888
 - G) TOTAL LATERAL BASE SHEAR, V:.....27 KIPS

3. QUALITY ASSURANCE PLAN

- A. DETAILED REQUIREMENTS: PER ICC 500, SECTION 107.3.1, DETAILS CONTAINED WITHIN THESE DOCUMENTS EXEMPLIFY THE FOLLOWING CRITERIA.
 - 1) ROOF CLADDING, SOFFITS AND ROOF FRAMING CONNECTIONS.
 - A) COMPOSITE ROOF DECK ON STEEL BEAMS DETAILED REQUIREMENTS:
 - 1. COMPOSITE DECK WELDED TO STEEL BEAMS
 - 2. HEADED STUDS CONNECTED TO STEEL BEAMS (THROUGH DECK) OR TO GIRDETS.
 - 3. MINIMUM 4" CONCRETE THICKNESS OVER COMPOSITE METAL DECK.
 - 4. REINFORCEMENT OF CONCRETE DECK WITH A MINIMUM OF #4 AT 12 INCHES ON CENTER EACH WAY.
 - 5. STEEL BEAM CONNECTIONS TO WALL WITH EMBED PLATE.
 - 6. STEEL BEAM CONNECTION TO BEAM SHEAR TAB PLATE.
 - 7. STEEL BEAM TO INTERIOR COLUMN CONNECTION.
 - 2) WALL CONNECTIONS TO ROOF DIAPHRAGM AND FRAMING.
 - A) DOWELS FROM CONCRETE WALL INTO SLAB.
 - B) EMBED PLATES IN CAST-IN-PLACE WALLS TO DECK ANGLES.
 - 3) ROOF DIAPHRAGM SYSTEM, INCLUDING CONNECTORS, DRAG STRUTS AND BOUNDARY ELEMENTS.
 - A) CAST-IN-PLACE SLAB WITH MINIMUM #4 AT 12 INCHES ON CENTER AND MINIMUM CHORD STEEL OF 1 #5 BARS.
 - 4) MAIN WIND FORCE RESISTING SYSTEMS INCLUDING BRACED FRAMES, MOMENT FRAMES AND SHEAR WALLS.
 - A) ORDINARY REINFORCED CAST-IN-PLACE CONCRETE SHEAR WALLS
 - 5) MAIN WIND FORCE RESISTING SYSTEM CONNECTIONS TO THE FOUNDATION.
 - A) REINFORCING STEEL DOWELS.
 - B) ANCHOR BOLTS.
 - C) GROUT.
 - 6) FABRICATION AND INSTALLATION OF COMPONENTS AND ASSEMBLIES OF THE SHELTER ENVELOPE REQUIRED TO MEET MISSILE IMPACT TEST REQUIREMENTS OF CHAPTER 3.
 - A) REFER TO ITEMS 1.D, 1.E, AND 1.F INDICATED ABOVE.
 - B) VERIFY DOOR TESTING AND ANCHORAGE REQUIREMENTS.
 - C) VERIFY SHUTTER TESTING AND ANCHORAGE REQUIREMENTS.
 - D) VERIFY OVERHEAD DOOR TESTING AND ANCHORAGE REQUIREMENTS.
 - E) VERIFY LOUVER TESTING AND ANCHORAGE REQUIREMENTS.
 - 7) WALL CLADDING AND WALL CLADDING CONNECTIONS.
 - A) CAST-IN-PLACE - VERTICAL AND HORIZONTAL REINFORCING.
 - 8) CORROSION RESISTANCE OR PROTECTION OF EXPOSED METAL CONNECTORS PROVIDING LOAD PATH CONTINUITY.
 - A) GALVANIZED EMBED PLATES.
 - B) ALL WELDS TO GALVANIZED EMBED PLATES MUST BE PROPERLY PREPPED PRIOR TO WELDING, SLAG REMOVED, WELD CLEANED AND COLD GALVANIZING PAINT ADDED.
 - 9) FOUNDATION DESIGN:
 - A) SHALLOW CONT. AND SPREAD FOUNDATION SYSTEM WITH SLIDING AND PASSIVE RESISTANCE.
 - B) SLAB-ON-GRADE NOT USED AS DIAPHRAGM AND SUBGRADE DRAG.
- B. MAIN WINDFORCE-RESISTING SYSTEMS AND WIND-RESISTING COMPONENTS
 - 1) SHALLOW CONT./SPREAD FOOTING
 - 2) CONCRETE BEARING/SHEAR WALLS
 - 3) COMPOSITE STEEL BEAMS
 - 4) STEEL EMBEDS AND PERIMETER ANGLES
 - 5) COMPOSITE METAL DECK
 - 6) REINFORCING STEEL
 - 7) STEEL PROTECTION DEVICES
 - 8) SHELTER ROOM DOORS, WINDOWS, AND LOUVERS.
- C. REQUIRED SPECIAL INSPECTIONS SHALL BE PROVIDED FOR CONSTRUCTION AND INSTALLATION OF MATERIALS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE. TYPE AND FREQUENCY ARE IDENTIFIED ON S1.05.
 - 1) ANCHORAGE OF ALL OPENING PROTECTIVE DEVICES (DOORS, WINDOWS, SHUTTERS, LOUVERS, AND AFFIXED COWLINGS) SHALL BE CONTINUOUSLY OBSERVED BY A SPECIAL INSPECTOR.
- D. INSPECTION OF FABRICATORS: WHERE FABRICATION OF STRUCTURAL LOAD-BEARING AND DEBRIS-IMPACT-RESISTANT COMPONENTS AND ASSEMBLIES IS BEING PERFORMED ON THE PREMISES OF A FABRICATOR SHOP, SPECIAL INSPECTION OF THE FABRICATOR SHALL BE PROVIDED.
 - 1) EXCEPTION: PREFABRICATED STORM SHELTER COMPONENTS THAT HAVE BEEN INSPECTED AND LABELED BY AN APPROVED AGENCY MEETING THE REQUIREMENTS OF THE APPLICABLE BUILDING CODE.
- E. STRUCTURAL OBSERVATIONS: IN ADDITION TO THE REQUIREMENTS OF THE SPECIAL INSPECTOR, THE OWNER SHALL EMPLOY A LICENSED PROFESSIONAL STRUCTURAL ENGINEER TO INSPECT THE FOLLOWING ELEMENTS OF THE MAIN WIND FORCE RESISTING SYSTEM OF THE SHELTER TO VERIFY CONFORMANCE WITH THE CONTRACT DOCUMENTS AT SIGNIFICANT CONSTRUCTION STAGES AND AT THE COMPLETION OF THE STRUCTURAL SYSTEM. DEFICIENCIES SHALL BE REPORTED IN WRITING TO THE OWNER AND AHJ. AT THE CONCLUSION OF THE WORK, THE REGISTER DESIGN PROFESSIONAL SHALL SUBMIT TO THE AHJ A WRITTEN STATEMENT INDICATING SITE VISITS MADE AND IDENTIFYING ANY OUTSTANDING DEFICIENCIES THAT HAVE NOT BEEN RESOLVED.
 - 1) FOUNDATIONS
 - A) REBAR SIZE, SPACING AND LAP LENGTHS AND LOCATIONS
 - 2) WALLS
 - A) REBAR SIZE, SPACING, LAP LENGTHS
 - B) EMBED SIZE AND LOCATIONS
 - 3) ROOF
 - A) REBAR SIZE, SPACING, LAP LENGTHS
 - B) PERIMETER AND OPENING DECK EDGE INSTALLATION
 - C) METAL DECK SIZE AND ATTACHMENT
 - D) HEADED STUD ANCHORS SIZE, SPACING, AND ATTACHMENT
 - 4) DOORS
 - A) VERIFY INSTALLATION OF EACH DOOR IS PER MANUFACTURER'S TESTED ASSEMBLY.
 - B) VERIFY ALL DOOR HARDWARE IS FULLY OPERATIONAL.
 - C) VERIFY DOORS HAVE PROPER LABELS INDICATING REQUIRED PRESSURE AND IMPACT RATING.
 - 5) PROTECTION DEVICES
 - A) VERIFY INSTALLATION OF EACH STEEL PLATE PROTECTION DEVICES IS PER CONTRACT DRAWINGS.
 - B) VERIFY ALL OPENINGS REQUIRING PROTECTION HAVE PROTECTION DEVICE INSTALLED.
- F. CONTRACTOR RESPONSIBILITY: EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION, FABRICATION OR INSTALLATION OF A MAIN WIND FORCE-RESISTING SYSTEM OR ANY COMPONENT LISTED IN THE QUALITY ASSURANCE PLAN SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE AHJ, THE ARCHITECT/ENGINEER, AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL BE INCLUDED WITH THE FIRST SUBMITTAL/SHOP DRAWING. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN:
 - 1) ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE QUALITY ASSURANCE PLAN.
 - 2) ACKNOWLEDGEMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS.
 - 3) PROCEDURES FOR EXERCISING CONTROL WITHIN THE CONTRACTOR'S ORGANIZATION, THE METHOD AND FREQUENCY OF REPORTING AND THE DISTRIBUTION OF REPORTS.
 - 4) IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THEIR POSITION(S) IN THE ORGANIZATION.

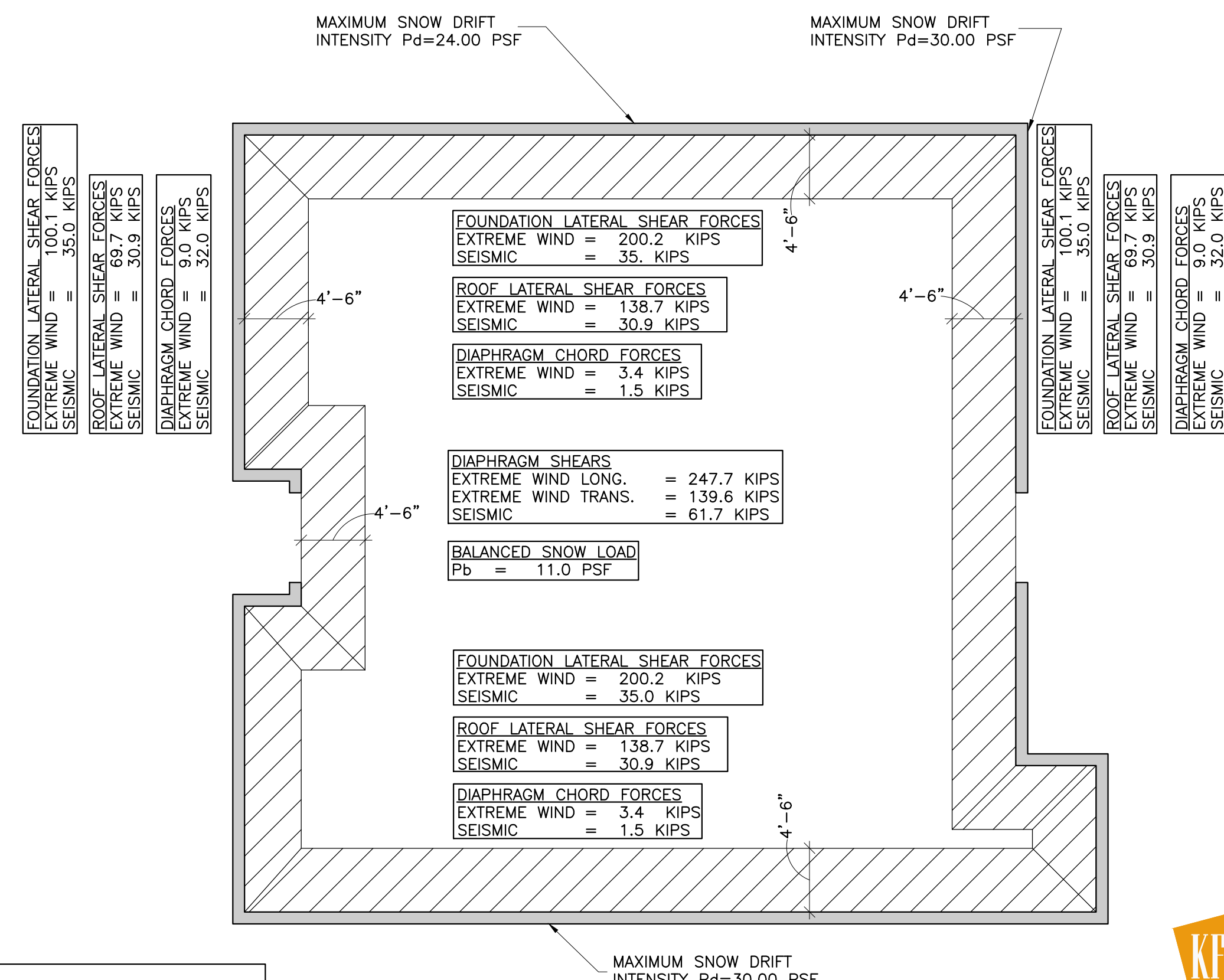
- G. PRE-CONSTRUCTION MEETING: TO BE HELD PRIOR TO STARTING CONSTRUCTION AN INCLUDE THE CONSTRUCTION MANAGER, DESIGN TEAM, SPECIAL INSPECTOR, STRUCTURAL OBSERVER, AND THE CONTRACTORS RESPONSIBLE FOR FABRICATION AND INSTALLATION OF THE MAIN WIND FORCE-RESISTING SYSTEM AND COMPONENTS. AT A MINIMUM THE MEETING SHALL CONSIST OF THE FOLLOWING ITEMS:
 - 1) REVIEW THE CONSTRUCTION DOCUMENTS AND QUALITY ASSURANCE PLAN.
 - 2) REVIEW THE CONTRACTORS STATEMENT OF RESPONSIBILITY.
 - 3) REVIEW THE CONSTRUCTION SCHEDULE AND SEQUENCE OF REQUIRED SPECIAL INSPECTIONS.
- H. SHELTER PENETRATIONS: THE DESIGN TEAM, CONSTRUCTION MANAGER, MEP TRADES, PRECAST PROVIDER, AND SPECIAL INSPECTOR SHALL MEET TO IDENTIFY ALL ITEMS PENETRATING THE PRECAST SHELTER ENVELOPE. THE METHOD OF INSTALLATION (FIELD CORING VS. FORMING) AND APPROPRIATE PROTECTION DETAILS SHALL BE REVIEWED FOR EACH INSTANCE.
- I. SHELTER SPECIAL INSPECTION
 - 1) POST INSTALLED ANCHORAGE AT THE SHELTER IN CONCRETE SHALL BE CONTINUOUSLY INSPECTED.
 - 2) INSTALLATION OF SHELTER DOORS OR AFFIXED COWLINGS SHALL BE CONTINUOUSLY INSPECTED.
 - 3) WELDING OF SHELTER DOORS OR AFFIXED COWLINGS SHALL BE CONTINUOUSLY INSPECTED.
 - 4) HEADED STUD ANCHORS AND THE QUALITY OF THEIR CONNECTION TO THE TOP OF BEAM FLANGES
 - 5) COMPOSITE METAL DECK SIZE AND ATTACHMENT



1 COMPONENT AND CLADDING ISOMETRIC
S103 SCALE: 1/16"=1'-0"

NOTE: POSITIVE PRESSURES ARE DIRECTED INWARD ON THE EXTERIOR SURFACE. NEGATIVE PRESSURES ARE DIRECTED OUTWARD ON THE EXTERIOR SURFACE.

EXTREME WIND COMPONENTS AND CLADDING LOADS										
BUILDING ELEMENT	SPAN (FT)	WIDTH (FT)	AREA (FT ²)	WIND PRESSURE ZONE 1 (PSF)	WIND PRESSURE ZONE 2 (PSF)	WIND PRESSURE ZONE 3 (PSF)	WIND PRESSURE ZONE 4+2 (PSF)	WIND PRESSURE ZONE 5+3 (PSF)	WIND PRESSURE ZONE 4 (PSF)	WIND PRESSURE ZONE 5 (PSF)
14'-0 3/4" WALL	14.02	4.71	66						-192/180	-212/180
12'-8" WALL	12.67	4.26	54						-194/181	-215/181
WINDWARD + LEEWARD PARAPET	3.50	1.17	4				461	585		
ROOF BEAM	43.30	14.40	623	-197/102	-224/102	-224/102				
ROOF DECK	6.67	2.22	15	-209/114	-307/114	-425/114				
STORM DOOR	-	-	10						-209/197	-246/197



NOTES:
1. VERIFY FINAL LOCATION OF ALL ROOF PENETRATIONS AND HUNG EQUIPMENT.
2. REFER ARCHITECTURAL AND MECHANICAL DRAWINGS FOR ADDITIONAL HANGING LOADS NOT SHOWN.

2 SHELTER LOAD PLAN
S103 SCALE: 1/8"=1'-0"

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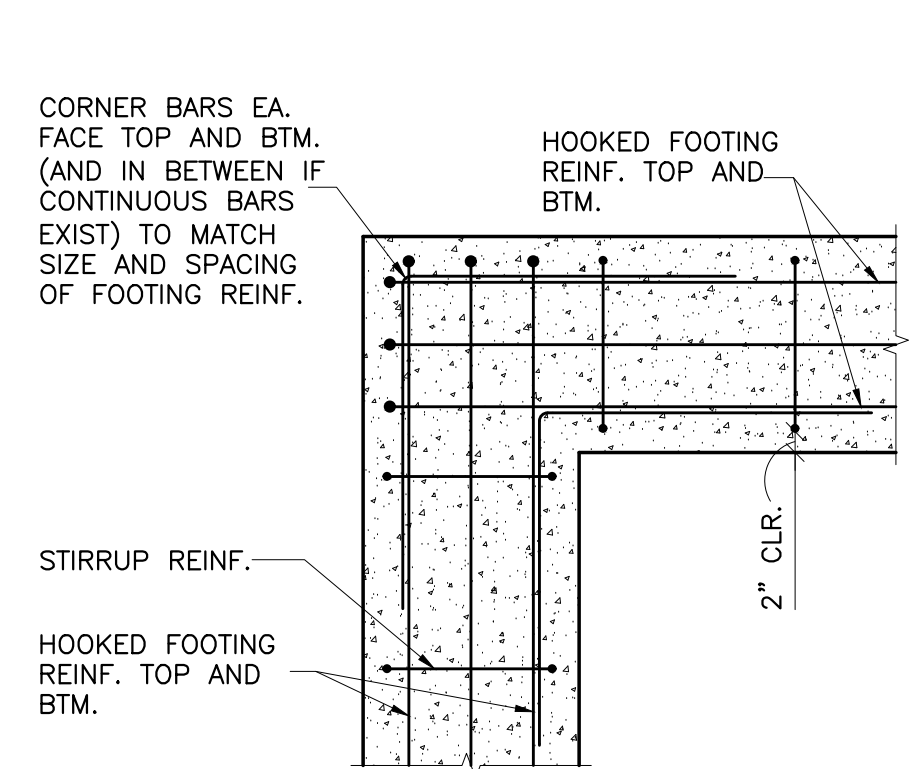
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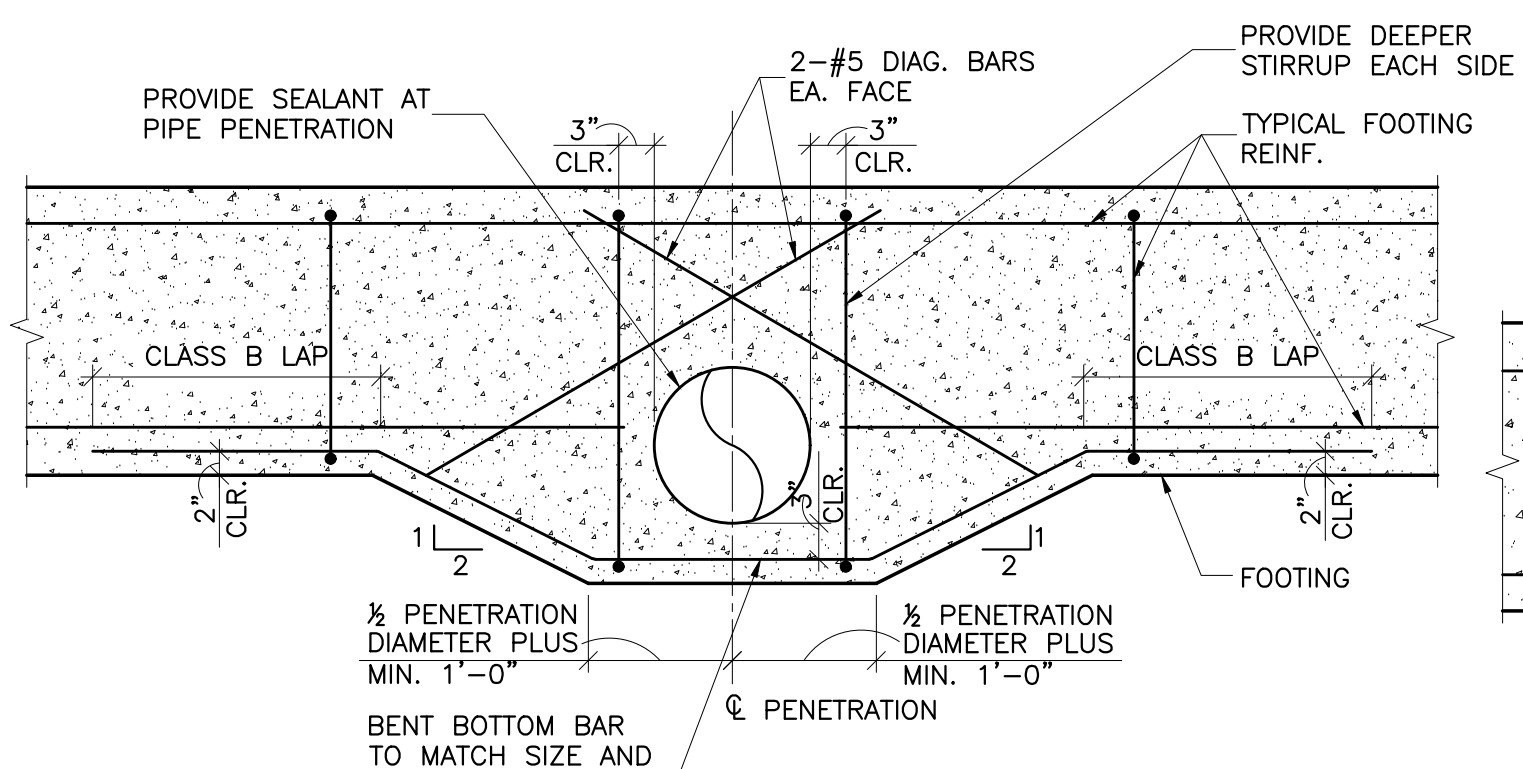
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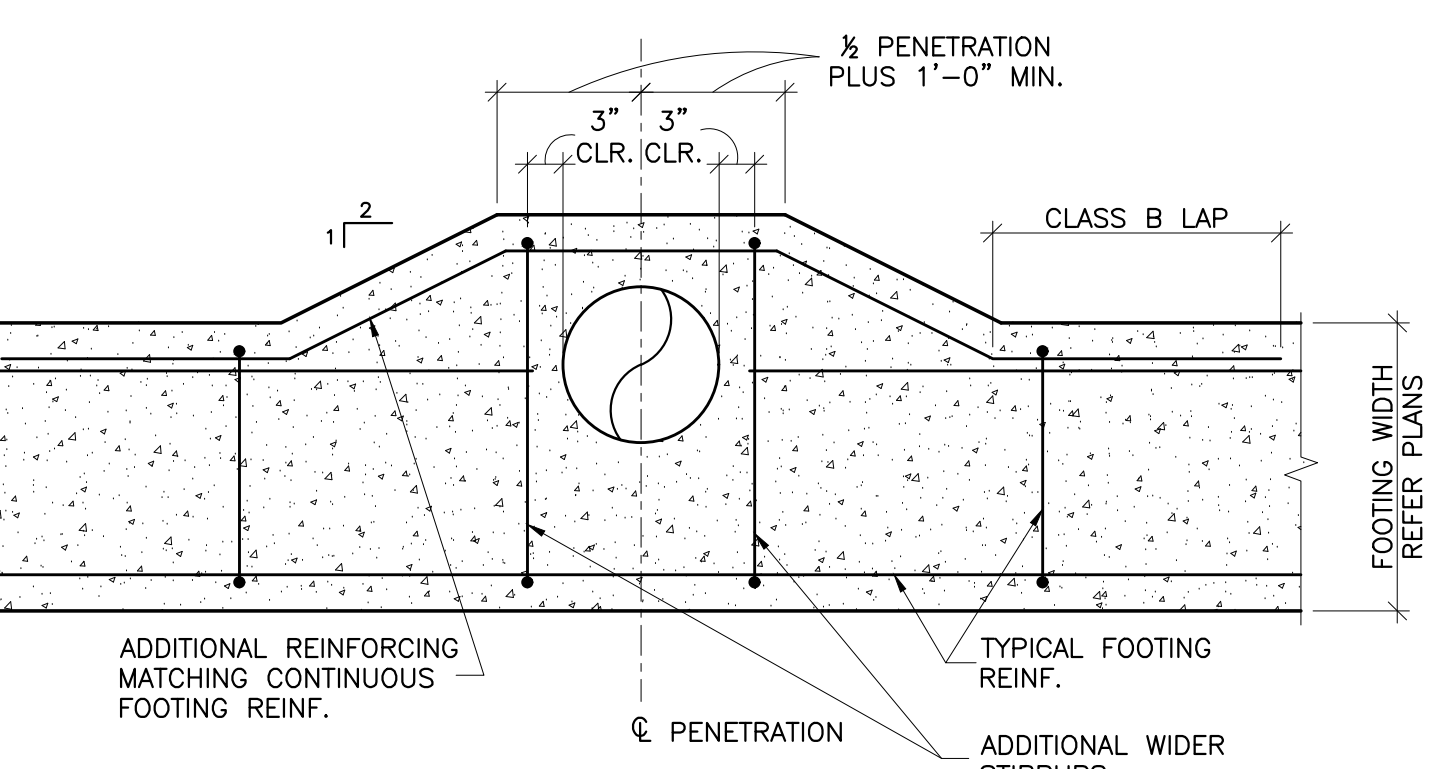
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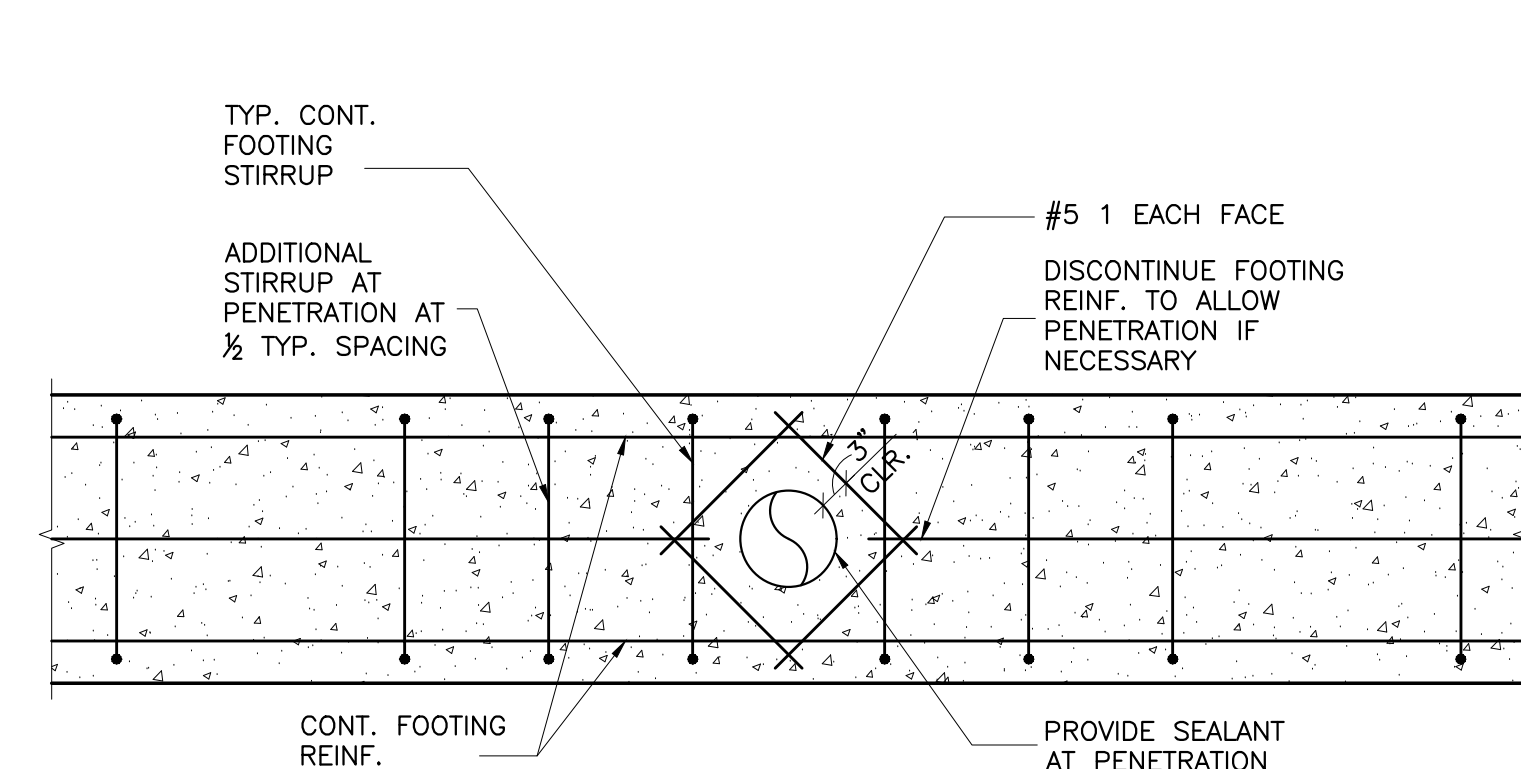
1 TYP. FOOTING CORNER REINF.
SCALE: NONE



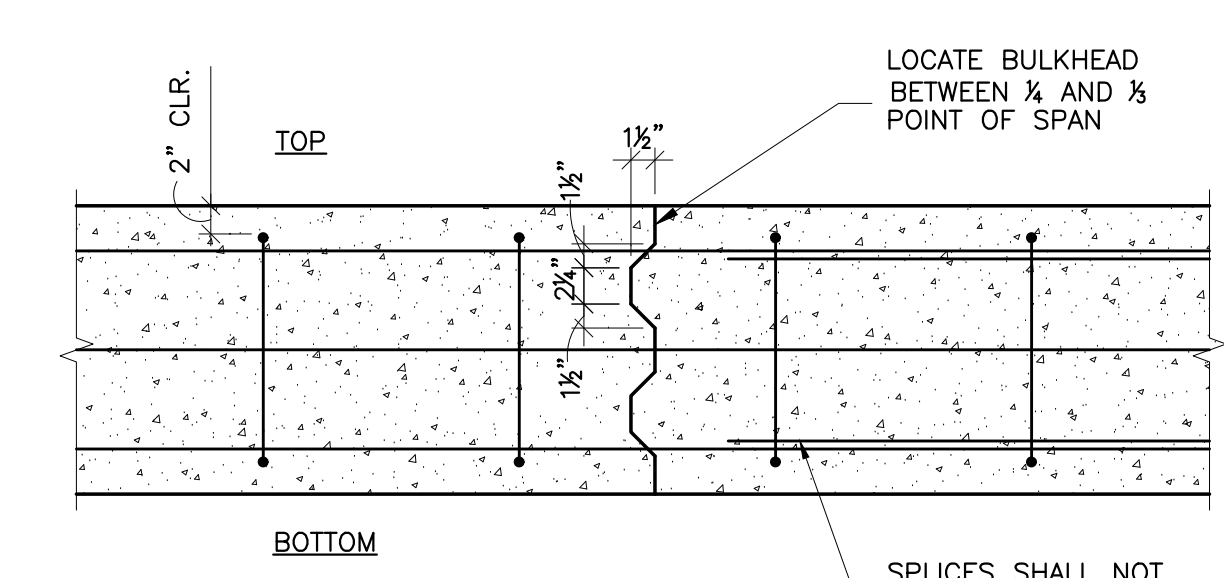
2 TYP. FOOTING PENETRATION
SCALE: NONE



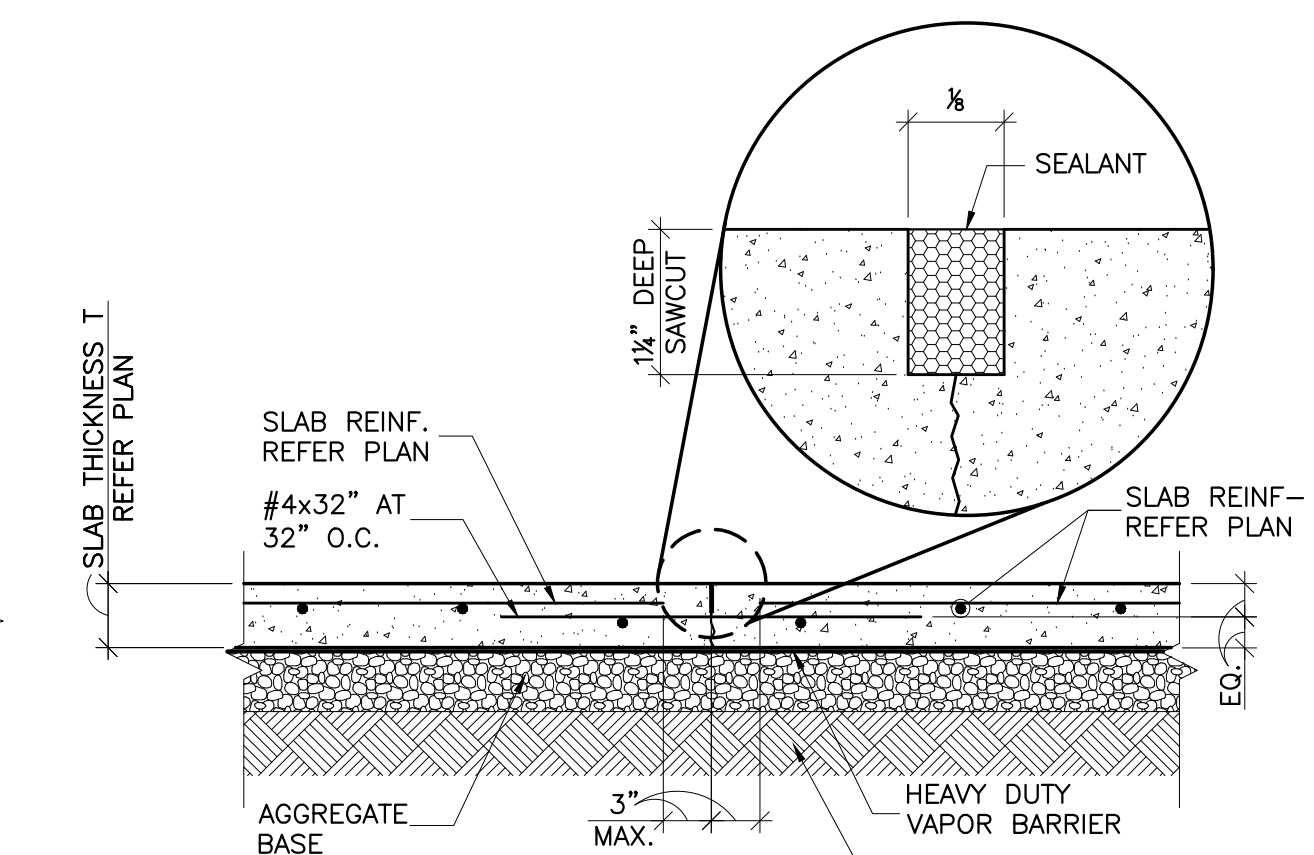
3 PLAN SECTION AT TYPICAL VERTICAL PENETRATION
SCALE: NONE



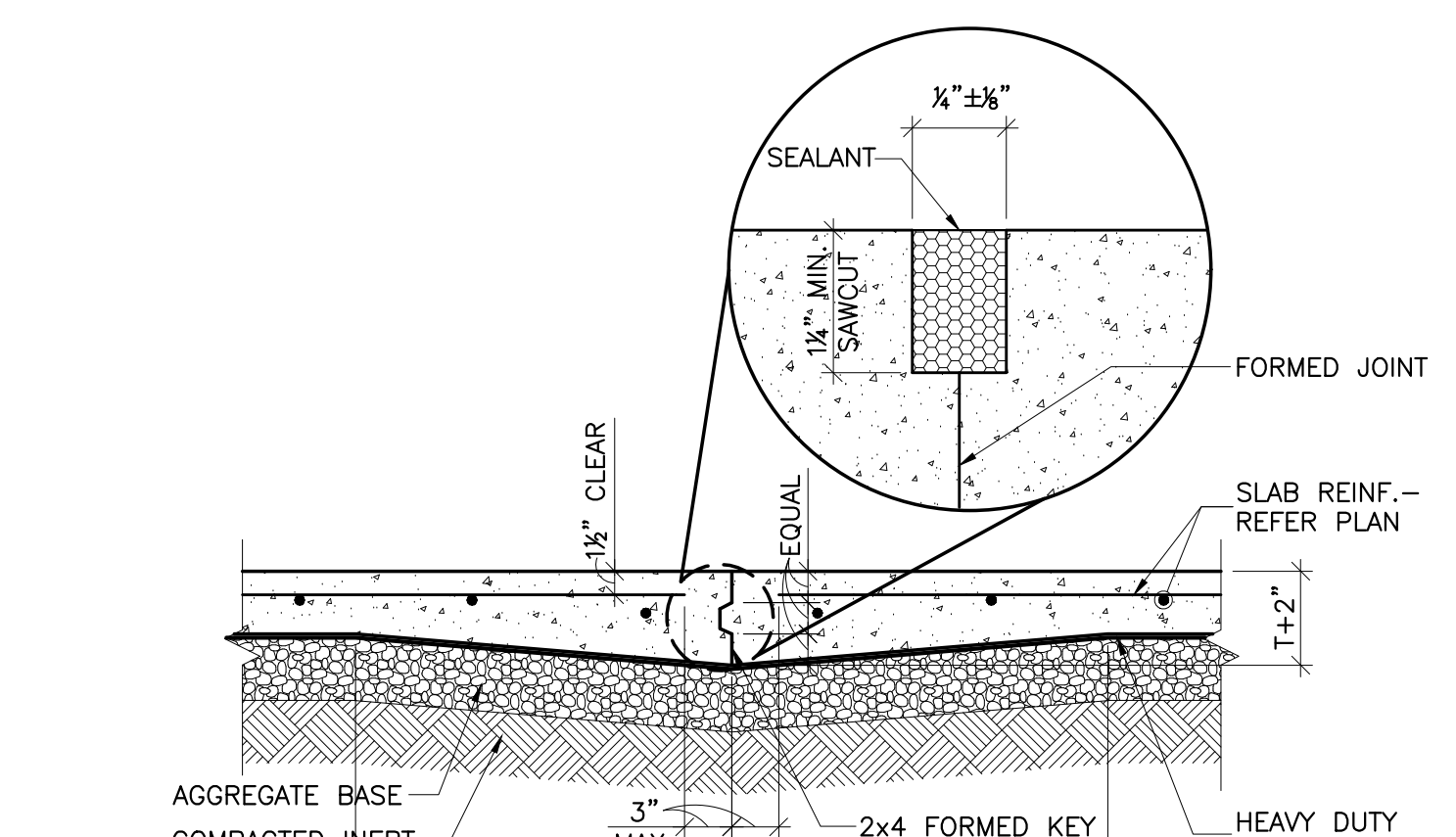
4 FOOTING PENETRATION
SCALE: NONE



5 CJ THROUGH FOOTING
SCALE: NONE

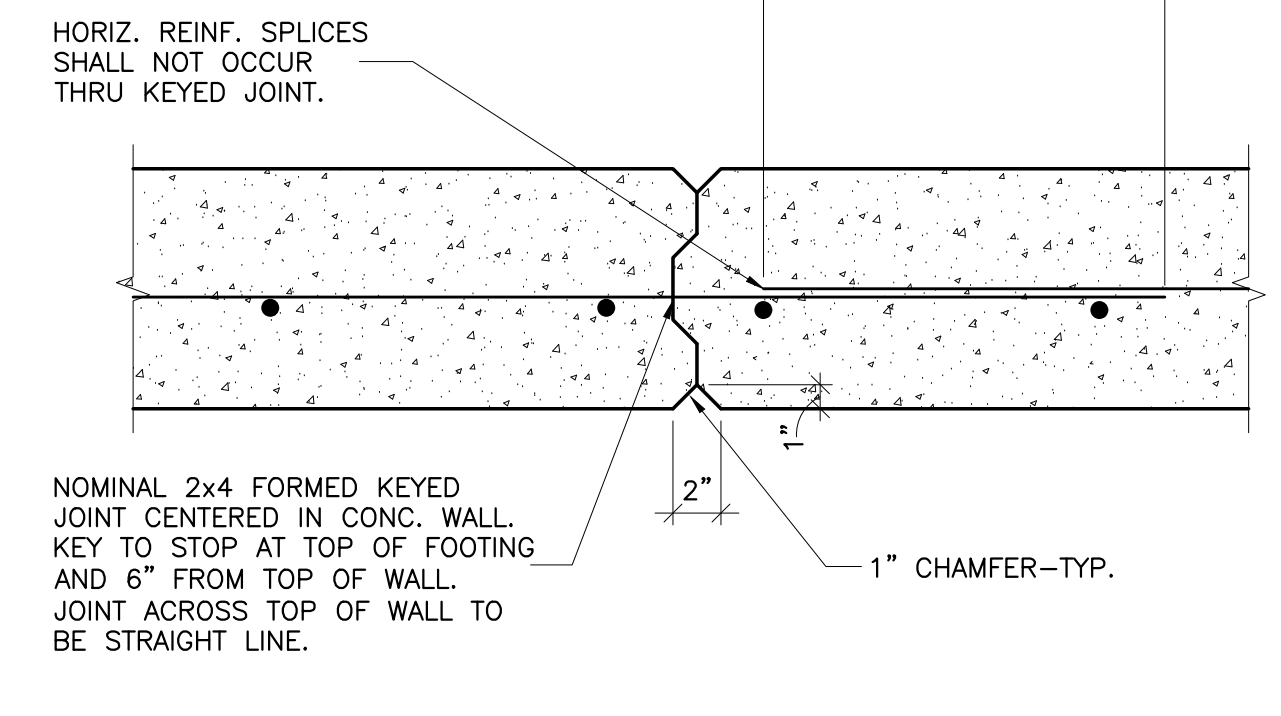


6 TYP. SAWED JOINT (SJ)
SCALE: NONE



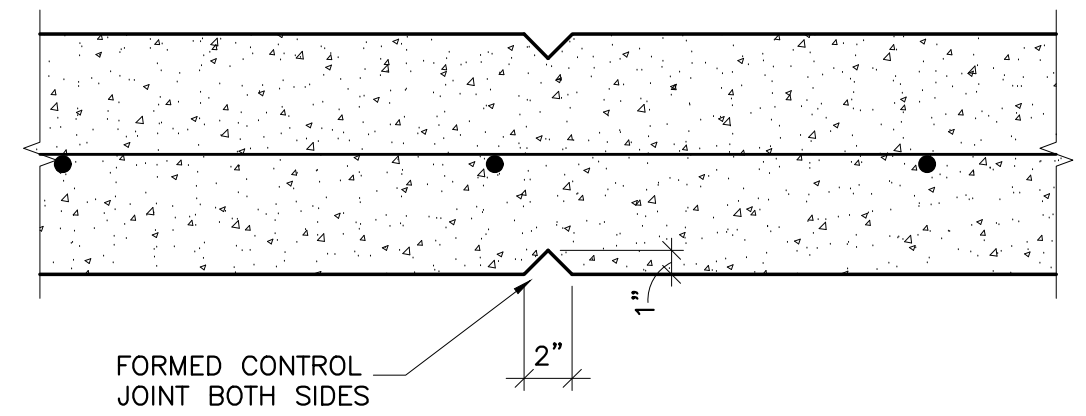
7 TYP. CONSTRUCTION JOINT (CJ)
SCALE: NONE

NOTE:
WALL C.J. SHALL NOT BE PLACED WITHIN WIND ZONE 5. REFER COMPONENT AND CLADDING ISOMETRIC ON SHELTER LOADING SHEET. COORDINATE FINAL LOCATION PRIOR TO INSTALLATION OF WALL REINF.



8 OPTIONAL VERTICAL CONSTRUCTION JOINT (C.J.)
SCALE: NONE

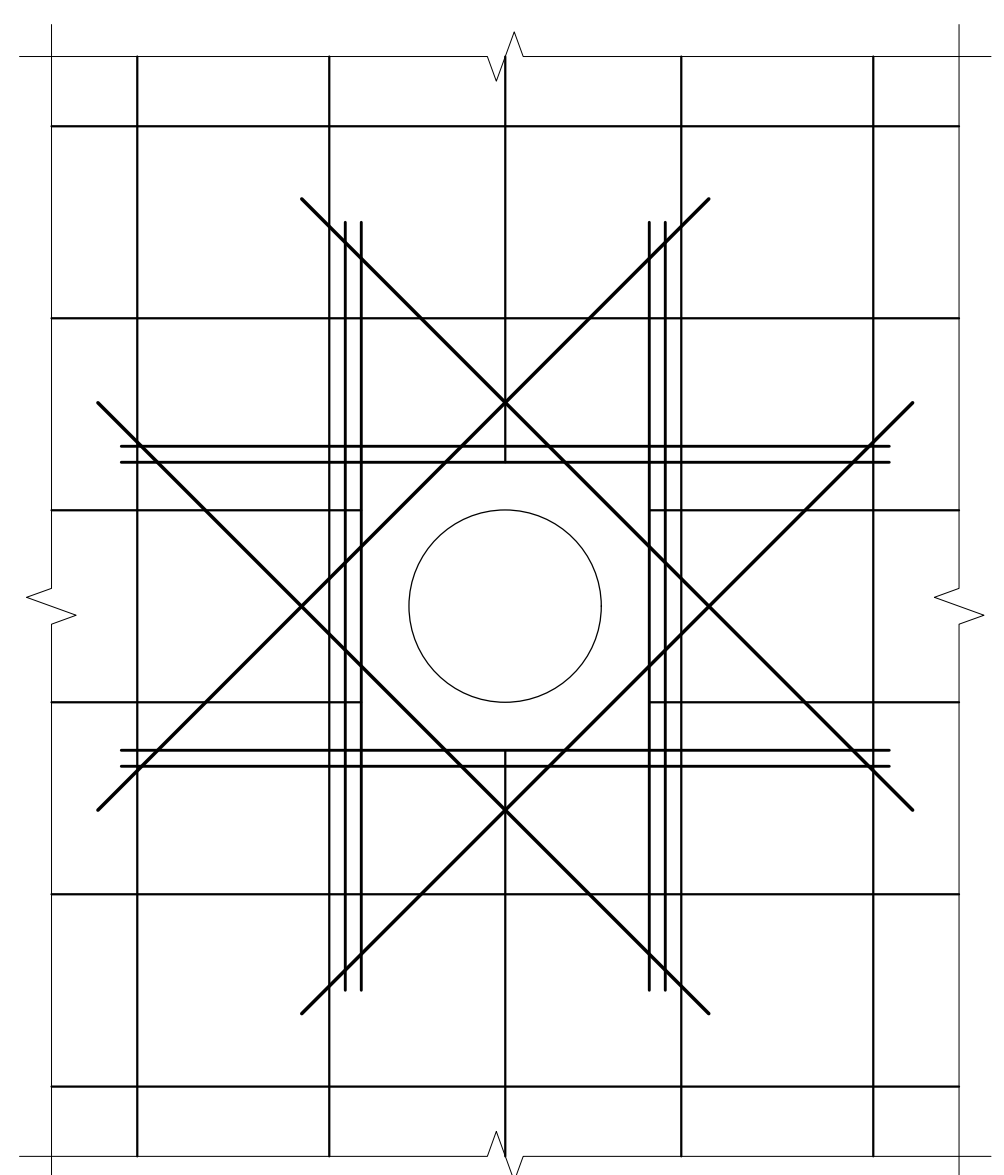
NOTES:
1. 30" MAX. SPACING TO BE COORDINATED WITH EOR AND SHOWN ON SUBMITTAL DRAWINGS.
2. WALL CONTROL JOINT SHALL NOT BE PLACED WITHIN WIND ZONE 5. REFER COMPONENT AND CLADDING ISOMETRIC ON SHELTER LOADING SHEET. COORDINATE FINAL LOCATION PRIOR TO INSTALLATION OF WALL REINF.



9 VERTICAL CONTROL JOINT
SCALE: NONE

CONCRETE EXPOSURE	MEMBER	REINFORCEMENTS	SPECIFIED COVER, IN.
CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND	ALL	ALL	3
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	ALL	NO. 6 THROUGH NO. 18 BAR	2
		NO. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1-1/2
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLAB, JOISTS, AND WALLS	NO. 14 AND NO. 18 AND SMALLER	1-1/2
		NO. 11 BAR AND SMALLER	3/4
	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINFORCEMENT, STIRRUPS, TIES, SPIRALS, AND HOOPS	1-1/2

10 TYP. MIN. CONCRETE COVER
SCALE: NONE



11 TYP. PENETRATION THRU CONC. SLAB OR WALL
SCALE: NONE

TENSION DEVELOPMENT AND LAP-SPICE LENGTHS FOR UNCOATED REINFORCING BARS

BAR SIZE	LAP CLASS	LAP LENGTH (IN.) PER SPACING AND COVER CASE			
		f'c=3500 psi (NORMAL WEIGHT)			
		TOP BARS		OTHER BARS	
		CASE 1	CASE 2	CASE 1	CASE 2
#3	A	22	32	17	25
	B	28	42	22	32
#4	A	29	43	22	33
	B	37	56	29	43
#5	A	36	54	28	41
	B	47	70	36	54
#6	A	43	64	33	50
	B	56	84	43	64
#7	A	63	94	48	72
	B	81	122	63	94
#8	A	72	107	55	82
	B	93	139	72	107
#9	A	81	121	62	93
	B	105	157	81	121
#10	A	91	136	70	105
	B	118	177	91	136
#11	A	101	151	78	116
	B	131	196	101	151
#14	N/A	121	181	93	139
#18	N/A	161	241	124	186

NOTES: 1 in.=25.4 mm.
1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL WEIGHT CONCRETE. LENGTHS ARE IN INCHES.
2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP-SPICE LENGTHS ARE CALCULATED PER ACI 318, SECTIONS 12.2.2 AND 12.15, RESPECTIVELY. TABULATED VALUES FOR BEAMS OR COLUMNS ARE BASED ON TRANSVERSE REINFORCEMENT AND CONCRETE COVER MEETING MINIMUM CODE REQUIREMENTS.
3. CASES 1 AND 2, WHICH DEPEND ON THE TYPE OF STRUCTURAL ELEMENT, CONCRETE COVER, AND CENTER-TO-CENTER SPACING OF THE BARS, ARE DEFINED AS: BEAMS OR COLUMNS: CASE 1-COVER AT LEAST 1.0d_b AND CENTER-TO-CENTER SPACING AT LEAST 2.0d_b AND CASE 2-COVER LESS THAN 1.0d_b OR CENTER-TO-CENTER SPACING LESS THAN 2.0d_b; ALL OTHERS: CASE 1-COVER AT LEAST 1.0d_b AND CENTER-TO-CENTER SPACING AT LEAST 3.0d_b; CASE 2-COVER LESS THAN 1.0d_b OR CENTER-TO-CENTER SPACING LESS THAN 3.0d_b.
4. LAP SPICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A=1.0d_b AND CLASS B=1.3d_b (ACI 318, SECTION 12.15.1).
5. ACI 318 DOES NOT ALLOW TENSION LAP SPICES OF #14 OR #18 BARS. THE TABULATED VALUES FOR THOSE BAR SIZES ARE THE TENSION DEVELOPMENT LENGTHS.
6. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 IN. OF CONCRETE CAST BELOW THE BARS.
7. FOR LIGHTWEIGHT-AGGREGATE CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.3.

TENSION DEVELOPMENT AND LAP-SPICE LENGTHS FOR UNCOATED REINFORCING BARS

BAR SIZE	LAP CLASS	LENGTHS (IN.) PER CONCRETE STRENGTH			
		f'c=4000 psi (NORMAL WEIGHT)			
		TOP BARS		OTHER BARS	
		CASE 1	CASE 2	CASE 1	CASE 2
#3	A	19	28	15	22
	B	24	36	19	28
#4	A	25	37	19	29
	B	32	48	25	37
#5	A	31	47	24	36
	B	40	60	31	47
#6	A	37	56	29	43
	B	48	72	37	56
#7	A	54	81	42	63
	B	70	106	54	81
#8	A	62	93	48	71
	B	80	121	62	93
#9	A	70	105	54	81
	B	91	136	70	105
#10	A	79	118	61	91
	B	102	153	79	118
#11	A	87	131	67	101
	B	113	170	87	131
#14	N/A	105	157	81	121
#18	N/A	139	209	107	161

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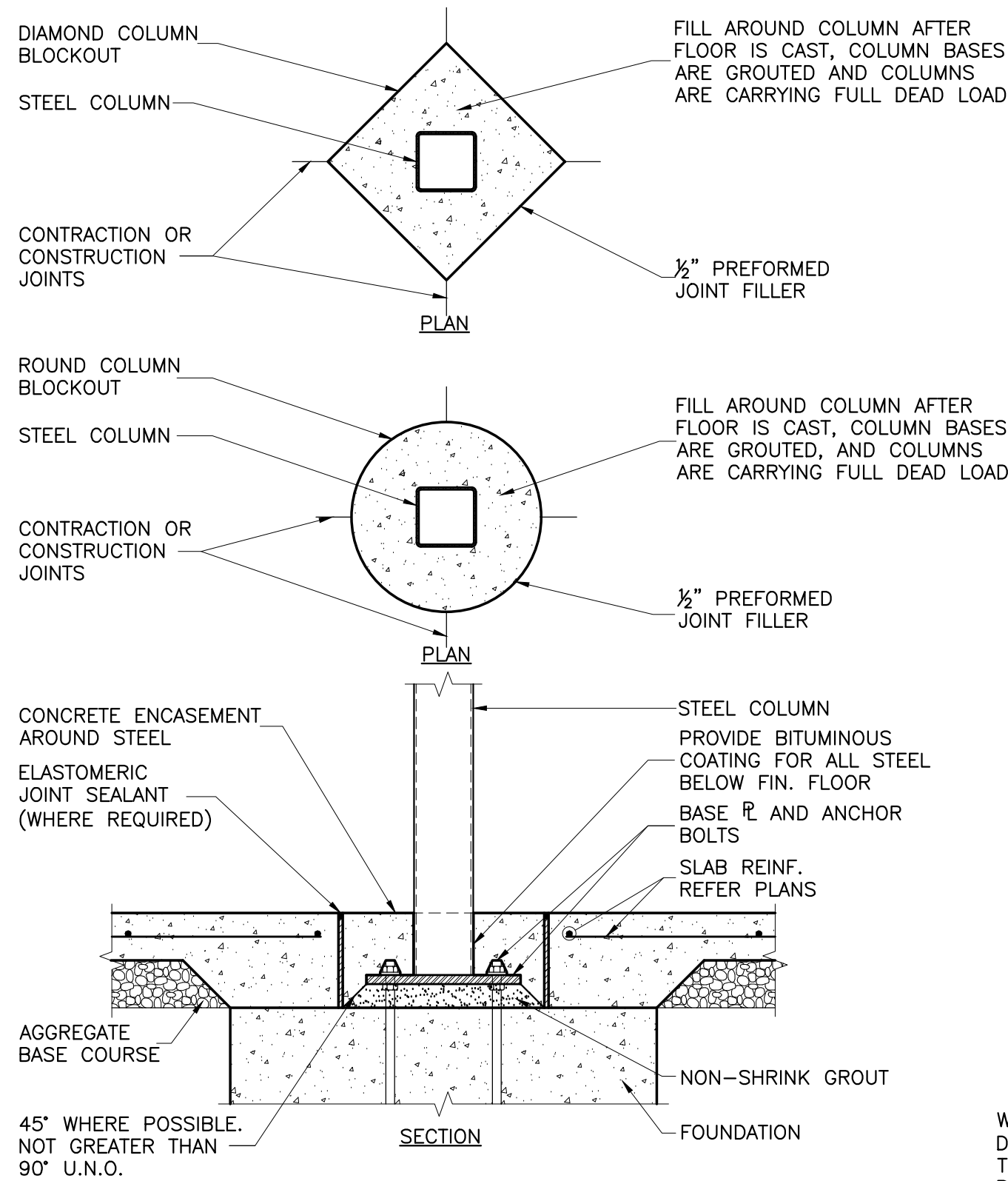
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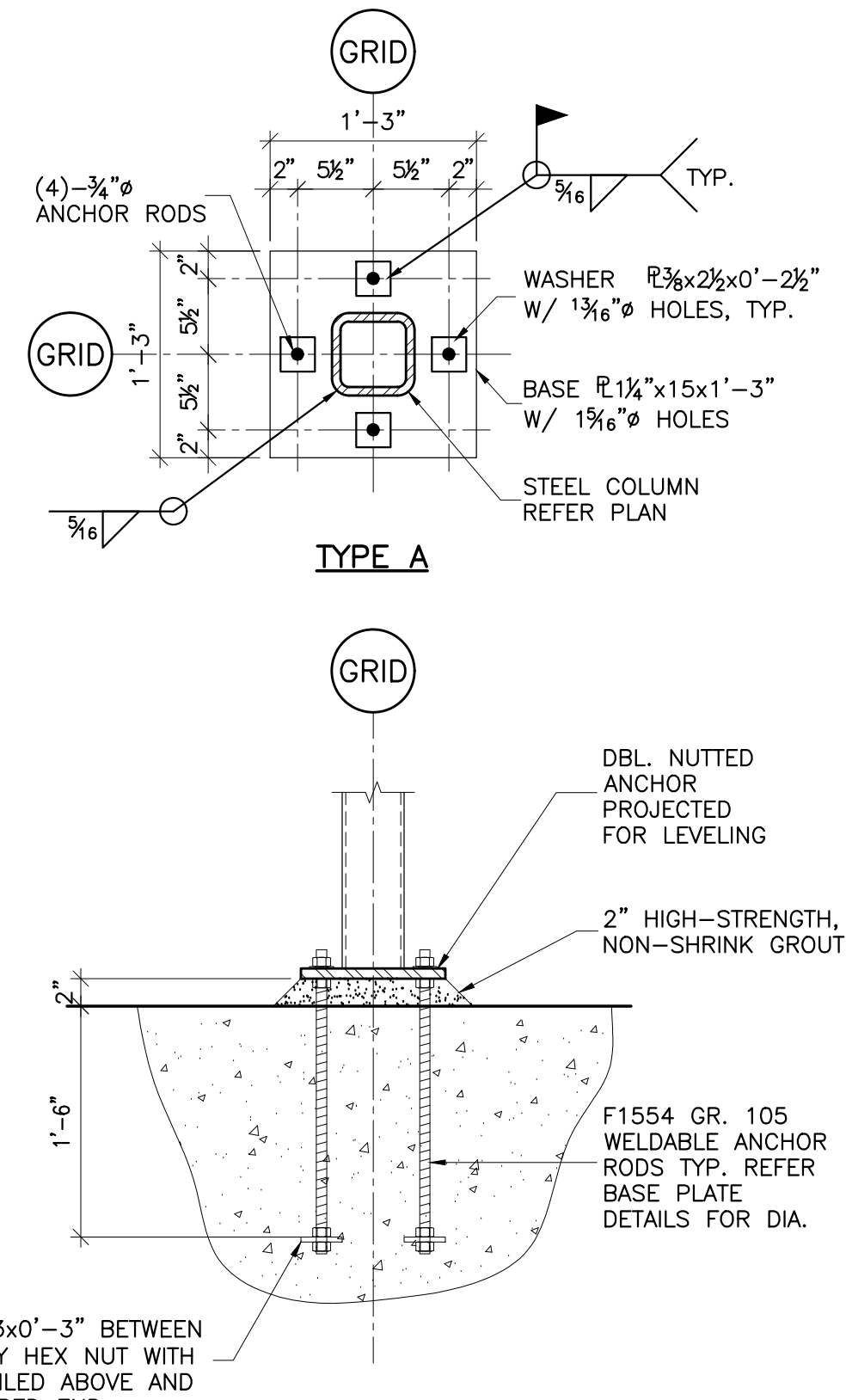
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1 TYP. ISOLATION JOINT DETAILS
SCALE: NONE

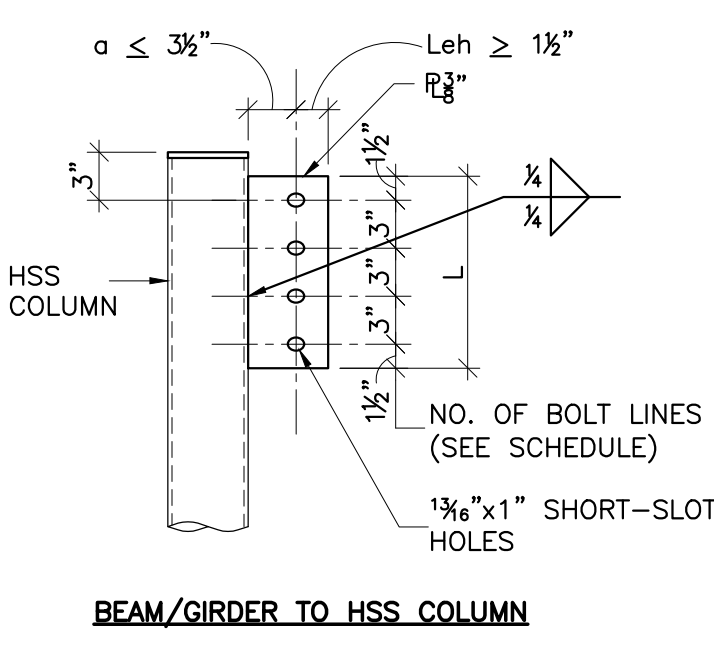
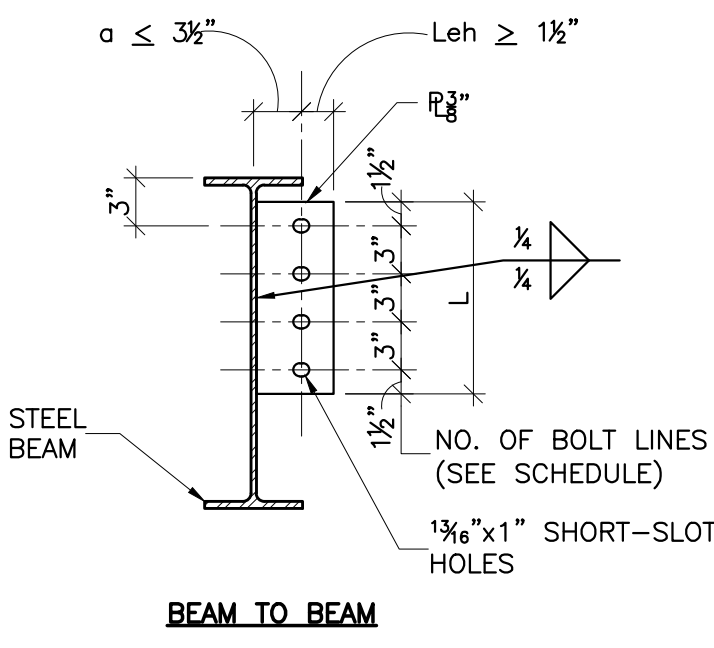


2 BASE PLATE DETAILS
SCALE: NONE

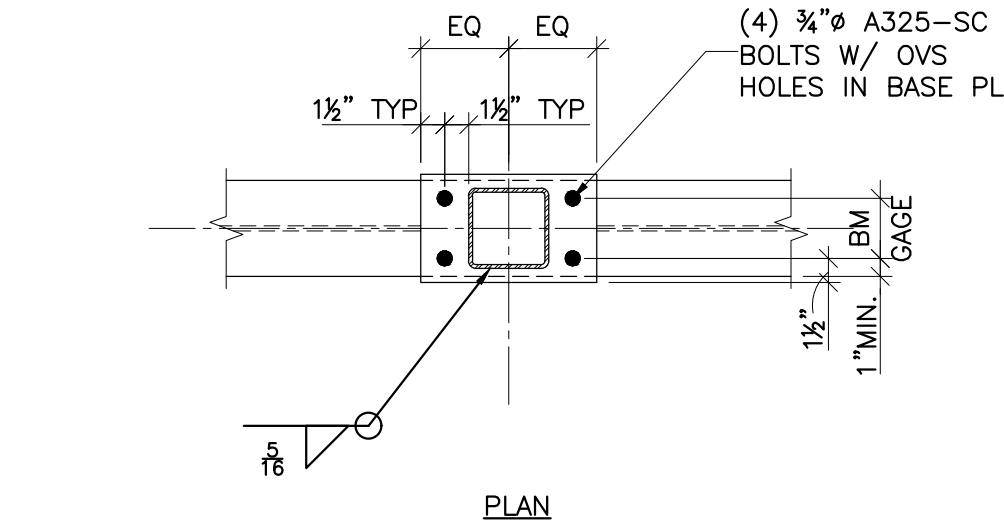
3/8" A325-N BOLT SCHEDULE FOR SINGLE PLATE SHEAR TAB CONNECTIONS (FACTORED LOADS 14 ED. MANUAL)

END REACTION	NO. OF BOLTS
0 THRU 24 KIPS	2-3/8"
24 THRU 43 KIPS	3-3/8"
43 THRU 62 KIPS	4-3/8"
62 THRU 81 KIPS	5-3/8"
81 THRU 100 KIPS	6-3/8"
100 THRU 118 KIPS	7-3/8"
118 THRU 137 KIPS	8-3/8"

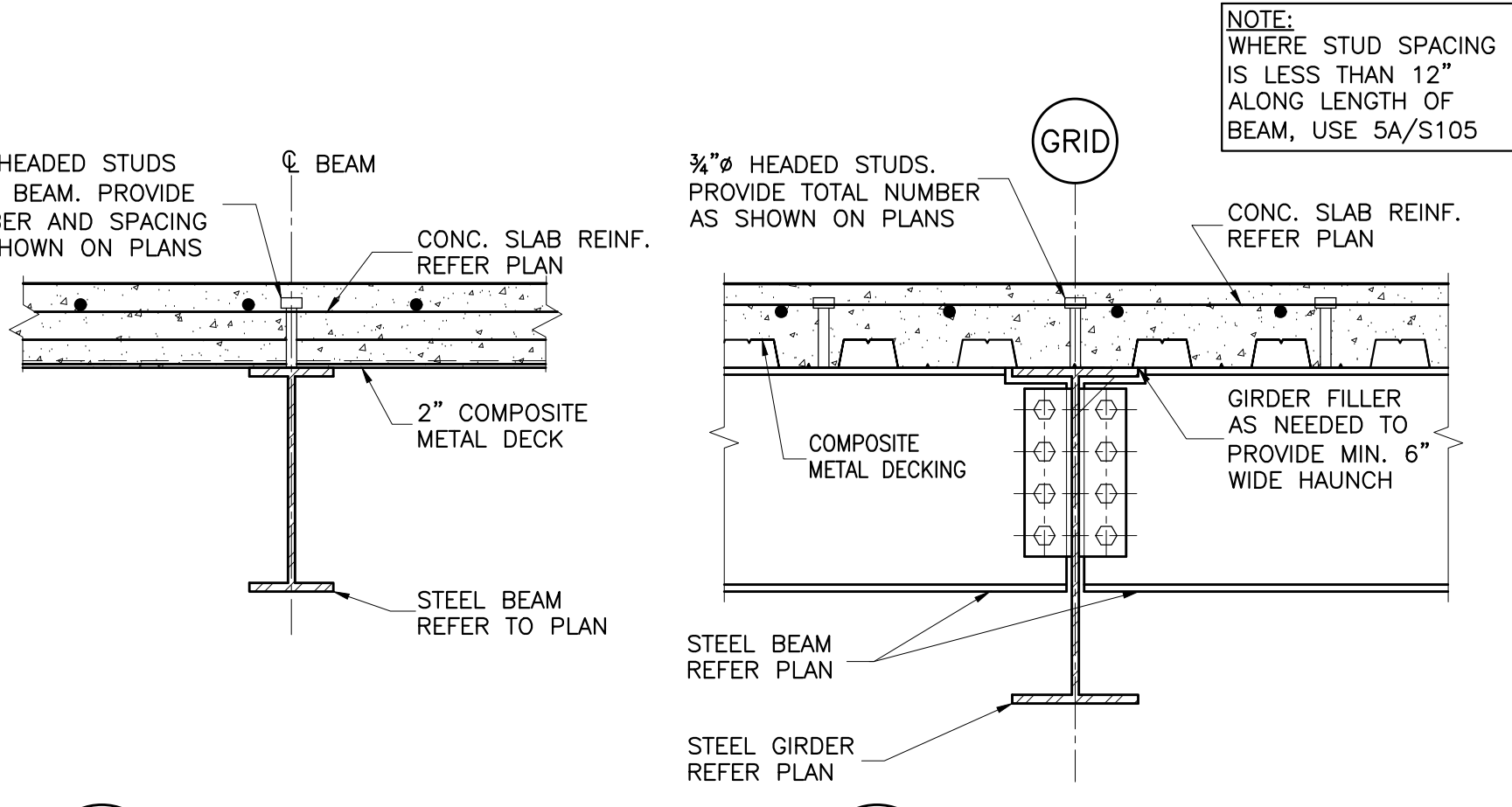
- NOTES:
- VALUES SHOWN ARE APPLICABLE FOR SINGLE PLATE SHEAR TAB CONNECTIONS
 - SEE PLAN FOR END REACTIONS
 - L = PLATE LENGTH ≥ T/2 OF CONNECTED BEAM.
 - AT HSS OR PIPE COLUMNS, A THROUGH-PLATE WITH EQUAL WELD ON THE BACK SIDE OF THE COLUMN IS REQUIRED UNDER EITHER OF THE FOLLOWING CIRCUMSTANCES:
 - FOR SQUARE OR RECTANGULAR HSS:
 - WHEN $\frac{R-2.7t}{0.93t} > 35.1$
 - FOR ROUND HSS OR PIPE:
 - WHEN $\frac{D}{t} > \frac{3.190}{F_y}$
 - REFER FRAMING PLANS FOR LOCATIONS WITH AXIAL TRANSFER FORCES WHICH REQUIRE MODIFIED CONNECTIONS PER DETAIL ON FRAMING ELEVATIONS SHEET.



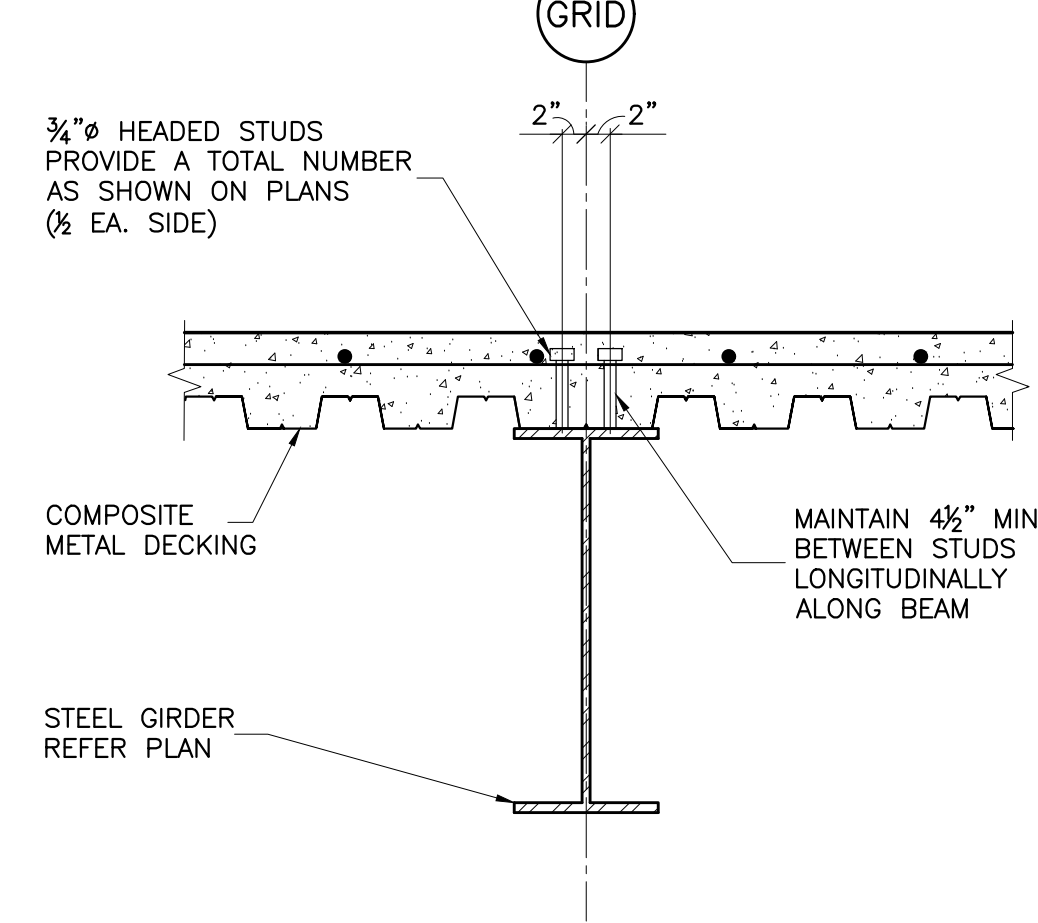
3 SINGLE PLATE SHEAR TAB CONNECTIONS (LRFD-AISC 14TH EDITION MANUAL)
SCALE: NONE



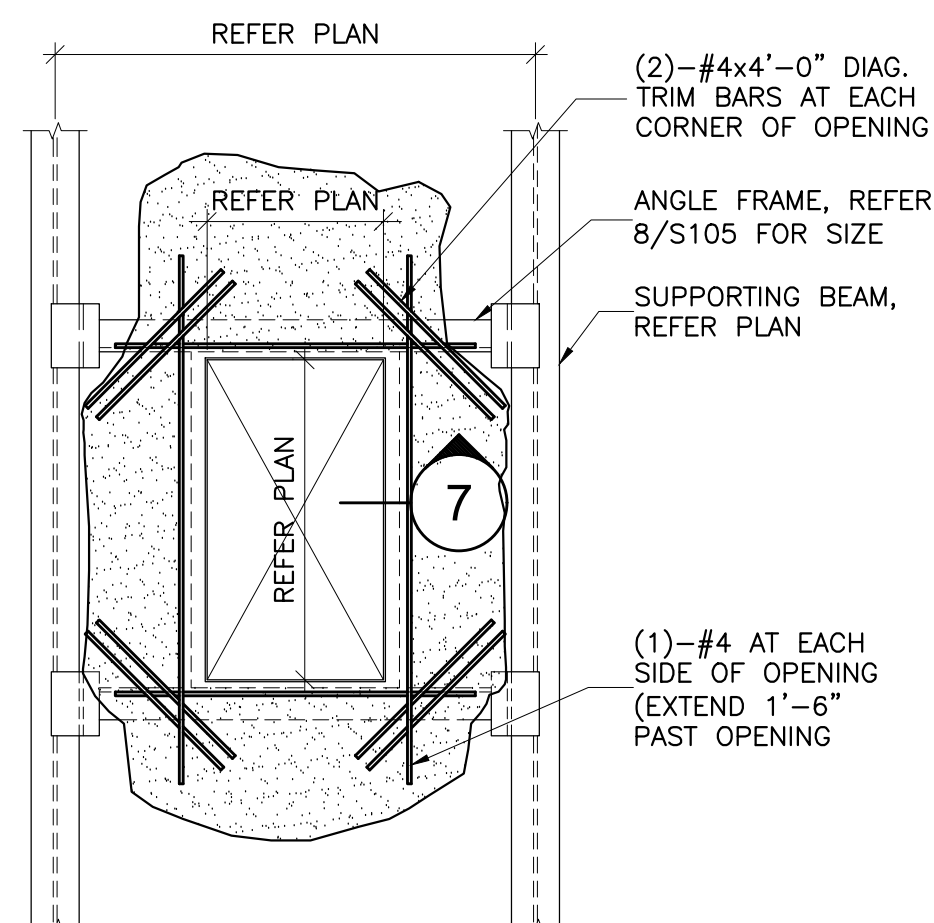
4 TYPICAL TRANSFER GIRDER DETAIL
SCALE: NONE



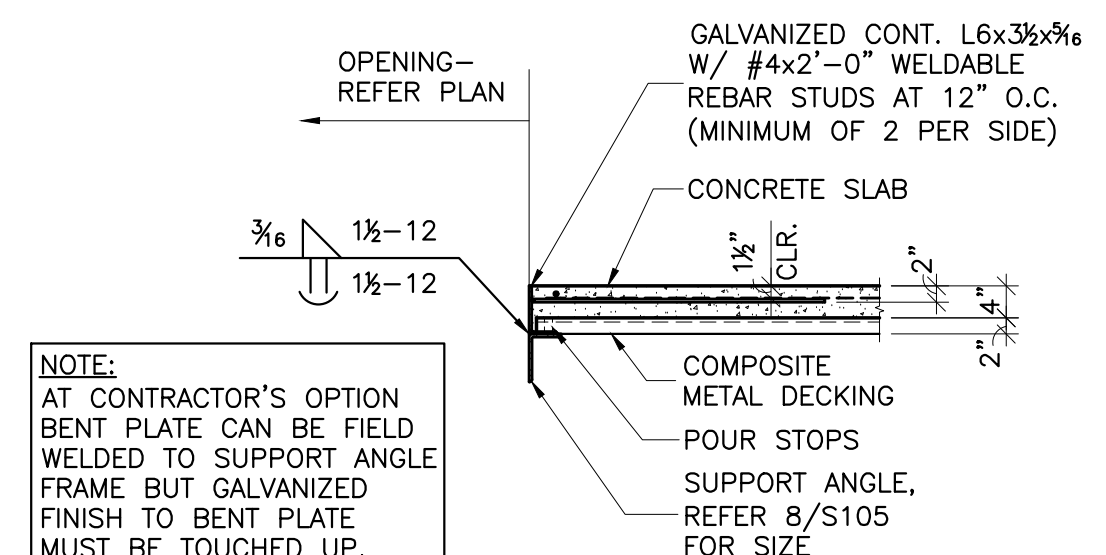
5 SECTION SCALE: NONE
6 SECTION SCALE: NONE



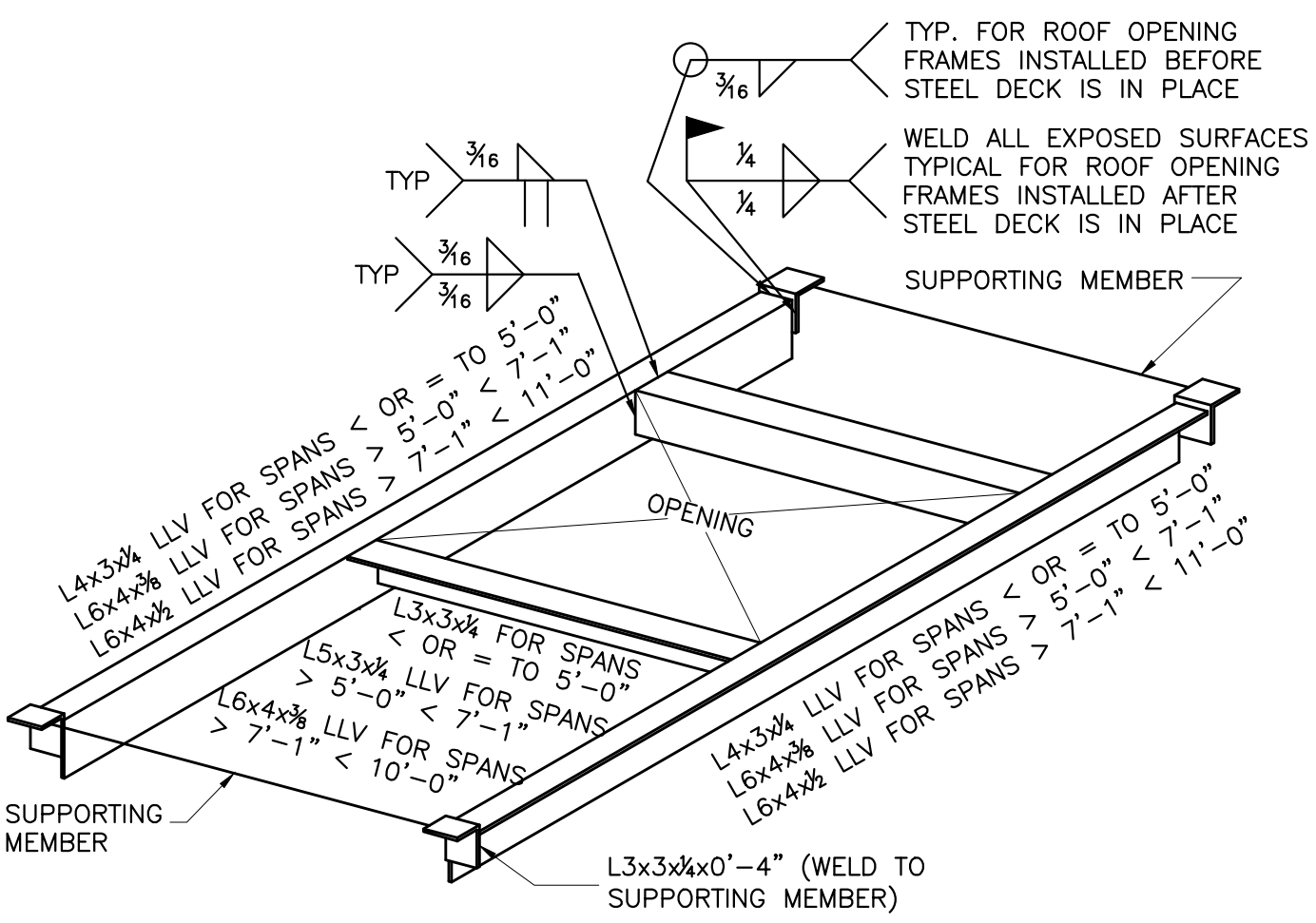
6A SECTION SCALE: NONE



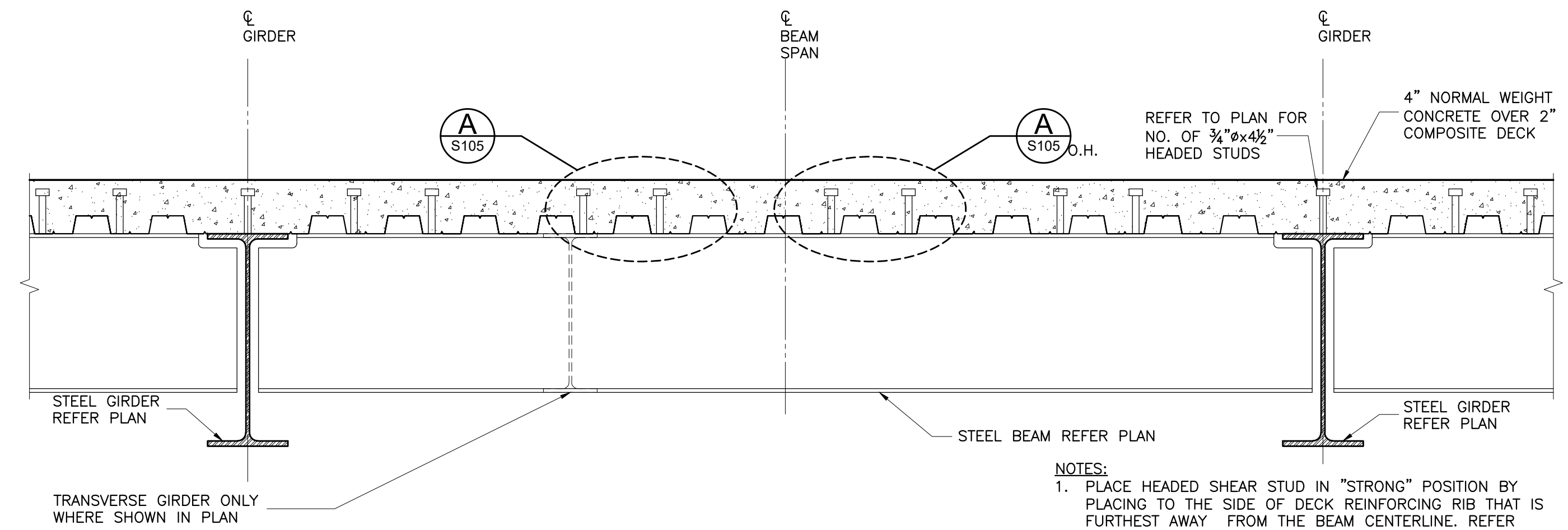
7 TYPICAL SHELTER ROOF ANGLE DETAIL
SCALE: NONE



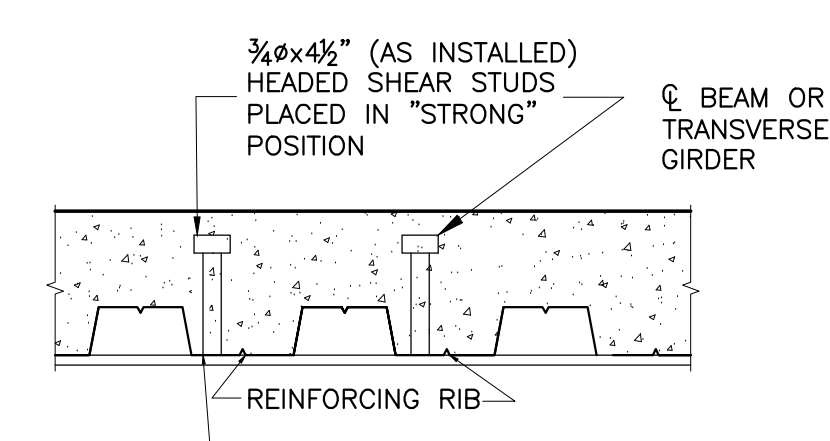
8 TYPICAL SECTION AT FLOOR OPENING
SCALE: NONE



9 TYP. ROOF OPENING FRAME AND MECHANICAL UNIT SUPPORT
SCALE: NONE



10 TYPICAL BEAM ELEVATION
SCALE: NONE



A DETAIL SCALE: NONE

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REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION			
VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCED STANDARD
	CONTINUOUS (inspect each joint/member)	PERIODIC (inspect random joint/members)	
1. Material verification of high-strength bolts, nuts and washers:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	-	QC and QA	AISC 360, Section A3.3 and applicable ASTM material standards
b. Manufacturer's certifications available for fastener materials.	QA	QC	AISC 360, Table N5.6-1
c. Fasteners marked in accordance with ASTM requirements.	-	QC and QA	
d. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane).	-	QC and QA	
e. Proper bolting procedure selected for joint detail.	-	QC and QA	
f. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements.	-	QC and QA	AISC 360, Table N5.4-2 During Welding
g. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used.	QC	QA	
h. Proper storage provided for bolts, nuts, washers and other fastener components.	-	QC and QA	
2. Inspection of high-strength bolting:			
<ul style="list-style-type: none"> For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures; determine that all piles of connected materials have been drawn together and properly snugged prior to pretensioning and monitor the installation of bolts to verify that fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point to the free edges. For joints required to be tightened only to the snug-tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged. 	-	QC and QA	AISC 360, Section M2.5
a. Snug-tight joints.	-	QC and QA	
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation.	-	QC and QA	
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking of calibrated wrench methods of installation.	QC and QA	-	
d. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required.	-	QC and QA	
e. Fastener component not turned by the wrench prevented from rotating.	-	QC and QA	
f. Document acceptance or rejection of bolted connections.	QC and QA	-	AISC 360, Table N5.6-2
3. Material verification of structural steel and cold-formed steel deck U.N.O.:			
a. For structural steel, identification markings to conform to AISC 360.	-	QC and QA	AISC 360, Section M1
b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	-	QC and QA	Applicable ASTM material standards
4. Inspection prior to welding:			
a. Verify identification markings of weld filler materials conform to AWS specification in the approved construction documents.	-	QC and QA	AISC 360, Section A3.5 and applicable AWS AS documents
b. Welding procedure specifications are available.	QC and QA	-	AISC 360, Table N5.4-1
c. Manufacturer certifications for welding consumables available.	QC and QA	-	
d. Material identification (type/grade) and welded identification system.	-	QC and QA	
e. Fit-up of welds including but not limited to joint preparation, dimensions, cleanliness, tacking, and backing type/fit as applicable.	-	QC and QA	
f. Configuration and finish of access holes	-	QC and QA	
g. Check welding equipment.	-	QC	

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION			
VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCED STANDARD
	CONTINUOUS (inspect each joint/member)	PERIODIC (inspect random joint/members)	
5. Inspection of welding:			
a. AISC 360 requirements for welding structural steel			
1) Use of qualified welders	-	QC and QA	AISC 360, Table N5.4-2 During Welding
2) Packaging and exposure control and handling of welding consumables.	-	QC and QA	
3) Welding over cracked tack welds	-	QC and QA	
4) Environmental conditions including but not limited to precipitation, temperature and wind.	-	QC and QA	
5) Verify settings on equipment, travel speeds, elected materials, shielding gas type/flow rate, preheating interpass temperatures and proper position meets WPS standards.	-	QC and QA	AISC 360, Table N5.4-2 After Welding
6) Verify welding techniques for interpass, final cleaning, profile limitations, and quality requirements.	-	QC and QA	
7) Welds are cleaned and painted where required.	-	QC and QA	
8) Verify size, length and locations of welds.	QC and QA	-	AISC 360, Table N5.4-2 After Welding
9) Visually verify welds for crack prohibition, weld/base-metal fusion, crater cross section, weld profiles, weld size, undercutting, and porosity.	QC and QA	-	
10) Arc strikes, k-area cracks within 3" of weld, removal of backing, and repair activities as applicable.	QC and QA	-	
11) Documentation of acceptance or rejection of welded joint or member.	QC and QA	-	
b. American Welding Society requirements for structural steel and cold-formed steel deck:			
1) Complete and partial joint penetration groove welds.	X	-	AWS D1.1
2) Multipass fillet welds.	X	-	
3) Single-pass fillet welds > 5/16"	X	-	
4) Plug and slot welds.	X	-	
5) Single-pass fillet welds ≤ 5/16"	-	X	
6) Floor and roof deck welds.	-	X	AWS D1.3
7) Welded studs & deformed bar anchors (DBA's).	-	X	AWS D1.1
8) Welded sheet steel for cold-formed steel members	-	X	AWS D1.3
9) Welding of stairs & railing systems	-	X	AWS D1.1
c. Reinforcing steel:			
1) Verification of weldability of reinforcing steel other than ASTM A 706.	-	X	AWS D1.4, ACI 318: Section 3.5.2
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	-	
3) Shear reinforcement.	X	-	
4) Other reinforcing steel.	-	X	
6. Inspection of steel elements of composite construction prior to concrete placement:			
a. Placement and installation of steel deck.	QC and QA	-	AISC 360, Table N6.1
b. Placement and installation of steel HSA.	QC and QA	-	AISC 360, Table N6.1
c. Documentation of acceptance or rejection of steel elements.	QC and QA	-	AISC 360, Table N6.1

TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION				
TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE
1) Inspect reinforcement, including prestressing tendon, and verify placement.	-	X	ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2) Reinforcing bar welding:	-	X	AWS D1.4 ACI 318: 26.6.4	-
a) Verify weldability of reinforcing bars other than ASTM A706;	-	X		
b) Inspect single-pass fillet welds, maximum 5/16"; and	X	-		
c) Inspect all other welds.	-	-	-	-
3) Inspect anchors cast in concrete.	-	X	ACI 318:17.8.2	-
4) Inspect anchors post-installed in hardened concrete members:	-	-	ACI 318: 17.8.2.4	-
a) Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.	X	-		
b) Mechanical anchors and adhesive anchors not defined in 4.a.	-	X	ACI 318: 17.8.2	-
5) Verify use of required design mix.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6) Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C 172 ASTM C 31 ACI 318: 26.5, 26.12	1908.10
7) Inspect concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8) Verify maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9) Inspect prestressed concrete for:	X	-	ACI 318: 26.10	-
a) Application of prestressing forces; and				
b) Grouting of bonded prestressing tendons.	X	-	-	-
10) Inspect erection of precast concrete members.	-	X	ACI 318: Ch. 26.9	-
11) Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	-	X	ACI 318: 26.11.2	-
12) Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.11.1.2(b)	-

TABLE 1705.6 REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS		
TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	-	X
2. Verify excavations are extended to proper depth and have reached proper material.	-	X
3. Perform classification and testing of compacted fill materials.	-	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	-
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	-	X

1. STATEMENT OF SPECIAL INSPECTIONS NOTES:

- A. THIS STATEMENT OF SPECIAL INSPECTIONS IS INCLUDED AS REQUIRED BY SECTIONS 1704.1 AND 1705 OF THE 2018 INTERNATIONAL BUILDING CODE.
- B. SPECIAL INSPECTIONS SHALL CONFORM TO CHAPTER 17 OF THE 2018 INTERNATIONAL BUILDING CODE AND AS SUMMARIZED HEREIN. GENERAL REQUIREMENTS ARE LISTED BELOW AND IN THE ATTACHED INSPECTION TABLES.
- C. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL SPECIAL INSPECTION REQUIREMENTS. IF CONFLICTING REQUIREMENTS ARE FOUND BETWEEN THIS STATEMENT OF SPECIAL INSPECTIONS AND THE PROJECT SPECIFICATIONS, THE MORE STRINGENT PROVISION SHALL CONTROL UNLESS DIRECTED OTHERWISE IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD.
- D. THE GENERAL CONTRACTOR SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS FOR THIS PROJECT. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR THE INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
- E. THE SPECIAL INSPECTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE BUILDING OFFICIAL DEMONSTRATING HIS OR HER COMPETENCE AND RELEVANT EXPERIENCE OR TRAINING. EXPERIENCE OR TRAINING SHALL BE CONSIDERED RELEVANT WHEN THE DOCUMENTED EXPERIENCE OR TRAINING IS RELATED IN COMPLEXITY TO THE SAME TYPE OF SPECIAL INSPECTION ACTIVITIES FOR PROJECTS OF SIMILAR COMPLEXITY AND MATERIAL QUALITIES.
- F. THE SPECIAL INSPECTOR SHALL PROVIDE CONTINUOUS OR PERIODIC INSPECTIONS AS SHOWN IN THE ATTACHED INSPECTION TABLES
- 1) CONTINUOUS INSPECTION: THE SPECIAL INSPECTOR SHALL BE PRESENT AT ALL PROCEDURAL EVENTS.
- 2) PERIODIC INSPECTION: THE SPECIAL INSPECTOR SHALL BE PRESENT AT THE START OF THE WORK AND PERIODIC INSPECTION IS MADE TO VERIFY PROGRESS OF WORK IS IN COMPLIANCE.
- G. INSPECTION OF FABRICATORS: WHERE FABRICATION OF STRUCTURAL LOADBEARING MEMBERS AND ASSEMBLIES IS BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS SHALL BE REQUIRED BY SECTION 1704.2.5 OF THE 2018 INTERNATIONAL BUILDING CODE AND AS REQUIRED ELSEWHERE IN THE CODE.
- H. FABRICATOR APPROVAL: SPECIAL INSPECTIONS REQUIRED BY SECTION 1704 ARE NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.
- I. REPORT REQUIREMENTS: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED AT A POINT IN TIME AGREED UPON PRIOR TO THE START OF WORK BY THE APPLICANT AND THE BUILDING OFFICIAL.
- J. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING REASONABLE NOTICE TO THE SPECIAL INSPECTOR(S) REGARDING WHEN ELEMENTS OF THE PROJECT WILL BE READY FOR EFFICIENT IMPLEMENTATION OF SPECIAL INSPECTIONS.
- K. THE CONTRACTOR SHALL PROVIDE ACCESS TO THE LATEST VERSION OF ALL APPROVED PLANS AND SHOP DRAWINGS FOR THE SPECIAL INSPECTOR'S USE IN PERFORMING SPECIAL INSPECTIONS.
- L. CONTRACTOR SHALL GRANT ACCESS TO OWNER'S SPECIAL INSPECTOR AS IS REASONABLY NECESSARY FOR THE PROPER PERFORMANCE OF SPECIAL INSPECTIONS.
- M. SPECIAL INSPECTIONS DO NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO COMPLY WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND METHODS AND JOBSITE SAFETY ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

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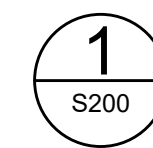
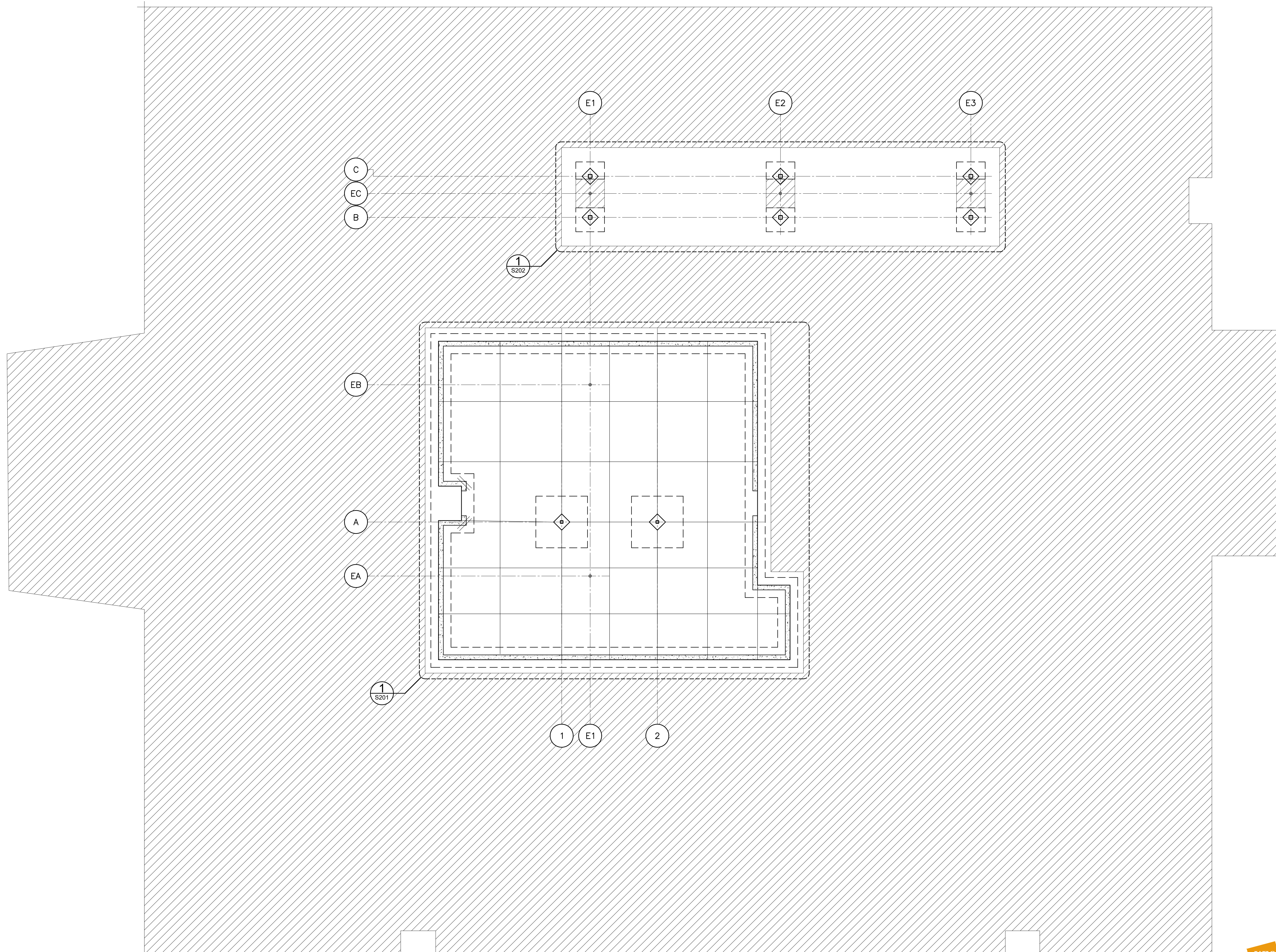
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1 OVERALL FOUNDATION PLAN

S200 SCALE: 1/8"=1'-0"

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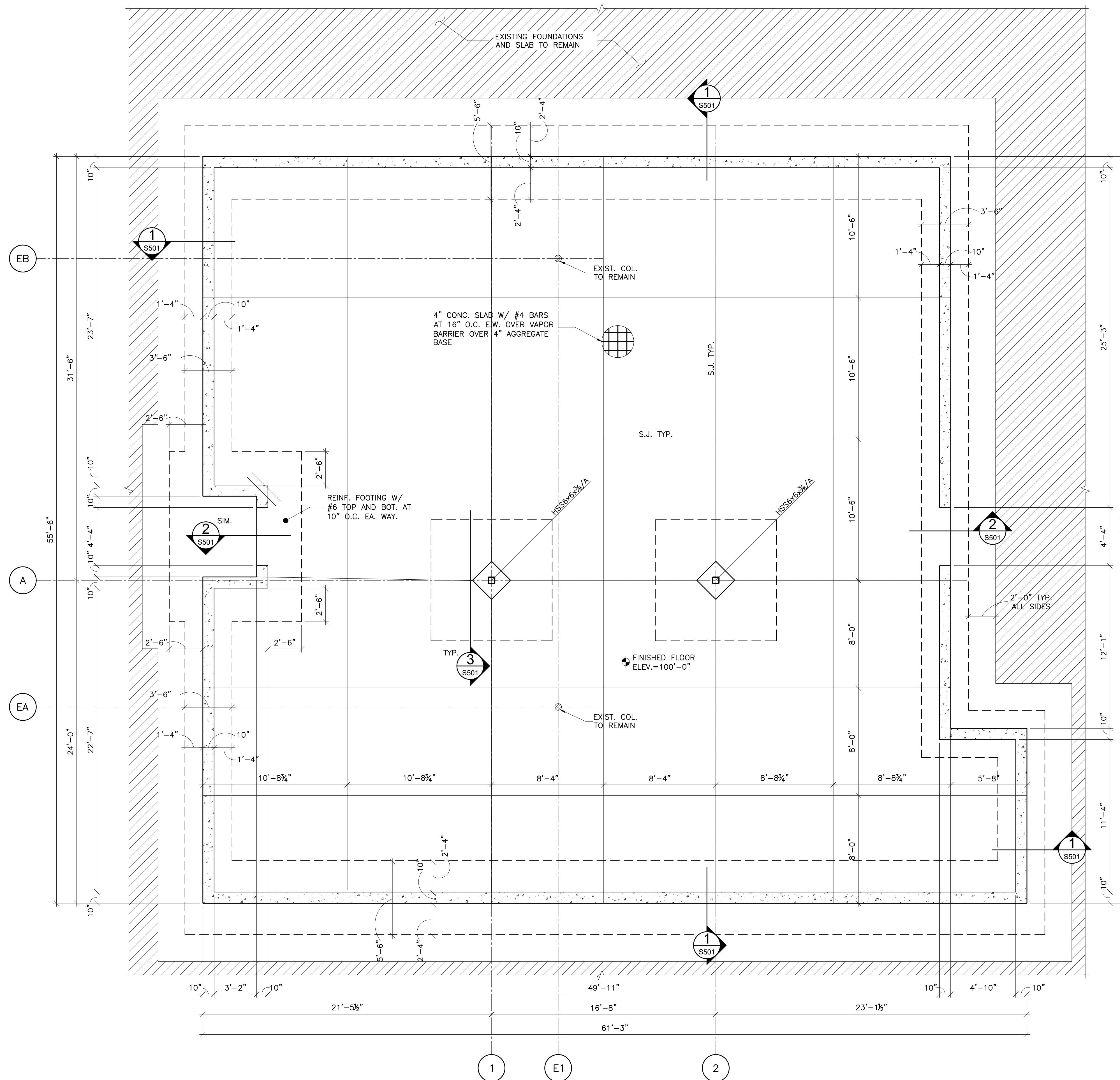
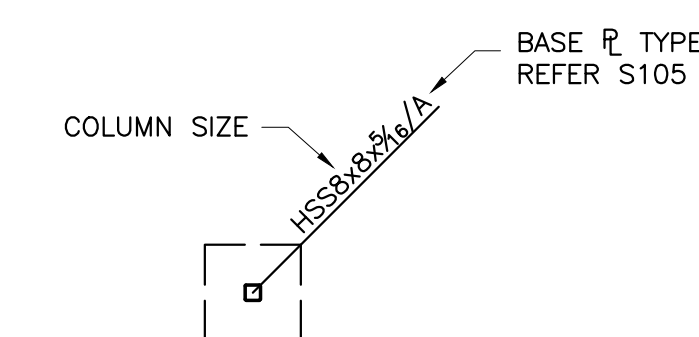
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FOUNDATION PLAN NOTES:

- FOUNDATION AND SLAB SUBGRADE SHALL BE PREPARED AS OUTLINED IN THE STRUCTURAL GENERAL NOTES.
- REFERENCE ELEVATION OF 100'-0" EQUALS DATUM FINISHED FLOOR ELEVATION OF 1246.09' FEET FOR THE NEW AND EXISTING BUILDING. MATCH EXISTING ELEVATION.
- EXCEPT WHERE SHOWN OTHERWISE, SLABS-ON-GRADE SHALL BE 4" THICK CONCRETE REINFORCED WITH #3 BARS AT 15" ON CENTER EACH WAY OVER A 15 MIL VAPOR RETARDER OVER A 4" AGGREGATE BASE COURSE. REINFORCING BARS SHALL BE PLACED 1/2" CLEAR FROM TOP OF SLAB USING CHAIRS OR SLAB BOLSTERS COMPLYING WITH CRS1'S "MANUAL OF STANDARD PRACTICE".
- SLABS-ON-GRADE SHALL BE WATER CURED FOR A MINIMUM OF 7 DAYS BY PONDING, SPRAYING, SPRINKLING OR BY USE OF SATURATED COVERINGS. THE USE OF CURING COMPOUNDS FOR SLABS-ON-GRADE IS PROHIBITED.
- SAWED JOINTS (SJ) AND REQUIRED CONSTRUCTION JOINTS (CJ) ARE SHOWN ON THE DRAWINGS. AT THE CONTRACTOR'S OPTION, ADDITIONAL CONSTRUCTION JOINTS MAY BE PLACED AT LOCATIONS INDICATED TO BE SAWED JOINTS.
- // INDICATES (2)#4 BARSx4'-0" TO BE PLACED IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS. RE-ENTRANT CORNERS ARE DEFINED AS INTERIOR CORNERS WHERE JOINTS DO NOT OCCUR IN BOTH DIRECTIONS. SIMILAR BARS SHALL BE PLACED AT ANY DISCONTINUOUS ENDS OF SAWED JOINTS OR CONSTRUCTION JOINTS.
- REFER MECHANICAL FOR FLOOR DRAIN (F.D.) INFORMATION.

FOUNDATION PLAN LEGEND:



1 FOUNDATION PLAN
SCALE: 1/4"=1'-0"

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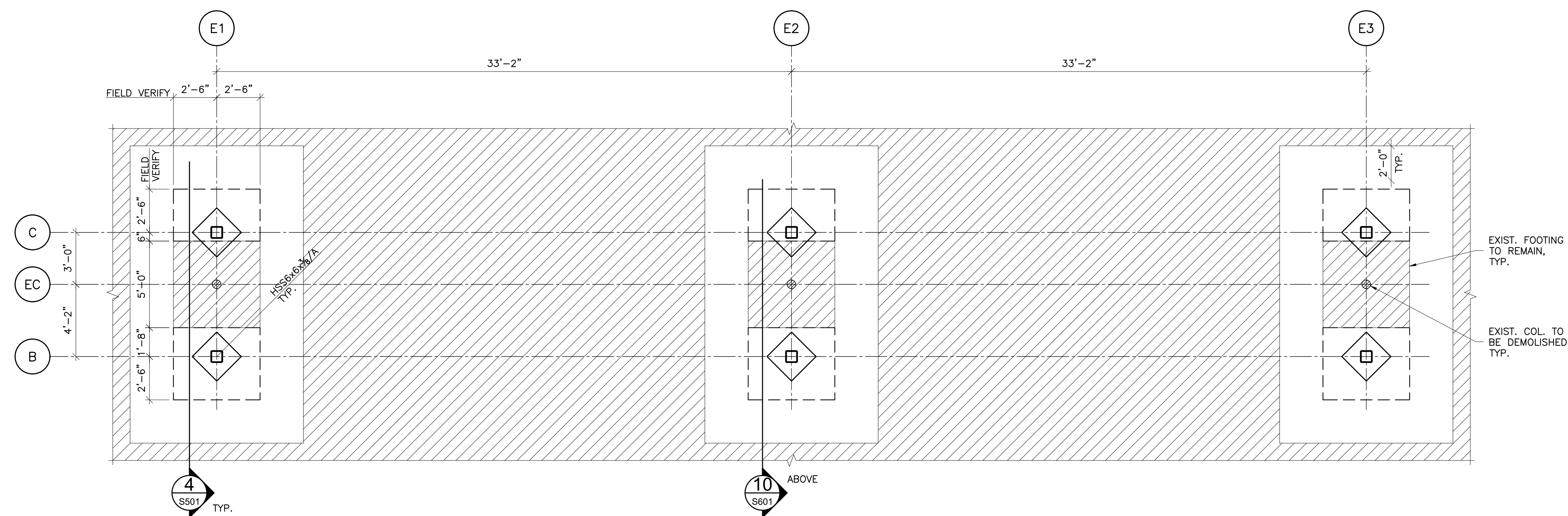
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1 PARTIAL FOUNDATION PLAN

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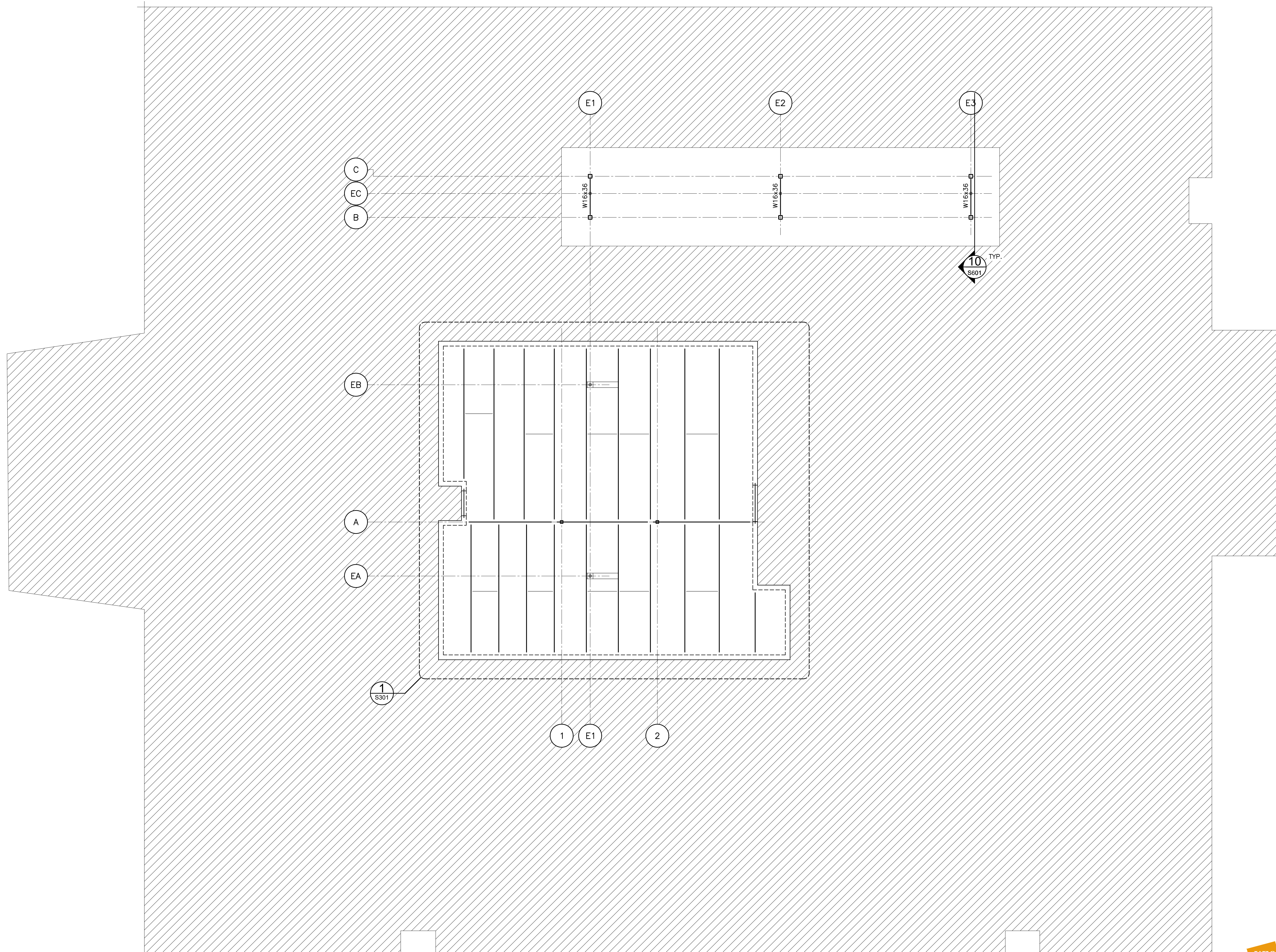
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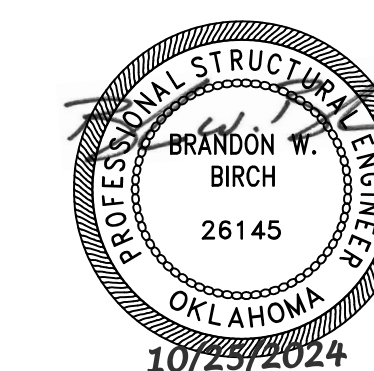


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S300

OVERALL FRAMING PLAN

SCALE: 1/8"=1'-0"

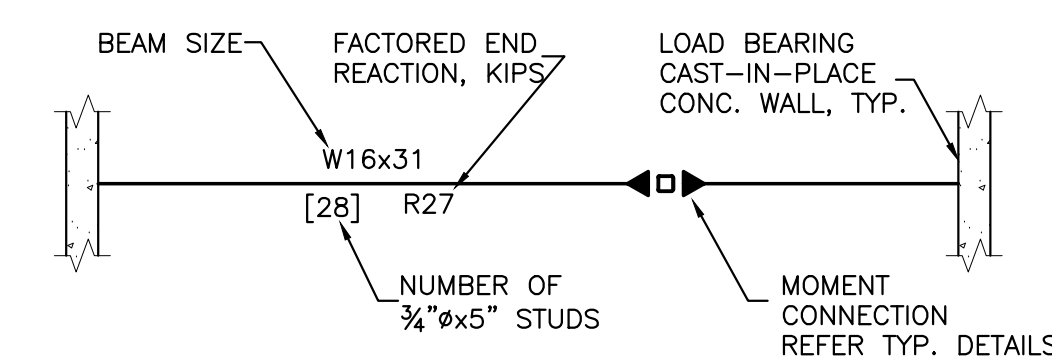




SHELTER ROOF FRAMING PLAN NOTES:

1. ALL ELEVATIONS ARE REFERENCED FROM FINISHED FLOOR DATUM OF 100'-0". REFER GENERAL NOTES FOR ACTUAL ELEVATION.
2. [10] INDICATES THE NUMBER OF 3/4"x5" HEADED STUDS THAT ARE REQUIRED. AT BEAMS, HEADED STUDS ARE UNIFORMLY SPACED ALONG BEAM LENGTH. AT GIRDERS, STUDS ARE UNIFORMLY SPACED BETWEEN INTERSECTING TRANSVERSE BEAMS. LENGTH OF STUD IS THE FINAL INSTALLED LENGTH AFTER WELDING. SELECT LENGTH OF STUD PRIOR TO WELDING BASED ON BURN THROUGH CONDITIONS, I.E., THROUGH METAL DECK OR DIRECTLY TO STEEL.
3. AT COMPOSITE BEAMS, PLACE HEADED STUDS IN THE "STRONG" POSITION. REFER TYPICAL DETAILS.
4. PROVIDE GIRDER FILLERS TO PROVIDE AT LEAST A 6" HAUNCH DIMENSION AT GIRDERS. REFER TYPICAL DETAILS.
5. PROVIDE 16 GAGE SHEET METAL CLOSURES AT COLUMN TO BEAM OR GIRDER CONNECTIONS PRIOR TO CONCRETE PLACEMENT.
6. PROVIDE [2] #4x4'-0" DIAGONAL BARS AT ALL RE ENTRANT CORNERS.
7. ALL CONCRETE SLABS SHALL BE WET CURED FOR A MINIMUM OF 7 DAYS. USE OF SPRAY-ON OR ROLL-ON CURING COMPOUND IS PROHIBITED.
8. PROVIDE CONTINUOUS BUTT SPLICE WELDING IN FIELD AT DECK ANGLES.
9. FOR COLUMN SIZES, REFER TO FOUNDATION PLAN
10. ALL ROOF OPENINGS FOR MECHANICAL ROOF TOP UNITS ARE APPROXIMATELY LOCATED. EXACT SIZE AND LOCATIONS SHALL BE COORDINATED WITH THE SUCCESSFUL MECHANICAL CONTRACTOR. ALL ROOF WALL OPENINGS SHALL BE SUPPORTED WITH TYPICAL ANGLE FRAME AND PENETRATION/SKROUD DETAILS.
 - a. EF = EXHAUST FAN
 - b. RH = ROOF HOOD
11. DETAILING FOR CAST IN PLACE CONSTRUCTION ALLOWS FOR SHEAR WALLS AND COLUMNS TO BE PLACED VERTICALLY BEFORE PLACING ADDITIONAL FRAMING. THIS WILL REQUIRE TEMPORARY BRACING OF VERTICAL 10" WALLS UNTIL ROOF LEVELS ARE PLACED. COORDINATE BRACING OF WALLS WITH ARCHITECT IF BRACING TO EXPOSED STRUCTURE.
12. MECHANICAL OPENINGS SHALL NOT OCCUR WITHIN 24" OF EMBEDDED STUD ANCHORS.

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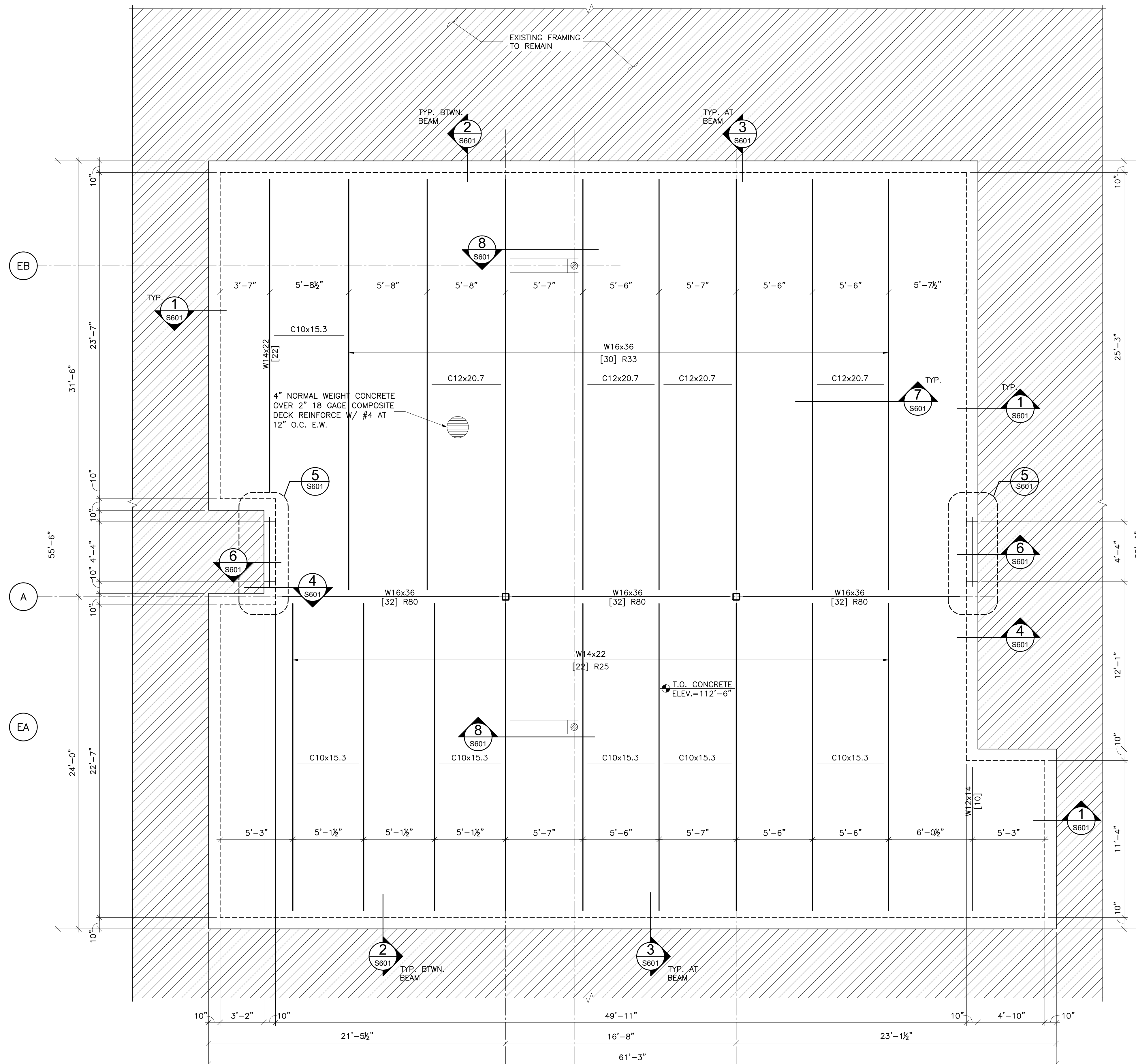
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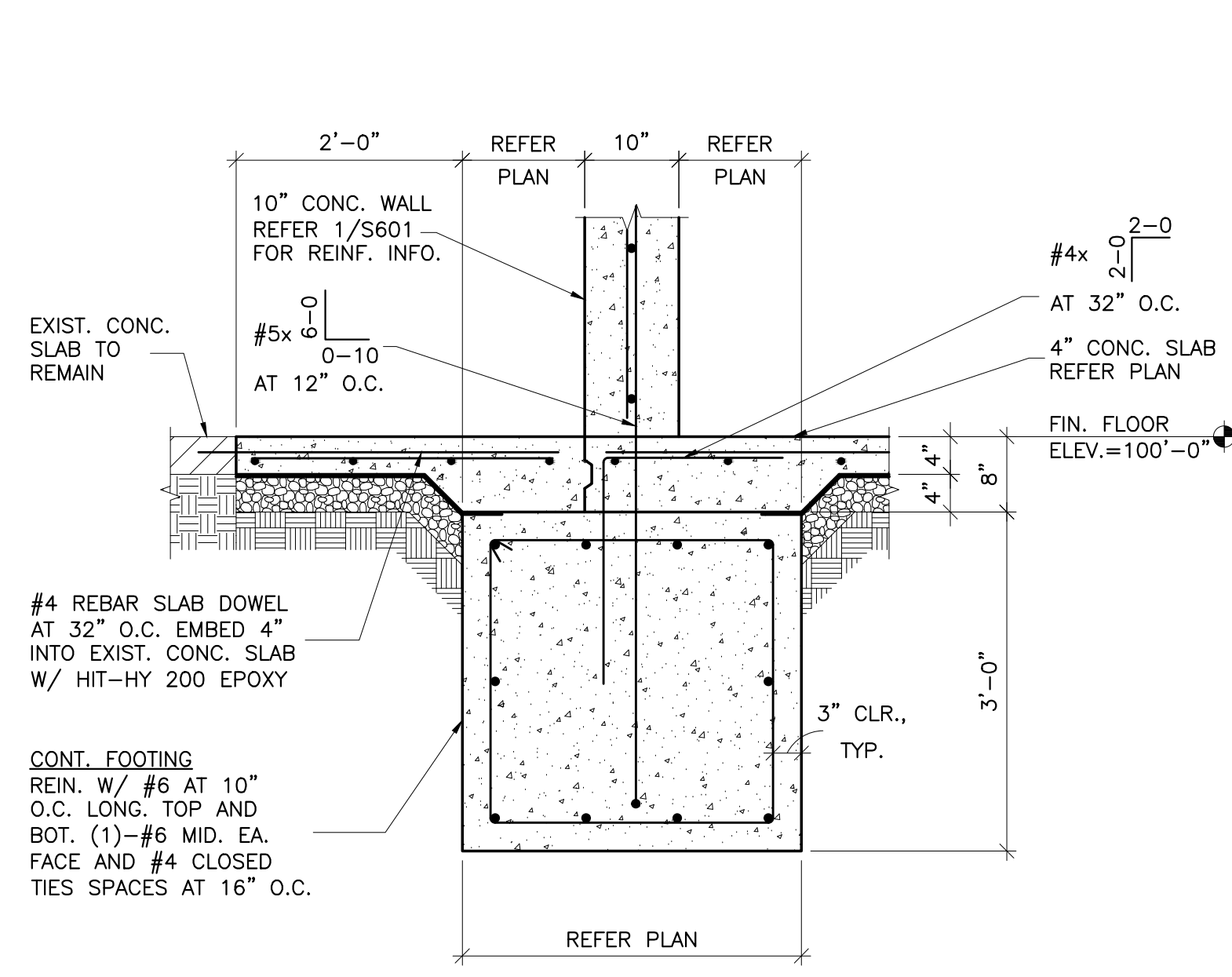


1 FRAMING PLAN
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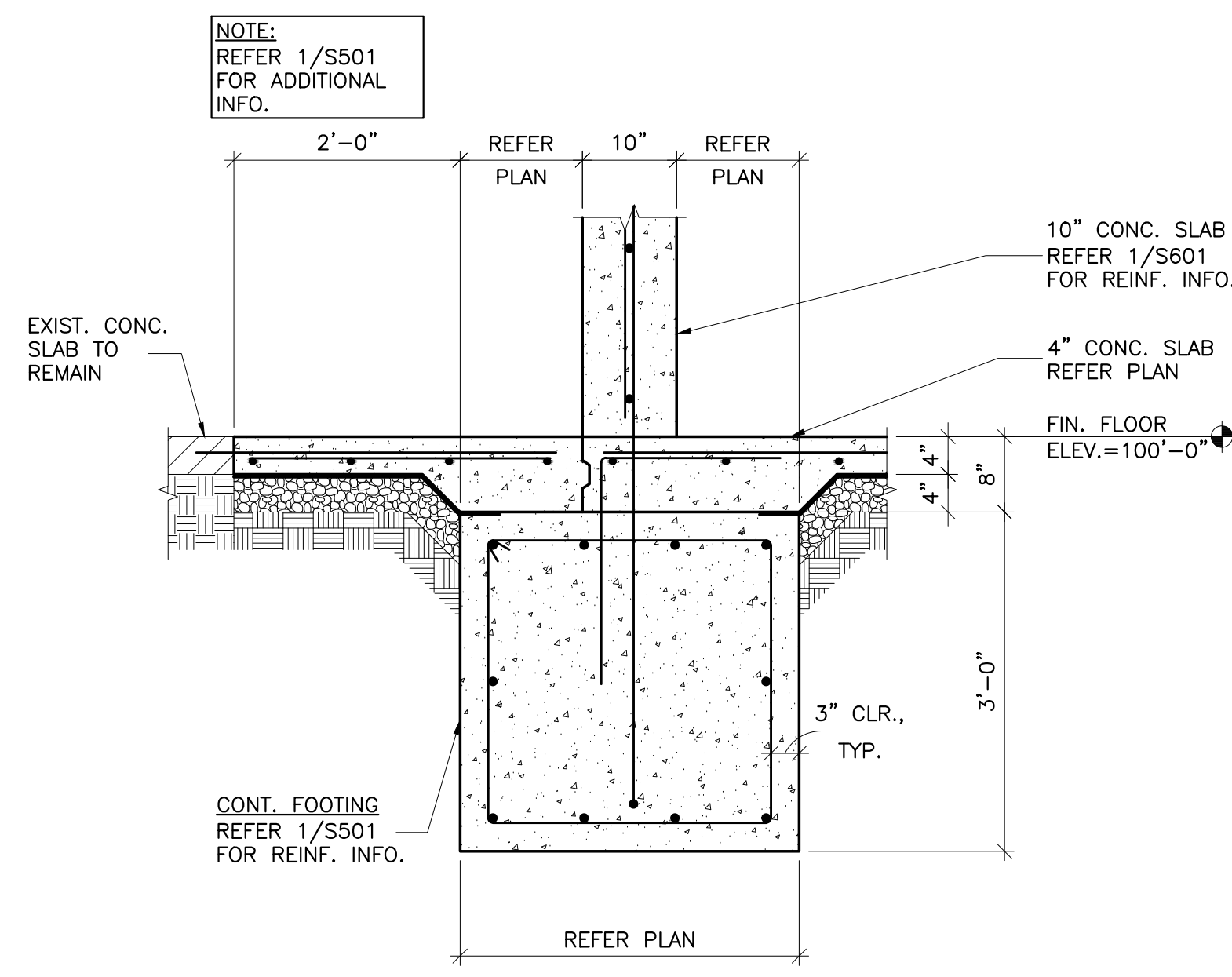
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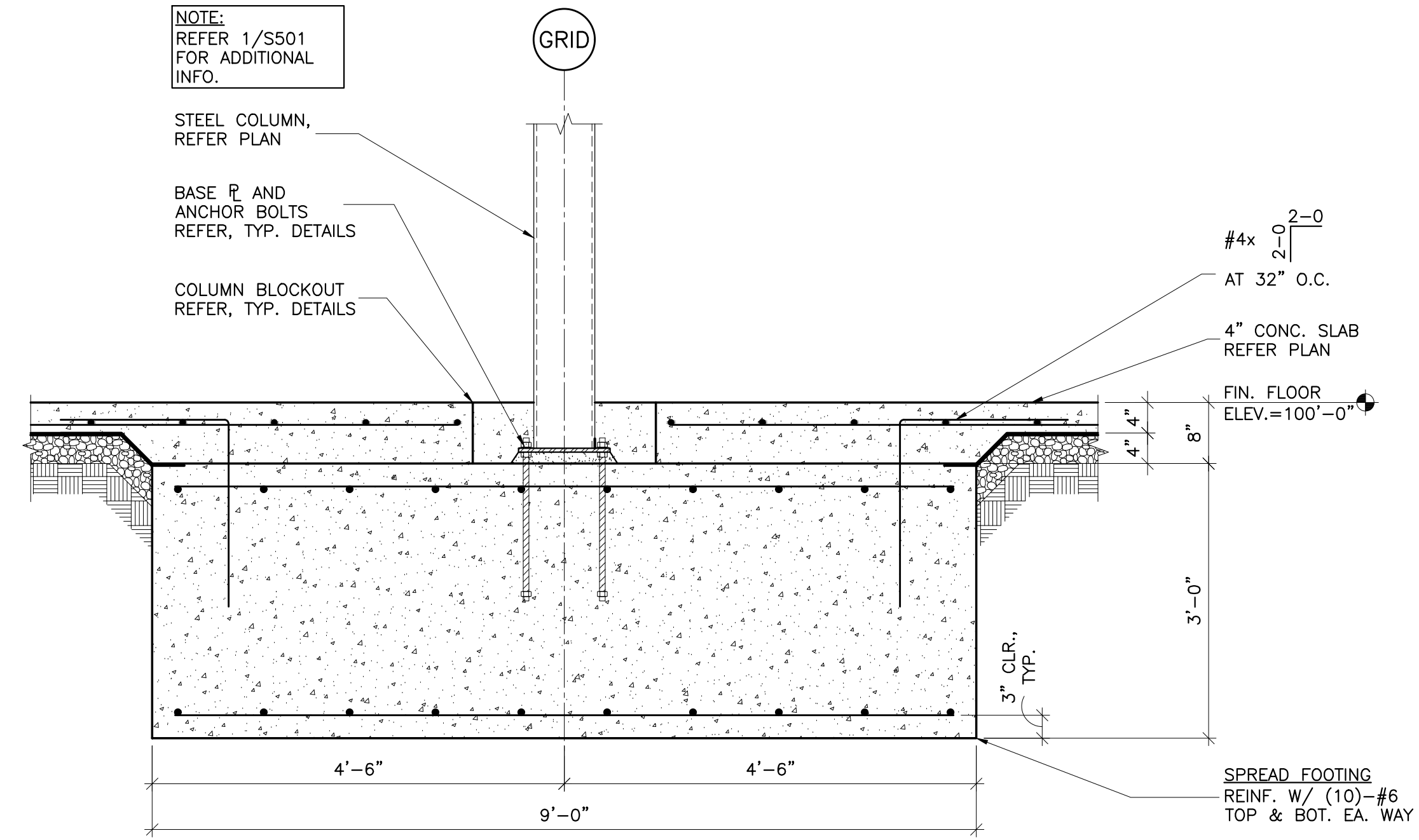
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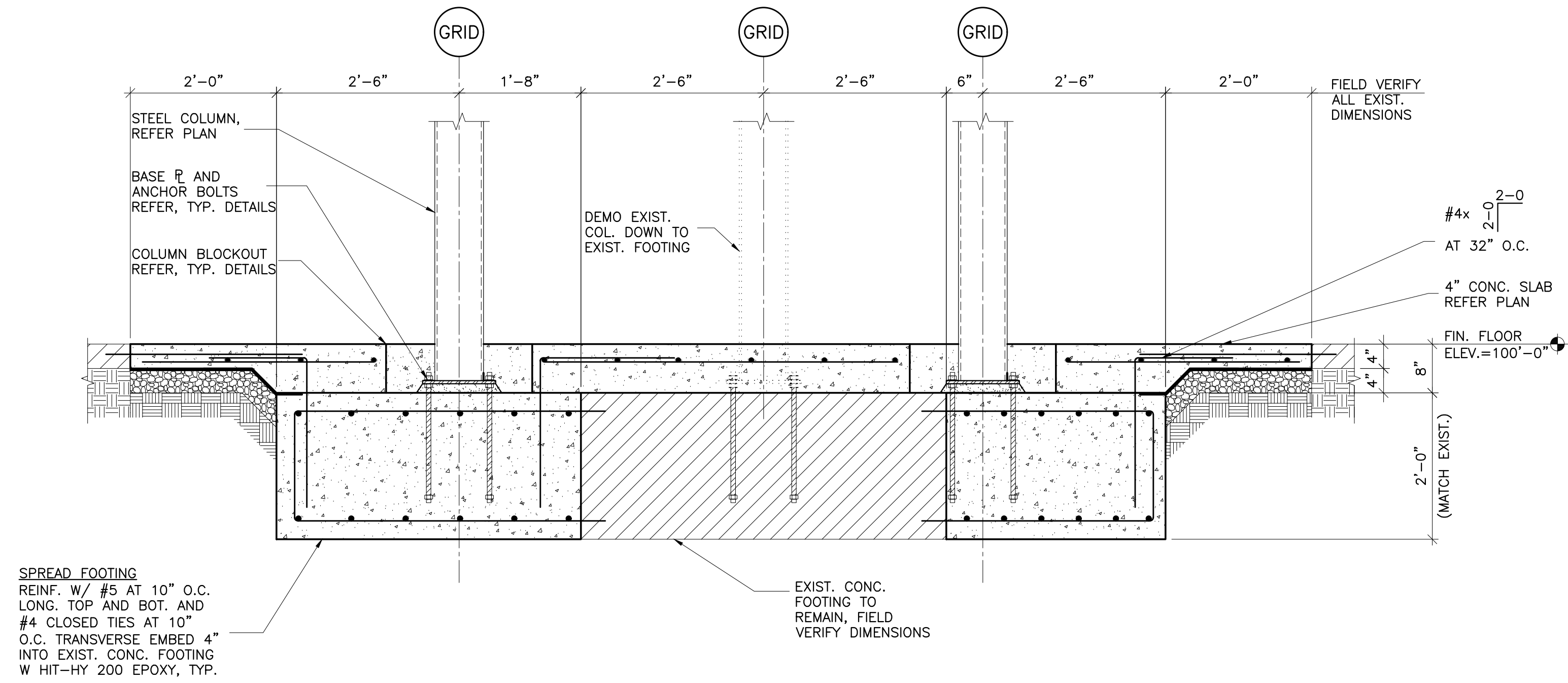
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2 SECTION
S501 SCALE: 3/4"=1'-0"



3 SECTION
S501 SCALE: 3/4"=1'-0"



4 SECTION
S501 SCALE: 3/4"=1'-0"

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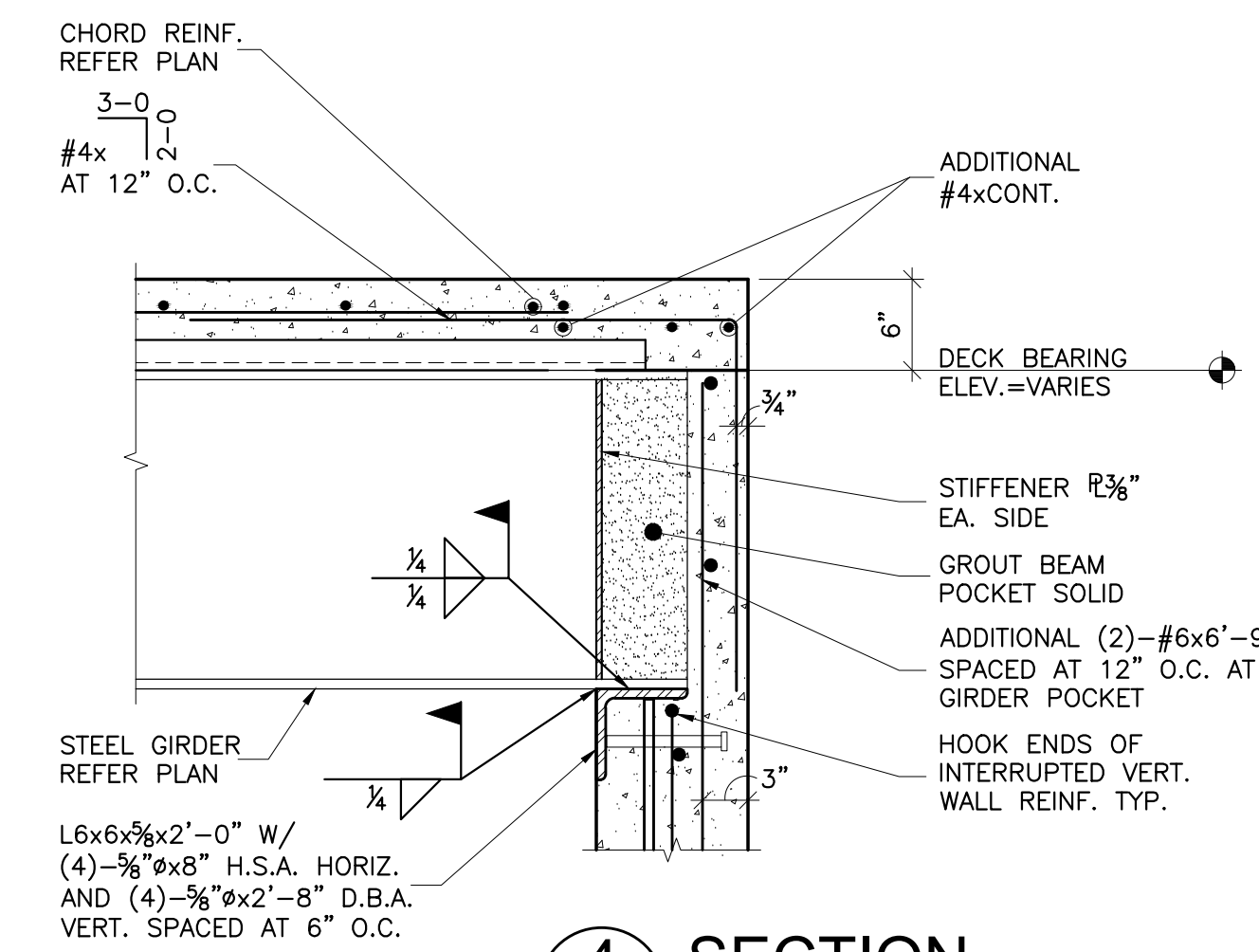
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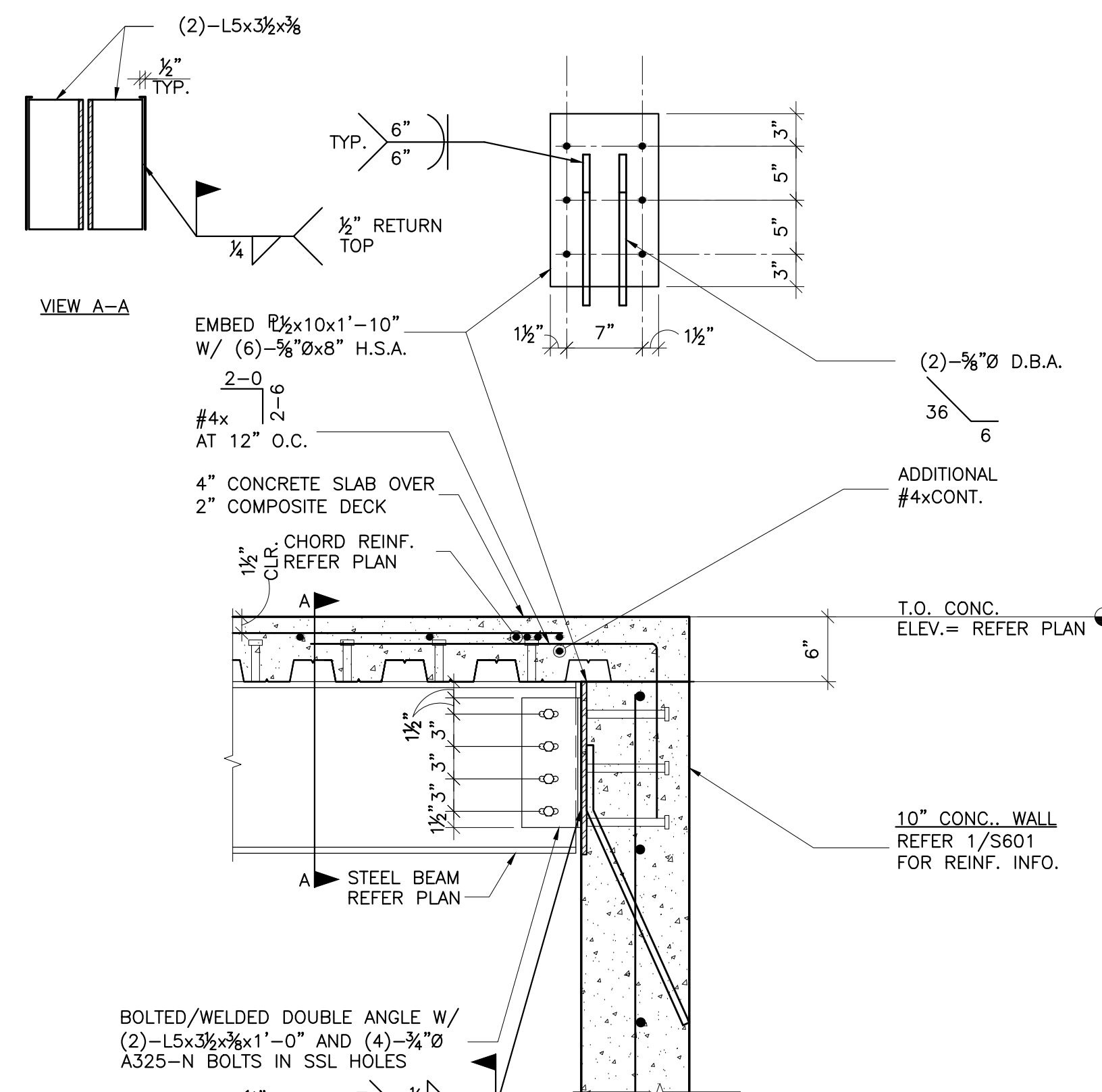
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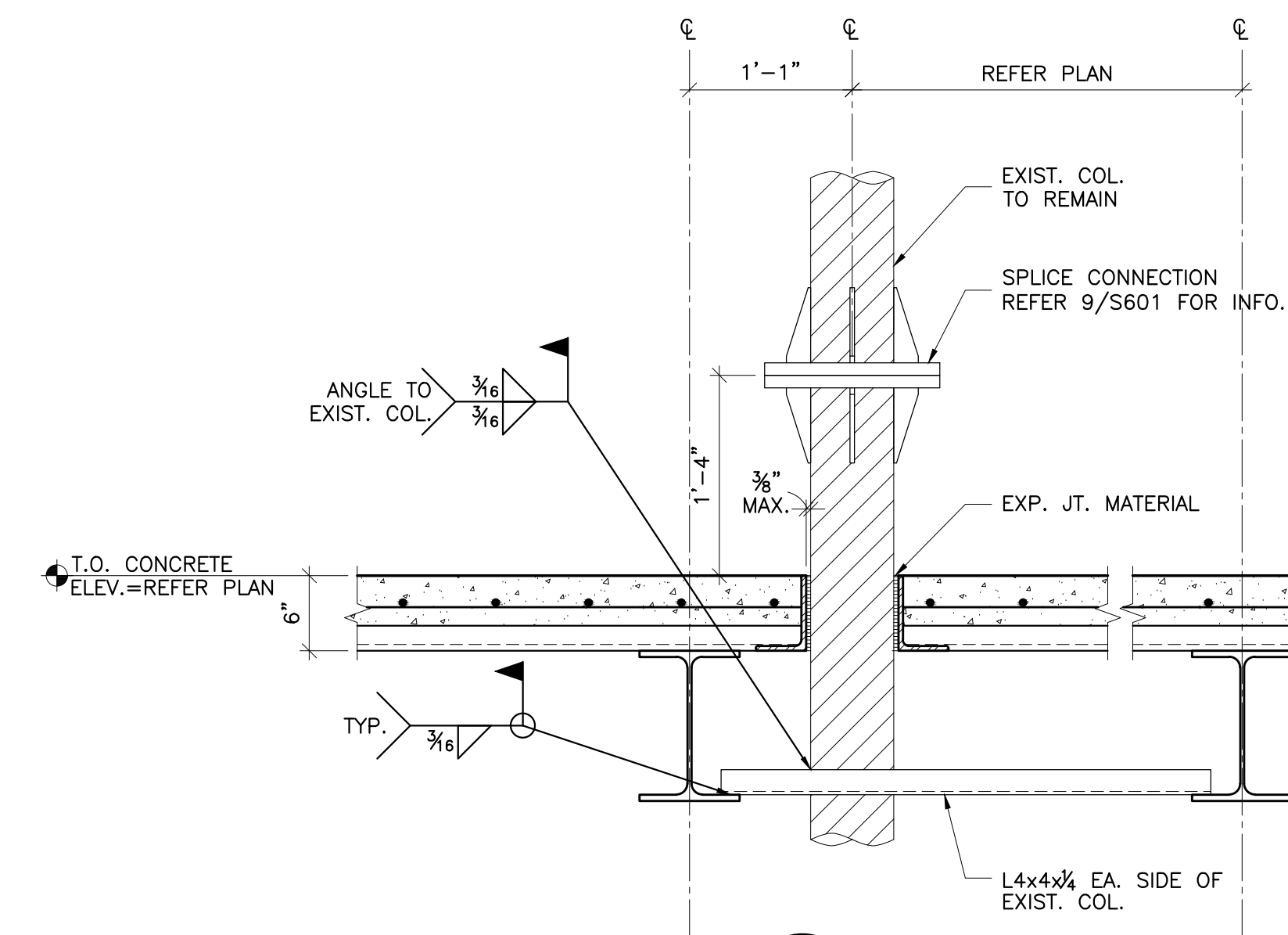
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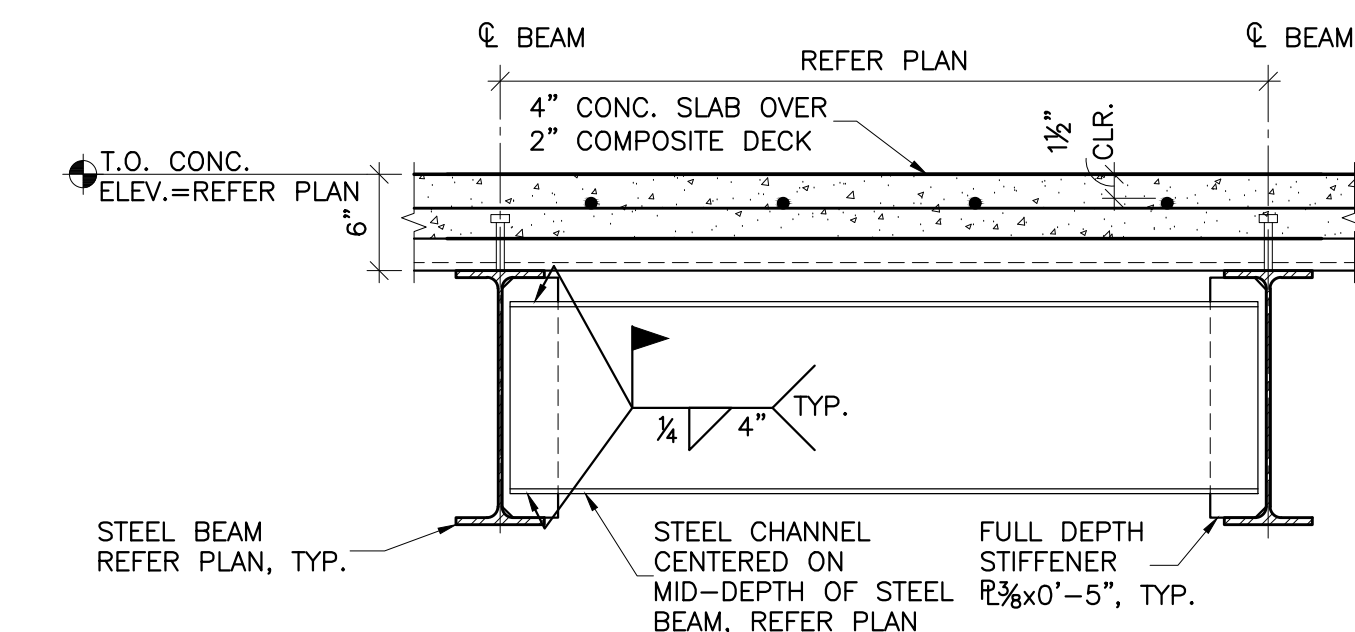
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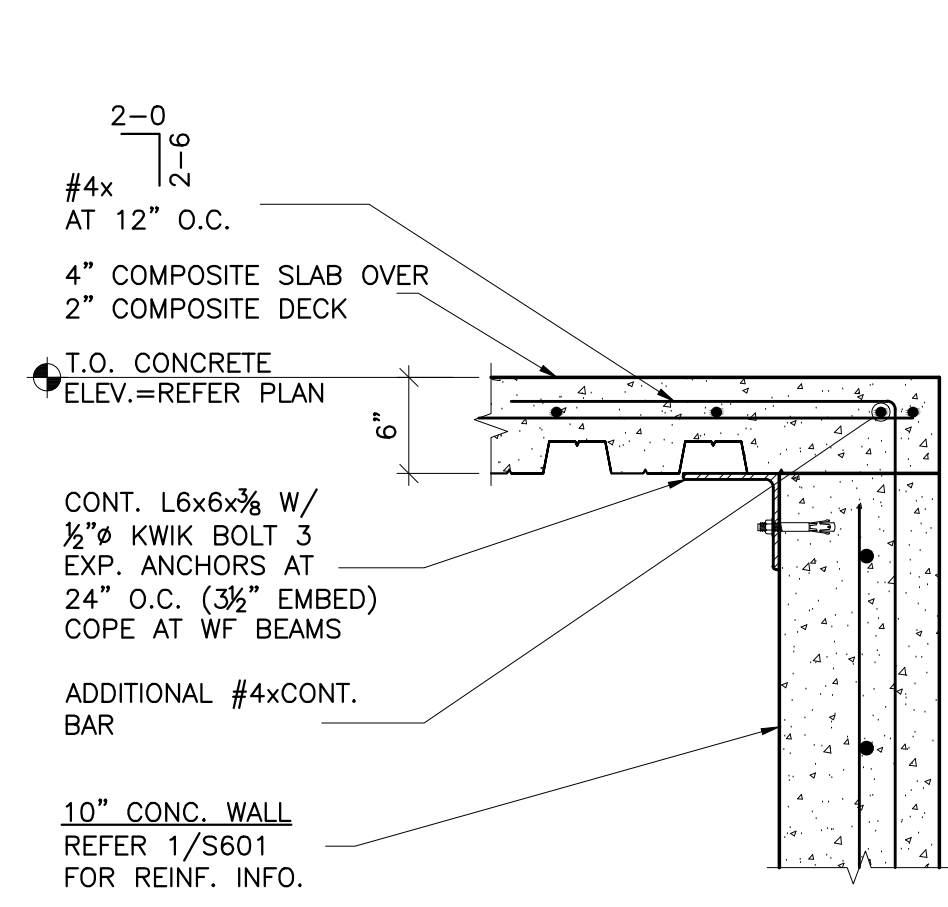
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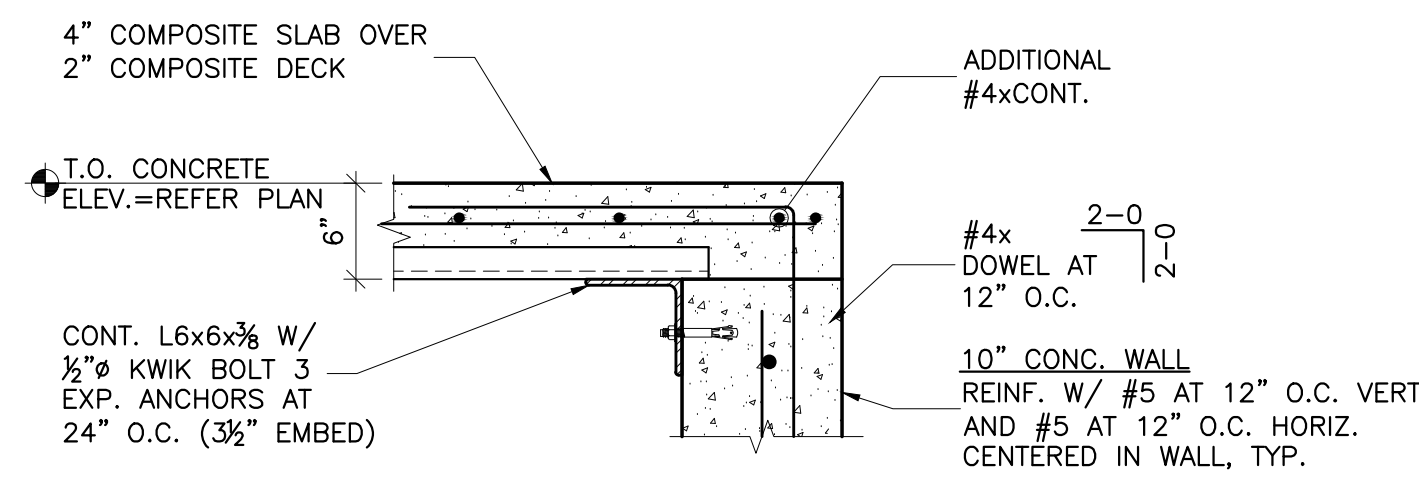
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S601 SCALE: 1"=1'-0"



7 SECTION
S601 SCALE: 1"=1'-0"

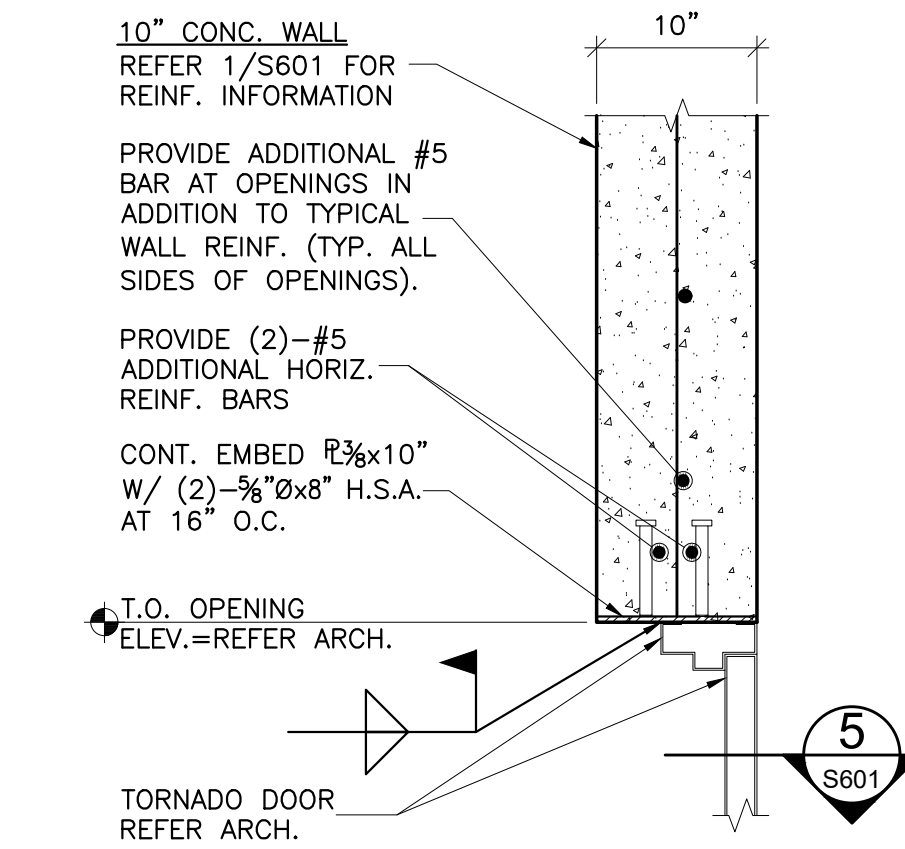


2 SECTION
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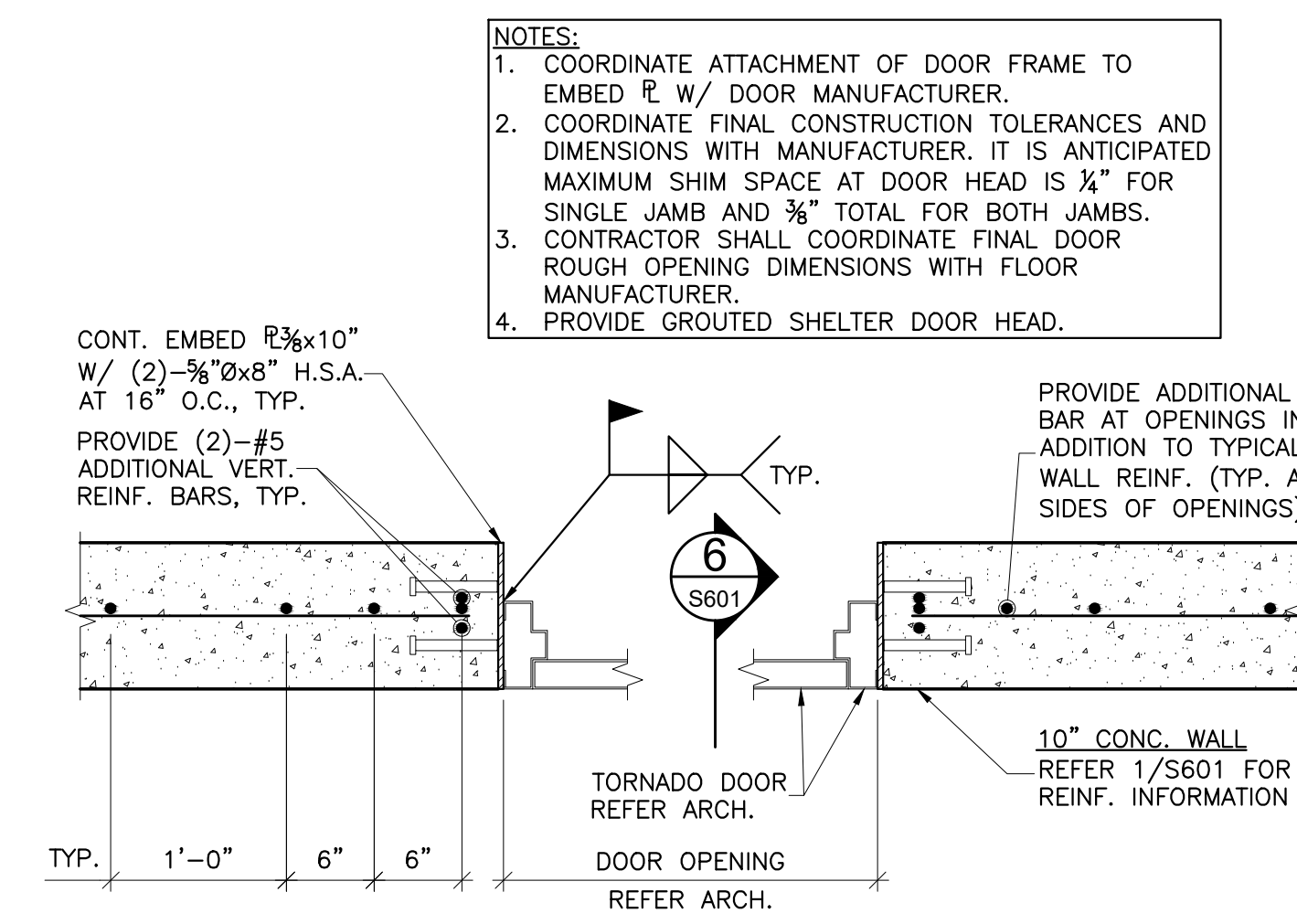


1 SECTION
S601 SCALE: 1"=1'-0"

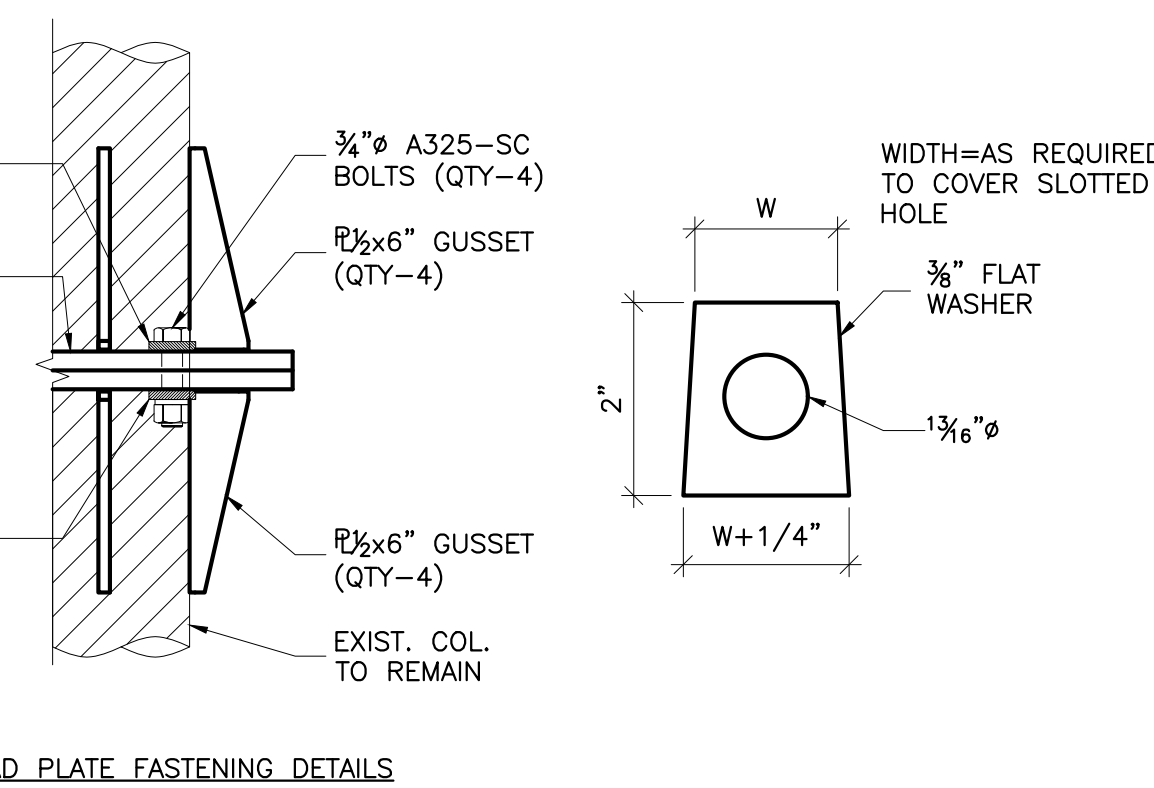
- NOTES:
- COORDINATE ATTACHMENT OF DOOR FRAME TO EMBED \bar{r} W/ DOOR MANUFACTURER.
 - COORDINATE FINAL CONSTRUCTION TOLERANCES AND DIMENSIONS WITH MANUFACTURER. IT IS ANTICIPATED MAXIMUM SHIM SPACE AT DOOR HEAD IS $\frac{1}{4}$ " FOR SINGLE JAMB AND $\frac{3}{8}$ " TOTAL FOR BOTH JAMBS.
 - CONTRACTOR SHALL COORDINATE FINAL DOOR ROUGH OPENING DIMENSIONS WITH FLOOR MANUFACTURER.
 - PROVIDE GROUTED SHELTER DOOR HEAD.



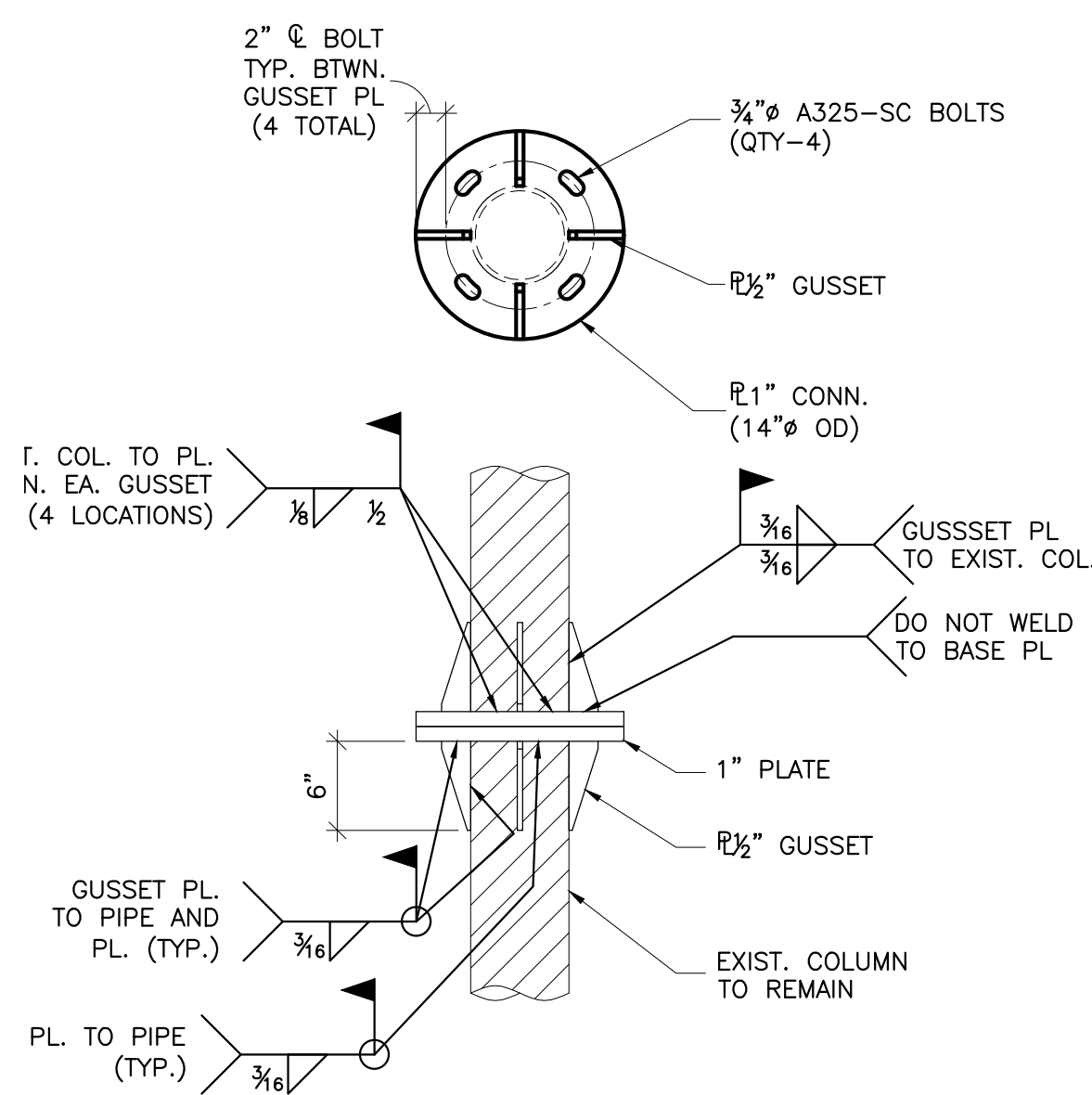
5 DOOR HEAD
S601 SCALE: 1"=1'-0"



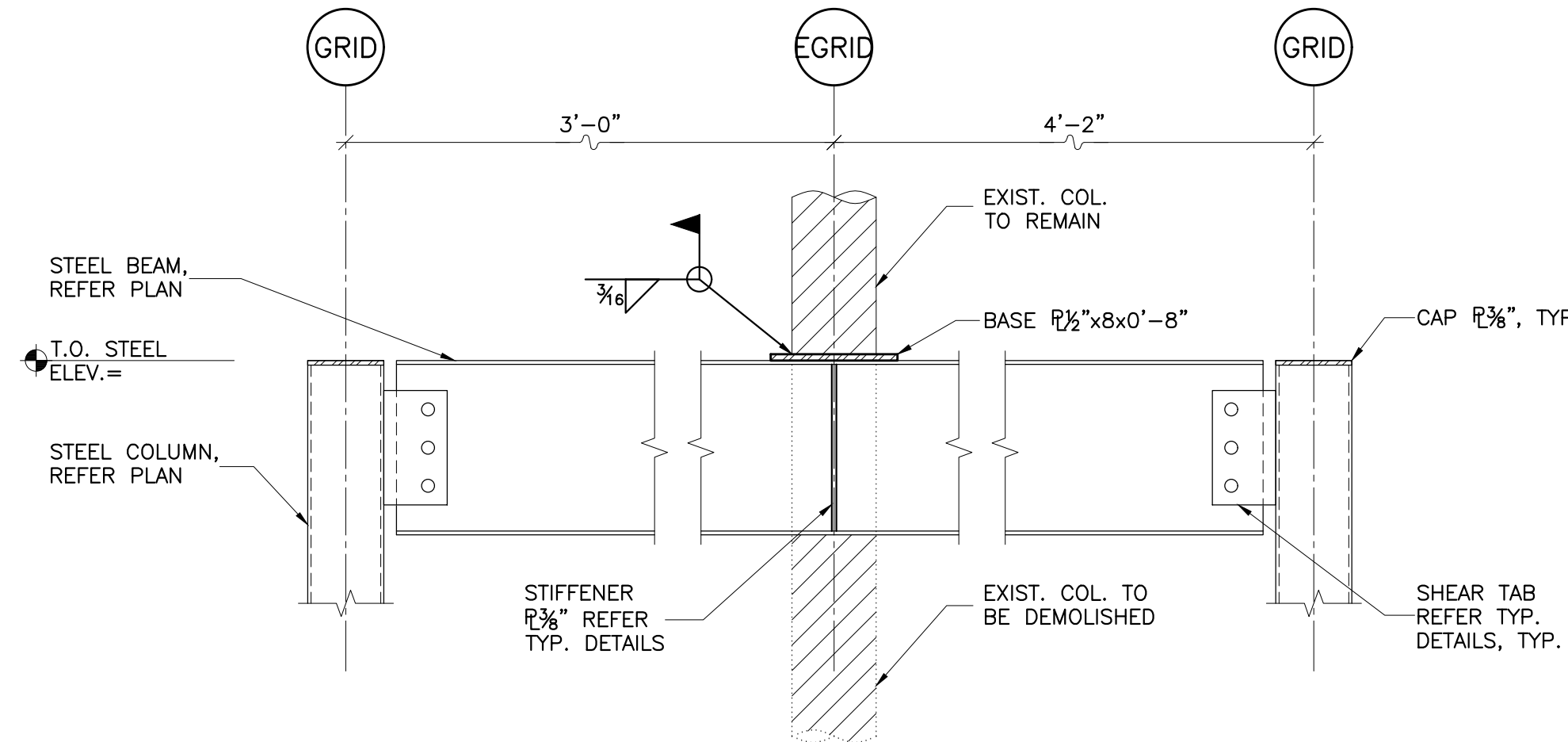
6 ENLARGED PLAN AT DOOR
S601 SCALE: 1"=1'-0"



9 SECTION
S601 SCALE: 1"=1'-0"



10 SECTION
S601 SCALE: 1"=1'-0"



NOTE:
EXIST. COLUMN IS TO BE CUT AND PLATES
WELDED/BOLTED AS SHOWN. TOP PART OF EXIST.
COLUMN TO BE THE BREAKAWAY CONNX.
- PAY CAREFUL ATTENTION TO THE BREAKAWAY WELDS.

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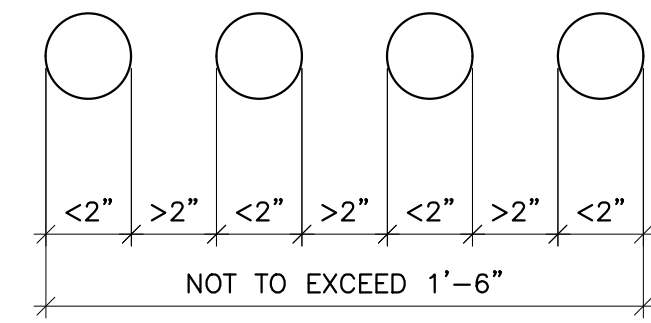
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- NOTES:**
1. WE ARE NOT AWARE OF ANY OPENINGS LARGER THAN 5'-0", IF AN OPENING LARGER THAN 5'-0" IS REQUIRED, CONTACT ENGINEER IMMEDIATELY FOR EVALUATION AND FURTHER INSTRUCTIONS.
 2. REFER 6/S105 AND 7/S105 FOR ADDITIONAL INFORMATION.
 3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

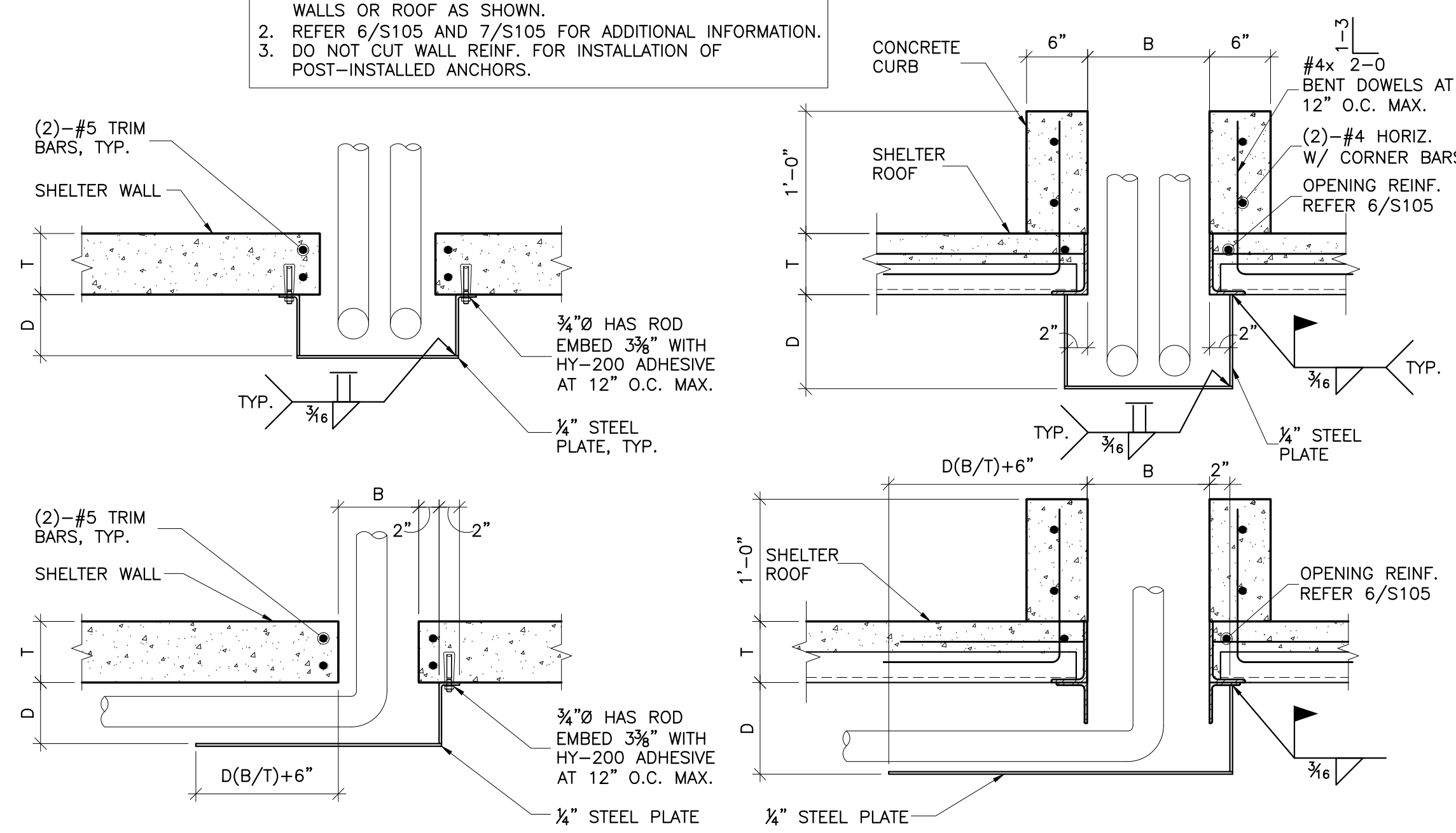
- NOTES:**
1. OPENINGS 18" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF AS SHOWN.
 2. REFER 6/S105 AND 7/S105 FOR ADDITIONAL INFORMATION.
 3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

NOTE:
OPENINGS 2" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF WITHOUT PROTECTION OR REGARD TO THE TYPICAL REINFORCING (SPECIAL REINFORCING AROUND OPENINGS SHALL NOT BE CUT). GROUPS OF UP TO 4 OPENINGS 2" OR LESS MAY BE MADE PROVIDED THE CLEAR SPACE BETWEEN OPENINGS EXCEEDS 2" AND THE TOTAL LENGTH OF THE GROUP DOES NOT EXCEED 18". OPENINGS CAN BE HORIZONTAL (AS SHOWN) OR VERTICAL.



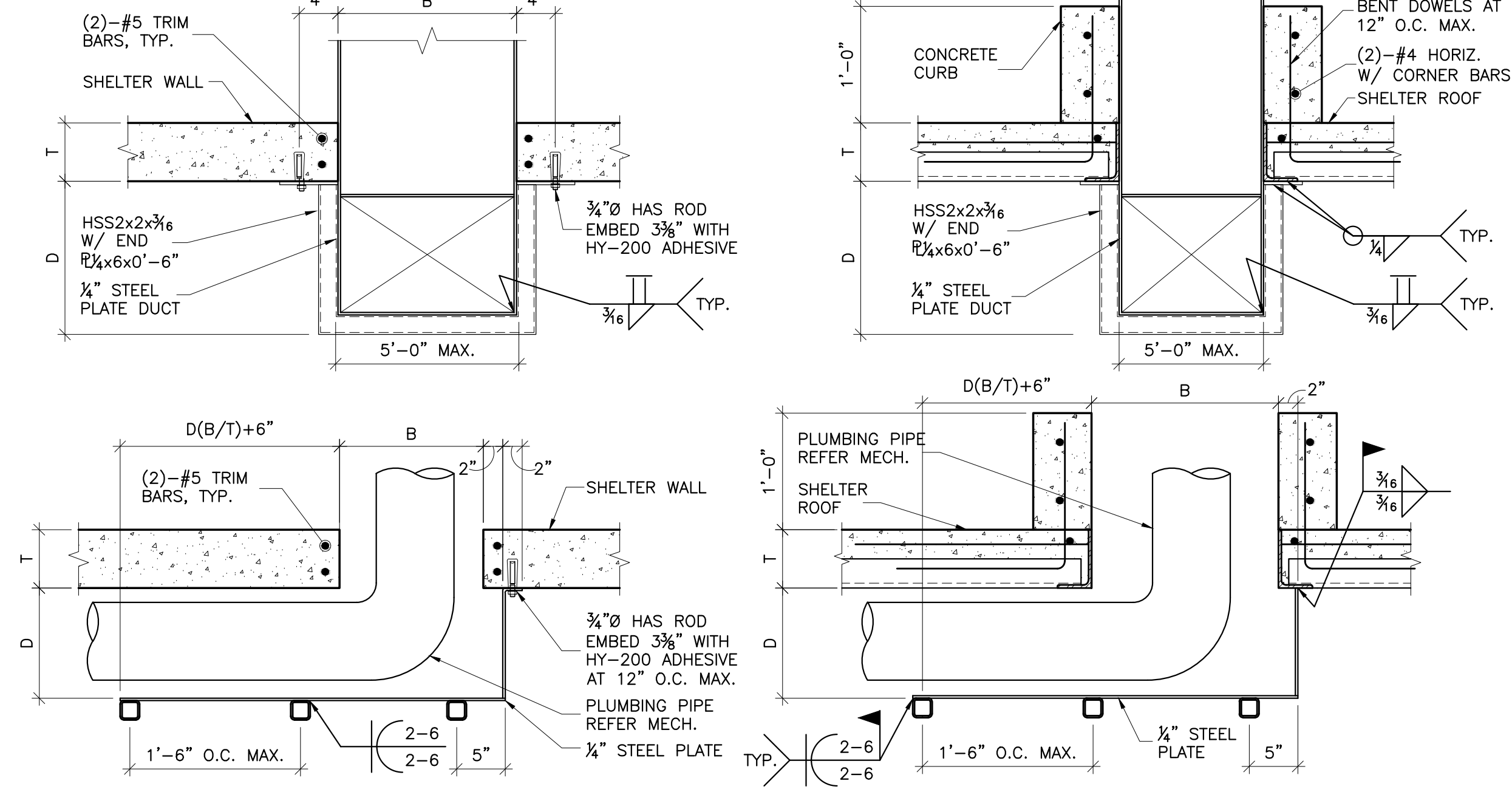
1 OPENINGS IN SHELTER 2" OR LESS

S602 SCALE: 1"=1'-0"



2 OPENINGS IN SHELTER 2" TO 1'-6"

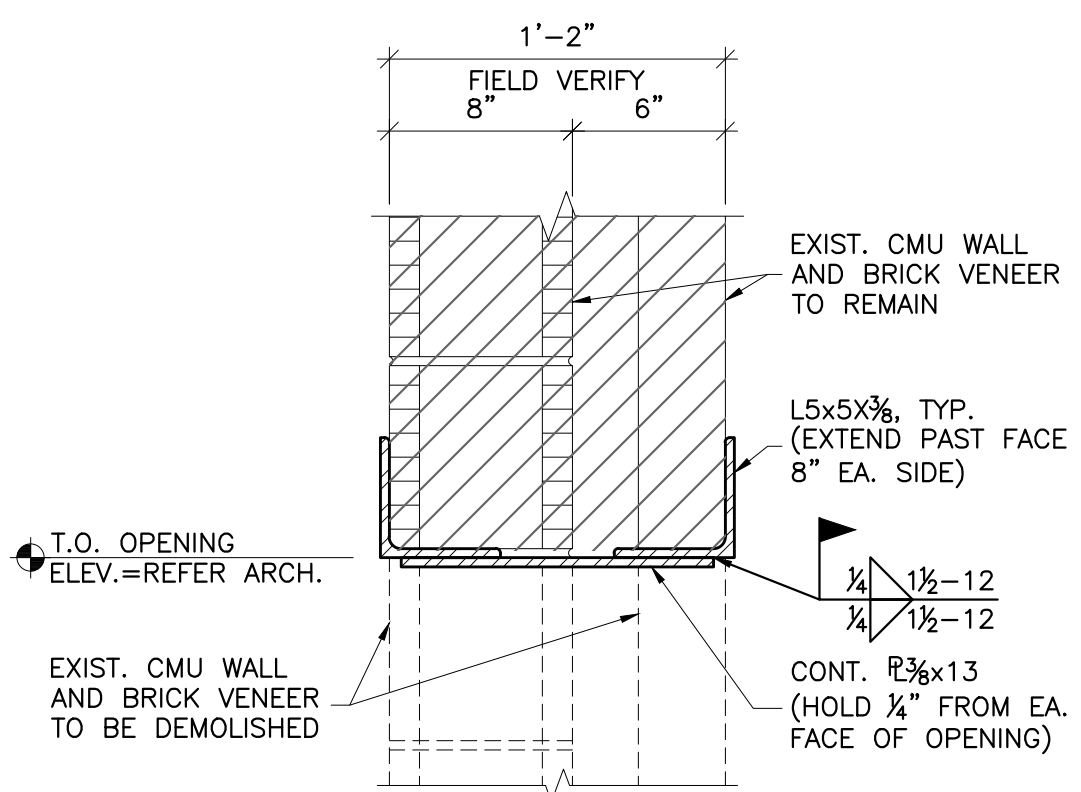
S602 SCALE: 1"=1'-0"



3 OPENINGS IN SHELTER TO 1'-6" TO 5'-0"

S602 SCALE: 1"=1'-0"

- SEQUENCING NOTES:**
1. SAW-CUT HORIZONTAL SLOT INTO ONE SIDE OF EXISTING WALL FOR PLACEMENT OF NEW ANGLE. SAW-CUT SHALL EXTEND A MINIMUM OF 8" BEYOND NEW OPENING.
 2. INSTALL NEW ANGLE TIGHT INTO SLOT. ANGLES SHALL EXTEND A MINIMUM OF 8" BEYOND OPENING.
 3. REPEAT STEPS 1 AND 2 ON OPPOSITE SIDE OF WALL.
 4. DEMOLISH MASONRY AND BRICK VENEER TO EXTENTS SPECIFIED BY ARCH., FOR NEW OPENING.
 5. INSTALL BOTTOM PL TO WITHIN 1/4" OF EACH JAMB OF NEW OPENING.
 6. PAINT ANY EXPOSED PORTIONS OF LINTEL, REFER ARCH FOR COLOR.



4 SECTION

S602 SCALE: 1 1/2"=1'-0"

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MOORE, OKLAHOMA



DEMOLITION PACKAGE
CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

S602

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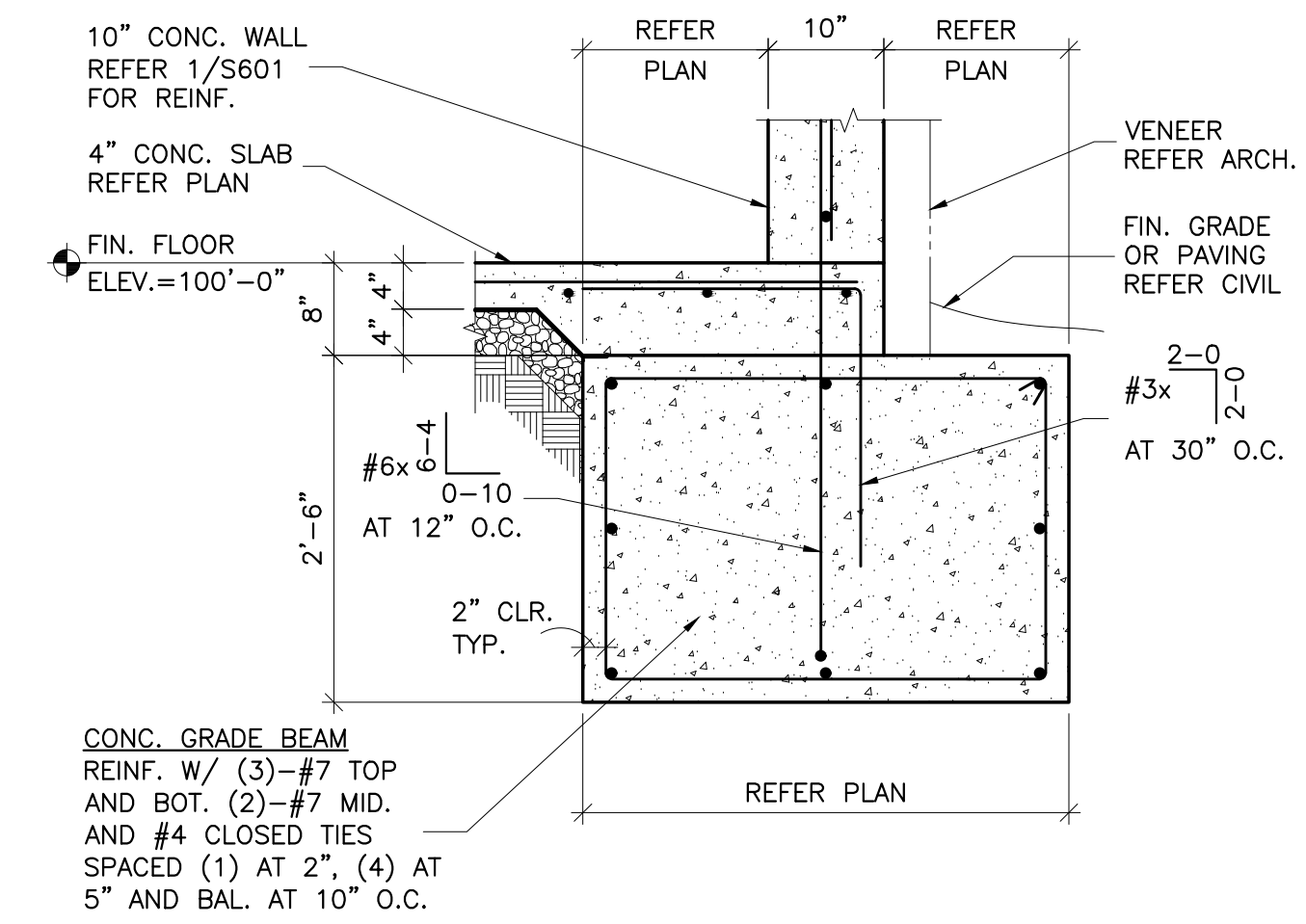
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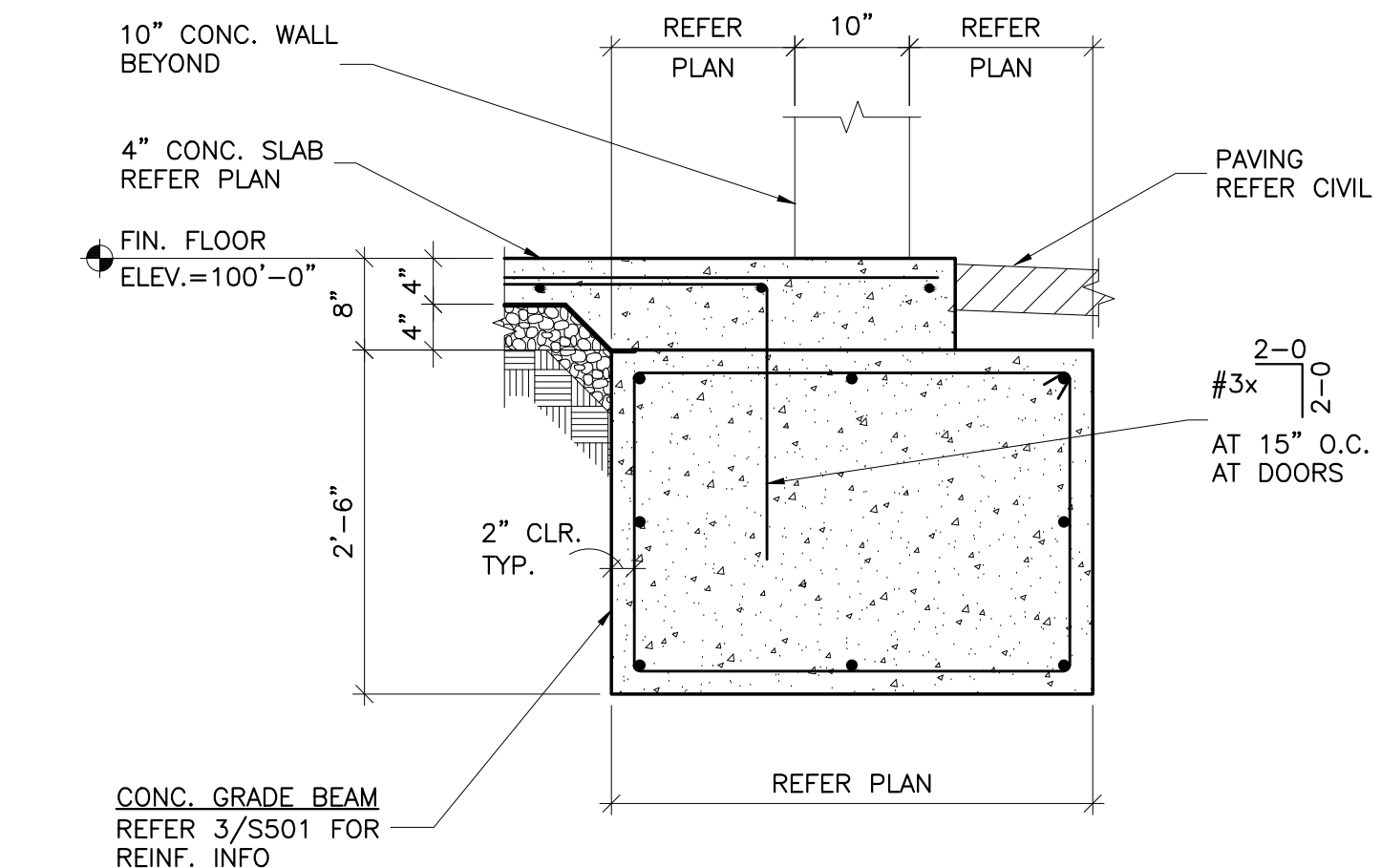
S701

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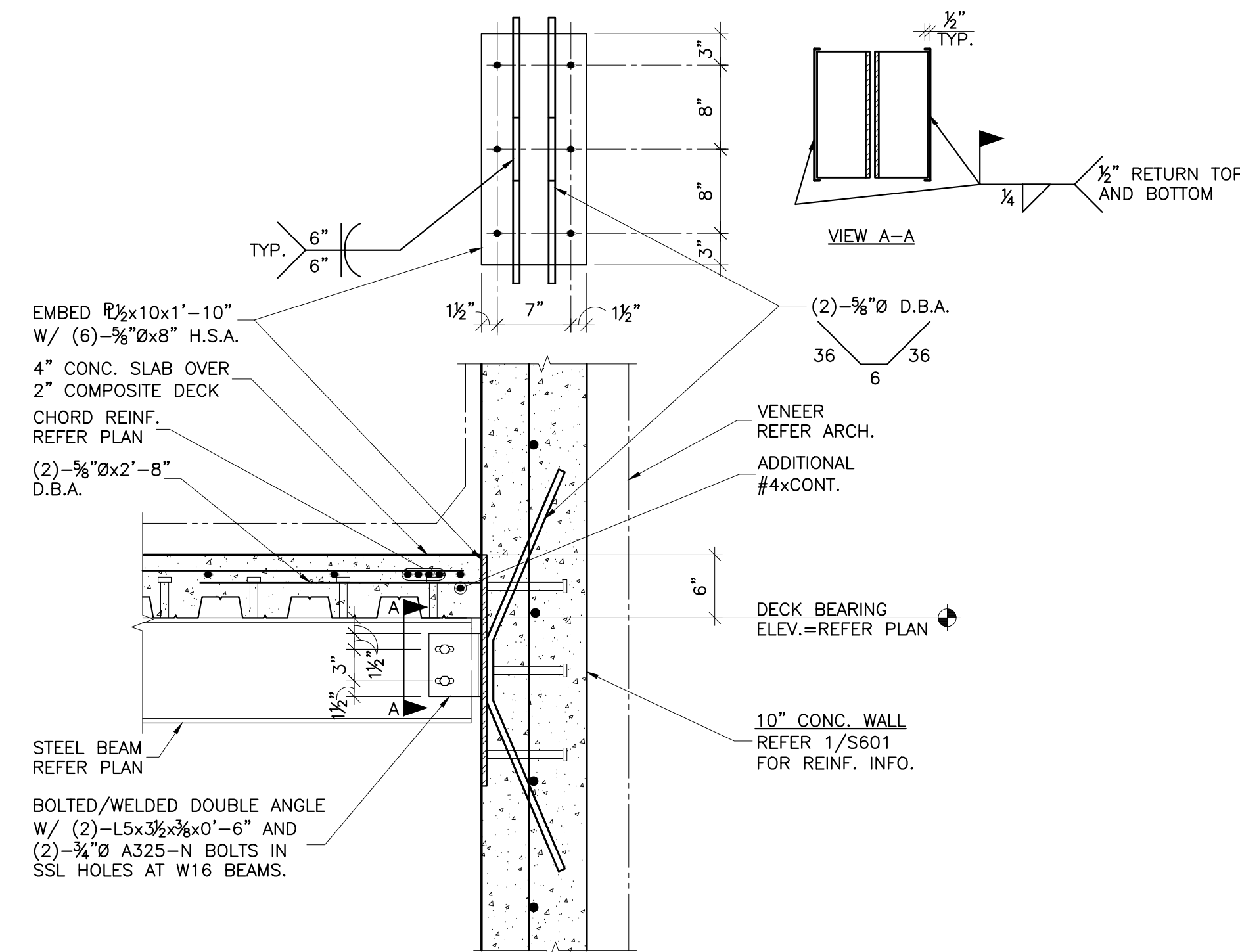
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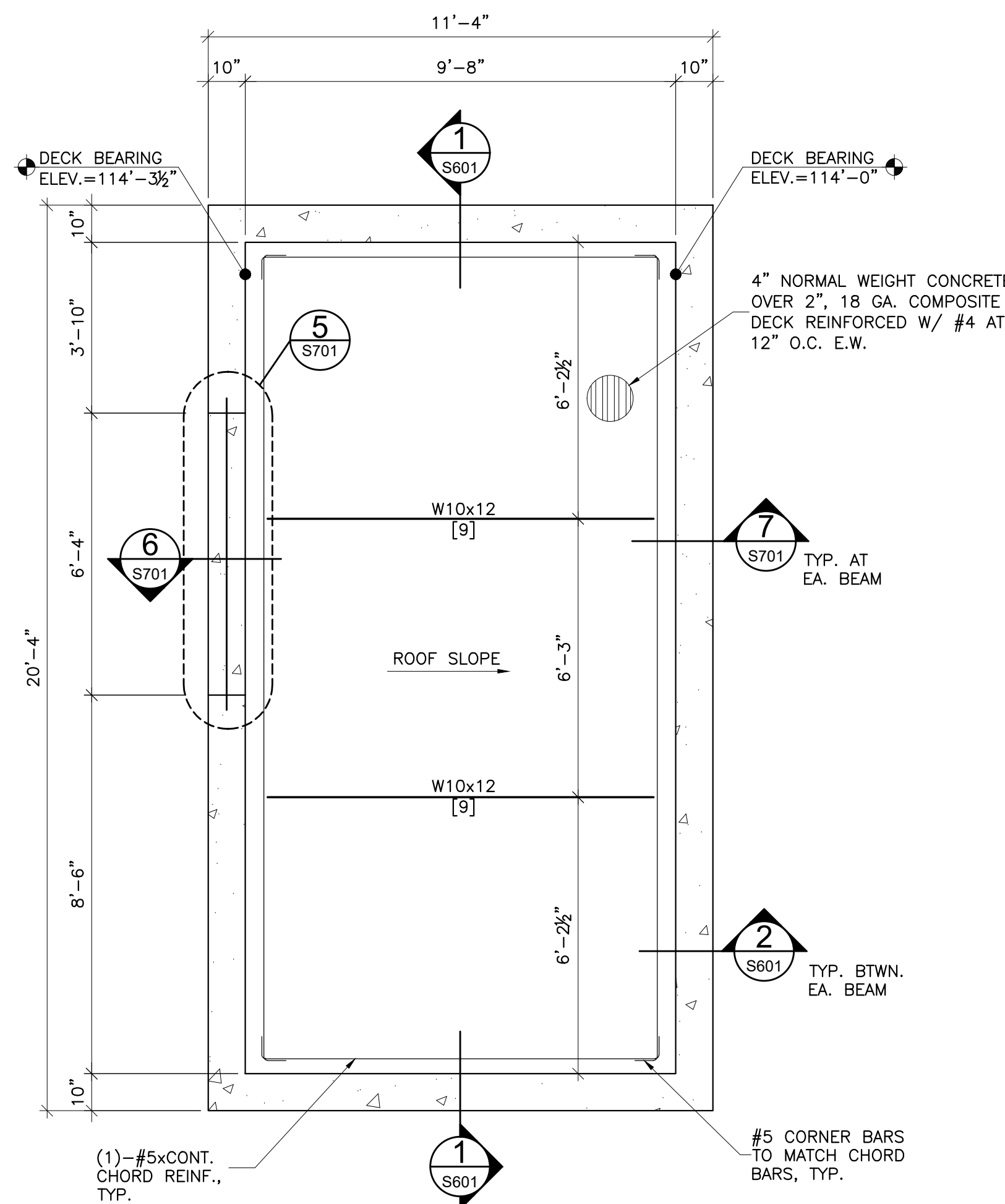
3 SECTION
S701 SCALE: 3/4"=1'-0"



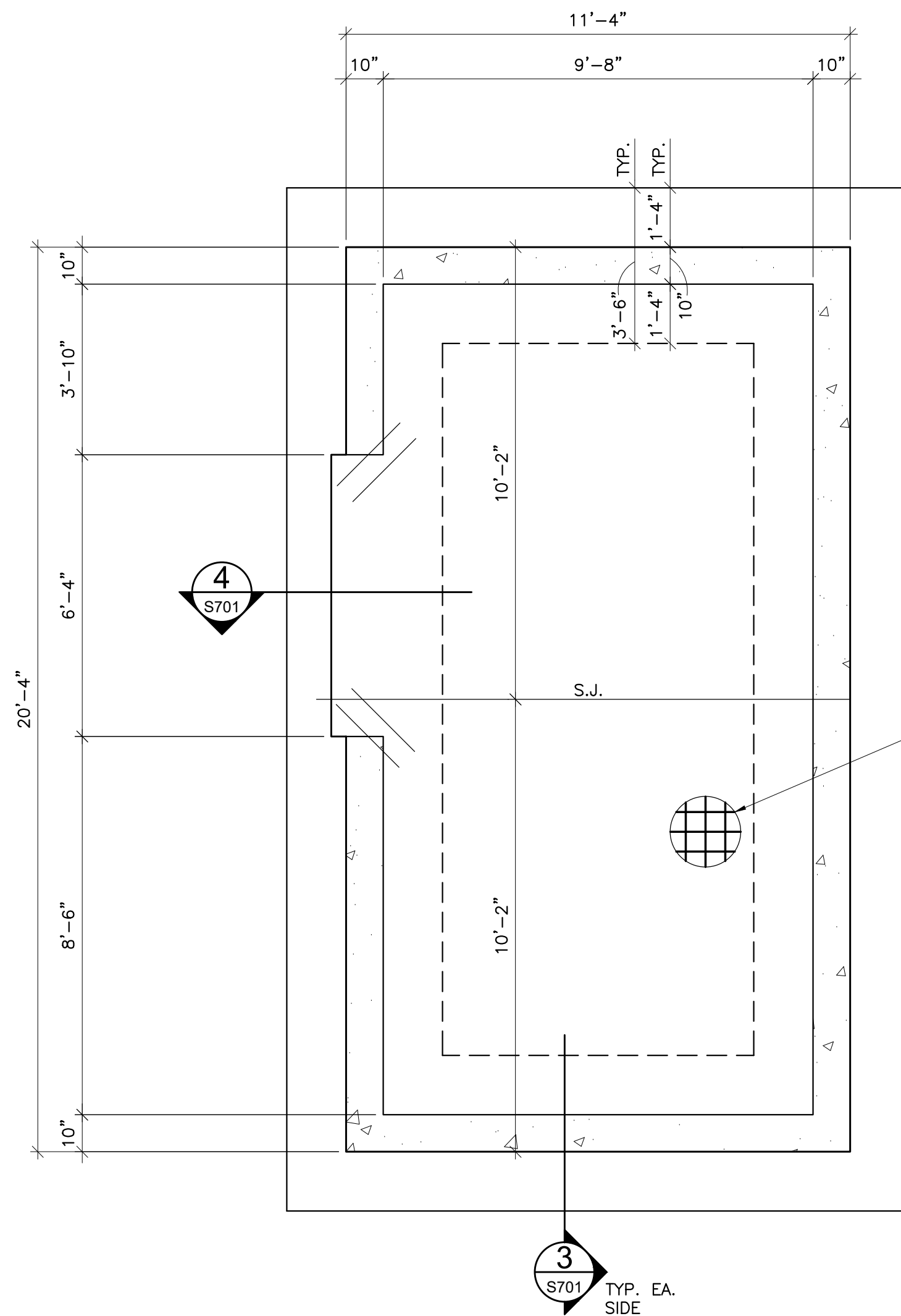
4 SECTION
S501 SCALE: 3/4"=1'-0"



7 SECTION
S701 SCALE: 1"=1'-0"

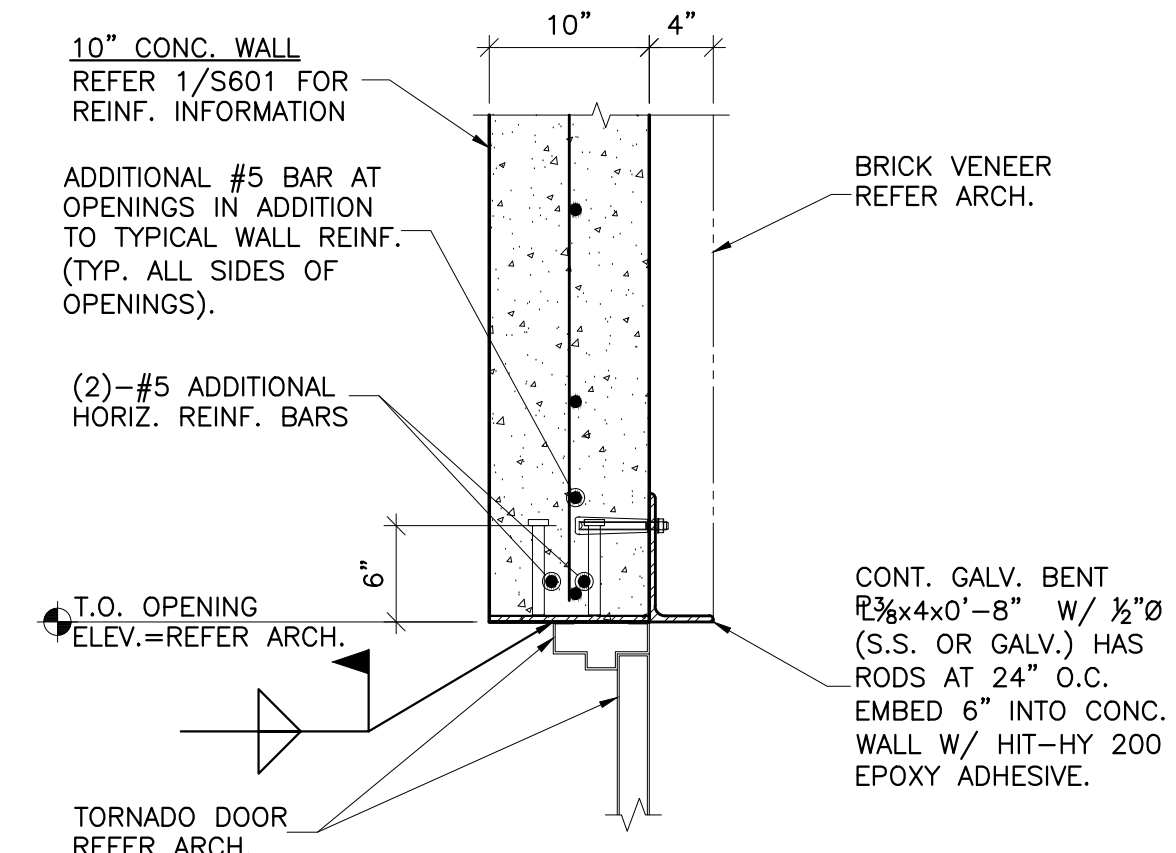


2 GENERATOR FRAMING PLAN
S701 SCALE: 3/8"=1'-0"



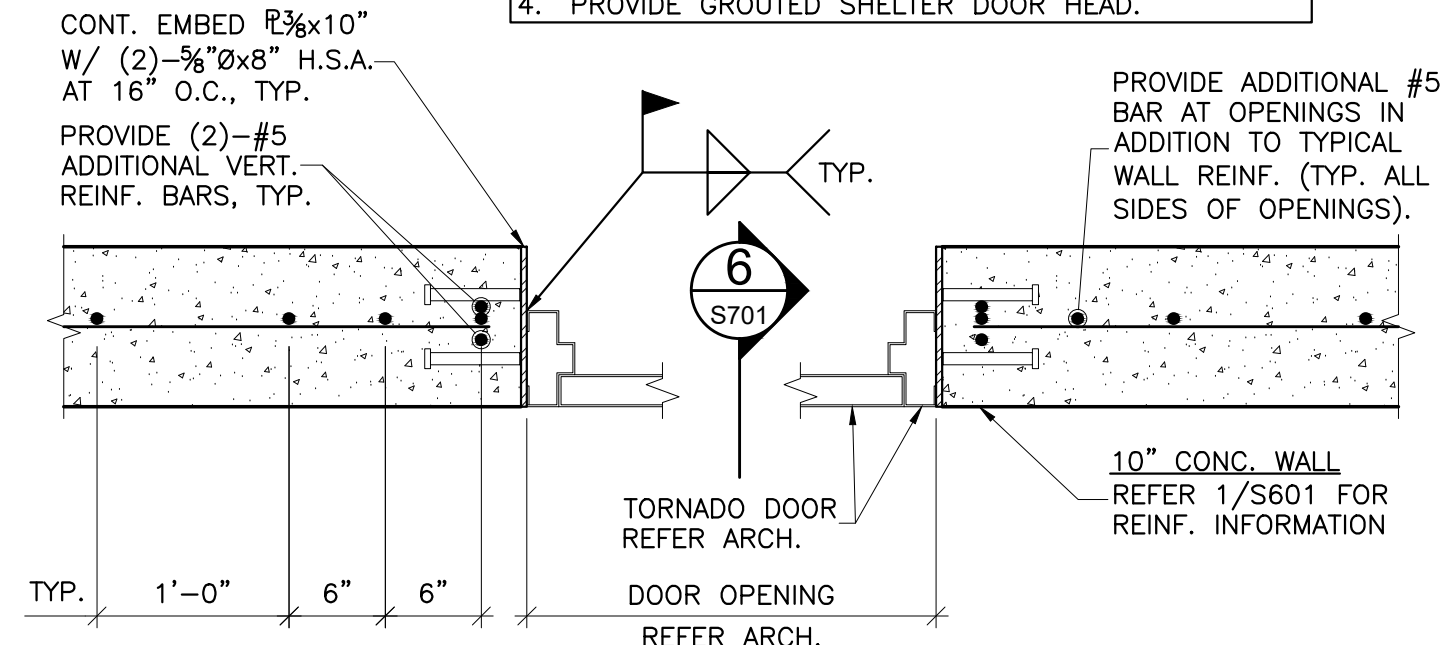
1 GENERATOR FOUNDATION PLAN
S701 SCALE: 3/8"=1'-0"

- NOTES:**
- DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.
 - COORDINATE ATTACHMENT OF DOOR FRAME TO EMBED \bar{r} W/ DOOR MANUFACTURER
 - COORDINATE FINAL CONSTRUCTION TOLERANCES AND DIMENSIONS WITH MANUFACTURER. IT IS ANTICIPATED MAXIMUM SHIM SPACE AT DOOR HEAD IS 1/4".
 - PROVIDE GROUTED SHELTER DOOR HEAD.



6 DOOR HEAD
S701 SCALE: 1"=1'-0"

- NOTES:**
- COORDINATE ATTACHMENT OF DOOR FRAME TO EMBED \bar{r} W/ DOOR MANUFACTURER.
 - COORDINATE FINAL CONSTRUCTION TOLERANCES AND DIMENSIONS WITH MANUFACTURER. IT IS ANTICIPATED MAXIMUM SHIM SPACE AT DOOR HEAD IS 1/4" FOR SINGLE JAMB AND 3/8" TOTAL FOR BOTH JAMBS.
 - CONTRACTOR SHALL COORDINATE FINAL DOOR ROUGH OPENING DIMENSIONS WITH FLOOR MANUFACTURER.
 - PROVIDE GROUTED SHELTER DOOR HEAD.



5 ENLARGED PLAN AT DOOR
S701 SCALE: 1"=1'-0"



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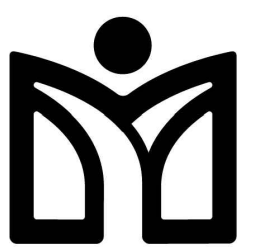
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GENERAL PLUMBING NOTES

- THESE DRAWINGS SHALL NOT BE SCALED. SEE ARCHITECTURAL/CIVIL DRAWINGS FOR DIMENSIONAL INFORMATION. THIS ENGINEER WILL NOT BE LIABLE FOR MISCALCULATED PRODUCT TAKE-OFFS DUE TO SCALING OF DRAWINGS.
- ALL SANITARY PIPING SHALL HAVE A 1/8" PER FOOT SLOPE UNLESS OTHERWISE NOTED. 2" SANITARY OR SMALLER SHALL HAVE A 1/4" PER FOOT SLOPE.
- VALVES AND FITTINGS SHALL BE OF SAME SIZE AS THE LINE ON WHICH THEY ARE LOCATED, UNLESS OTHERWISE INDICATED ON DRAWINGS.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES.
- CONTRACTOR SHALL FIELD VERIFY ALL GIVEN MEASUREMENTS PRIOR TO LAYING AND CONNECTING ALL SANITARY AND WASTE PIPING AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING FIRE RATING AND WEATHERPROOFING INTEGRITY OF ALL PIPING AND PENETRATIONS.
- ALL WATER SUPPLY AND SANITARY LINES SHALL BE RUN AS CLOSE TO PLANS AS POSSIBLE WITH NO CHANGES IN SIZING.
- CHANGES IN THE DIRECTION OF SANITARY DRAIN PIPING SHALL NOT BE MADE WITH FITTINGS WHICH WILL CAUSE EXCESSIVE REDUCTION IN THE VELOCITY OF FLOW OR CREATE ANY OTHER ADVERSE EFFECT UNLESS PHYSICALLY IMPOSSIBLE (I.E.: USE OF SANITARY TEE IN A HORIZONTAL CONNECTION, USE OF A DOUBLE SANITARY TEE IN A VERTICAL STACK, IN GENERAL, USE OF SHORT-RADIUS FITTINGS FOR BRANCH TO HOUSE DRAIN OR STACK CONNECTION).
- CONTRACTOR SHALL GIVE 48 HOURS HOUR EMERGENCY LOCATE NOTICE TO APPLICABLE UTILITY COMPANY PRIOR TO PERFORMING WORK INVOLVING UTILITIES.
- ALL DRAINAGE PIPING SHALL BE MARKED WITH THE SEAL OF APPROVAL OF THE NATIONAL SANITATION FOUNDATION.
- ROUTE ALL PIPING CONCEALED ABOVE CEILINGS, WITHIN WALLS, OR IN CHASES. PIPING EXPOSED SHALL BE SLOPED AND PAINTED TO MATCH ARCHITECTURAL FINISHES. PIPING IN MECHANICAL ROOMS MAY BE EXPOSED.
- CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF SEWERS TO WHICH NEW SEWER LINES ARE TO BE CONNECTED BEFORE INSTALLATION OF NEW SEWER LINE.
- ALL VENTS THROUGH ROOF SHALL BE MIN. 10'-0" FROM ANY AIR INTAKES.
- CONTRACTOR SHALL INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALS.
- CONTRACTOR SHALL ROUGH-IN ALL WASTES AND SUPPLIES TO SPECIAL EQUIPMENT ACCORDING TO MANUFACTURER'S SHOP DRAWINGS AND MAKE FINAL CONNECTIONS. ALL SUPPLIES SHALL BE VALVED. INSTALL VACUUM BREAKERS WHERE REQUIRED BY CODE.
- DO NOT PENETRATE WALL FOOTINGS WITH PIPING, COORDINATE WITH GENERAL CONTRACTOR TO DROP FOOTINGS AS REQUIRED TO CLEAR PLUMBING SERVICES WHERE ABSOLUTELY NECESSARY. ALL PIPING PENETRATING A BEARING WALL OR FOOTING MUST BE SLEEVED AND LOCATION APPROVED BY STRUCTURAL ENGINEER. PROVIDE LINK-SEALS IN ALL PENETRATIONS OF EXTERIOR WALLS.
- ALL PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE IN PROVIDED CEILING SPACE.
- COORDINATE PIPING INSTALLATION AS TO NOT INTERFERE WITH HVAC EQUIPMENT ACCESS.
- ANY ERRORS OR AMBIGUITIES IN THE PLANS AND/OR SPECIFICATIONS THAT ARE DISCOVERED BY THE CONTRACTOR SHALL BE REPORTED TO THE ARCHITECT/ENGINEER BEFORE WORK IS STARTED. OMISSION OF PARTICULAR REFERENCE TO ANY ITEM NECESSARY FOR COMPLETE INSTALLATION AND PROPER OPERATION THEREOF SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF FURNISHING THE SAME AT NO EXTRA COST. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL CONSTRUCTION DOCUMENTS FOR INFORMATION PRIOR TO BID.
- VERIFY WITH ARCHITECT ON ALL EQUIPMENT AND FIXTURES REQUIRING PLUMBING PRIOR TO BID. COORDINATE EXACT LOCATIONS AND CONNECTIONS.
- ALL WORK SHALL BE IN COMPLIANCE WITH STATE AND LOCAL CODES.
- CONTRACTOR SHALL PAY ALL FEES, PERMITS, LICENSES, ETC. NECESSARY FOR PROPER COMPLETION OF WORK.
- INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

PLUMBING PIPING LINETYPES

LINETYPE	DESCRIPTION
----	DEMOLITION
-----G-----	GAS
=====	SANITARY ABOVE GRADE
-----	SANITARY BELOW GRADE
=====	STORM ABOVE GRADE
-----	STORM BELOW GRADE
-----	VENT ABOVE GRADE
-----	VENT BELOW GRADE
-----	COLD WATER
-----	COLD WATER BELOW GRADE
-----	HOT WATER
-----	HOT WATER BELOW GRADE
-----	RECIRC WATER
-----	RECIRC WATER BELOW GRADE

PLUMBING PIPING LEGEND

	CIRCUIT SETTER
	BALL VALVE OR SHUT-OFF VALVE
	SPRING CHECK VALVE
	END CAP
	NEW TO EXISTING PIPE CONNECTION
	FLOW DIRECTION ARROW
	NEW TO EXISTING POINT OF CONNECTION SYMBOL
	PIPE CONNECTION
	HAMMER ARRESTOR (PISTON TYPE)
	HAMMER ARRESTOR (BELLOWS TYPE)
	PIPING LINEWEIGHT: NEW/DEMOLITION
	PIPING LINEWEIGHT: EXISTING

PLUMBING ABBREVIATIONS

AG	ABOVE GRADE	MAU	MAKE-UP AIR UNIT
ADD	ADDENDUM	MC	MECHANICAL CONTRACTOR
ADDL	ADDITIONAL	MECH	MECHANICAL
ADJ	ADJUSTABLE	MIN	MINIMUM
AFF	ABOVE FINISH FLOOR	NG	NATURAL GAS
AFG	ABOVE FINISH GRADE	NTS	NOT TO SCALE
ALT	ALTERNATE	NPCW	NON POTABLE COLD WATER
BG	BELOW GRADE	ORD	OVERFLOW ROOF DRAIN
CO	CLEANOUT	OS	OPEN SITE
COL	COLUMN	OSD	OVERFLOW STORM DRAIN
CW	COLD WATER	PC	PLUMBING CONTRACTOR
DN	DOWN	PLBG	PLUMBING
DS	DOWNSPOUT	PRES	PRESSURE
EC	ELECTRICAL CONTRACTOR	QTY	QUANTITY
ECO	EXTERIOR CLEANOUT	RD	ROOF DRAIN
EQ	EQUAL	RTU	ROOFTOP UNIT
FCD	FLOOR CLEANOUT	SAN	SANITARY
FD	FLOOR DRAIN	SCH	SCHEDULE
FLR	FLOOR	SD	STORM DRAIN
FS	FLOOR SINK	SPEC	SPECIFICATIONS
FT	FOOT (FEET)	SS	STAINLESS STEEL
F	FURNACE	TEMP	TEMPERATURE
GAL	GALLON	TYP	TYPICAL
GC	GENERAL CONTRACTOR	UR	URINAL
GPM	GALLONS PER MINUTE	V	VENT
GI	GREASE INTERCEPTOR	VTR	VENT THRU ROOF
GW	GREASE WASTE	W/	WITH
HW	HOT WATER	WCO	WALL CLEANOUT
HWR	HOT WATER RETURN	WC	WATER CLOSET
KEC	KITCHEN EQUIPMENT CONSULTANT		

PLUMBING SHEET INDEX

P000	PLUMBING TITLE SHEET
P001	PLUMBING SITE PLAN
P101	PLUMBING PLAN - BELOW GRADE
P110	PLUMBING PLAN - ABOVE GRADE
P201	PLUMBING ROOF PLAN
P301	PLUMBING ISOMETRICS - WASTE & VENT
P302	PLUMBING ISOMETRICS - WATER SUPPLY
P501	PLUMBING DETAILS
P502	PLUMBING DETAILS
P601	PLUMBING SCHEDULES



2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

- GENERAL NOTES**
1. COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
 2. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
 3. PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
 4. COORDINATE ALL BELOW GRADE NATURAL GAS PIPE ROUTING WITH EXISTING SITE CONDITIONS.

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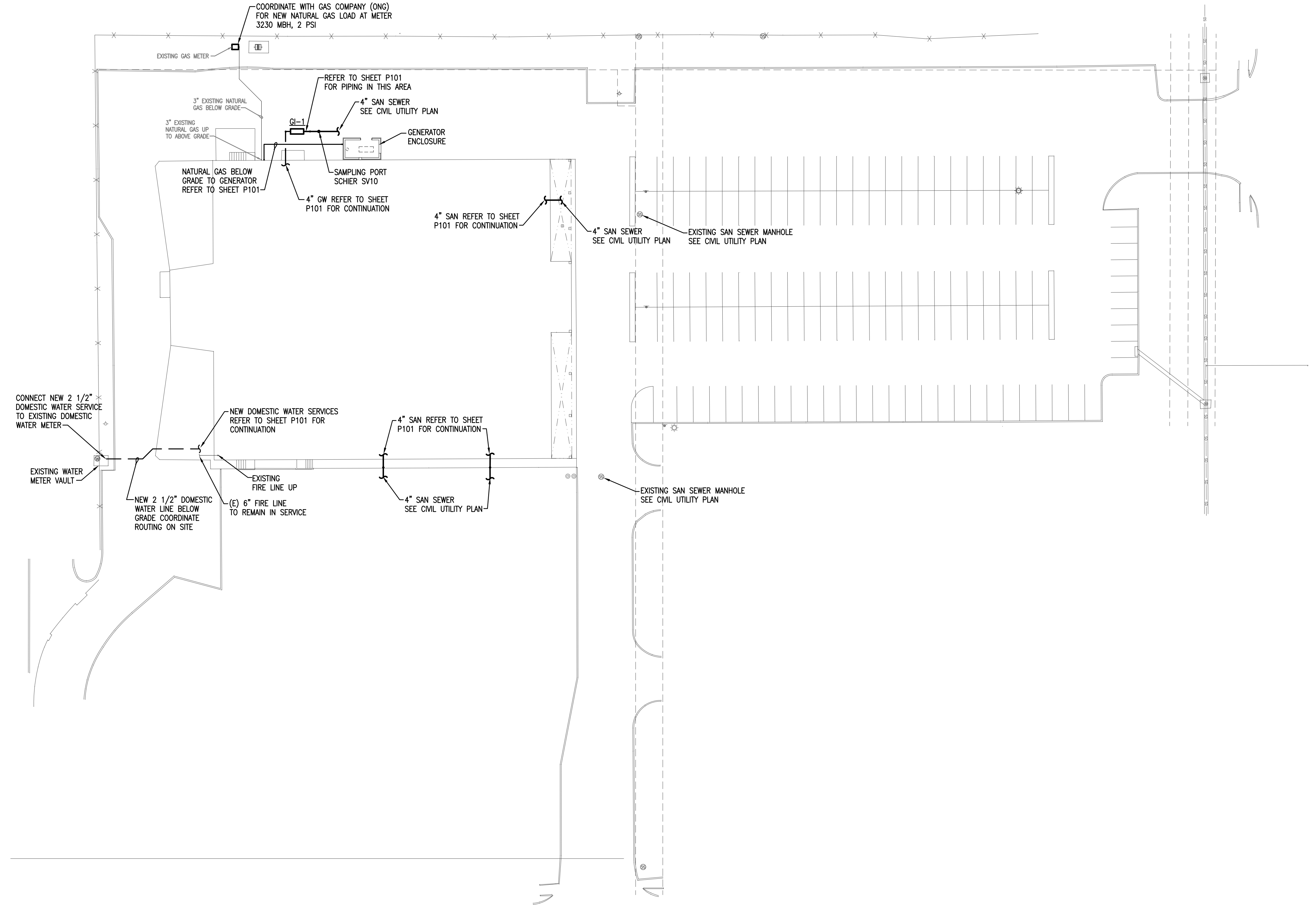
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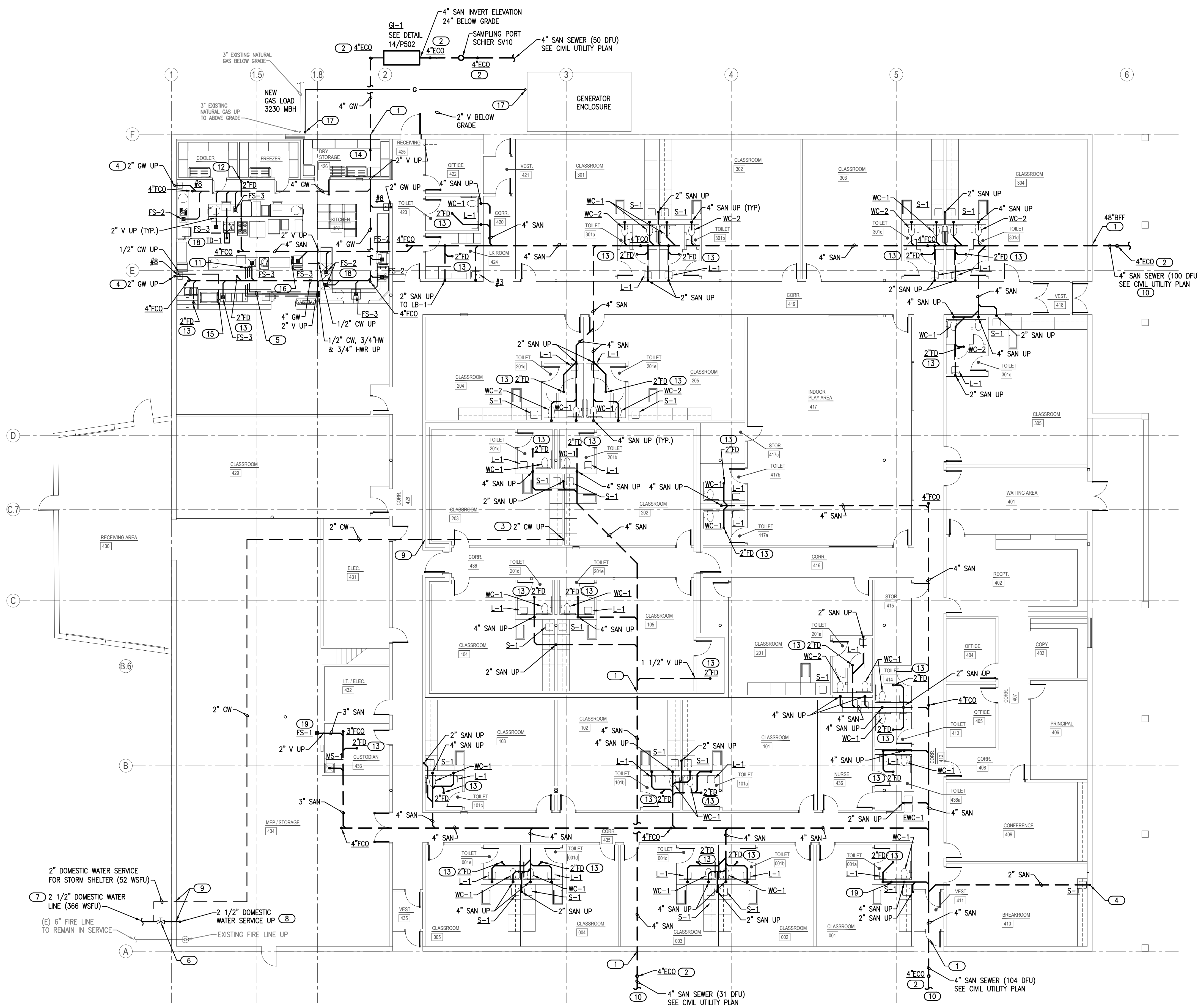
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1 PLUMBING SITE PLAN
SCALE: 1/32" = 1'-0"





- ### GENERAL NOTES
- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
 - COORDINATE ALL BELOW GRADE PIPE ROUTING WITH STRUCTURAL FOUNDATIONS AND REQUIRED PIPE SLEEVES THRU FOUNDATION PENETRATIONS.
 - FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
 - PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
 - REFER TO PLUMBING FIXTURE SCHEDULE ON SHEET P601 FOR FIXTURE ROUGH-IN PIPE SIZES. REFER TO ISOMETRIC SHEETS P301 AND P302 FOR ADDITIONAL PIPE SIZES.
 - PIPE TRENCHES SHALL HAVE SAND BEDDING TO A MINIMUM POINT 6" ABOVE THE TOP OF PIPE. REFER TO SPECIFICATIONS.
 - TRAP PRIMER LINES SHALL BE COPPER TYPE "K" OR PEX-g TUBING WITH CONTINUOUS SLOPE TOWARDS DRAIN CONNECTION.
 - COORDINATE WITH GENERAL CONTRACTOR FOR ALL REQUIRED FLOOR CUTTING AND PATCHING TO INSTALL NEW BELOW GRADE/FLOOR PIPING.
 - INSTALL TRAP PRIMER LINES TO ALL FLOOR DRAINS AND FLOOR SINKS. SEE DETAIL 1/P501.

- ### KEYED NOTES
- PROVIDE CAST IRON PIPE SLEEVE FOR SANITARY OR GREASE WASTE PIPE BELOW OR THRU FOUNDATION WALL OR GRADE BEAM. INSTALL FOAM SPACER BLOCKS TO MAINTAIN PIPE IN CENTER OF SLEEVE. COORDINATE PIPE SLEEVE INSTALLATION WITH STRUCTURAL.
 - INSTALL 4" EXTERIOR CLEANOUT IN CONCRETE PAD AT GRADE. COORDINATE INVERT ELEVATION WITH CIVIL. SEE DETAIL 4/P501.
 - INSTALL PVC PIPE SLEEVE THRU CONCRETE FLOOR AND STUB UP 2" AFF FOR WATER LINE. INSTALL FOAM PIPE INSULATION ON WATER LINE IN SLEEVE. SEAL SLEEVE OPENINGS WATERTIGHT.
 - ROUTE 2" SANITARY OR GREASE WASTE UP INTO FUR OUT OF EXISTING CMU WALL. COORDINATE PIPE ROUTING WITH EXISTING WALL FOOTING.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR (PEX-g TUBING) BELOW FLOOR TO COOK'S TABLE PREP SINK.
 - INSTALL DOMESTIC WATER CURB STOP IN NEW WATER SERVICE WITH ACCESS COVER AT GRADE.
 - REMOVE EXISTING BELOW GRADE 1 1/2" DOMESTIC WATER SERVICE PIPE FROM BUILDING OUT TO WATER METER CONNECTION. REPLACE WITH 2 1/2" PIPE. COORDINATE WORK WITH SITE CONTRACTOR AND CITY WATER UTILITY DEPARTMENT. SEE SHEET P001 FOR CONTINUATION.
 - REMOVE EXISTING 1 1/2" DOMESTIC WATER SERVICE PIPE AND REPLACE WITH 2 1/2" PIPE. INSTALL PIPE IN PVC PIPE SLEEVE THRU CONCRETE FLOOR. INSULATE PIPE IN SLEEVE WITH CELLULAR FOAM INSULATION.
 - COORDINATE WITH STRUCTURAL FOR ROUTING WATER LINE IN PIPE SLEEVE THRU FOOTING OR FOUNDATION WALL IN THIS AREA.
 - COORDINATE 4" SANITARY SEWER CONNECTION TO EXISTING SEWER MANHOLE WITH SITE CONTRACTOR.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR (PEX-g TUBING) FROM BELOW FLOOR UP TO SERVE COOK'S TABLE PREP SINK. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINES WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
 - INSTALL FUNNEL FASTENED TO STRAINER FOR CONDENSATE DRAIN LINES FROM FREEZER AND COOLER. MINIMUM FUNNEL HEIGHT 3" AND TOP DIAMETER 4". PROVIDE TRAP PRIMER LINE TO FLOOR DRAIN.
 - INSTALL TRAP PRIMER LINE TO FLOOR DRAIN. SEE DETAIL 1/P501.
 - 4" GREASE WASTE DOWN AND THRU EXISTING WALL FOOTING. COORDINATE ROUTING WITH STRUCTURAL.
 - ROUTE 1/2" CW (PEX-g TUBING) FROM BELOW FLOOR UP SERVING COUNTER COLD WELL. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINES WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
 - ROUTE 1/2" CW (PEX-g TUBING) FROM BELOW FLOOR UP TO SERVE ICEMAKER. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINES WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
 - INSTALL 1" NATURAL GAS (2 PSI) ANODELESS GAS RISER FOR TRANSITION FROM BELOW GRADE MDPE TUBING TO ABOVE GRADE BLACK IRON PIPE. COORDINATE LOCATION ON SITE.
 - PROVIDE TRAP PRIMER LINE TO FLOOR SINK OR TRENCH DRAIN. ROUTE LINE BELOW OR ABOVE FLOOR AS REQUIRED FOR LOCATION.
 - ROUTE 3" SANITARY UP TO OPEN SITE DRAIN IN CHASE FOR CONDENSATE DRAIN LINES.

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CHILD CARE FACILITY
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sheet no:

P101

1 PLUMBING PLAN - BELOW GRADE
SCALE: 3/32" = 1'-0"

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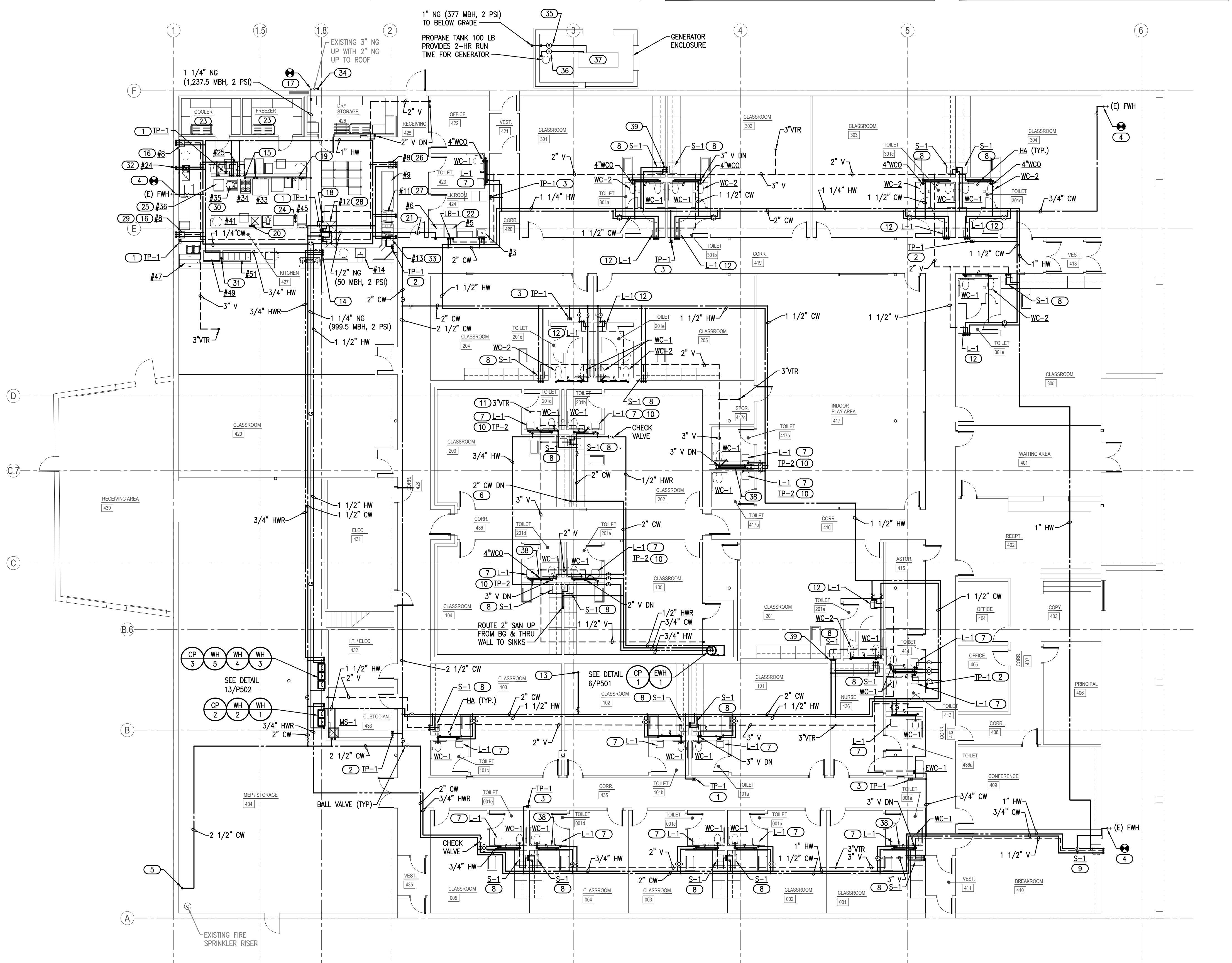
- KEYED NOTES**
- 36 INSTALL 100 POUND PROPANE TANK WITH SUPPORT STRAP FASTENED TO WALL. INSTALL 2-STAGE PRESSURE REGULATOR WITH VENT PIPED TO ROOF WITH GOOSENECK. ROUTE 1" PROPANE GAS LINE TO GENERATOR. (355 MBH, 10" W.C. PRESSURE). COORDINATE CONNECTION WITH GENERATOR SUPPLIER ON SITE.
 - 37 DUAL FUEL GENERATOR WITH AUTOMATIC SWITCH OVER TO PROPANE WHEN UNIT SENSES LOSS OF NATURAL GAS PRESSURE IN FUEL INLET 1.
 - 38 INSTALL 2" OPEN SITE DRAIN IN CHASE FOR CONDENSATE DRAIN LINES FROM RTU'S. CONNECT TO SANITARY SERVING LAVATORY. COORDINATE ROUTING WITH MC. COORDINATE WALL ACCESS PANEL WITH GC.
 - 39 INSTALL 1 1/2" OPEN SITE DRAIN IN SINK CABINET FOR CONDENSATE DRAIN LINES FROM RTU'S. CONNECT TO SANITARY SERVING SINK. COORDINATE ROUTING WITH MC.

- KEYED NOTES**
- 32 ROUTE 1/2" CW AND 1/2" HW DOWN INTO FUR OUT OF EXISTING CMU WALL TO SERVE PREP SINK #24 PROVIDED BY KEC. COORDINATE PIPE ROUTING WITH GC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 33 3/4" CW AND 3/4" HW DROPS IN WALL TO SERVE FAUCET AND HOSE REEL PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 34 CONNECT NEW 1" NATURAL GAS LINE (2 PSI) WITH LOCKABLE SHUT-OFF VALVE TO EXISTING 3" NATURAL GAS RISER AND ROUTE DOWN TO BELOW GRADE TO SERVE GENERATOR.
 - 35 INSTALL 1" NATURAL GAS (2 PSI) BALL VALVE, DRIP LEG, PRESSURE REGULATOR, UNION AND FINAL 1" CONNECTION (10" W.C. PRESSURE) TO GENERATOR. COORDINATE CONNECTION WITH GENERATOR SUPPLIER ON SITE.

- KEYED NOTES**
- 28 3/4" CW AND 3/4" HW DROPS IN WALL TO SERVE 2 FAUCETS AT #12 3-COMP SINK PROVIDED BY KEC. ROUTE DRAIN LINES TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. SEE DETAIL 15/P502.
 - 29 ROUTE 1/2" CW FROM HAND SINK DOWN WITH TRANSITION TO PEX TUBING TO BELOW FLOOR TO SERVE COLD WELL AT SERVING COUNTER.
 - 30 1/2" CW AND 1/2" HW DOWN IN WALL TO SERVE KETTLE #35 PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 31 CONNECT 1/2" CW TO FAUCET AT SERVING COUNTER COLD WELL. ROUTE 1/2" CW LINE DOWN WITH TRANSITION TO PEX TUBING TO BELOW FLOOR TO PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.

- KEYED NOTES**
- 24 ROUTE 3/4" CW UP FROM BELOW FLOOR AND CONNECT TO ICE MAKER #45. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. ICE MAKER PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR SINK.
 - 25 INSTALL (2) 3/4" CW DROPS IN WALL TO SERVE CONVENTION STEAMER PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 26 ROUTE 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE HAND SINK PROVIDED BY KEC. PROVIDE THERMOSTATIC MIXING VALVE AND PIPE WRAP UNDER FIXTURE. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 27 1/2" CW AND 1/2" HW DROPS IN WALL TO SERVE DISHWASHER #11 PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. PROVIDE WATER ARRESTORS, TRYS AND VALVES ON WATER LINES IN ACCESSIBLE LOCATION. ROUTE DRAIN LINE TO FLOOR SINK.

- GENERAL NOTES**
- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
 - PROVIDE WATER HAMMER ARRESTORS (HA) ON WATER LINES TO FLUSH VALVES, AND QUICK CLOSING VALVES. LOCATE UNITS IN ACCESSIBLE LOCATIONS.
 - SINK AND LAVATORY WATER SUPPLY STUB OUTS SHALL BE COPPER PIPE WITH SUPPORT BRACKET FASTENED IN WALL CAVITY.
 - FIRE SEAL ALL PENETRATIONS THRU RATED STRUCTURES TO MAINTAIN FIRE RATING.
 - REFER TO PLUMBING FIXTURE SCHEDULE ON SHEET P601 FOR FIXTURE ROUGH-IN PIPE SIZES. REFER TO ISOMETRIC SHEETS P301 AND P302 FOR ADDITIONAL PIPE SIZES.
 - PROVIDE ACCESS PANELS FOR ALL VALVES/DEVICES ABOVE HARD CEILINGS AND BEHIND WALLS.
 - ALL GAS PIPE SHALL COMPLY WITH IFCC. BRANCH LINES SHALL TAP OFF TOP OF GAS MAINS AND INSTALL SHUT-OFF VALVE ON BRANCH LINE.
 - TRAP PRIMER LINES SHALL BE COPPER TYPE "K" OR PEX-a TUBING WITH CONTINUOUS SLOPE TOWARDS DRAIN CONNECTION.
 - FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



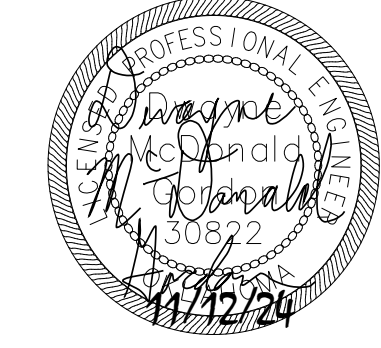
- KEYED NOTES**
- INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (4) 1/2" DISCHARGE LINES TO FLOOR DRAINS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (3) 1/2" DISCHARGE LINES TO FLOOR DRAINS OR FLOOR SINKS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (2) 1/2" DISCHARGE LINES TO FLOOR DRAINS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - FIELD VERIFY LOCATION OF EXISTING WALL HYDRANT AND CONNECT NEW 3/4" CW TO EXISTING PIPE SERVING WALL HYDRANT.
 - ROUTE INSULATED 2 1/2" CW PIPE DOWN WITH BALL VALVE AT 24" AFF. AND CONNECT TO NEW WATER SERVICE.
 - ROUTE 2" CW PIPE DOWN TO BELOW FLOOR. INSTALL ACCESS PANEL IN BACK OF CABINET FOR BALL VALVE. SEE SHEET P101 FOR CONTINUATION.
 - ROUTE 1/2" CW, 1/2" HW AND 1 1/2" VENT IN CHASE TO SERVE LAVATORY. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE SINK. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN INTO FUR OUT OF EXISTING CMU WALL TO SERVE SINK. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501. COORDINATE PIPE ROUTING WITH ARCHITECT AND GC.
 - INSTALL TRAP PRIMER (TP-2) UNDER LAVATORY. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SEE DETAIL 11/P501.
 - COORDINATE WITH STRUCTURAL FOR DEBRIS GUARD BELOW SHELTER ROOF FOR PLUMBING VENT ROOF PENETRATION.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE LAVATORY. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 3/4" CW UP TO ROOF HYDRANT. SEE SHEET P201 FOR CONTINUATION.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR DOWN IN WALL WITH PEX TUBING TO BELOW FLOOR TO SERVE ISLAND PREP SINK.
 - ROUTE 1" NG (LOW PRESS) BEHIND EQUIPMENT AND PROVIDE 3/4" GAS TO KITCHEN EQUIPMENT (33 & 34) PROVIDED BY KEC. PROVIDE SHUT-OFF VALVE AND FINAL UNIT CONNECTION. SEE DETAIL 9/P501.
 - ROUTE 1/2" CW, 1/2" HW AND 1/2" HWR INTO FUR OUT OF EXISTING CMU WALL TO SERVE HAND SINK PROVIDED BY KEC. PROVIDE THERMOSTATIC MIXING VALVE AND PIPE WRAP UNDER FIXTURE. COORDINATE PIPE ROUTING WITH GC.
 - CONNECT NEW 1 1/4" NATURAL GAS LINE (2 PSI) TO EXISTING 3" NATURAL GAS RISER AND ROUTE NEW LINE INTO BUILDING.
 - ROUTE 3/4" CW DOWN IN WALL WITH TRANSITION TO PEX TUBING TO BELOW FLOOR TO SERVE ICE MAKER PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - INSTALL 3/4" NATURAL GAS BALL VALVE AND PRESSURE REGULATOR (KITCHEN EQUIP). INSTALL GAS SOLENOID VALVE FURNISHED BY KITCHEN EQUIPMENT SUPPLIER AND COORDINATE POWER WITH EC TO INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION SYSTEM.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR UP FROM BELOW FLOOR, TRANSITION TO COPPER PIPE AND CONNECT TO COOK'S TABLE SINK PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - INSTALL 1/2" BALL VALVE AND PRESSURE REGULATOR IN NATURAL GAS LINE SUPPLYING DRYER #6. PROVIDE 1/2" LOW PRESSURE GAS DOWN IN WALL TO GAS VALVE BOX (GVB-1) AND FLEXIBLE CONNECTION TO UNIT.
 - CLOTHES WASHER FURNISHED BY OTHERS. ROUGH-IN AND MAKE FINAL CONNECTION. PROVIDE 1/2" CW AND HW LINES DOWN IN WALL TO LAUNDRY BOX. CONNECT FLEXIBLE SUPPLY LINES TO WASHER. ROUTE WASHER DRAIN LINE INTO WALL BOX DRAIN FITTING AND SECURE. COORDINATE WITH EQUIPMENT SUPPLIER.
 - COORDINATE WITH FREEZER / COOLER SUPPLIER FOR ROUTING CONDENSATE DRAIN LINES TO FLOOR DRAIN. INSTALL ELECTRIC HEAT TAPE AND PIPE INSULATION ON DRAIN LINES PER MFR'S GUIDELINES.

1 PLUMBING PLAN - ABOVE GRADE
SCALE: 3/32" = 1'-0"

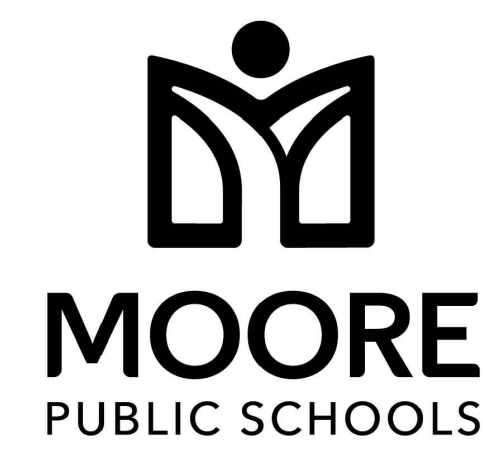
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KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL



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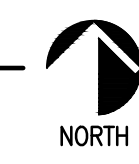
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201 N. EASTERN AVE.

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Salas O'Brien Project Number: 2450-70304-00

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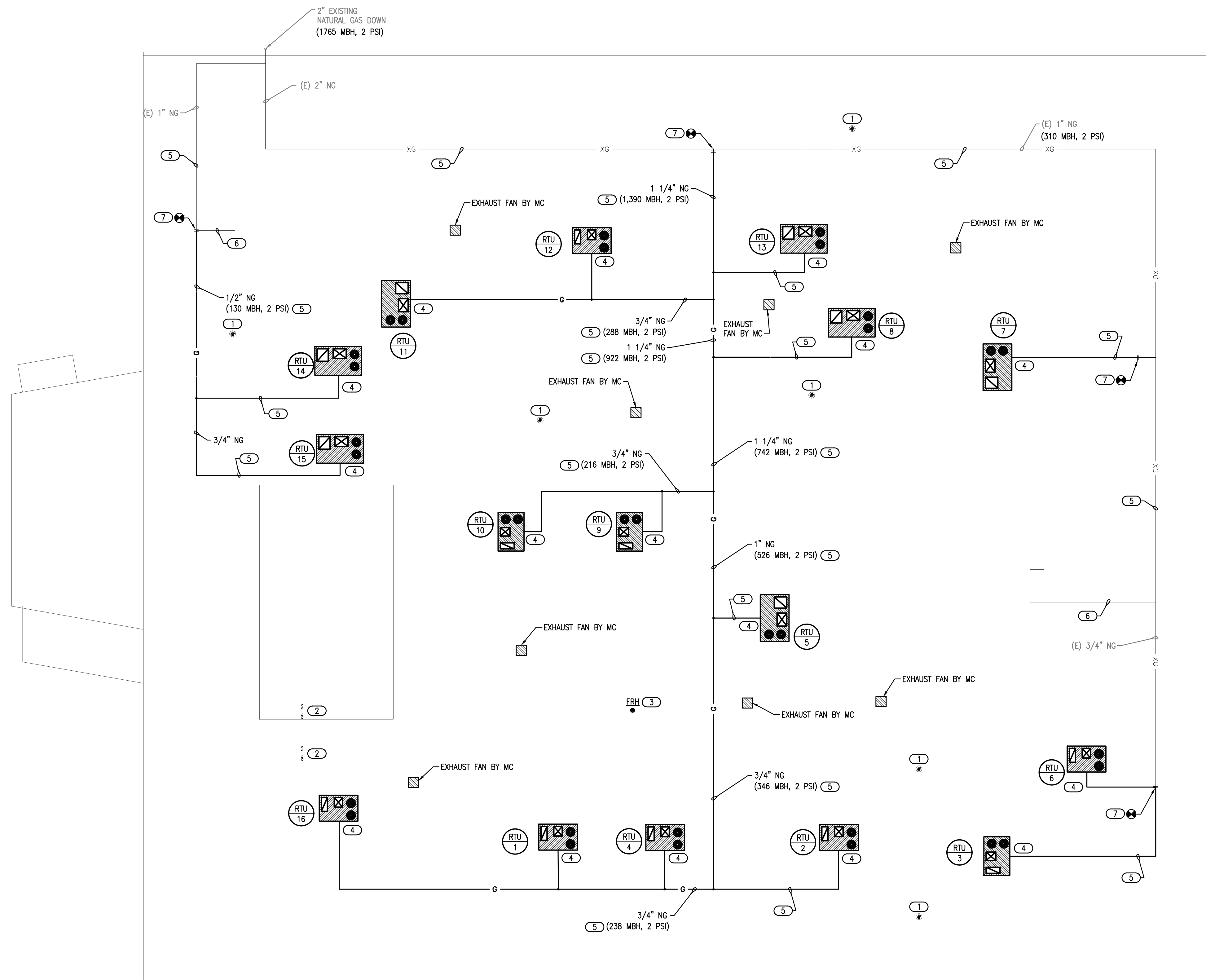


GENERAL NOTES

- COORDINATE WITH ALL OTHER TRADES ON SITE.
- FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
- MAINTAIN A MINIMUM OF 10'-0" CLEAR BETWEEN EXHAUST AND INTAKE VENTS WITH MECHANICAL EQUIPMENT AND OTHER ROOF OPENINGS.
- ALL ABOVE GRADE EXTERIOR NATURAL GAS PIPE SHALL BE CLEANED AND DEGREASED PRIOR TO BEING PRIMED THEN PAINTED YELLOW WITH WEATHER RESISTANT ZINC RICH PAINT.
- PIPE IDENTIFICATION SHALL BE THE WORDS "NATURAL GAS" IN BLACK LETTERS AT 5 FOOT INTERVALS USING PLASTIC PIPE MARKERS OR STENCILED PAINTED LETTERS.
- ALL GAS PIPE SHALL COMPLY WITH IFGC. BRANCH LINES SHALL TAP OFF TOP OF GAS MAINS AND INSTALL SHUT-OFF VALVE ON BRANCH LINE.

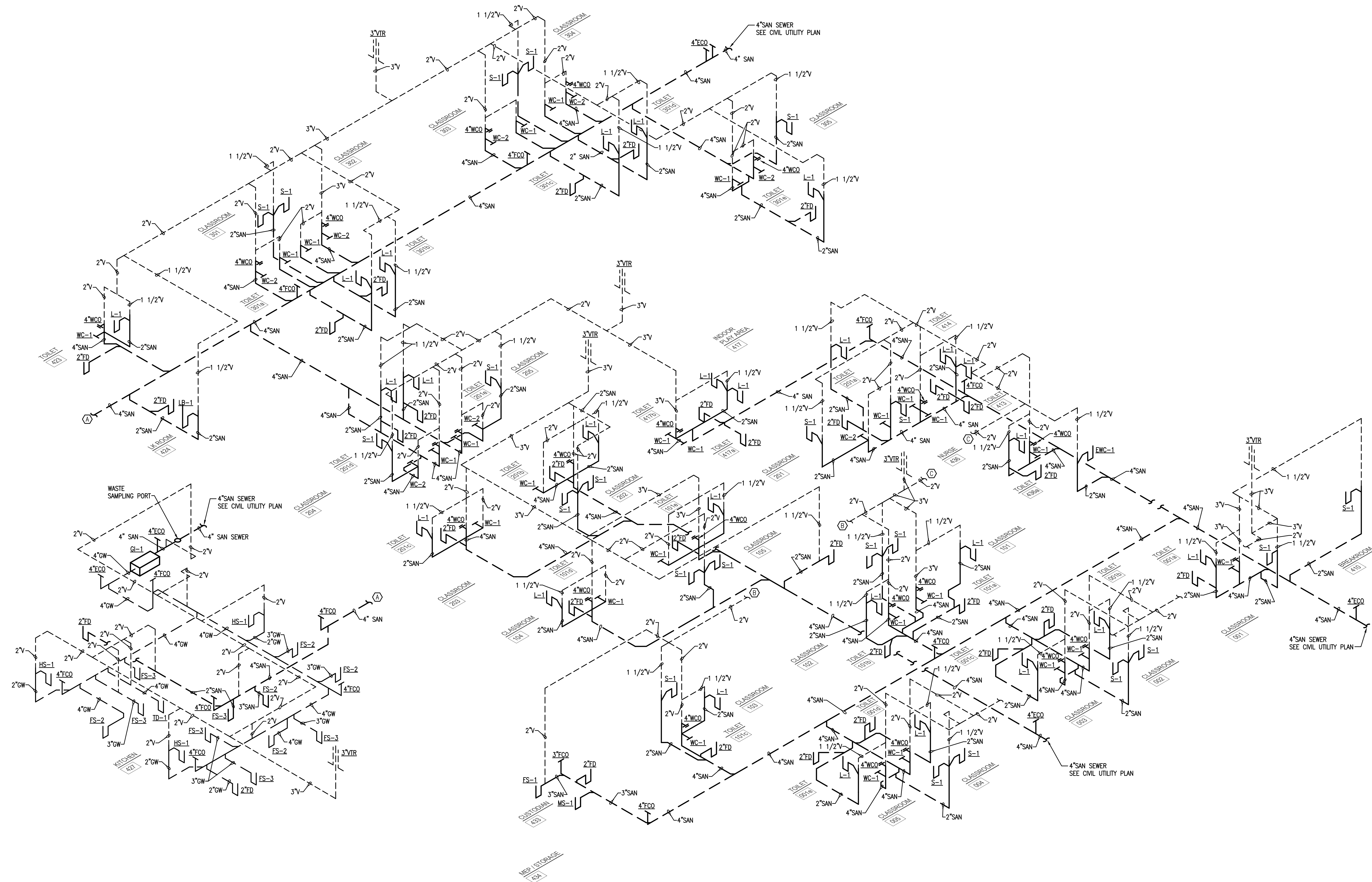
KEYED NOTES

- COORDINATE INSTALLATION OF PLUMBING VENTS WITH ROOFING CONTRACTOR. INSTALL VENT A MINIMUM 10'-0" FROM ANY OPENINGS, EQUIPMENT, INTAKES OR EXHAUST VENTS.
- COORDINATE INSTALLATION OF WATER HEATER CONCENTRIC VENT WITH ROOFING CONTRACTOR AND PER MANUFACTURER'S RECOMMENDATIONS. INSTALL VENT A MINIMUM OF 10'-0" FROM ANY OPENINGS, EQUIPMENT, INTAKES AND EXHAUST VENTS.
- COORDINATE INSTALLATION OF FREEZELESS ROOF HYDRANT (FRH) WITH STRUCTURAL AND ROOFING CONTRACTOR.
- INSTALL 1/2" NATURAL GAS LINE (2 PSI) TO ROOFTOP UNIT. PROVIDE SHUT-OFF VALVE, DRIP LEG, PRESSURE REGULATOR AND FINAL UNIT CONNECTION. ROUGH-IN AND COORDINATE FINAL CONNECTION WITH MECHANICAL CONTRACTOR. SEE DETAIL 8/P501.
- INSTALL ROOF PIPE SUPPORTS FOR NATURAL GAS PIPE (2 PSI). PROVIDE MIRO INDUSTRIES MODEL 3-RAH-8 ROOF TOP SUPPORTS OR APPROVED EQUAL. INSTALL AT MAXIMUM OF 10'-0" ON CENTER FOR 1 1/4" PIPE OR LARGER. INSTALL AT 8'-0" ON CENTER FOR 1" AND 3/4" PIPE. INSTALL AT 6'-0" ON CENTER FOR 1/2" PIPE. REFER TO GENERAL NOTES FOR PAINTING GAS PIPE. SEE DETAIL 10/P501.
- REMOVE GAS PIPING BACK TO MAIN AND CAP.
- INSTALL NEW GAS PIPE TO EXISTING GAS MAIN FOR NEW MECHANICAL EQUIPMENT. FIELD VERIFY SIZE AND LOCATION.





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1 PLUMBING ISOMETRIC - WASTE & VENT NO SCALE

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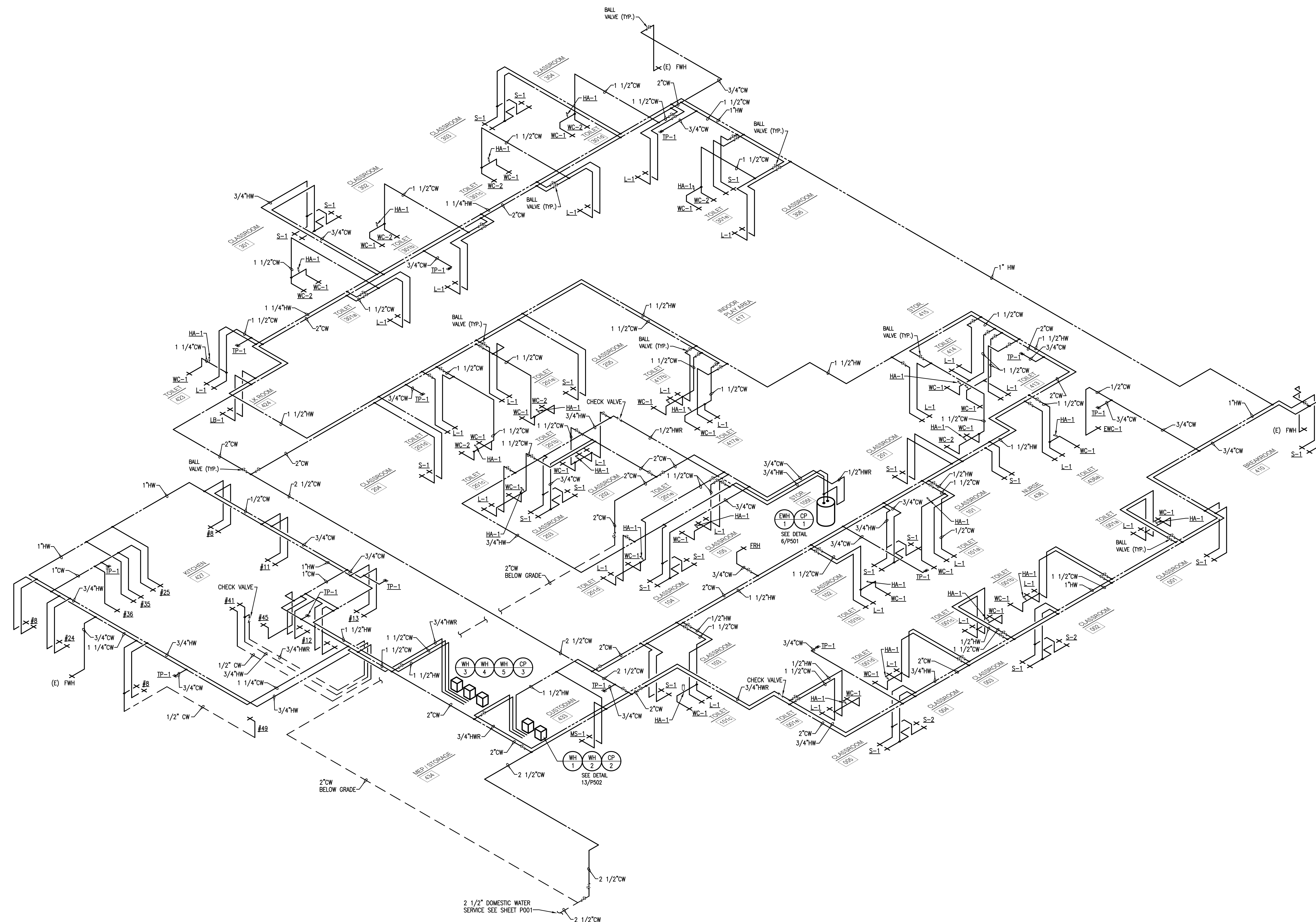


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1 PLUMBING ISOMETRIC - WATER SUPPLY

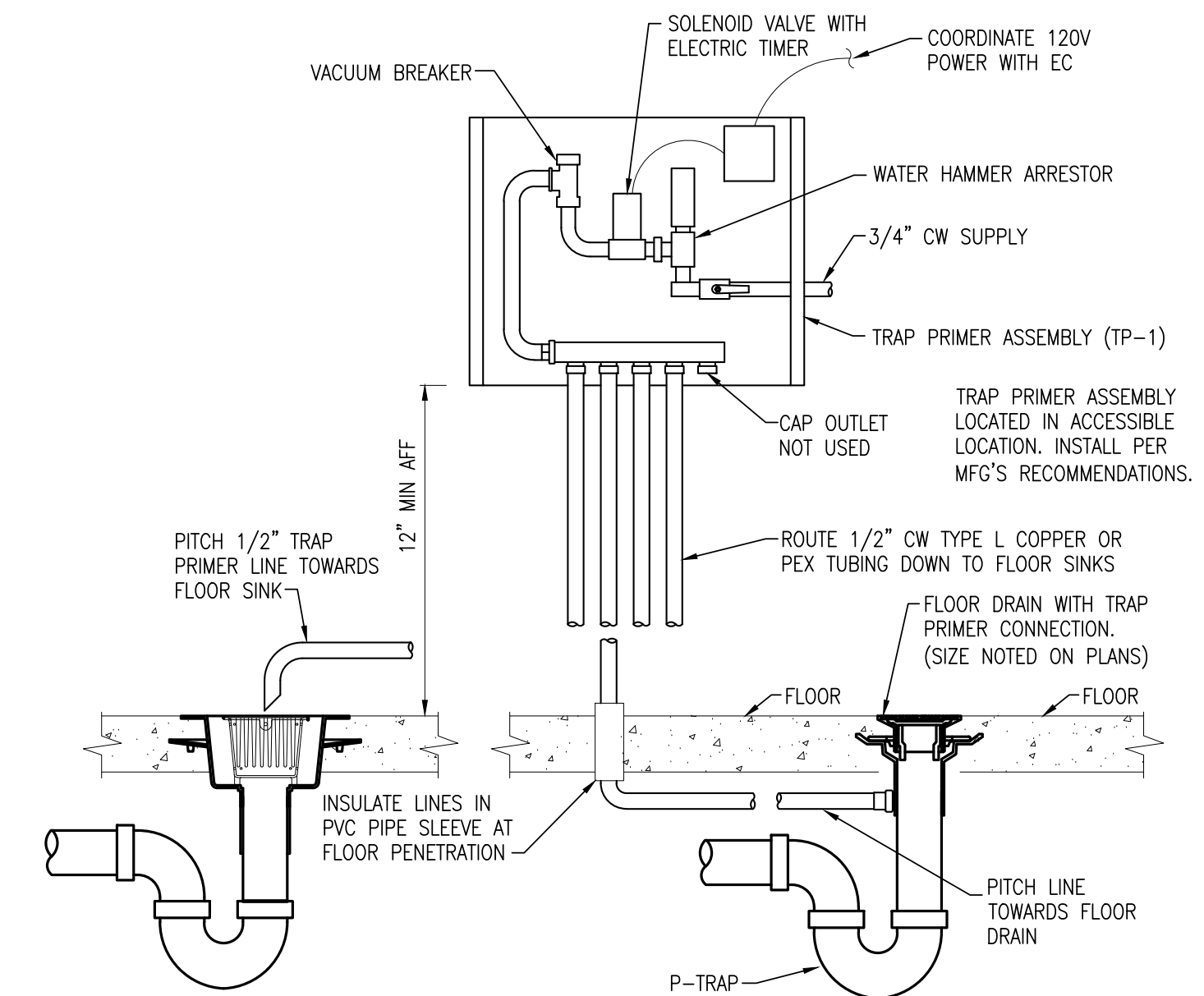
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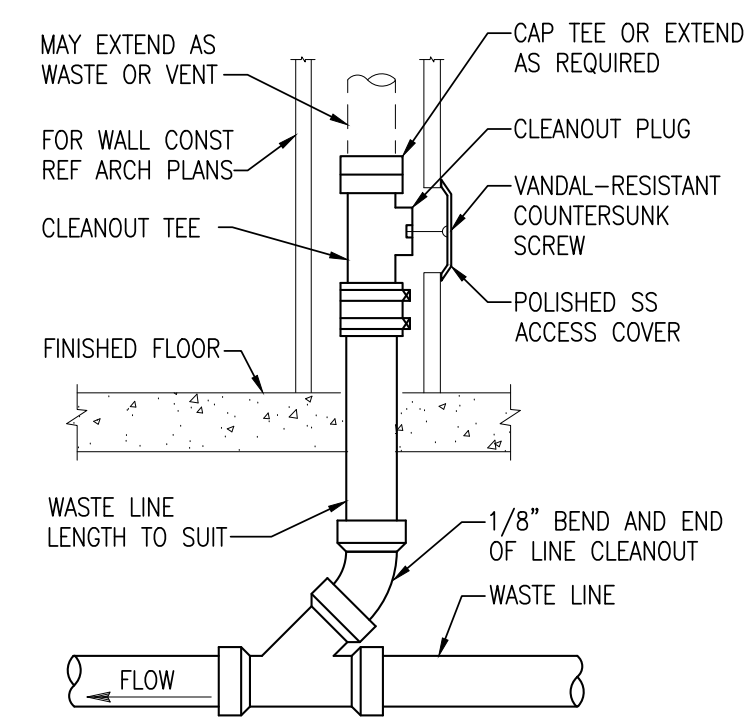
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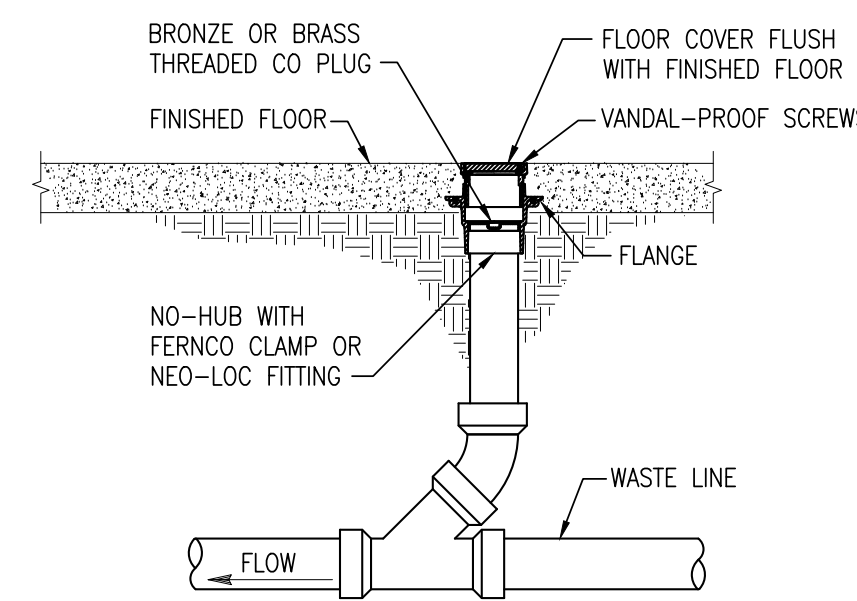
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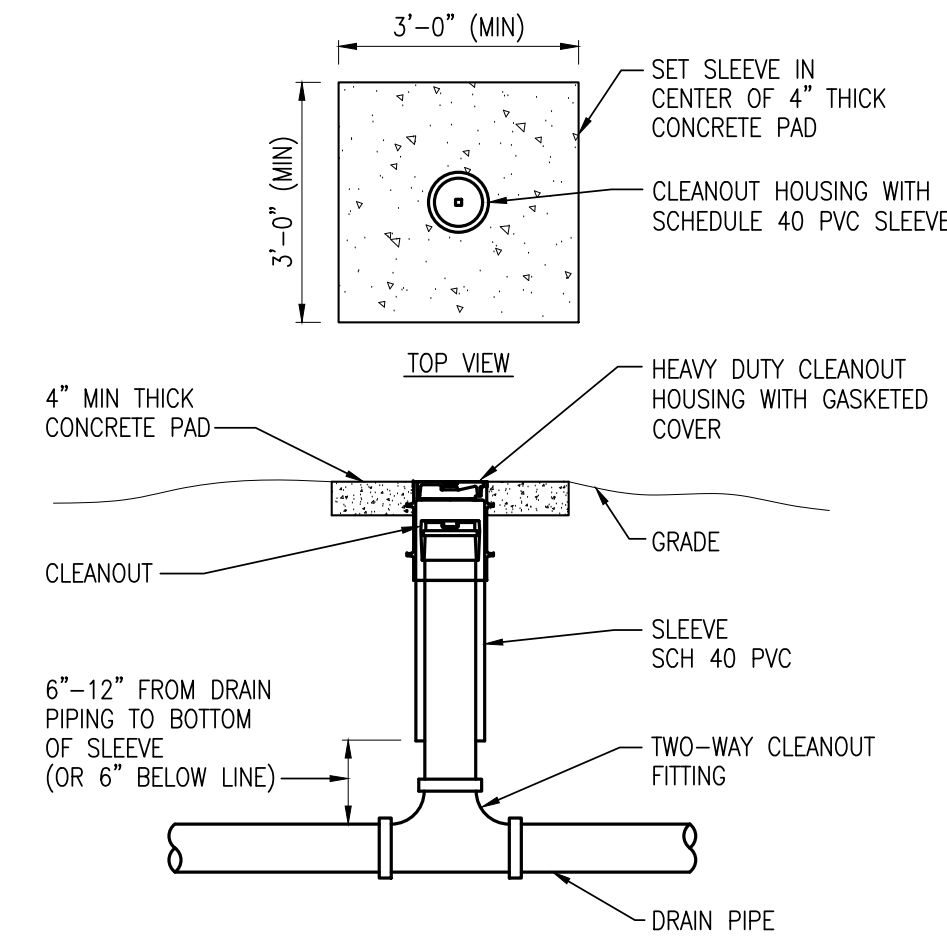
1 ELECTRONIC TRAP PRIMER MANIFOLD DETAIL
NOT TO SCALE



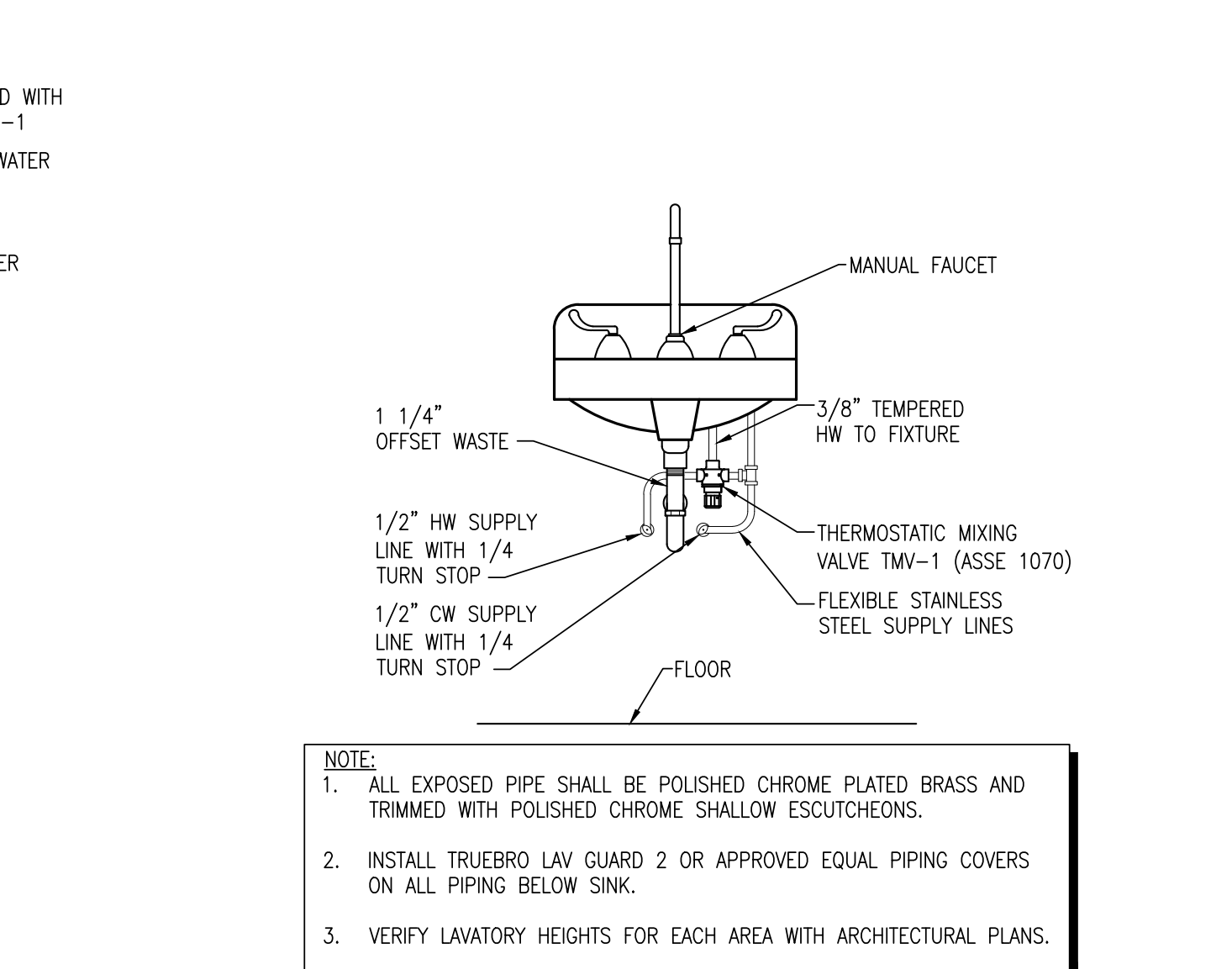
2 WALL CLEANOUT DETAIL
NOT TO SCALE



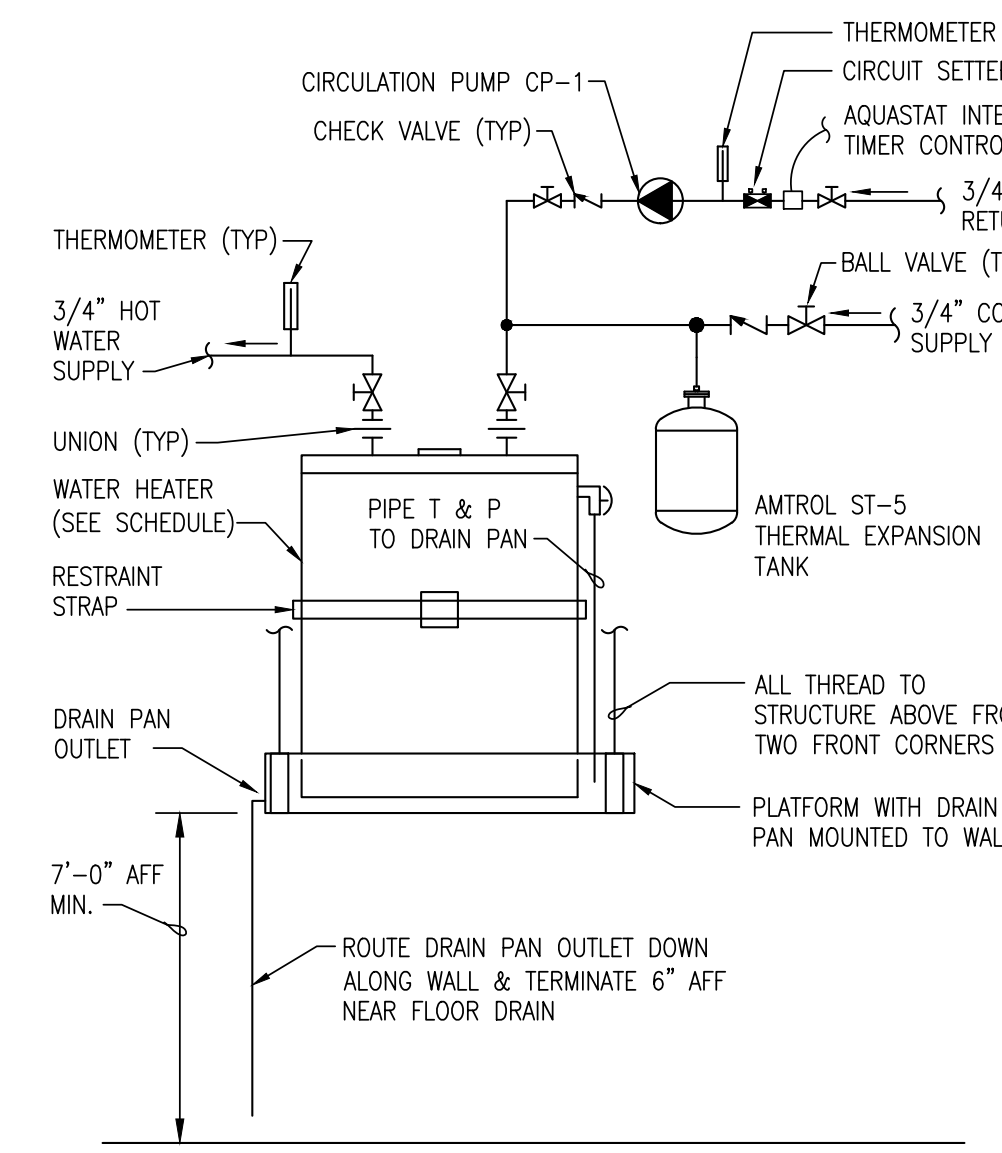
3 INTERIOR CLEANOUT DETAIL
NOT TO SCALE



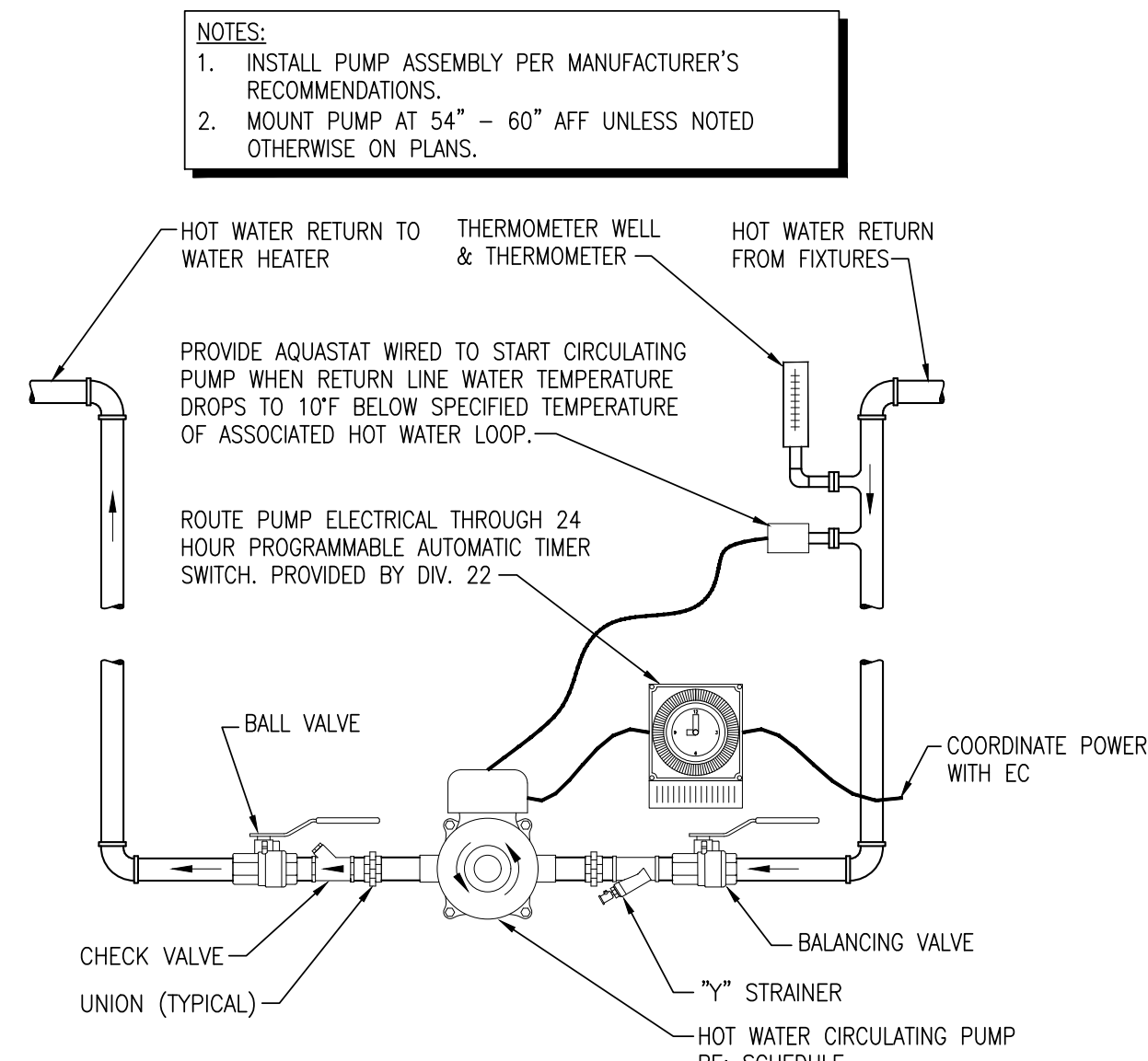
4 EXTERIOR CLEANOUT DETAIL
NOT TO SCALE



5 LAVATORY OR SINK W/MIXING VALVE DETAIL
NOT TO SCALE

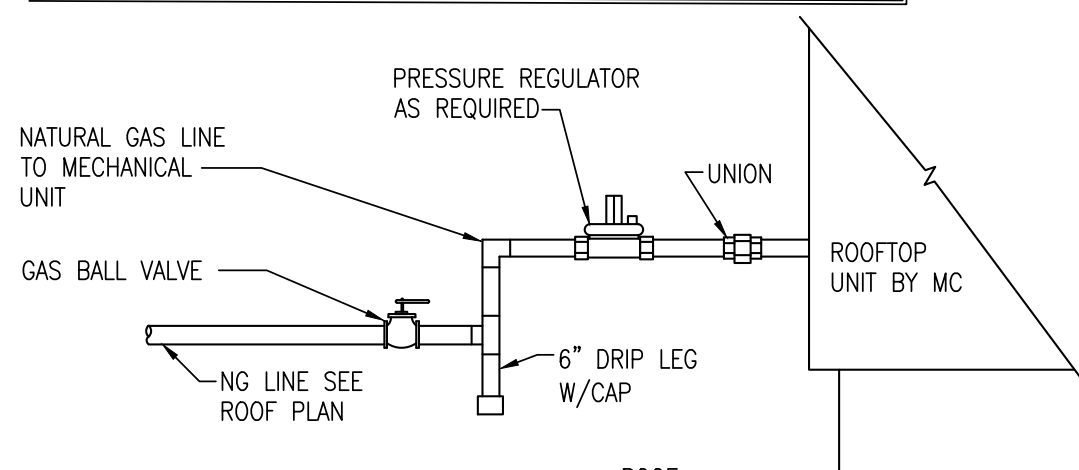


6 ELECTRIC WATER HEATER DETAIL
NOT TO SCALE

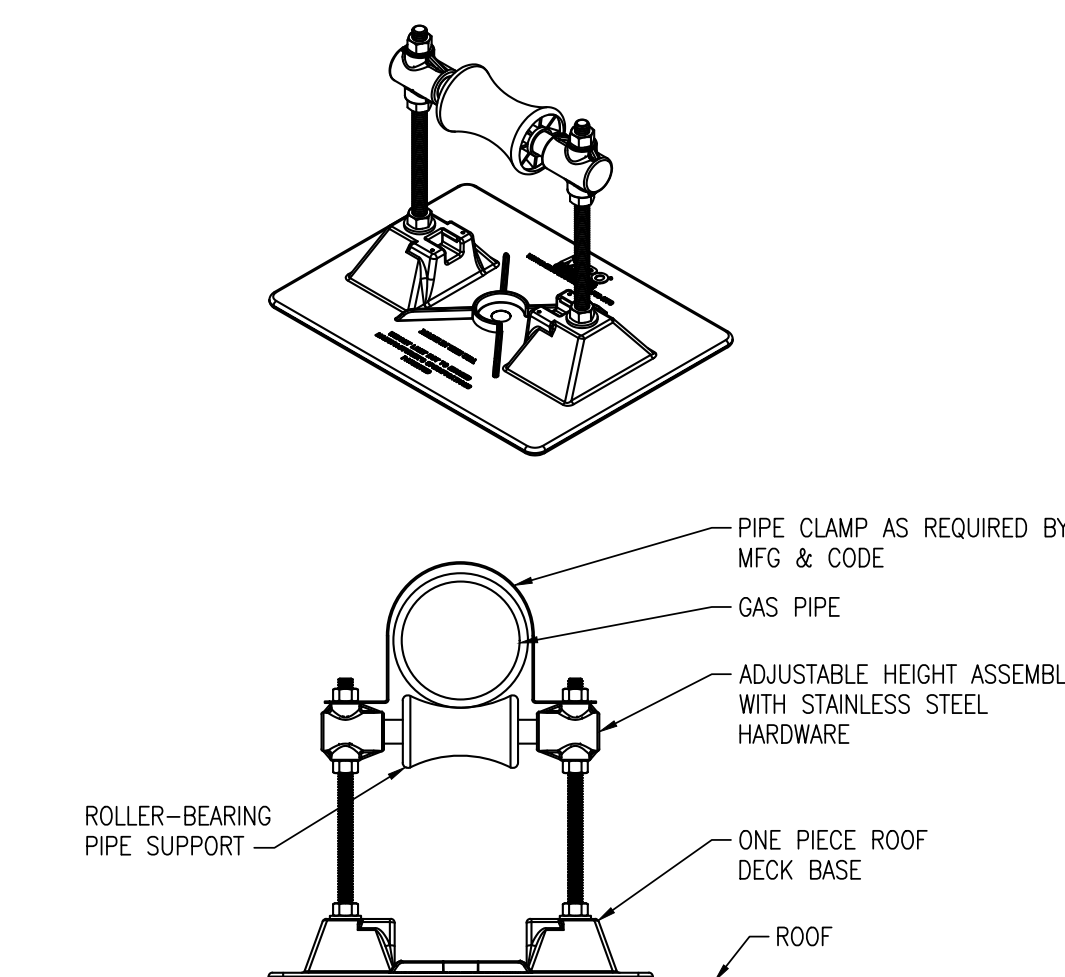


7 HW RECIRCULATION PUMP DETAIL
NOT TO SCALE

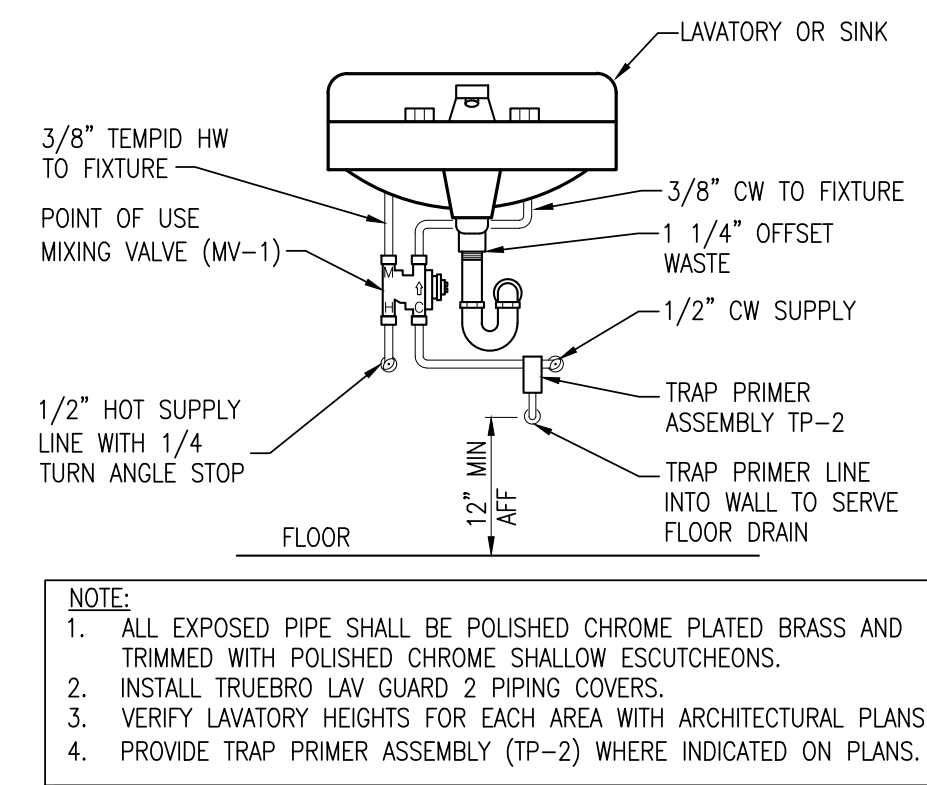
- NOTES:**
1. PROVIDE GAS REGULATOR VENT PROTECTOR. INSTALL REGULATOR PER MANUFACTURER'S RECOMMENDATIONS.
 2. COORDINATE DISTANCE BETWEEN PRESSURE REGULATOR AND GAS-FIRED EQUIPMENT WITH EQUIPMENT MANUFACTURER. COORDINATE FINAL CONNECTION TO UNIT WITH MC.
 3. PROVIDE ROOF PIPE SUPPORTS FOR NATURAL GAS PIPING.
 4. PIPING ABOVE GRADE SHALL BE SCHEDULE 40 BLACK IRON. REFER TO SPECIFICATIONS FOR PAINTING PIPING YELLOW.



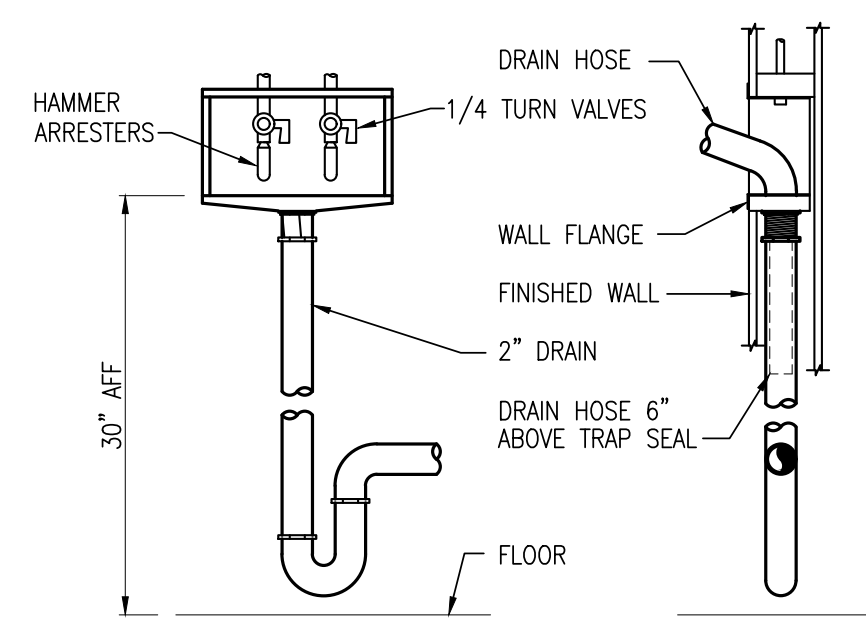
8 RTU GAS CONNECTION DETAIL
NOT TO SCALE



10 ROOF PIPE SUPPORT DETAIL
NOT TO SCALE



11 LAVATORY W/ TRAP PRIMER DETAIL
NOT TO SCALE



12 LAUNDRY BOX DETAIL
NOT TO SCALE

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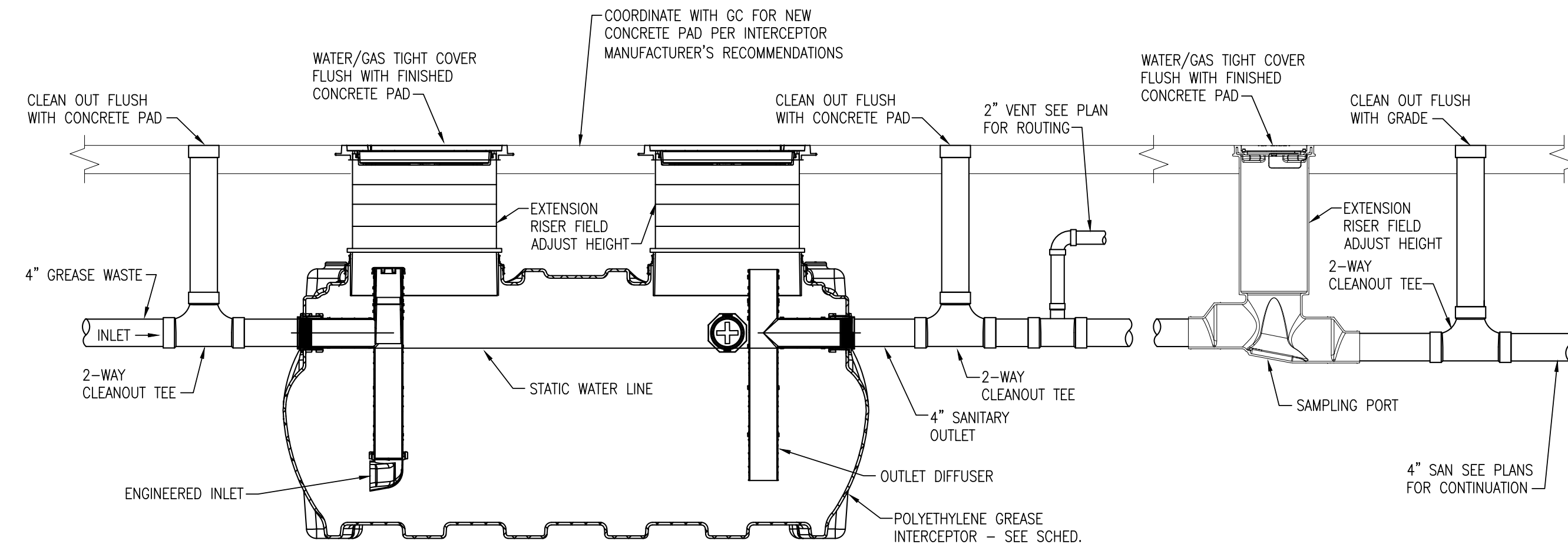


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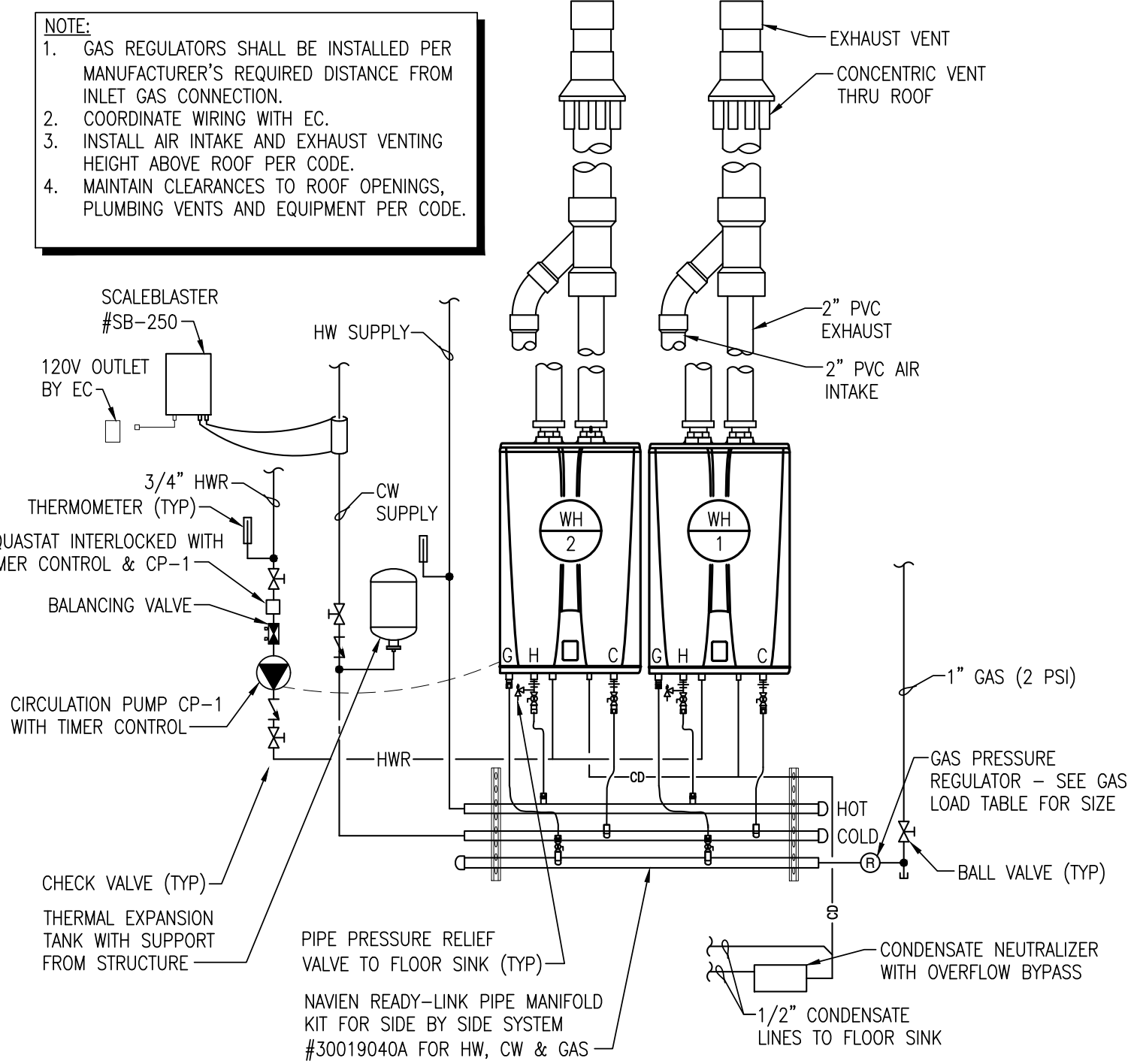
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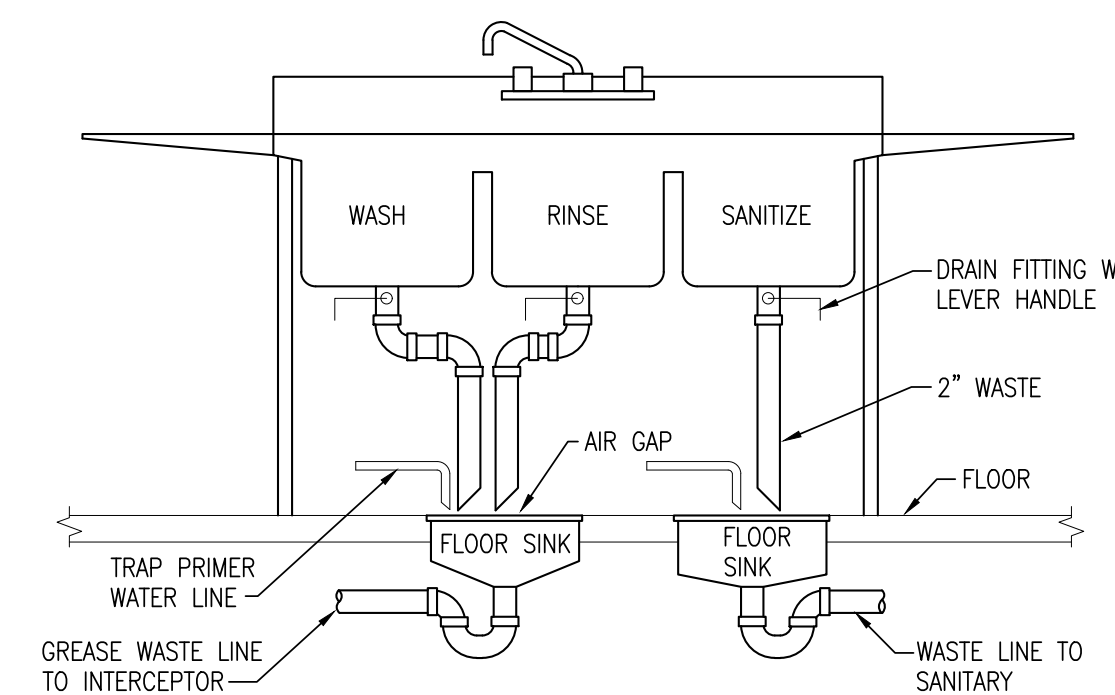
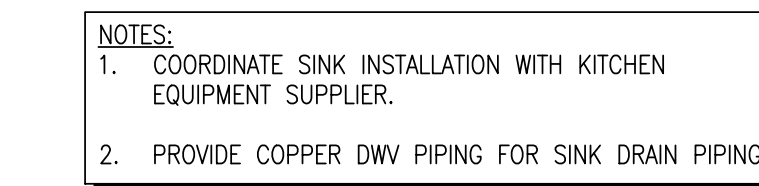
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14 EXTERIOR GREASE INTERCEPTOR WITH SAMPLING PORT DETAIL
NOT TO SCALE



13 DUAL TANKLESS GAS WATER HEATERS DETAIL
NOT TO SCALE



15 3 COMPARTMENT SINK DRAIN DETAIL
NOT TO SCALE

GAS LOAD TABLE					
MARK	INPUT (MBH)	REQUIRED PRESSURE	REQUIRED REGULATOR	SYSTEM PRESSURE	NOTES
RTU-1	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-2	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-3	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-4	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-5	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-6	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-7	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-8	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-9	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-10	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-11	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-12	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-13	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-14	XXX	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-15	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-16	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
MAU-1	XXX	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
WH-1	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-2	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-3	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-4	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
KITCHEN	238	10"	MAXITROL 325-5L	2 PSI	1,2,5
DRYER	50	7"	MAXITROL 325-3L	2 PSI	1,2,5
GEN SET	377	10"	MAXITROL 325-5L	2 PSI	1,2,5
TOTAL LOAD	3230 MBH				

NOTES:

- INSTALL AND VENT REGULATOR PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE VENT LIMITING DEVICE FOR INDOOR REGULATORS EQUIPPED WITH INTEGRAL VENT LIMITING GRIFICE MODEL 12A09 OR 12A39.
- COORDINATE WITH MECHANICAL CONTRACTOR FOR EQUIPMENT LOCATIONS AND REQUIRED CONNECTION.
- PROVIDE VENT PROTECTOR DEVICE FOR OUTDOOR REGULATORS MODEL 13A15 OR 13A15-5.
- GAS SYSTEM DESIGN FOR INITIAL METER OUTLET PRESSURE OF 2 PSIG WITH PRESSURE DROP OF 1 PSIG AND TOTAL LENGTH OF 450 FEET.

PLUMBING KITCHEN EQUIPMENT SCHEDULE							
ITEM	DESCRIPTION	INDIRECT DRAIN	DIRECT DRAIN	VENT	CW	HW	GAS
3	MOP SINK	-	2"	1 1/2"	1/2"	1/2"	-
5	WASHER BY OWNER	-	2"	1 1/2"	1/2"	1/2"	-
6	DRYER BY OWNER	-	-	-	-	-	1/2" 50 MBH
8	HAND SINK	-	2"	1 1/2"	1/2"	1/2"	-
9	CLEAN DISHTABLE	2"	-	-	-	-	-
11	DISHWASHER	2"	-	-	1/2"	1/2"	-
12	SOILED DISHTABLE	2"	-	-	3/4"	3/4"	-
13	HOSE REEL	-	-	-	1/2"	1/2"	-
14	SOAK SINK	2"	-	-	-	-	-
24	PREP TABLE	2"	-	-	1/2"	1/2"	-
25	FOOD ALLERGY WORKTABLE	2"	-	-	1/2"	1/2"	-
33	CONNECTION OVEN	-	-	-	-	-	(2) 3/4" 55 MBH
34	HOTPLATE COUNTERTOP	-	-	-	-	-	3/4" 128 MBH
35	KETTLE	2"	-	-	1/2"	1/2"	-
36	CONNECTION STEAMER	3/4" x2	-	-	3/4" x2	-	-
45	ICEMAKER	3/4"	-	-	3/4"	-	-
47	MILK COOLER	3/4"	-	-	-	-	-
48	SERVING COUNTER	2"	-	-	1/2"	-	-
49	COLD FOOD WELL	3/4"	-	-	-	-	-
51	HOT FOOD WELL	3/4"	-	-	-	-	-

EQUIPMENT LISTED PROVIDED BY KITCHEN EQUIPMENT CONTRACTOR (KEC). COORDINATE WITH KEC FOR REQUIRED CONNECTIONS.

GAS WATER HEATER SCHEDULE									
MARK	LOCATION	TEMPERATURE RISE	FLOW RATE GAL/MIN	CAPACITY (GALLONS)	MBH INPUT MAX	AIR INTAKE	FLUE EXHAUST	MANUFACTURER & MODEL NO.	NOTES
WH 1	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 2	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 3	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 4	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 5	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL

NOTES:

- INSTALL AND VENT PER MANUFACTURER'S RECOMMENDATIONS.
- COORDINATE POWER SUPPLY WITH ELECTRICAL CONTRACTOR. POWER SUPPLY TO UNIT 120V, 2 AMP (GFCI OUTLET).
- PROVIDE AMTROL ST-12 THERMAL EXPANSION TANK ON COLD WATER LINE. REFER TO DETAILS SHEET P501.
- PROVIDE CLEAR WATER ENVIRO TECHNOLOGIES SCALEBLASTER MODEL SB-250 ELECTRONIC DESCALER. COORDINATE 120 VOLT OUTLETS WITH EC.
- PROVIDE CIRCULATION PUMP WIRING FROM WATER HEATERS. COORDINATE POWER CONNECTIONS WITH EC.
- PROVIDE NAVIEN CONDENSATE NEUTRALIZER KIT AND OVERFLOW BY-PASS PIPING TO FLOOR SINK PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE ONE COMMUNICATION CABLE FOR WH-1 / WH-2 AND TWO CABLES FOR WH-3, WH-4 & WH-5.
- PROVIDE NAVIEN READY-LINK WALL MOUNT PIPING MANIFOLD SYSTEM FOR WATER HEATERS.
- PROVIDE NAVIEN EXHAUST/INTAKE CONCENTRIC VENT KIT THRU ROOF.
- SEE DETAIL 13/P502 FOR MORE INFORMATION.

ELECTRIC WATER HEATER SCHEDULE									
MARK	LOCATION	TEMPERATURE RISE	CAPACITY GALLONS	AMPS	ELEMENT KW	VOLTAGE	PHASE	MANUFACTURER & MODEL NO.	NOTES
EW 1	ELEC RM IN SAFEROOM	70 DEG @ 25 GPH	20	22	4.5	208	1	A.O. SMITH DEL-20	ALL

NOTES:

- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- WATER HEATER OUTLET TEMPERATURE SET TO 120°F. VERIFY TEMPERATURE WITH OWNER.
- PROVIDE AMTROL ST-5 THERMAL EXPANSION TANK ON COLD WATER LINE TO WATER HEATER.
- PROVIDE HOLD RITE WALL SUPPORT PLATFORM MODEL 50-SWHP-W & RESTRAINT STRAP FOR WATER HEATER.
- COORDINATE WIRING WITH E.C.
- SEE DETAIL 6/P501 FOR MORE INFORMATION.

CIRCULATION PUMP SCHEDULE										
MARK	MAXIMUM WORKING PRESSURE	MAXIMUM OPERATING TEMP (°F)	MOTOR				FLANGE SIZE (INCHES)	MATERIAL	MANUFACTURER & MODEL NO.	NOTES
			ELECTRICAL CHAR	F.L. AMPS	HP	RPM				
CP 1	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	
CP 2	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	
CP 3	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	

NOTES:

- PROVIDE GRUNDFOS BRONZE 3/4" FLANGE SET.
- DATA: CP-1: 0.5 GPM AT 10 FEET HEAD.
- DATA: CP-2: 1.5 GPM AT 8 FEET HEAD.
- DATA: CP-3: 1 GPM AT 10 FEET HEAD.
- PROVIDE 24 HOUR TIMER AND AQUASTAT - SET TIMER PER OWNER'S REQUIREMENTS.
- COORDINATE WIRING WITH E.C.
- SEE DETAIL 7/P501 FOR MORE INFORMATION.

GREASE INTERCEPTOR SCHEDULE											
MARK	LOCATION	FLOW RATE (GPM)	LIQUID CAP. (GAL)	GREASE CAP. (LBS)	STANDARD CONNECTION LENGTH	DIMENSIONS (INCHES)			MANUFACTURER & MODEL NO.	NOTES	
						WIDTH	HEIGHT	WEIGHT (LBS)			
GI 1	EXTERIOR BELOW GRADE	100	277	1,865	4"	87	33	44	376	SCHIER GB-250	ALL

NOTES:

- INSTALL AND VENT PER MANUFACTURER'S RECOMMENDATION AND LOCAL PLUMBING CODE.
- INSTALL EXTERIOR BELOW GRADE GREASE INTERCEPTOR SO COVERS ARE FLUSH WITH FINISHED CONCRETE. PROVIDE EXTENSION RISER ASSEMBLY AS REQUIRED.
- INSTALL GREASE INTERCEPTOR WITH REQUIRED CLEARANCES FOR ACCESS AND CLEANING.
- PROVIDE SAMPLING PORT SCHIER SV10 WITH EXTENSION RISER DOWNSTREAM OF INTERCEPTOR PER MANUFACTURER'S RECOMMENDATIONS.
- SEE DETAIL 14/P502 FOR ADDITIONAL INFORMATION.

GREASE INTERCEPTOR SIZING
GREASE INTERCEPTOR SIZED TO COMPLY WITH INTERNATIONAL PLUMBING CODE 2018 AND PDI-G101.
FIXTURES DRAINING TO GREASE INTERCEPTOR:
3- COMPARTMENT SINK: WASH AND RINSE BOWLS TO INTERCEPTOR. BOWL SIZE: 20" x 24" x 14" = 6720 CU INCHES x 2 = 13,440 CU INCHES. 13,440 CU INCHES / 231 = 58 GAL x 75% = 43.5 GALLONS
HANDSINKS: 3 FIXTURES X 2 GPM = 6 GPM
PREP SINGLE SINK: 2 FIXTURES: 18" x 18" x 14" = 4,536 CU INCHES x 2 / 231 x 75% = 30 GALLONS
TRENCH DRAIN AT SOUP KETTLE: 16 GALLONS
DISHWASHER: 36 GALLONS
PREP DOUBLE SINK: BOWL SIZE: 18" x 18" x 14" = 4,536 CU INCHES x 2 / 231 x 75% = 30 GALLONS
FLOOR SINKS WITH 2" OUTLET: 4 FIXTURES: 3 GPM x 4 = 12 GPM
TOTAL DRAIN FLOW PER 2 MINUTES = 173.5 GALLONS / 2 MIN = 87 GALLONS
USE INTERCEPTOR SIZED FOR FLOW RATE OF 100 GPM.

PLUMBING FIXTURE SCHEDULE									
MARK	FIXTURE	MANUFACTURER	MODEL	MOUNT	ROUGH-IN SCHEDULE				FITTINGS AND REMARKS
					COLD	HOT	WASTE	VENT	
L-1	LAVATORY ADA	AMERICAN STANDARD	0355.012	WALL	1/2"	1/2"	1 1/2"	1 1/2"	COLOR WHITE. PROVIDE CHICAGO FAUCET 420-ABCP. MCGUIRE HD155A GRID STRAINER, 8902C P-TRAP, LFBV2165SC 1/4 TURN SUPPLY STOPS. TRUEBRO LAV GUARD2 PIPE COVERS. ZURN WALL FIXTURE CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE. INSTALL THERMOSTATIC MIXING VALVE TMV-1 UNDER FIXTURE. SEE DETAIL 5/P501.
WC-1	WATER CLOSET ADA	AMERICAN STANDARD	2257.101	WALL	1 1/4"	-	4"	-	COLOR WHITE. PROVIDE SLOAN ROYAL 111-1.6 SFSM BATTERY OPERATED FLUSH VALVE. PROVIDE BEIMS 1655SCT OPEN FRONT ELONGATED SEAT. EXTERNAL CHECK HINGE, COLOR WHITE. ZURN NARROW WALL CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE. ADA INSTALLATION.
WC-2	WATER CLOSET	AMERICAN STANDARD	2257.101	WALL	1 1/4"	-	4"	-	COLOR WHITE. PROVIDE SLOAN ROYAL 111-1.6 SFSM BATTERY OPERATED FLUSH VALVE. PROVIDE BEIMS 1655SCT OPEN FRONT ELONGATED SEAT. EXTERNAL CHECK HINGE, COLOR WHITE. ZURN NARROW WALL CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE.
S-1	SINK	ELKAY	LRAD1919602	COUNTERTOP	1/2"	1/2"	1 1/2"	1 1/2"	SINGLE BOWL, 6" DEEP, 2 FAUCET HOLES, REAR CENTER DRAIN. PROVIDE ELKAY LK035 DRAIN & ELKAY LK4060Q814 FAUCET. MCGUIRE 8912 P-TRAP & LFBV2165 SUPPLY STOPS. INSTALL MIXING VALVE TMV-1 UNDER SINK.
MS-1	MOP SINK	FIAT	TSB-3000 24x24x12	FLOOR	1/2"	1/2"	3"	1 1/2"	MOLDED STONE, 6" DROP FRONT, SS THRESHOLD. PROVIDE FIAT 832AA HOSE & WALL BRACKET, 889-CC MOP BRACKET, MCG2424 SS WALL GUARDS, PROVIDE T&S BRASS FAUCET B-0665-BSTR. PROVIDE ASSE 1011 APPROVED HOSE CONNECTION VACUUM BREAKER.
EW-1	ELECTRIC WATER COOLER	ELKAY	LZSTLBWSSK	WALL	1/2"	-	1 1/2"	1 1/2"	DUAL LEVEL WITH SENSOR WATER BOTTLE FILLING STATION ON LOWER UNIT. VANDAL-RESISTANT, FILTERED, PUSH BUTTON ACTIVATION, 120 VOLT. PVC P-TRAP AND 1/4 TURN SUPPLY STOP. REFER TO ARCHITECT'S PLANS FOR MOUNTING HEIGHT. ADA INSTALLATION.
FD	FLOOR DRAIN	ZURN	ZN415-BZ1-P -VP	FLOOR	-	-	SEE PLANS	-	6" ROUND NICKEL BRONZE STRAINER, CAST IRON BODY ANCHOR FLANGE, CLAMP COLLAR, ADJUSTABLE COLLAR, ADJUSTABLE STRAINER HEIGHT, VANDAL-PROOF SECURED TOP, 1/2" TRAP PRIMER CONNECTION. SEE DETAIL 1/P501.
FS-1	FLOOR SINK	ZURN	ZN1910-K-2 -23	FLOOR	-	-	3"	-	8"x8" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, 1/2" GRATE WITH NICKEL BRONZE FINISH & SEDIMENT BUCKET.
FS-2	FLOOR SINK	ZURN	ZS1901-K-2-23	FLOOR	-	-	4"	-	12"x12" TOP, 8" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, STAINLESS STEEL FRAME, 1/2" GRATE, & SEDIMENT BUCKET.
FS-3	FLOOR SINK	ZURN	ZS1910-K-P -2-23	FLOOR	-	-	2"	-	8"x8" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, 1/2" TRAP PRIMER CONNECTION, STAINLESS STEEL FRAME WITH 1/2" GRATE & SEDIMENT BUCKET.
TD-1	TRENCH DRAIN	IMC/TEDDY	ASFT-1224	FLOOR	-	-	4"	-	12" W x 24" L TRENCH DRAIN. STAINLESS STEEL 6" DEEP, SLOPED BOTTOM TO CENTER 4" OUTLET. PERFORATED BASKET STRAINER. STAINLESS STEEL ADA COMPLIANT BAR GRATE MODEL SG-ADA-1224.
FCO	FLOOR CLEANOUT	ZURN	ZN1400-K-VP	FLOOR	-	-	SEE PLANS	-	ADJUSTABLE, CAST IRON BODY, ANCHOR FLANGE, ABS THREAD PLUG, ROUND SCORPIED TOP WITH NICKEL BRONZE FINISH, VANDAL RESISTANT COVER SCREWS.
WCO	WALL CLEANOUT	ZURN	Z1446-VP	WALL	-	-	SEE PLANS	-	CAST IRON CLEANOUT TEE, THREAD ABS PLUG, STAINLESS STEEL ROUND ACCESS COVER WITH VANDAL RESISTANT SECURING SCREW.
ECO	EXTERIOR CLEANOUT	ZURN	Z1474-N-VP	GRADE	-	-	SEE PLANS	-	CAST IRON CLEANOUT ACCESS HOUSING, ANCHOR FLANGE, SECURED GASKETED COVER WITH CLEANOUT FERRULE WITH ABS PLUG. VANDAL PROOF COVER SCREWS.
HA-1	HAMMER ARRESTOR	WATTS	LF15M2	PIPE	VARIES	-	-	-	LEAD-FREE DESIGN, PDI WH201 LISTED, MAINTENANCE FREE, INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
TP-1	TRAP PRIMER (ELECTRIC)	PRECISION PLUMBING PRODUCTS	PTS-4	PIPE	3/4"	-	-	-	ELECTRONIC UNIT ENCLOSED IN METAL CABINET WITH 24 HOUR TIMER, SOLENOID VALVE, VACUUM BREAKER, 3/4" CW INLET, HAMMER ARRESTOR & 1/2" OUTLETS, WATER, 120V POWER HARDWIRED. PROVIDE STRAINER PRIOR TO UNIT. COORDINATE 120 VOLT POWER OUTLET WITH EC. SEE DETAIL 1/P501.
TP-2	TRAP PRIMER	PRECISION PLUMBING PRODUCTS	PRO1-ULP500	PIPE	1/2"	-	-	-	UNDER FIXTURE TRAP PRIMER VALVE, CHROME PLATED, 1/2" CW INLET WITH ANGLE STOP, 3/8" OUTLET TO FAUCET, AIR GAP WITH 1/2" OUTLET TO FLOOR DRAIN. WALL ESCUTCHEON. MOUNT MINIMUM 12" ABOVE FLOOR. SEE DETAIL 11/P501.
TMV-1	THERMOSTATIC MIXING VALVE	WATTS	LFMVV-M1	BELOW FIXTURE	1/2"	1/2"	-	-	LEAD FREE MIXING VALVE WITH ADJUSTABLE TEMPERATURE SET-POINT & LOCKABLE, INTEGRAL CHECK STOPS & STRAINERS, 1/2" INLETS & OUTLET. SET OUTLET TEMP AT 105 DEGREES F. ASSE 1070 LISTED.
AP-1	ACCESS PANEL	ACUDOR	UF-5000 14x14 CLSS	WALL	-	-	-	-	14"x14" STEEL, 16 GAGE DOOR & FRAME, 18 GAGE MOUNTING FRAME. CONCEALED HINGE, CYLINDER LOCK & KEY, STAINLESS STEEL FINISH. CONCEALED FASTENING POINTS.
CD-1	CLOTHES DRYER	PROVIDED BY OTHERS	-	FLOOR	-	-	-	-	DRYER INSTALLED BY OTHERS. PC SHALL ROUGH-IN & MAKE FINAL CONNECTIONS. PROVIDE 1/2" DORMANT NATURAL GAS FLEXIBLE GAS LINE WITH BALL VALVE, SWIVEL CONNECTIONS & 36" LENGTH. LOW PRESSURE GAS. COORDINATE WITH UNIT SUPPLIER. 20 MBH GAS LOAD.
WM-1	WASHING MACHINE	PROVIDED BY OTHERS	-	FLOOR	3/4"	3/4"	3"	-	MACHINE INSTALLED BY OTHERS. PC SHALL ROUGH-IN & MAKE FINAL CONNECTIONS. ROUTE DRAIN HOSE TO LAUNDRY BOX DRAIN. CONNECT FLEXIBLE WATER HOSES TO WALL BOX & MACHINE. COORDINATE WITH UNIT SUPPLIER.
LB-1	LAUNDRY BOX	SIOUX CHIEF	696R2313WF	WALL	1/2"	1/2"	2"	1 1/2"	FIRE RATED RECESSED WALL MOUNTED BOX WITH FLANGE, 1/4 TURN BALL VALVES WITH HAMMER ARRESTORS, 3/4" THREADED OUTLETS, DRAIN CONNECTION. COORDINATE INSTALL HEIGHT FOR CLOTHES WASHER.
GVB-1	GAS VALVE BOX	SIOUX CHIEF	696R1020GF	WALL	-	-	-	-	FIRE RATED RECESSED WALL MOUNTED BOX WITH FLANGE, NATURAL GAS 1/4 TURN BALL VALVE, 1/2" THREADED OUTLET. PROVIDE DORMANT FLEXIBLE GAS LINE. COORDINATE INSTALL HEIGHT FOR CLOTHES DRYER GAS CONNECTION.

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KFC ENGINEERING

STRUCTURAL

SALAS O'BRIEN

MECHANICAL / ELECTRICAL



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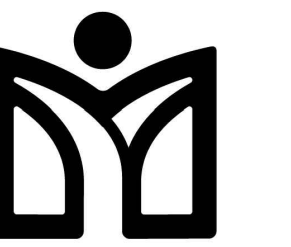
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revisions



MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
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Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

TEXT	DESCRIPTION
WP	DEVICE SHALL BE WEATHER PROOF AND RATED FOR EXTERIOR CONDITIONS
•	FIELD COORDINATE ELEVATION.
AFF	ABOVE FINISHED FLOOR
UC	DEVICE IS TO BE MOUNTED ON THE UNDERSIDE OF THE ELEVATED CANOPY.
WM	DEVICE IS TO BE WALL MOUNTED.
WG	WIRE GUARD TO BE PROVIDED AND INSTALLED TO PROTECT ASSOCIATED DEVICE.

TEXT	DESCRIPTION
E	EXISTING TO REMAIN.
D	DEVICE IS EXISTING AND IS TO BE REMOVED. CONTRACTOR TO REMOVE THE DEVICE AND RETURN TO OWNER.
R	REMOVE EXISTING DEVICE AND RELOCATE TO A LOCATION INDICATED ON THE DRAWINGS.

NOTES TO CONTRACTOR	
1.	EVERY SYMBOL SHOWN ON LEGEND MAY NOT APPEAR ON DRAWINGS.
2.	SYSTEM INSTALLERS SHALL COORDINATE LOCATIONS AND CONNECTIONS WITH THE PROJECTS ELECTRICAL CONTRACTOR.
3.	CONTRACTOR TO PROVIDE PROPERLY GROUNDED LIGHTING PROTECTION ON ALL CABLING ENTERING AND EXITING THE BUILDING.

SCOPE ITEM	RESPONSIBILITY			NOTES
	OFI	CFI	OCFI	
COMMUNICATIONS - DIVISION 27				
CATEGORY 6 STRUCTURED CABELLING SYSTEM		X		
BUILDING INTERCOMPA, BELL, AND CLOCK SYSTEM		X		
NETWORK EQUIPMENT				
-- MD/FIDF NETWORK EQUIPMENT		X		
-- VOIP TELEPHONES		X		
-- WIRELESS ACCESS POINTS		X		
-- UNINTERRUPTABLE POWER SUPPLIES (UPS)		X		
RACEWAY, CONDUIT, BACK BOXES, SLEEVES, ETC.		X		SEE NOTE 1.
ELECTRICAL POWER		X		SEE NOTE 1.
LIFE SAFETY AND SECURITY - DIVISION 28				
ACCESS CONTROL SYSTEM(ACS)		X		
INTRUSION DETECTION SYSTEM		X		
VIDEO SURVEILLANCE SYSTEM (VSS)				
-- VSS SERVERS		X		
-- VSS CAMERAS		X		
-- VSS PROGRAMMING		X		
-- VSS CABLING		X		SEE NOTE 2.
FIRE ALARM SMOKE DETECTION WITH VOICE EVACUATION		X		SEE NOTE 1.
RACEWAY, CONDUIT, BACK BOXES, SLEEVES, ETC.		X		SEE NOTE 1.
ELECTRICAL POWER		X		SEE NOTE 1.
OFI - OWNER FURNISHED AND OWNER INSTALLED CFI - CONTRACTOR FURNISHED AND CONTRACTOR INSTALLED OCFI - OWNER FURNISHED AND CONTRACTOR INSTALLED				
RESPONSIBILITY MATRIX NOTES:				
1. BY DIVISION 26. 2. BY DIVISION 27.				

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
ACP	ACCESS CONTROL SYSTEM, CONTROL PANEL	+60" AFF TO CENTER	AS REQUIRED	COORDINATE POWER, NOTE #4.
CR	ACCESS CONTROL PROXIMITY CARD READER. DEFAULT SYMBOL INDICATES WALL MOUNTED *M - INDICATES MULLION MOUNTED READER	+42" A.F.F.	1-G, 3/4" C	
CR	DOOR MOUNTED ACCESS CONTROL PROXIMITY CARD READER THAT IS INTEGRATED INTO THE DOOR HARDWARE.	+42" AFF	N/A	
ES	2-WAY AUDIO/VIDEO INTERCOM DOOR STATION. *DEFAULT INDICATES WALL MOUNTED *M - INDICATES MULLION MOUNTED DEVICE	+42" AFF	*W: 1-G, 3/4" C *M: 3/4" C	COORDINATE POWER, NOTE #4.
DS	DOOR MOUNTED, 2-WAY AUDIO/VIDEO INTERCOM DOOR STATION.	+42" AFF, FIELD COORDINATE		COORDINATE POWER, NOTE #4
MS	2-WAY AUDIO/VIDEO INTERCOM MASTER STATION.	DESK MOUNTED UNO		COORDINATE POWER, NOTE #4
DR	DOOR RELEASE BUTTON	COORDINATE WITH GC	1-G, 3/4" C	
DH	PIR MOTION REQUEST TO EXIT DEVICE, DOOR CONTACT AND ELECTRIC STRIKE.			ACCESS CONTROL ONLY DOOR SHALL BE SPST. DOOR WITH BOTH ACCESS CONTROL AND INTRUSION SHALL BE DPDT. ONLY 1 DOOR CONTACT PER DOOR IF DH AND DC SYMBOL ARE SHOWN

NOTES:
1. #G INDICATES BACK BOX SIZE
2. #C INDICATES CONDUIT SIZE
3. UNO, UNLESS NOTED OTHERWISE
4. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
W	WALL/CORNER MOUNT 4-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5 AND 6
W	CEILING MOUNTED 4-SENSOR CAMERA	CEILING		NOTE #5
W	3-SENSOR CAMERA	CEILING UNO		NOTE #5 AND 6
W	2-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5
W	1-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
+	SYMBOL ADDED TO CAMERA TO INDICATE WALL MOUNT.	+9" AFF UNO		NOTE #6
VRS	VIDEO RECORDING SERVER			
BMU	VIDEO SURVEILLANCE MAIN UNIT	ABOVE CEILING		NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE
2. #C INDICATES CONDUIT SIZE
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK
6. EXTERIOR WALL MOUNT SPEAKERS SHALL BE MOUNTED +10" AFF.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
IDP	INTRUSION DETECTION SYSTEM CONTROL PANEL	+60" AFF	TWO(2) - 1" TO CONTRACTOR PROVIDED BACK BOX	COORDINATE POWER WITH EC, NOTE #5
KP	INTRUSION DETECTION SYSTEM KEYPAD.	+48" AFF TO TOP	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
W	WALL MOUNTED MOTION DETECTOR *# = LR IF LONG RANGE	REFERENCE FLOOR PLAN	N/A	
W	CEILING MOUNTED GLASS BREAK DETECTOR	CEILING	N/A	
DC	DOOR CONTACT	FLUSH MOUNTED IN DOOR FRAME	N/A	INTRUSION ONLY DOOR SHALL BE SPST. DOOR WITH BOTH ACCESS CONTROL AND INTRUSION SHALL BE DPDT. ONLY 1 DOOR CONTACT PER DOOR IF DH AND DC SYMBOL ARE SHOWN
DDC	OVERHEAD DOOR MOUNT MAGNETIC DOOR CONTACT.	SURFACE MOUNTED ON DOOR FRAME	N/A	
HU	DMP WIRELESS HOLDUP BUTTON	UNDER DESK UNO	N/A	
SS	SECURITY SIREN	+9" AFF	SINGLE GANG BACKBOX	

NOTES:
1. #G INDICATES BACK BOX SIZE
2. #C INDICATES CONDUIT SIZE
3. UNO, UNLESS NOTED OTHERWISE
4. REFERENCE DIVISION 28 SPECIFICATION FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

FIRE ALARM	
*PROJECT SCOPE INCLUDES REPLACING EXISTING FIRE ALARM SYSTEM IN ITS ENTIRETY WITH NEW VOICE EVACUATION FIRE ALARM SYSTEM. FIRE ALARM SYSTEM SHALL BE FULLY OPERATIONAL THROUGHOUT ALL PHASES OF CONSTRUCTION. DEMOUSH EXISTING SYSTEM ONCE NEW SYSTEM IS INSTALLED, TESTED, AND ACCEPTED BY THE AHJ.	
LEGEND	
SYMBOL	DESCRIPTION
ACP	FIRE ALARM CONTROL. PROVIDE AND INSTALL 1 CATEGORY CABLE TO CONNECT PANEL TO NETWORK.
FAA	FIRE ALARM ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE
NOTES:	
1. REFERENCE SHEET SPECIFICATIONS	
2. A LICENSED FIRE ALARM PLANNING SUPERINTENDENT CERTIFIED TO A MINIMUM LEVEL 3, IN THE SUBFIELD OF FIRE ALARM SYSTEMS THROUGH THE NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET), SHALL PROVIDE PLANS AND CALCULATIONS FOR A MANUAL AND AUTOMATIC FIRE DETECTION AND ALARM SYSTEM TO COMPLY WITH THE BUILDING SPACE LAYOUT, BUILDING OCCUPANCY, CURRENT NFPA 72, LOCAL AND STATE CODE REQUIREMENTS, AND THE FIRE ALARM AND DETECTION SYSTEM SPECIFICATIONS.	

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
W	WALL MOUNTED NETWORK OUTLET D#: NUMBER OF DATA DROPS IN OUTLET AP. WIRELESS ACCESS POINT	+18" AFF, UNLESS OTHERWISE NOTED	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
W	COMMUNICATIONS OUTLET	FIELD COORDINATE	FIELD COORDINATE	
W	WALL MOUNTED NETWORK OUTLET	+44" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
B	WALL MOUNTED BOX FOR FUTURE USE.	+18" AFF UNO	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
D#	FLOOR MOUNTED NETWORK OUTLET	N/A	COORDINATE WITH ELECTRICAL CONTRACTOR	FINISHED HARDWARE PROVIDED BY DIV 27
D#	CEILING MOUNTED NETWORK OUTLET D#: NETWORK OUTLET	ABOVE CEILING	CEILING BRACKET WITH BISCUIT BLOCK	
D#	CEILING MOUNTED NETWORK OUTLET FOR ACCESS POINT D#: NETWORK DROP QUANTITY	ABOVE CEILING	CEILING BRACKET WITH BISCUIT BLOCK	

NOTES:
1. #G INDICATES BACK BOX SIZE
2. #C INDICATES CONDUIT SIZE
3. UNO, UNLESS NOTED OTHERWISE
4. CONDUIT STUB UP AND SLEEVES SHALL HAVE A SOLID UNOUC PLASTIC PROTECTIVE BUSHING.
5. NO CONDUITS SHALL EXCEED FOR 40% MAXIMUM FILL RATIO. CONTRACTOR TO PROVIDE ADDITIONAL CONDUITS REQUIRED.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
WMP	WALL MOUNTED PROJECTOR AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLANS.	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
CMPT	CEILING MOUNTED PROJECTOR AUDIOVISUAL OUTPUT OUTLET	CEILING MOUNTED	N/A	NOTE #5
AV-1	WALL MOUNTED AUDIO/VIDEO INPUT OUTLET	+18" AFF UNO	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	
FSD-1	WALL MOUNTED FLAT SCREEN DISPLAY AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLAN	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5
FSD-2	WALL MOUNTED FLAT SCREEN DISPLAY AUDIOVISUAL OUTPUT OUTLET ASSOCIATED WITH AV-1 INPUT OUTLET	REFERENCE FLOOR PLAN	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
IVD	INTERACTIVE VIDEO DISPLAY AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLAN	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
CP	AV CONTROL PANEL	+48" AFF TO TOP	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
ES	LOCAL INSTRUCTIONAL SPACE PRESENTATION SPEAKER	CEILING	CONTRACTOR PROVIDED CEILING BOX	COORDINATE POWER WITH EC
SC	STREAMING CAMERA	CEILING UNO	N/A	NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE
2. #C INDICATES CONDUIT SIZE
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
ICS	INTERCOM COMMUNICATIONS SYSTEM HEAD END UNIT.	FLOOR MOUNTED	COORDINATE WITH EC	COORDINATE POWER WITH EC
S	CEILING MOUNT INTERCOM SPEAKER, LAY-IN CEILING	CEILING	CONTRACTOR PROVIDED	
S	CEILING MOUNT INTERCOM SPEAKER, HARD CEILING.	CEILING	CONTRACTOR PROVIDED	
S	WALL MOUNT INTERIOR INTERCOM SPEAKER	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
S	WALL MOUNT EXTERIOR INTERCOM SPEAKER	+10" AFF UNO	CONTRACTOR PROVIDED	
S	PENDANT MOUNT INTERCOM SPEAKER	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
S	SURFACE MOUNT INTERCOM SPEAKER, MOUNT TO STRUCTURE	CEILING	CONTRACTOR PROVIDED	
S	CEILING MOUNTED EXTERIOR INTERCOM SPEAKER.	CEILING	CONTRACTOR PROVIDED	
IP	IP BASED SPEAKER. # TO BE REPLACED WITH S, S2, S3, S4 INDICATING THE SPECIFIC TYPE OF SPEAKER.	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	NOTE #5
IP	SPEAKER CONNECTED TO IP MODULE AND AMPLIFIER. # TO BE REPLACED WITH S, S2, S3, S4 INDICATING THE SPECIFIC TYPE OF SPEAKER.	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
VC	WALL MOUNTED VOLUME CONTROL.	+48" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
CB	INTERCOM CALL BUTTON	+48" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
C	SINGLE FACE CLOCK	90" AFF UNO.	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
C	DOUBLE FACE CLOCK	90" AFF UNO.	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
RPS	REMOTE PROGRAM SOURCE	DESK TOP	COORDINATE WITH EC	NOTE #5
ACS	ADMINISTRATIVE CALL STATION.	DESK TOP	N/A	NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE
2. #C INDICATES CONDUIT SIZE
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

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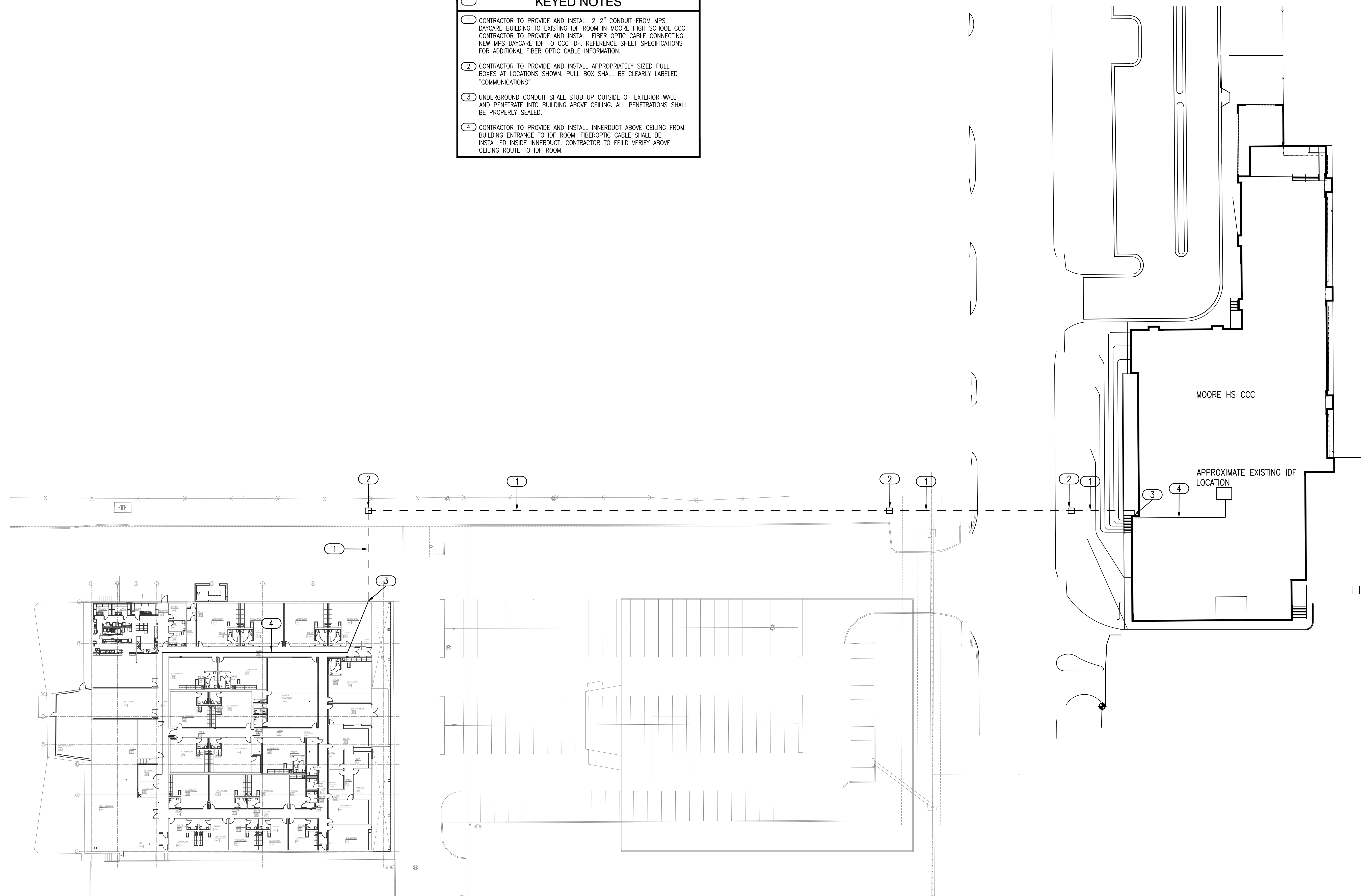
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KEYED NOTES	
1	CONTRACTOR TO PROVIDE AND INSTALL 2-2" CONDUIT FROM MPS DAYCARE BUILDING TO EXISTING IDF ROOM IN MOORE HIGH SCHOOL CCC. CONTRACTOR TO PROVIDE AND INSTALL FIBER OPTIC CABLE CONNECTING NEW MPS DAYCARE IDF TO CCC IDF. REFERENCE SHEET SPECIFICATIONS FOR ADDITIONAL FIBER OPTIC CABLE INFORMATION.
2	CONTRACTOR TO PROVIDE AND INSTALL APPROPRIATELY SIZED PULL BOXES AT LOCATIONS SHOWN. PULL BOX SHALL BE CLEARLY LABELED "COMMUNICATIONS"
3	UNDERGROUND CONDUIT SHALL STUB UP OUTSIDE OF EXTERIOR WALL AND PENETRATE INTO BUILDING ABOVE CEILING. ALL PENETRATIONS SHALL BE PROPERLY SEALED.
4	CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING FROM BUILDING ENTRANCE TO IDF ROOM. FIBEROPTIC CABLE SHALL BE INSTALLED INSIDE INNERDUCT. CONTRACTOR TO FIELD VERIFY ABOVE CEILING ROUTE TO IDF ROOM.



1 TECHNOLOGY DEMOLITION FLOOR PLAN

SCALE: 1/32" = 1'-0"

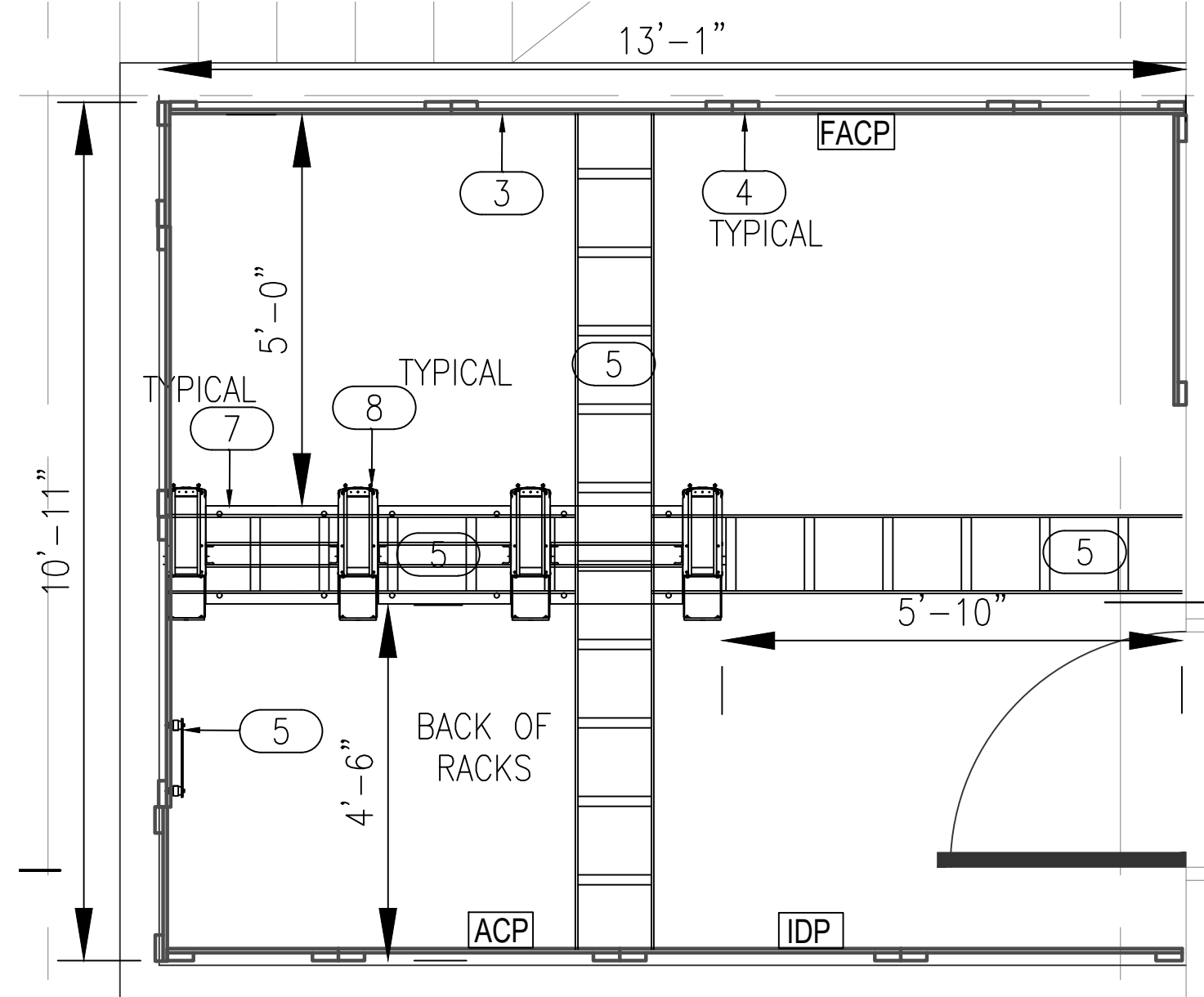
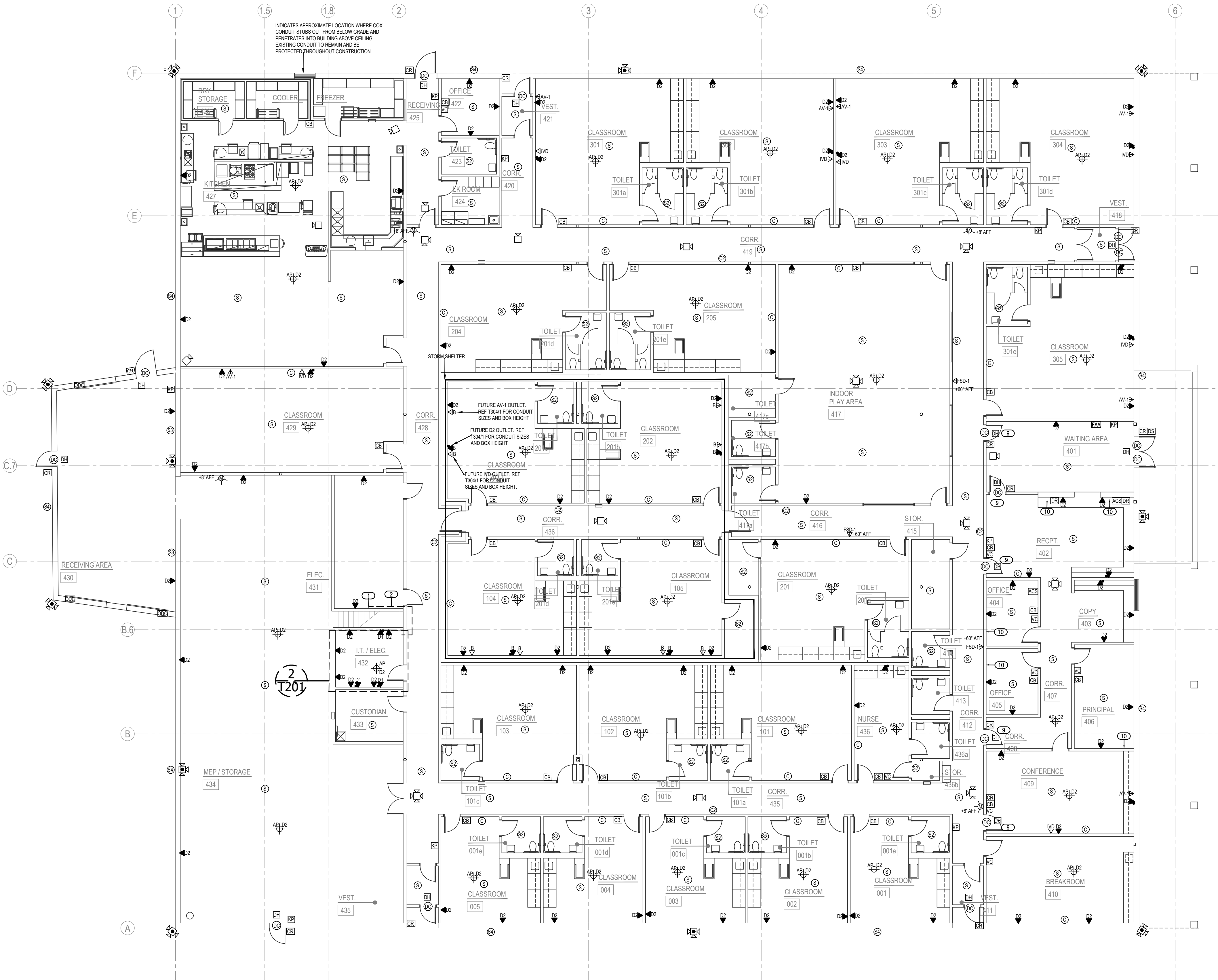


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Moore, OK 73160
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Salas O'Brien Project Number: 2450-70304-00

SAFEROOM NOTE
PER ICC 500-2014, 309.1:
PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
1. 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
2. 2 1/16" IN DIAMETER
SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

GENERAL NOTES
A. FIRE ALARM: CONNECT NEW FIRE ALARM DEVICES TO NEW SILENT KNIGHT 6820XL SUPPLY 6820XL PANEL AND ALL NAC PANELS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE AN CODE COMPLIANT SYSTEM. SYSTEM SHALL USE SK PROTOCOL DEVICES ONLY. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
B. SECURITY ALARM: CONNECT ALL NEW SECURITY ALARM DEVICES TO NEW DMP SECURITY ALARM PANEL. SUPPLY DMP PANEL AND ALL ZONE EXPANDERS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
C. INTERCOM: CONNECT ALL NEW INTERCOM DEVICES TO EXISTING RAULAND TELECENTER U.I.P. SUPPLY ALL MASTER CONSOLES, AMPLIFIERS, POWER SUPPLIES, MODULES, CALL BUTTONS, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
D. CLOCKS: CLOCKS SHALL BE RAULAND. SEE SHEET SPECIFICATIONS FOR APPROVED PART NUMBERS.
E. ACCESS CONTROL: CONNECT ALL NEW ACCESS CONTROL DEVICES TO NEW KEYSKAN CONTROLLERS. SUPPLY KEYSKAN CONTROLLERS AND ALL POWER SUPPLIES, READERS, STRIKES, ETC. NEEDED TO FURNISH A COMPLETE SYSTEM. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
F. CAMERA: CONNECT ALL NEW CAMERAS TO NEW MDF. CAMERA SYSTEM IS AVIGILON. CONTACT JACK PHILLIPS WITH MOORE PUBLIC SCHOOLS @ 405-473-5225 FOR EXACT CAMERA MOUNTING LOCATIONS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
G. DATA: CONNECT NEW DATA, WIFI AND CAMERA NETWORK DROPS TO NEW MDF. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.

KEYED NOTES
1 CONTRACTOR TO EXTEND ENTRANCE CONDUIT ABOVE CEILING. CONTRACTOR TO MATCH NEW CONDUIT SIZE WITH EXISTING CONDUIT SIZE.
2 CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING AT THE INDICATED ROUTE TO THE NEW IT ROOM. PENETRATE AND SEAL WALLS AS NEEDED.
3 INDICATES NEW DEMARC LOCATION. PLYWOOD IS RESERVED FOR SERVICE PROVIDER EQUIPMENT.
4 INDICATES THE LOCATION OF A 8" TALL, 3/4" FIRE-RATED PLYWOOD CONTRACTOR TO PROVIDE AND INSTALL PLYWOOD AND ALL REQUIRED MOUNTING HARDWARE. PLYWOOD SHALL BE PAINTED WHITE WITH FIRE RATED PAINT. TYPICAL FOR ALL SHOWN ON DRAWING.
5 INDICATES THE LOCATION OF A NEW WALL MOUNTED TELECOMMUNICATION GROUND BUS BAR (TGBB). CABLING CONTRACTOR TO PROVIDE BUS BAR AND ALL REQUIRED MATERIAL TO MOUNT AT THE LOCATION SHOWN. TGBB TO BE MOUNTED AT +93" A.F.F.
6 PROVIDE AND INSTALL A 12" WIDE, UNIVERSAL LADDER TRAY AND ALL REQUIRED MOUNTING HARDWARE. LADDER TRAY SHALL BE BLACK IN COLOR. TYPICAL FOR ALL SHOWN ON ENTIRE PROJECT.
7 PROVIDE AND INSTALL ONE (1) 2-POST, FLOOR MOUNTED, 7' RELAY RACK (BLACK IN COLOR). PROVIDE BONDING WASHERS, BOLTS, AND NUTS AT ALL MECHANICALLY CONNECTED LOCATIONS OF THE RACK TO ENSURE THAT ALL PIECES OF THE RACK ARE COMPLETELY BONDED. SCRAPING PAINT FROM RACKS TO MAKE A BOND WILL NOT BE ACCEPTED. ALL RACK MOUNTED COMPONENTS SHALL BE MOUNTED WITH BONDING SCREWS AND THE CONTRACTOR SHALL PROVIDE THE OWNER WITH (50) ADDITIONAL BONDING SCREWS FOR THE INSTALLATION OF OWNER EQUIPMENT. NO DAISY CHAINING GROUNDS FROM RACK TO CABLE TRAY OR TO OTHER RACKS WILL BE ACCEPTED. ALL GROUNDS SHALL BE HOME RUN TO THE TELECOMMUNICATIONS GROUND BUS BAR (TGBB). TYPICAL FOR ALL SHOWN ON THE ENTIRE PROJECT.
8 PROVIDE AND INSTALL ONE (1) 7'X6", FRONT AND REAR MANAGED, VERTICAL CABLE MANAGER (BLACK IN COLOR). CABLE MANAGERS SHALL BE INSTALLED ON EACH END OF THE RACK SYSTEMS AND BETWEEN EACH RACK. CABLE MANAGERS SHALL HAVE A SINGLE, SOLID, FULL HEIGHT HINGED DOOR IN THE FRONT AND WIDE SPACED CABLE RINGS WITH SPIN-OPEN LATCHES IN THE REAR. TYPICAL FOR ALL SHOWN IN THE ENTIRE PROJECT.
9 DOOR HARDWARE SPECIFIED FOR INDICATED DOORS SHOULD HAVE KEY ACCESS FROM BOTH SIDES ALLOWING EACH SIDE TO BE LOCKED AND UNLOCKED INDEPENDENTLY.
10 CONTRACTOR TO PROVIDE AND INSTALL A DMP WIRELESS HOLD UP BUTTON AT EACH LOCATION INDICATED.



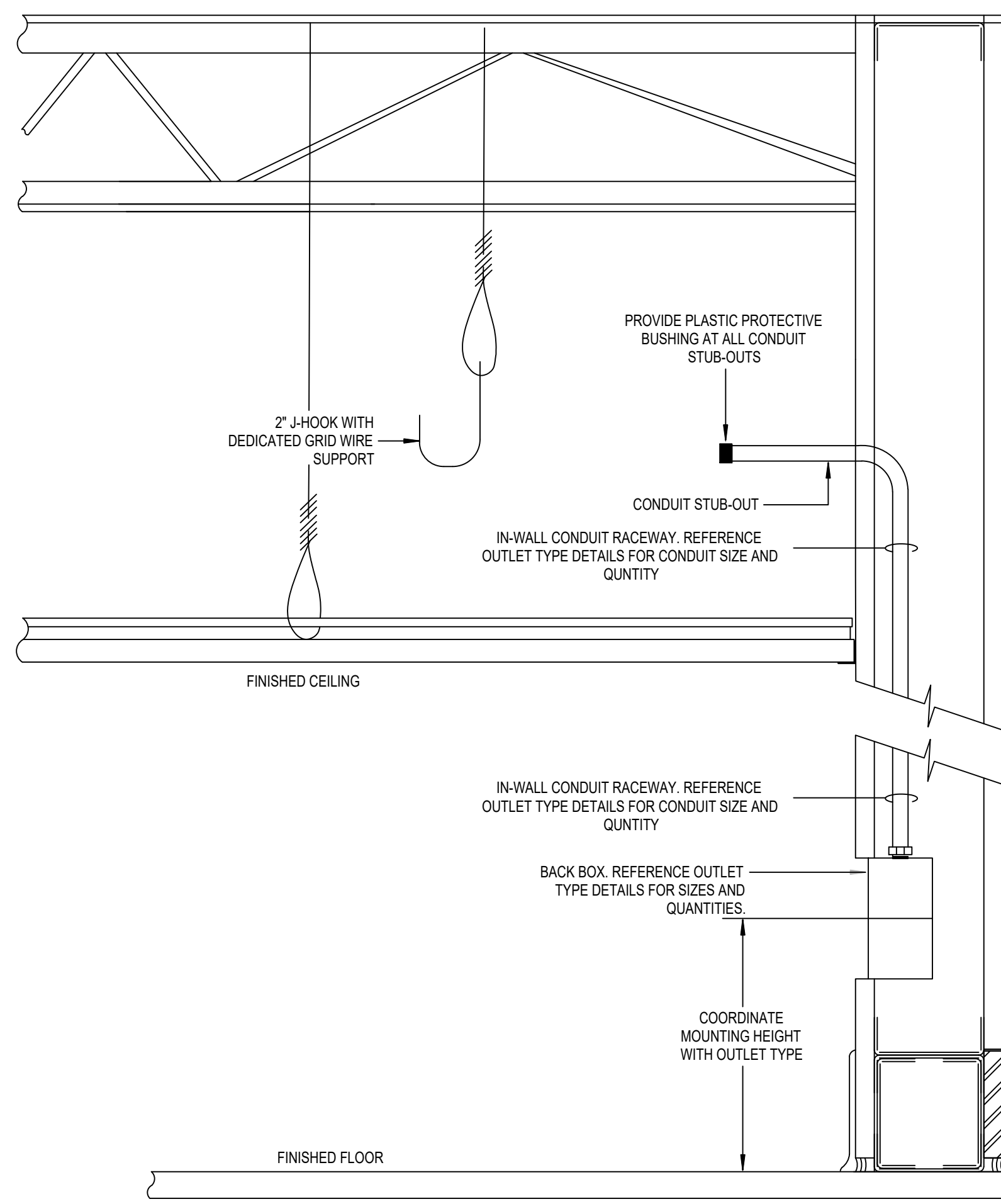
1 TECHNOLOGY FLOOR PLANS
SCALE: 3/32" = 1'-0"

2 TECHNOLOGY ENLARGED PLAN - I.T./ELEC. 432
SCALE: 1/2" = 1'-0"

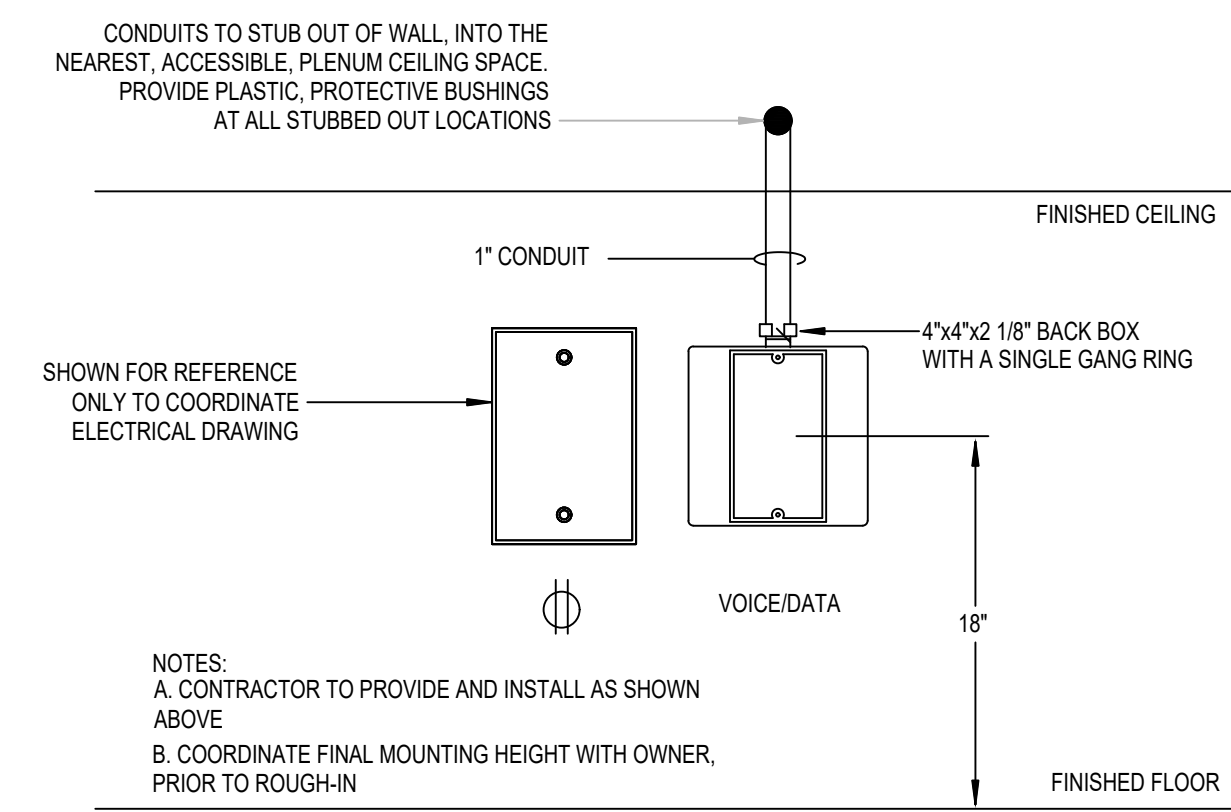
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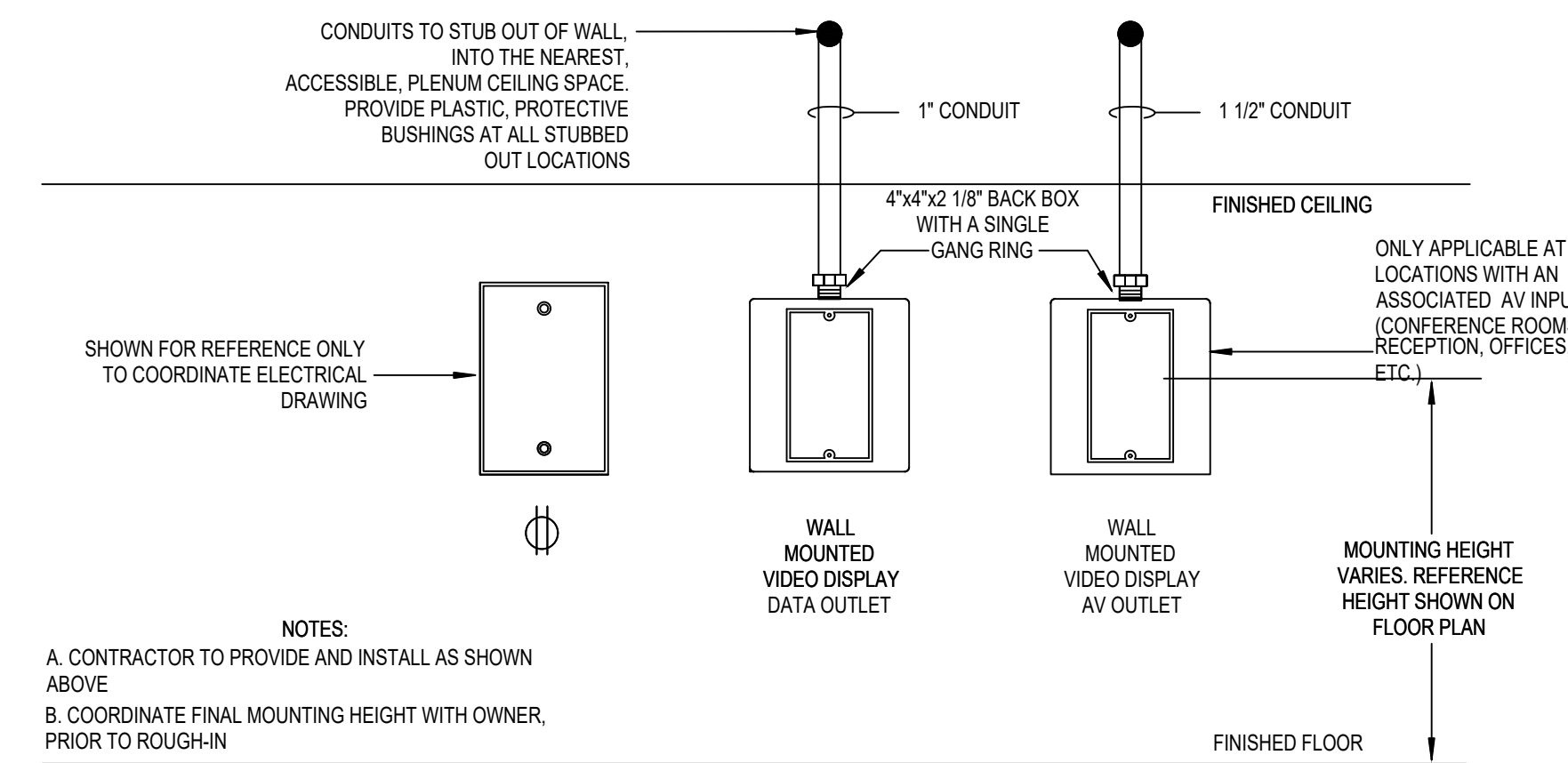
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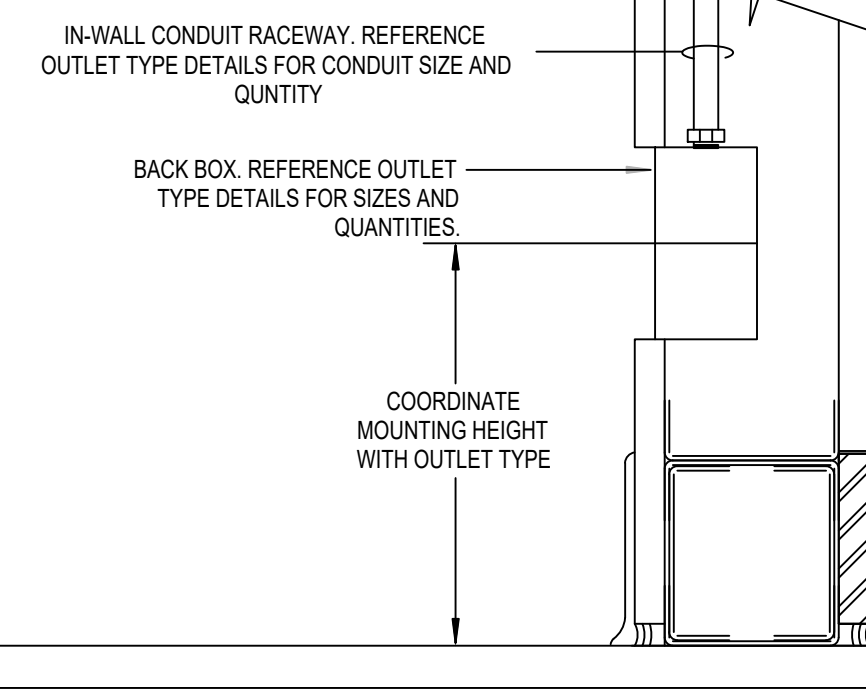
01 LOW VOLTAGE ELEVATION - IN-WALL RACEWAY NOT TO SCALE



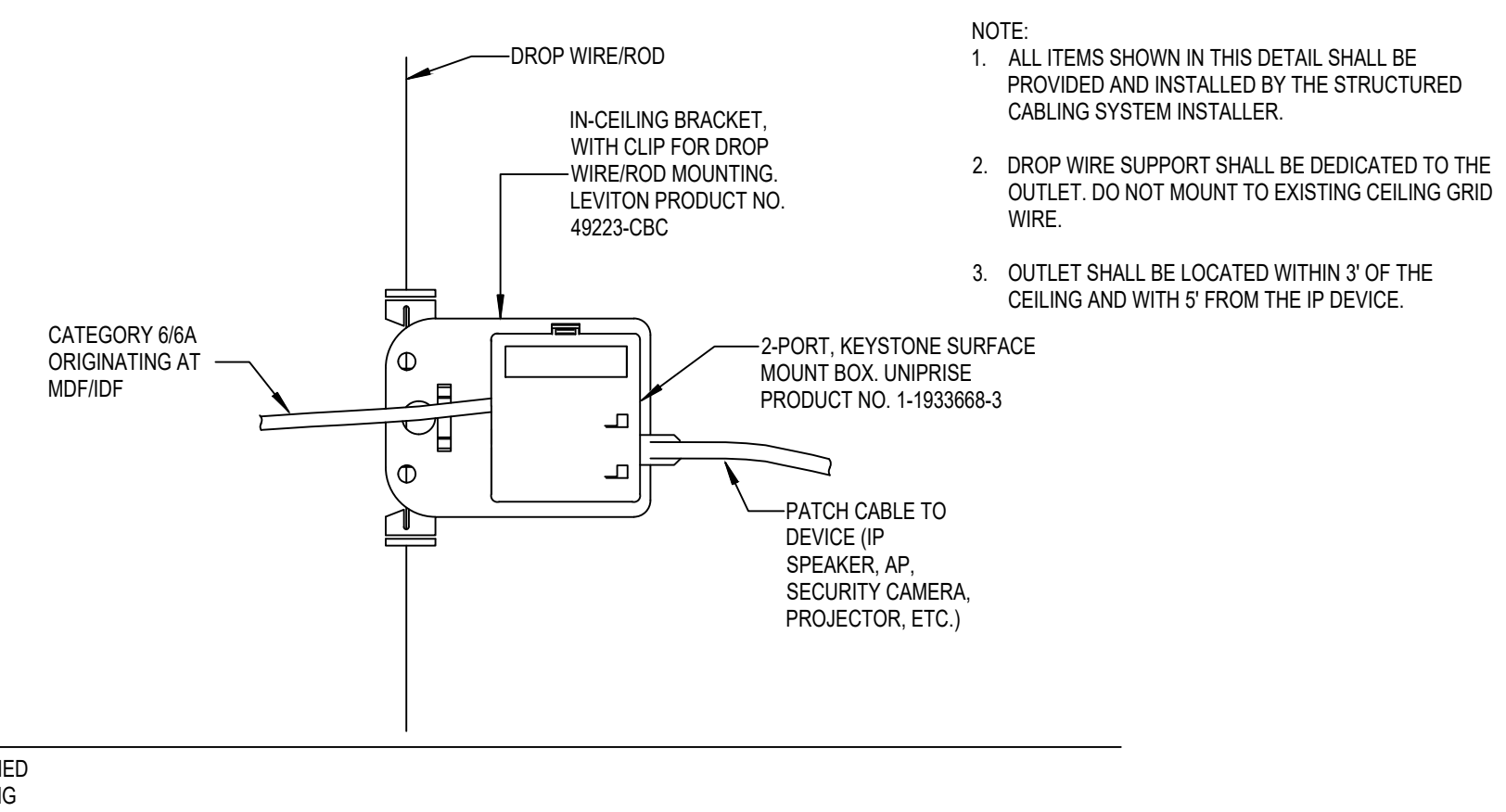
02 RACEWAY DETAIL - TYPICAL VOICE/DATA OUTLET NOT TO SCALE



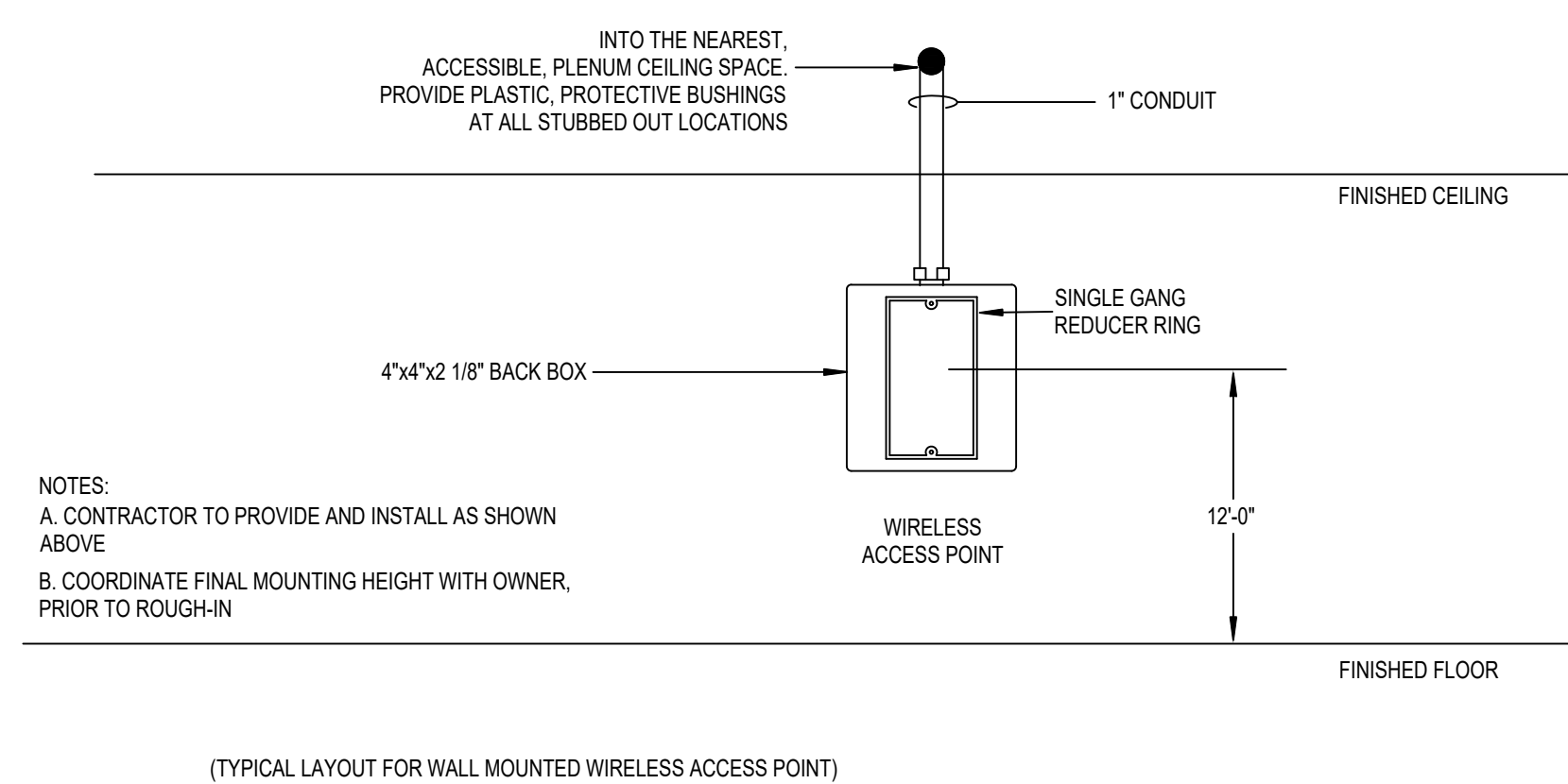
03 RACEWAY DETAIL - WALL MOUNTED DISPLAY NOT TO SCALE



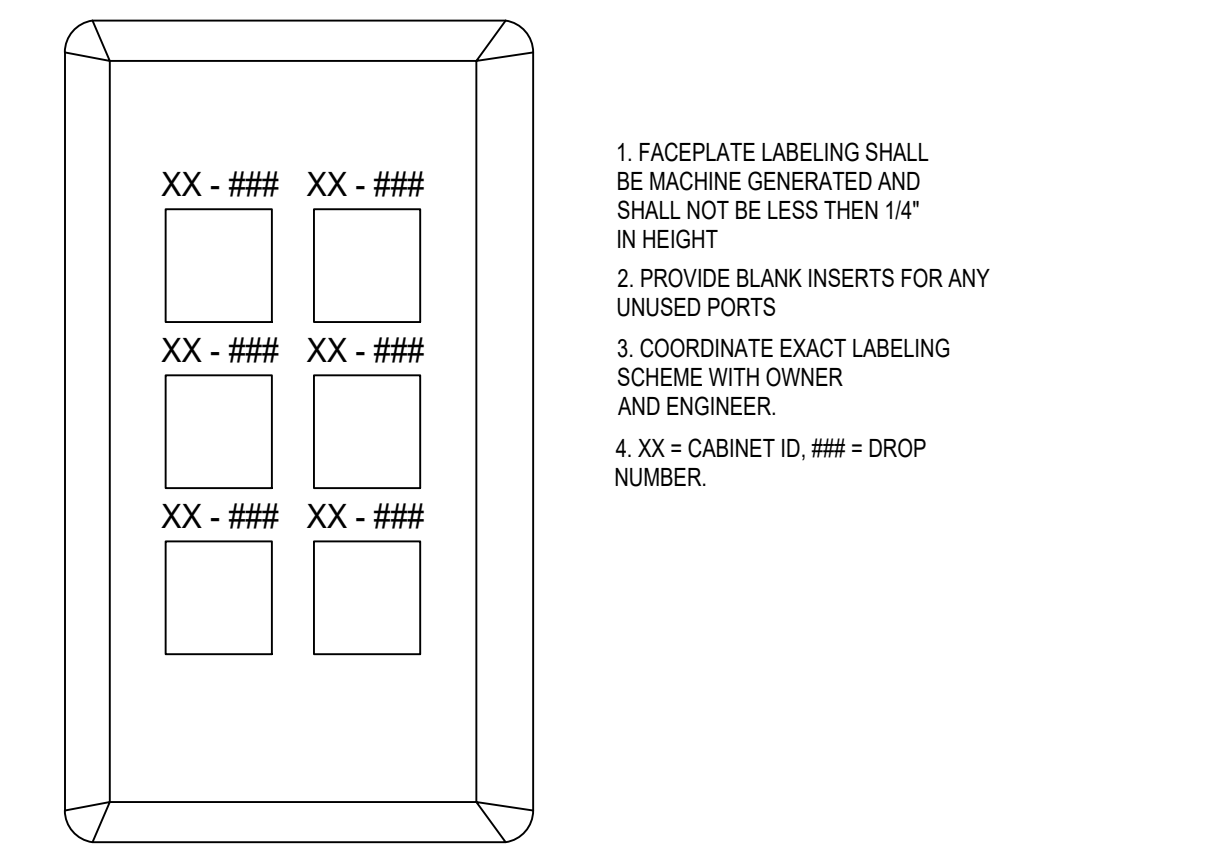
04 SECURITY CONDUIT DOOR JAMB HEADER NOT TO SCALE



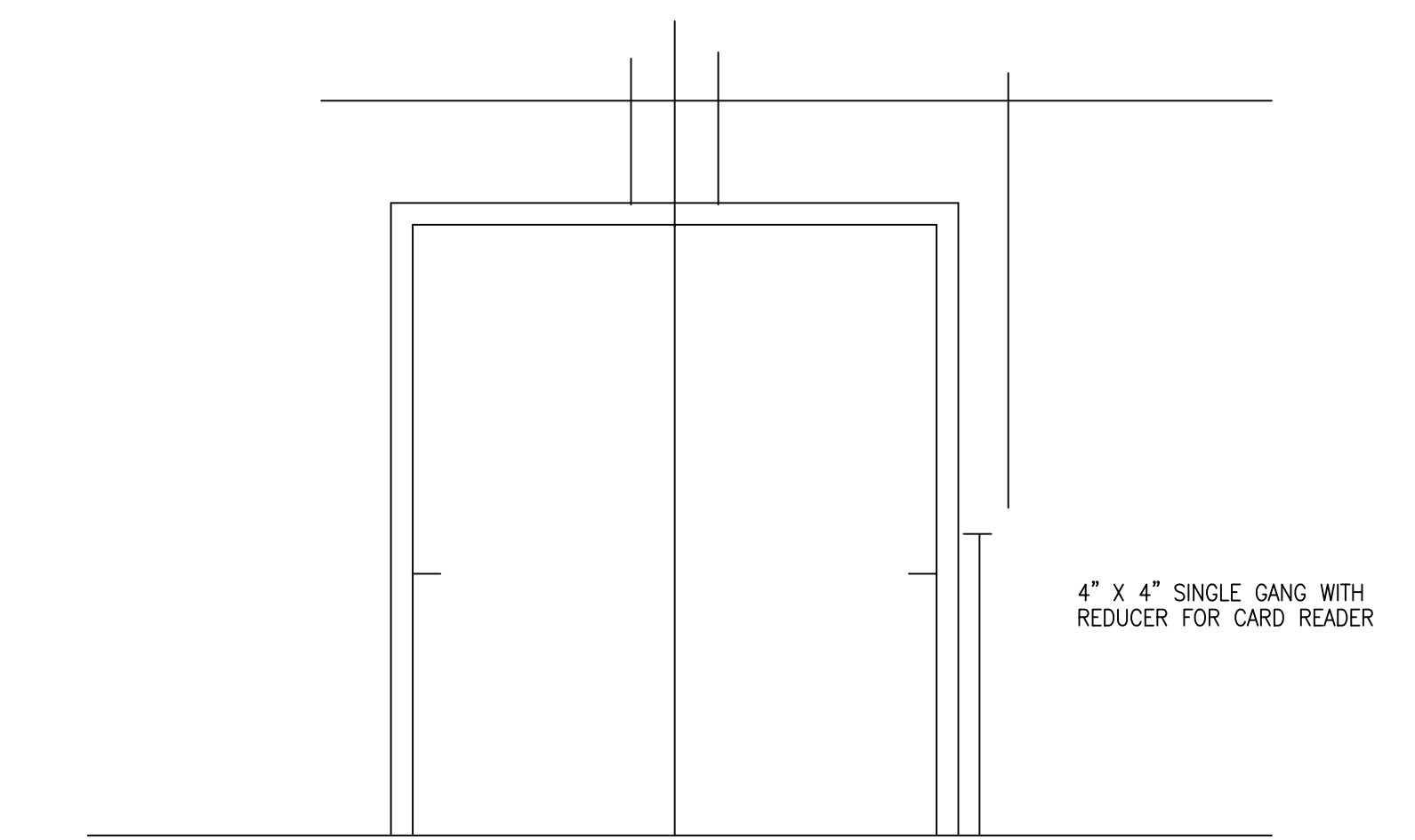
05 ABOVE CEILING STAND ALONE OUTLET NOT TO SCALE



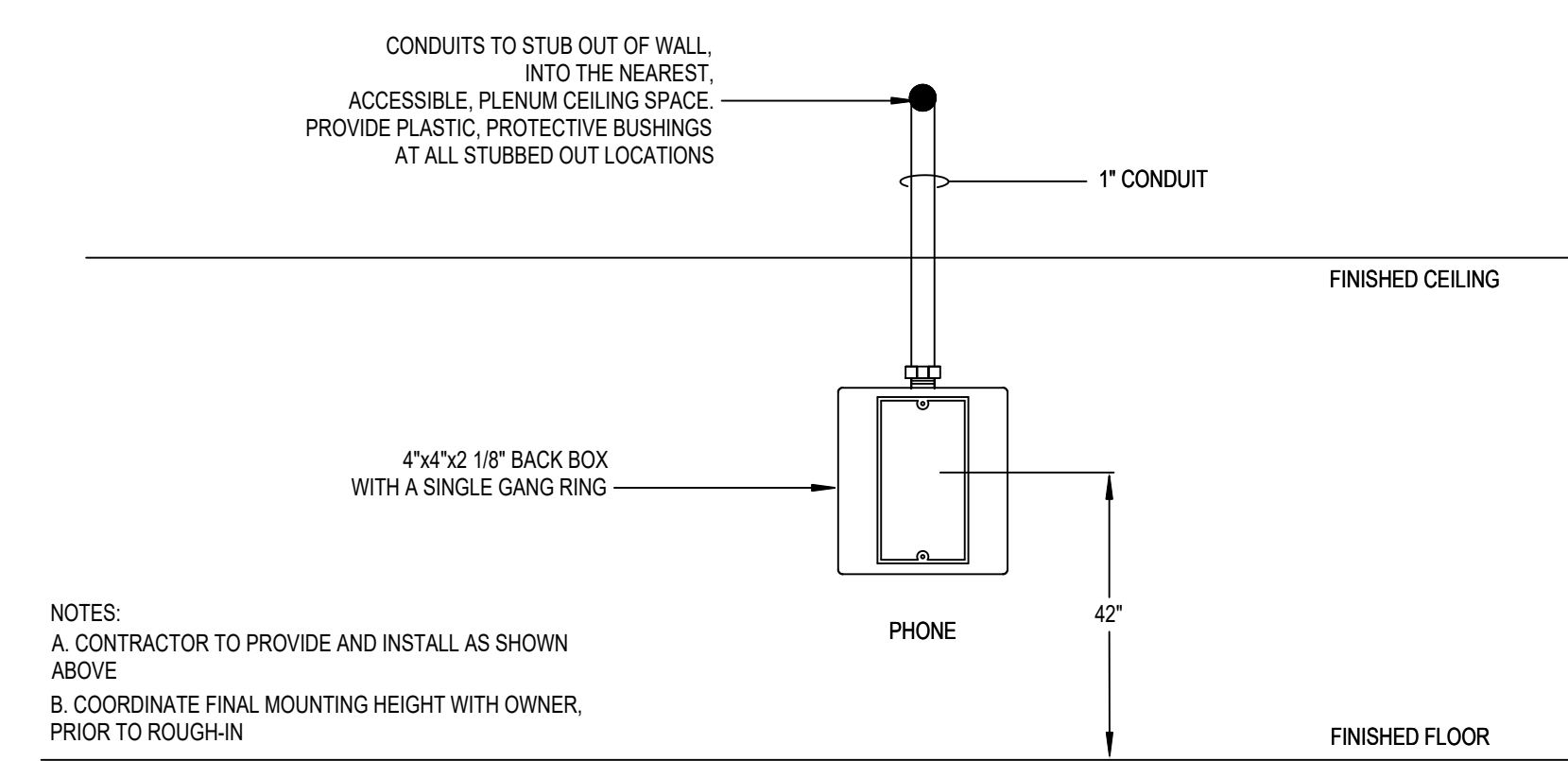
07 RACEWAY DETAIL - WALL MOUNTED WIRELESS AP NOT TO SCALE



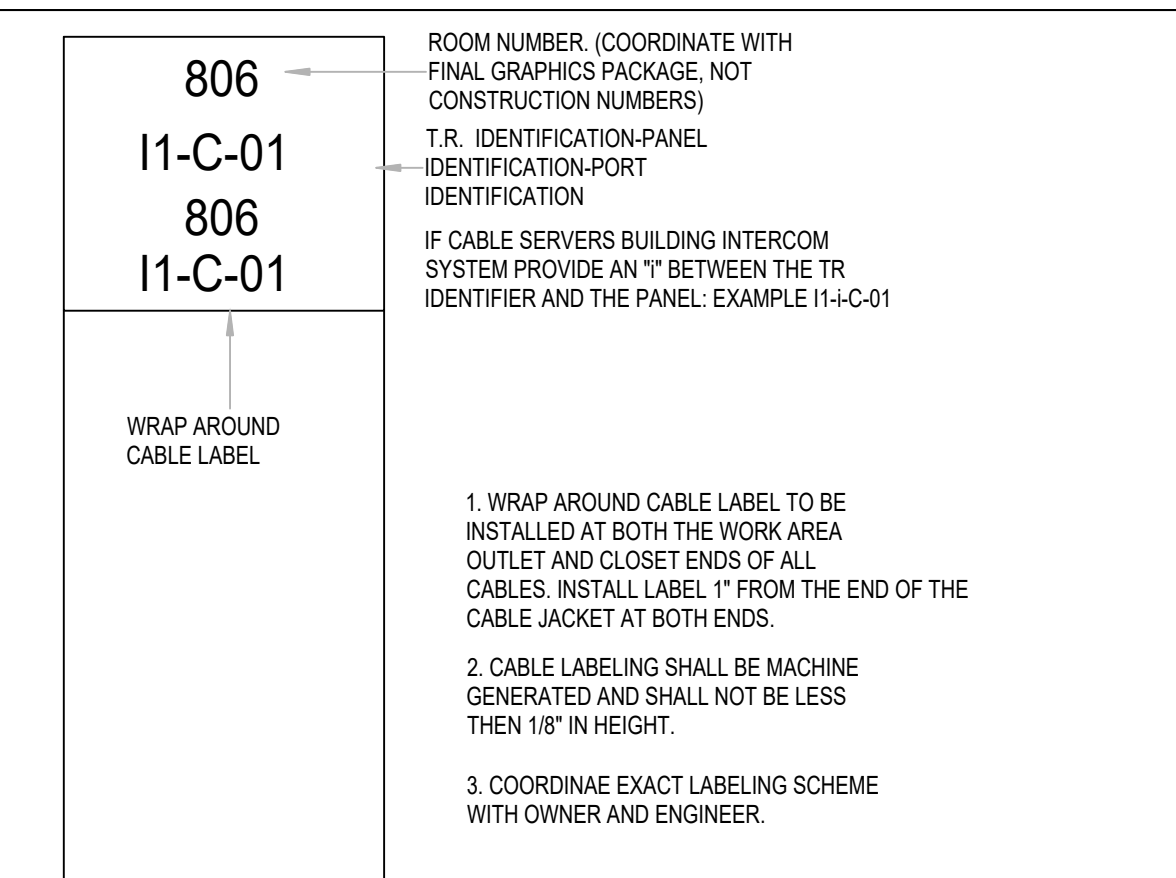
08 FACEPLATE LABEL DETAIL NOT TO SCALE



06 DOUBLE DOOR SECURITY & ACCESS CONTROL



09 RACEWAY DETAIL - WALL MOUNTED TELEPHONE NOT TO SCALE



10 CABLE LABEL DETAIL NOT TO SCALE

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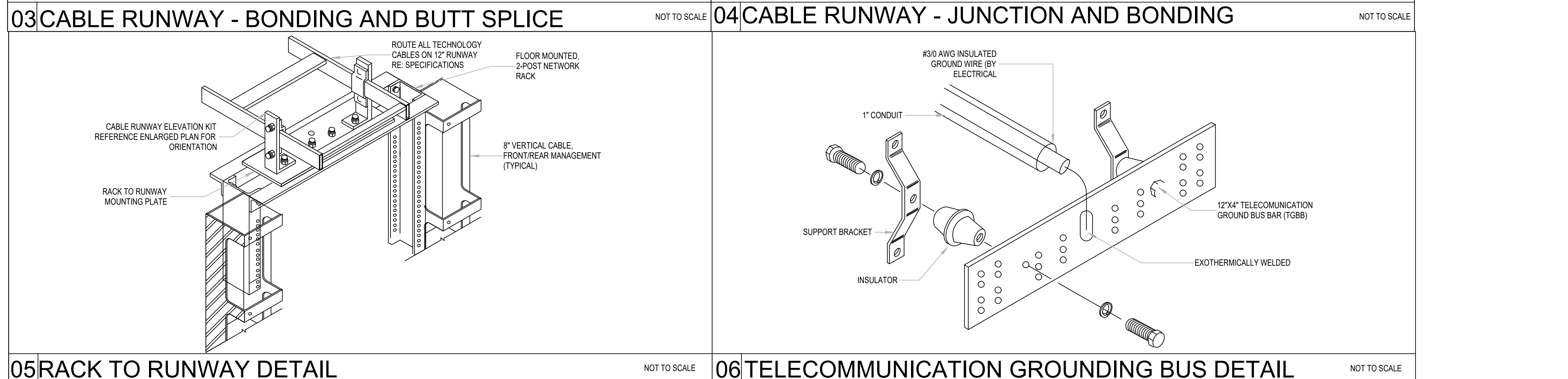
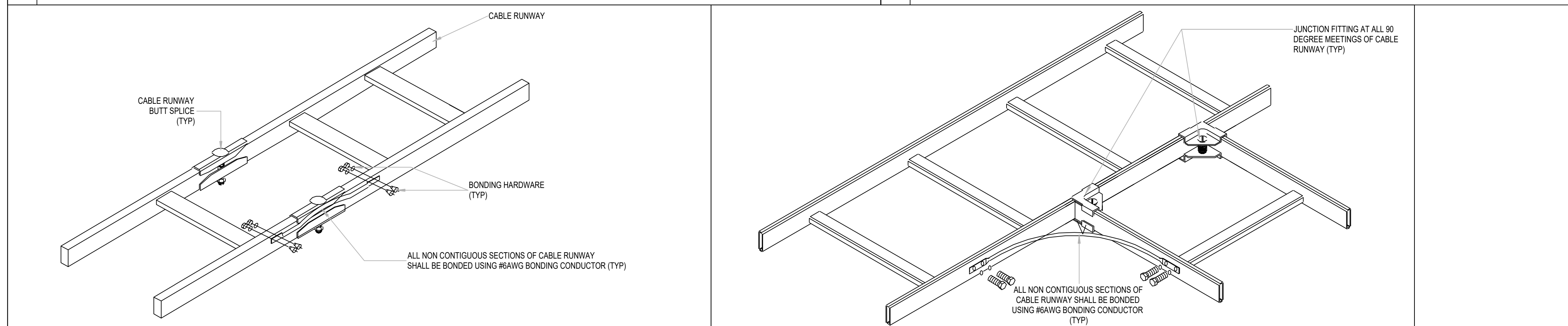
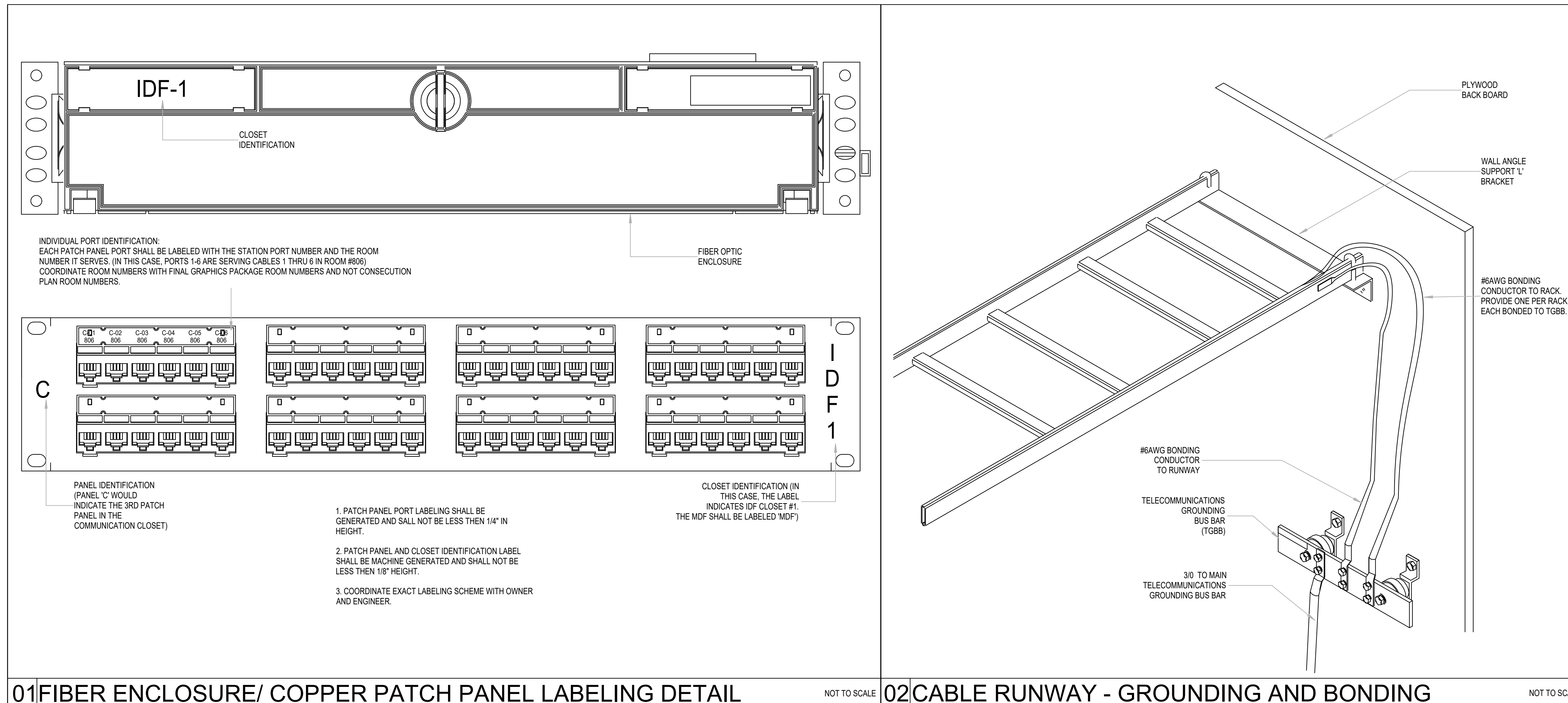
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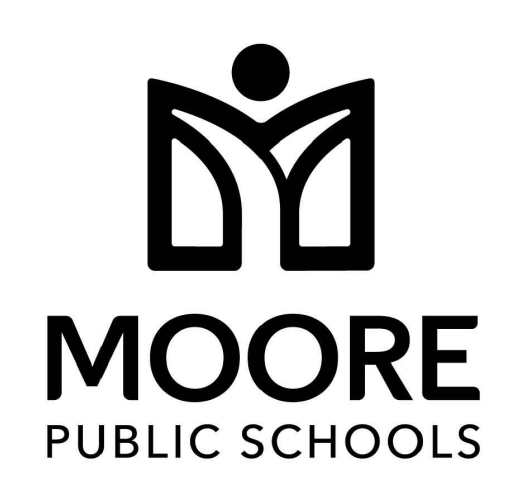


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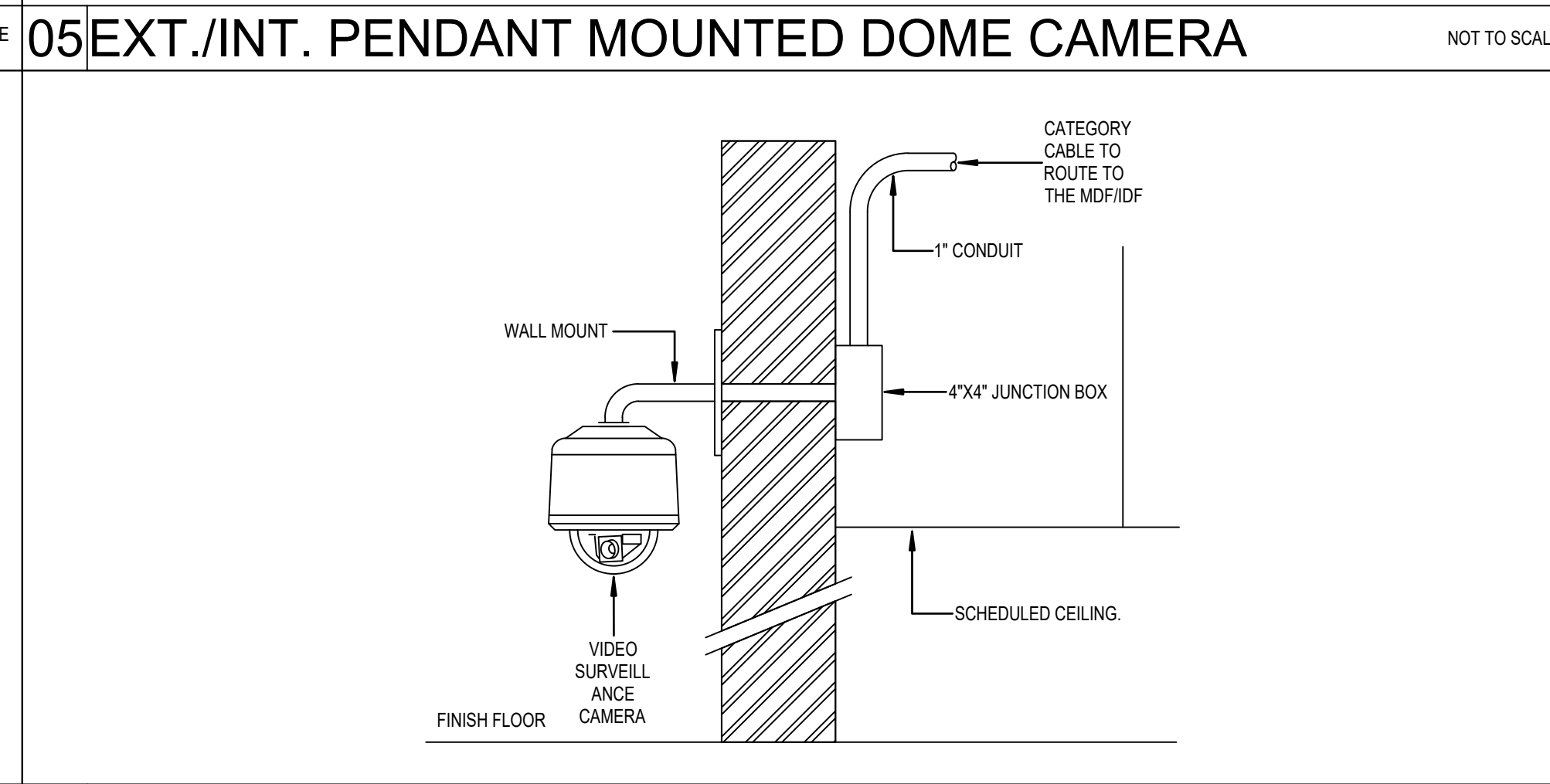
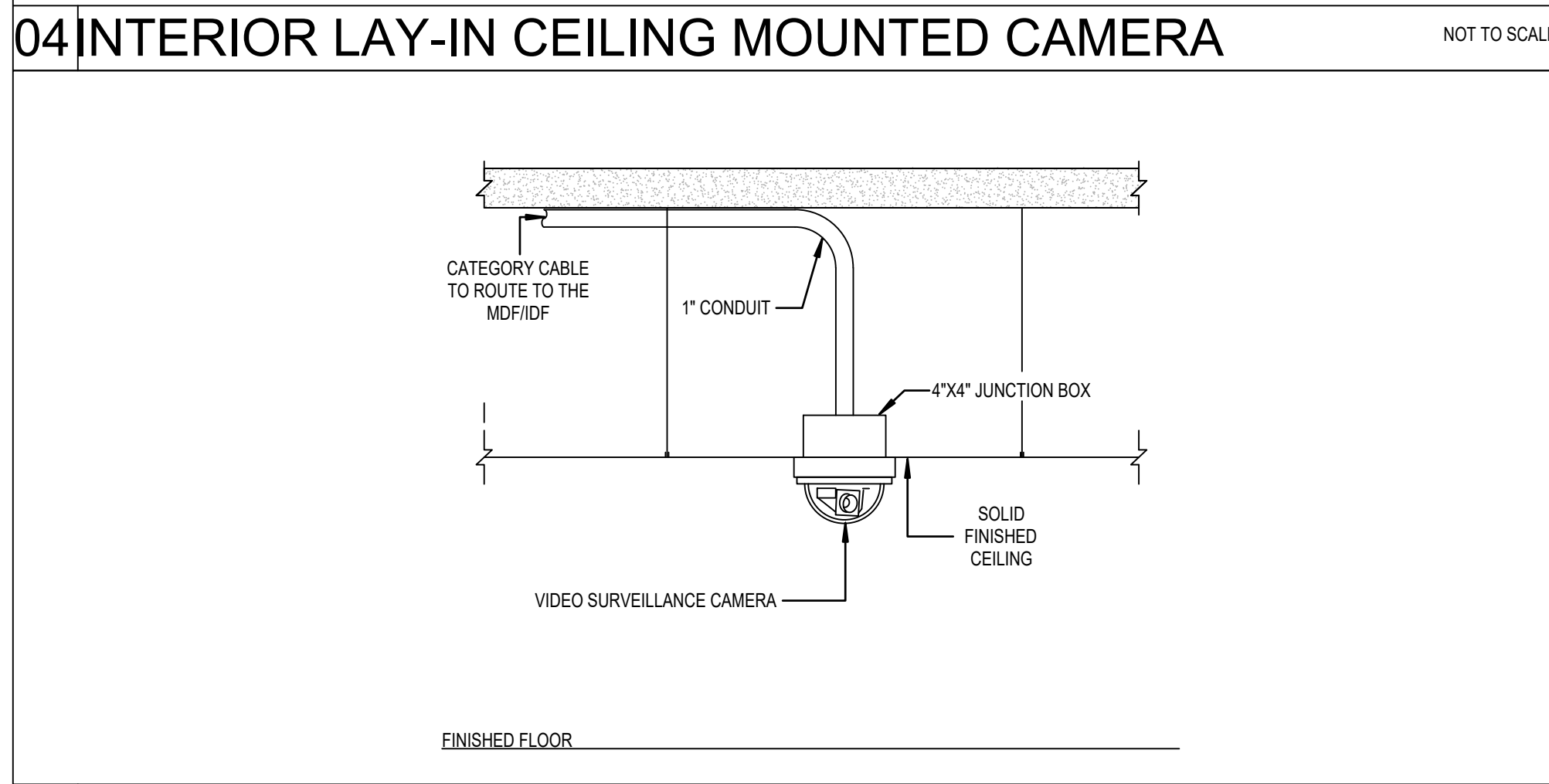
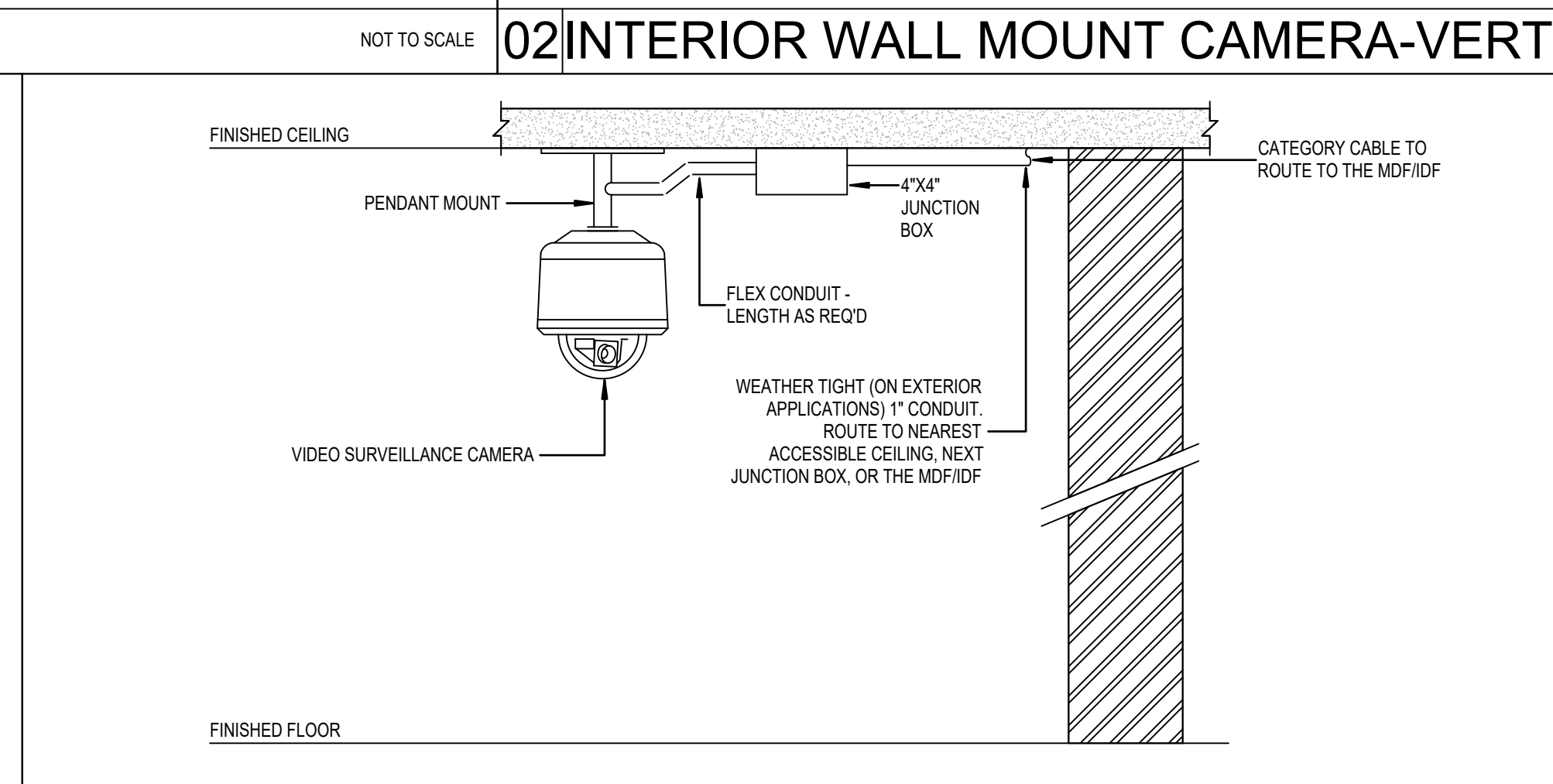
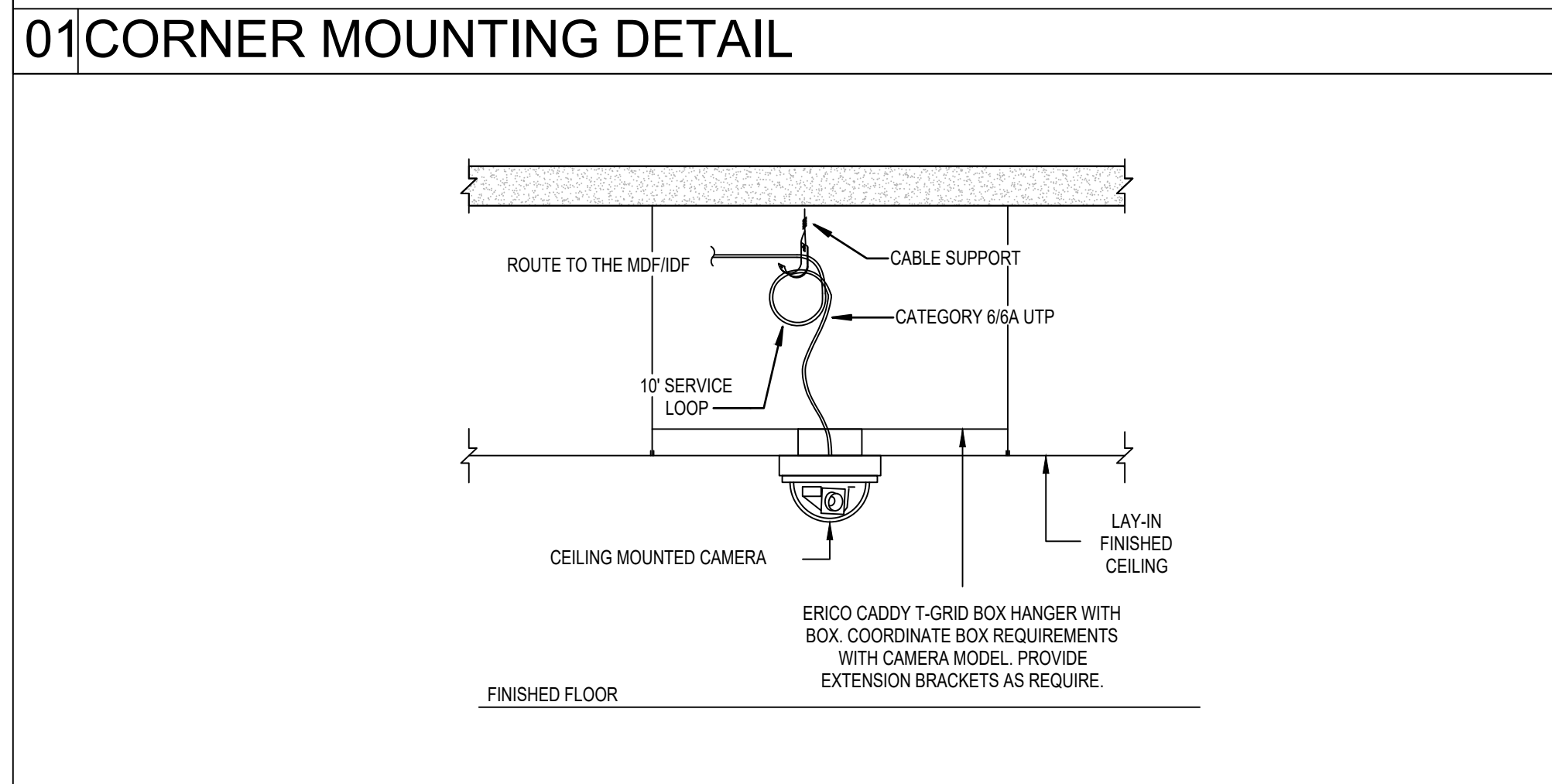
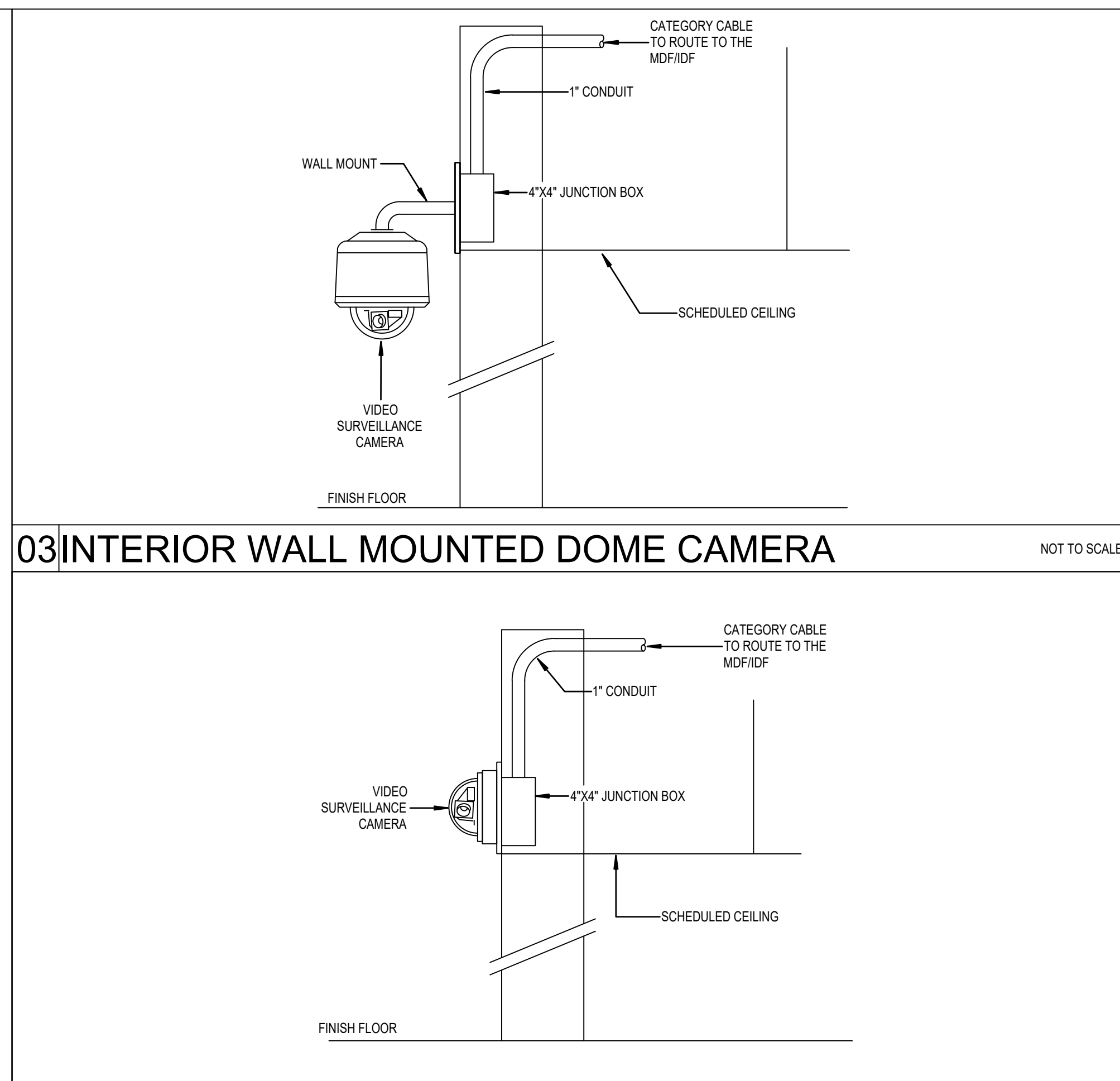
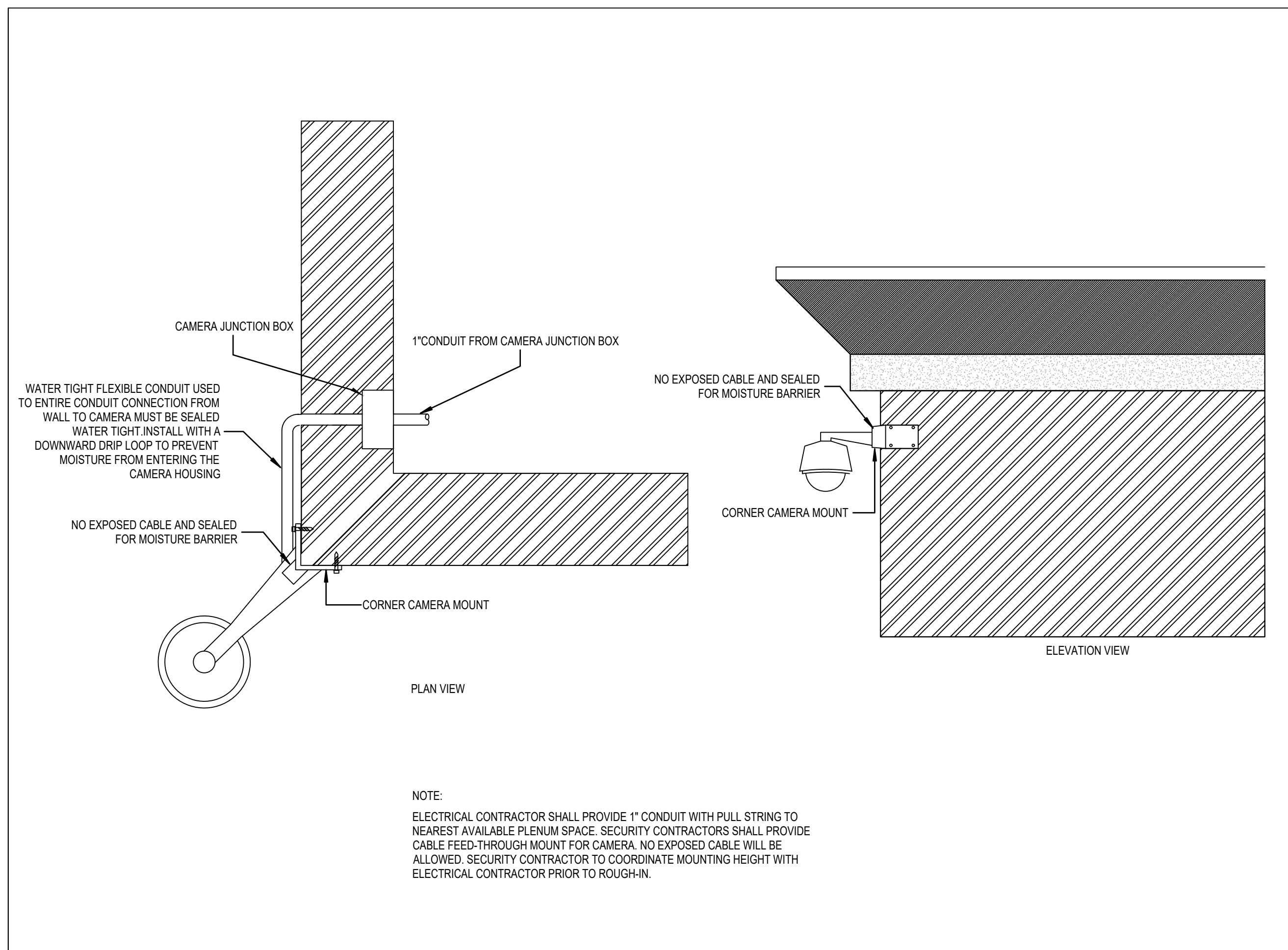
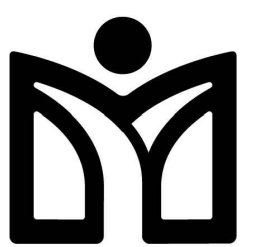


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08 NOTES NOT TO SCALE

GENERAL NOTES:
A. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUITS AND BACK BOXES. CONDUITS SHALL ROUTE TO THE NEAREST, ACCESSIBLE PLENUM SPACE.
B. ALL WALL, CORNER, PENDANT, AND UNDER CANOPY MOUNTING HEIGHTS SHALL BE COORDINATED WITH THE OWNER AND SECURITY CONSULTANT PRIOR TO ROUGH-IN.
C. SECURITY CONTRACTOR SHALL PROVIDE CAMERAS, MOUNTING HARDWARE, AND ANY OTHER COMPONENTS AND/OR HARDWARE REQUIRED FOR A COMPLETE INSTALLATION.
D. REFERENCE FLOOR PLANS, AND SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS.
E. CABLE FEED-THROUGH MOUNT FOR CAMERA. NO EXPOSED CABLE WILL BE ALLOWED. SECURITY CONTRACTOR TO COORDINATE MOUNTING HEIGHT WITH ELECTRICAL CONTRACTOR PRIOR TO ROUGH-IN.

06 EXTERIOR/INTERIOR SOLID CEILING MOUNT CAMERA NOT TO SCALE

07 EXTERIOR WALL MOUNTED DOME CAMERA NOT TO SCALE

08 NOTES NOT TO SCALE

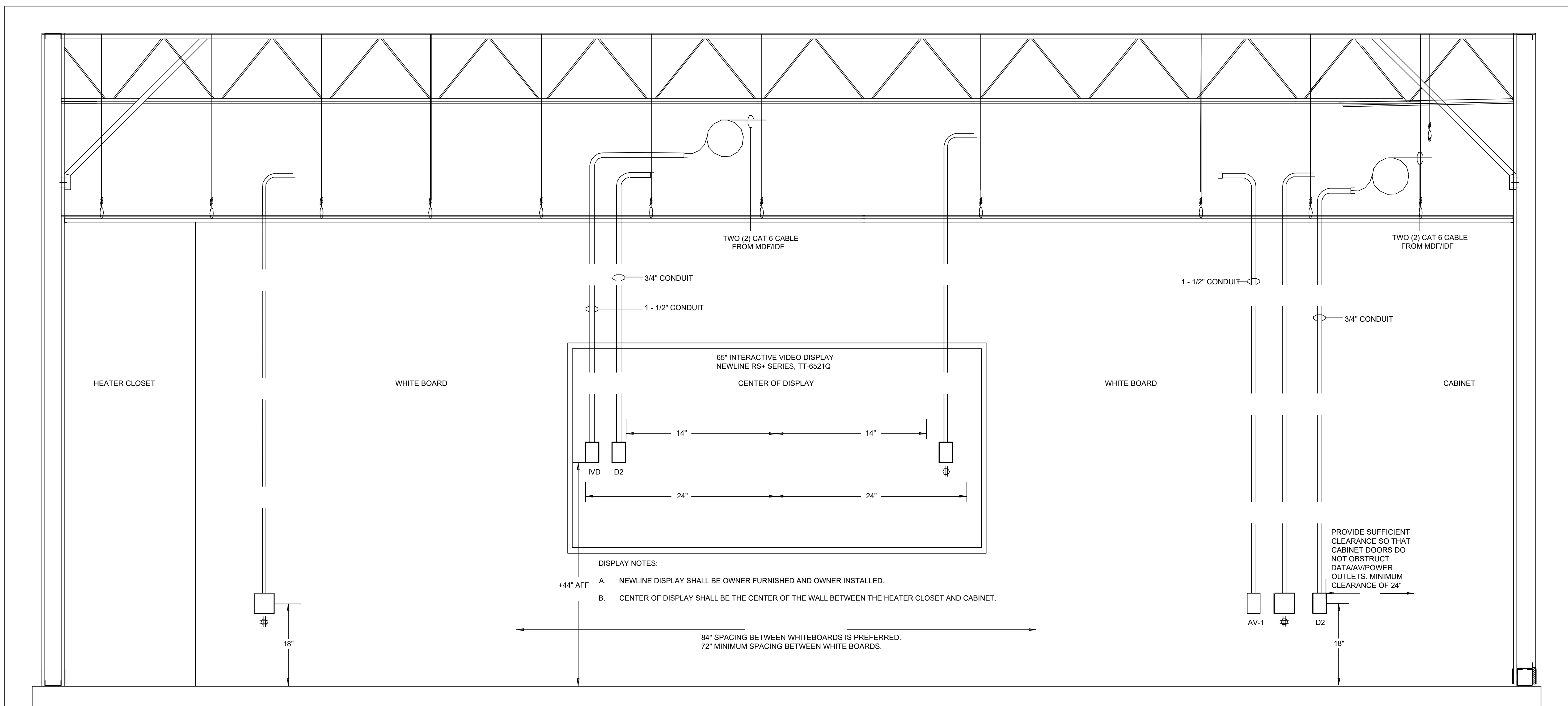
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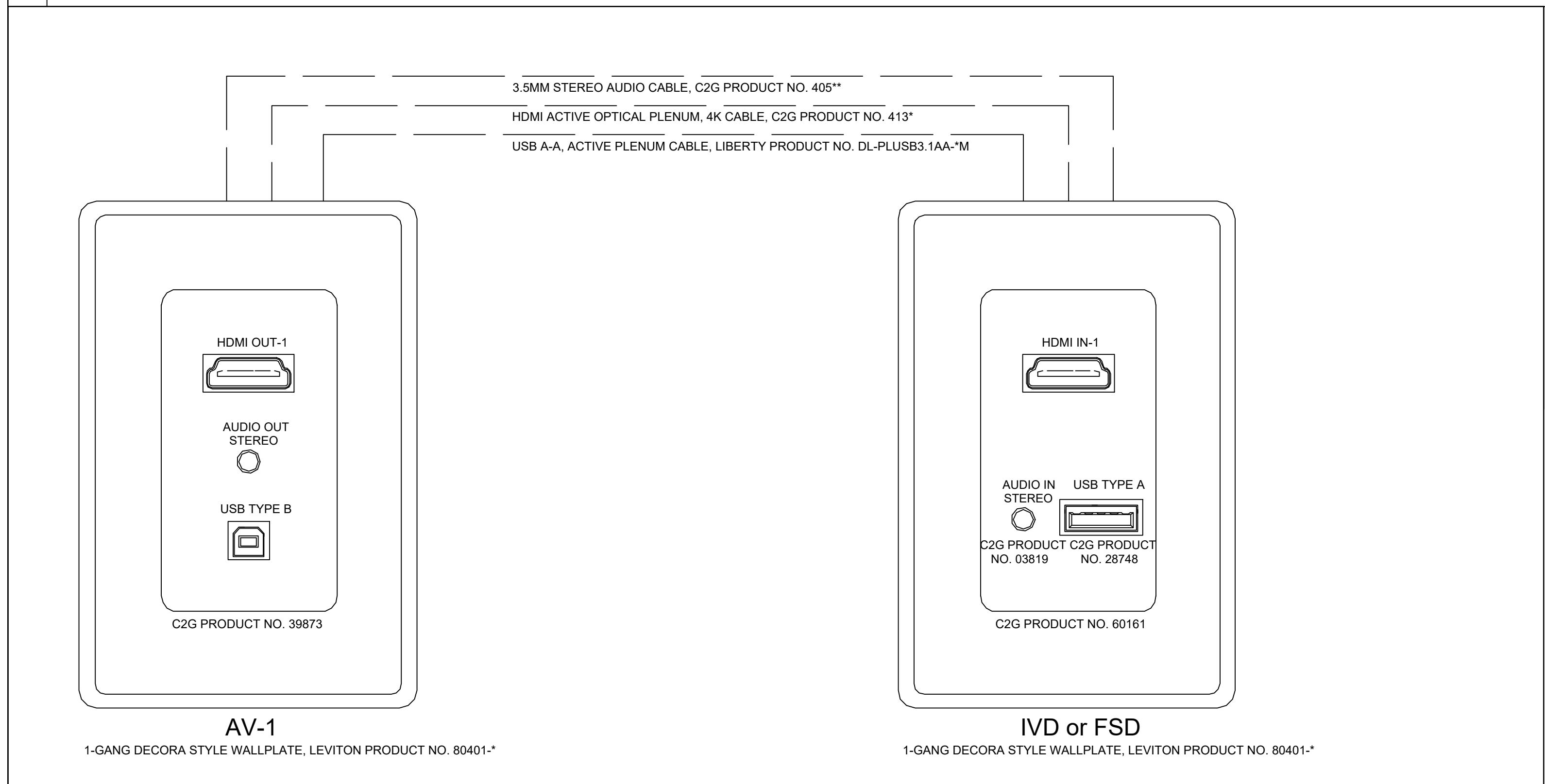
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01 TYPICAL TECHNOLOGY WALL PRESENTATION - ELEMENTARY SCHOOL

NOT TO SCALE



02 TYPICAL 'IVD' 'AV-1' OUTLET DETAIL

NOT TO SCALE

SYSTEMS SPECIFICATIONS

STRUCTURED CABLING									
Horizontal Cabling									
Requirements	<ul style="list-style-type: none"> • Copper cable shall be Category 6 plenum rated cable (blue in Color) for all work station drops. • Copper cable shall be Category 6 plenum rated cable (White in Color) for all Security camera drops. • Copper cable shall be Category 6 plenum rated cable (Yellow in Color) for all Wifi drops. • Approved Category 6 cables are as follows. <table border="1"> <tr> <td>Superior Essex Cat6 Plenum Part #s</td> <td>77-240-2B blue 77-240-4B white 77-240-6B yellow 77-240-5B green</td> </tr> <tr> <td>Mohawk Cat6 Plenum Part #s</td> <td>M58281B Blue M58280B white M58283B yellow M58286B green</td> </tr> <tr> <td>Berk-Tech Cat6 Plenum Part #s</td> <td>10136226 blue 10136230 white 10136749 yellow 10136748 green</td> </tr> <tr> <td>General Cat6 Plenum Part #s</td> <td>7131800 blue 7131841 white 7131802 yellow 7131806 green</td> </tr> </table> 	Superior Essex Cat6 Plenum Part #s	77-240-2B blue 77-240-4B white 77-240-6B yellow 77-240-5B green	Mohawk Cat6 Plenum Part #s	M58281B Blue M58280B white M58283B yellow M58286B green	Berk-Tech Cat6 Plenum Part #s	10136226 blue 10136230 white 10136749 yellow 10136748 green	General Cat6 Plenum Part #s	7131800 blue 7131841 white 7131802 yellow 7131806 green
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General Cat6 Plenum Part #s	7131800 blue 7131841 white 7131802 yellow 7131806 green								
<ul style="list-style-type: none"> • Connector shall be Leviton part # 61110-RO6 eXtreme 6 connector for all workstation drops. • Connector shall be Leviton part # 61110-RW6 eXtreme 6 connector for all Security camera drops. • Connector shall be Leviton part # 61110-RV6 eXtreme 6 connector for all Wifi drops. • Contractor shall provide Moore Public Schools, Technology Department, one 5' category 6 patch cord, (blue in color) for each category 6 work station cable installed. To be installed by contractor at the network cabinet. • Contractor shall provide Moore Public Schools, Technology Department, one 10' category 6 patch cord, (blue in color) for each category 6 work station cable installed. Leave in box at network cabinet. To be installed by MPS Technology Dept. • Contractor shall provide Moore Public Schools, Technology Department, one 5' category 6 patch cord, (White in color) for each category 6 Security Camera cable installed. To be installed by contractor at the network cabinet. • Contractor shall provide Moore Public Schools, Technology Department, one 10' category 6 patch cord, (White in color) for each category 6 Security Camera cable installed. Leave in box at network cabinet. To be installed by MPS Technology Dept. • Contractor shall provide Moore Public Schools, Technology Department, one 5' category 6 patch cord, (Yellow in color) for each category 6 Wifi cable installed. To be installed by contractor at the network cabinet. • Contractor shall provide Moore Public Schools, Technology Department, one 10' category 6 patch cord, (Yellow in color) for each category 6 Wifi cable installed. Leave in box at network cabinet. To be installed by MPS Technology Dept. • Each cable shall be terminated on the patch panel in data closets. • All Category 6 connectors shall be placed into QuickPort faceplates at the workstation end. • Faceplate shall be Leviton part # 41080-6wp • No substitutions. 	<ul style="list-style-type: none"> • Ensure pulling tensions of cables are not exceeded. • Maintain proper cable bend radius of 4 times the cable's outer diameter during placement. • No splices are permitted. • No link shall exceed 90 meters. Contractor is responsible for verifying proper footages. • Pull one additional "Mule Tape" or ¼" Nylon rope when pulling cables through any conduit utilizing existing pull string. • Mule Tape or Nylon rope is to be pulled into conduit separately and after all other cables have been installed. • Install sleeves when puncturing walls. • Cable shall not be installed between cinder block walls and roof decking. • Cable shall not be installed between red iron and roof decking. • Firestop all sleeves and conduit openings after cable installation. • Terminate all pairs and conductors at all ends according to manufacturer's instructions following color code sequence. • No splices are permitted in any fiber optic cable except when terminating connectors • Terminate all Fiber pairs. • All optical fiber cable shall be installed in the fiber panels in accordance with the manufacturer's instructions. • Optical fiber Back bone cable length shall not exceed 300 meters. • Copper backbone cable length shall not exceed 90 meters. • All back bone cables (Fiber and Copper) shall have 20' of slack at both ends. • Coming rack mount fiber patch panels are to be used where applicable. • Outdoor rated fiber will be used for all outdoor fiber runs. • Stress relief cable and the appropriate building fastener will be used on all aerial runs. • All aerial cables will be fastened to the stress relief cables. • 3" conduit is to be used for all buried runs, accessible at each end, with a pull string inside. • A trace wire and warning tape will be buried with all buried runs • All bends in conduit will be made with sweeps. • Back bone cabling shall utilize a star topology with no more than 2 levels of backbone. • Utilize Velcro ONLY in all closets. • Install all components in a neat and workmanlike manner. • Install all horizontal cables and termination frames in accordance with manufacturer's recommendations. 								

Communications Backbone Cabling	
Requirements - Optical fiber	<ul style="list-style-type: none"> • 1 Optical fiber cable shall be run from the MDF to each IDF. • Fiber shall be terminated with LC connectors. • Optical fiber cable shall be plenum rated Laser Optimized 50 micron Multi Mode distribution fiber. • Optical fiber cable shall be an OM3 rated cable guaranteed to support 10 Gigabit Ethernet for 300 meters using 850 nm wavelength. • Optical fiber cable shall have 24 strands using industry standard color coding. • Optical fiber cable shall have a flame retardant and low smoke FEP jacket. • Optical fiber cable shall support 10GBase-SX applications for the life of the system. • Optical fiber cable shall be armor jacketed or protected inside plenum rated plastic inner duct orange or aqua in color.
Requirements - Copper backbone	<ul style="list-style-type: none"> • 6 Cat 6 cables shall be run from the MDF to each IDF. • 3 Cat 6 cables shall be run from the phone Dmark to the MDF. • Copper cable shall be Category 6 cable. Green in color • Connector shall be Leviton part # 61110-RV6 eXtreme 6 connector. • Each cable shall be terminated on the patch panel in data closets. • Each cable end shall be terminated using the T568B pin/pair assignment. • No substitutions.
Cable Installation	<ul style="list-style-type: none"> • Properly support horizontal cables in ceiling every 4'-5' using J-Hooks or cable tray only. (no slings, pouches, or D rings.) • Place horizontal cables in pathways and spaces dedicated for communications cables. No pathways shall be in or above the red iron. Data cable will be run in separate pathways from all other cables. • Provide 30' of slack at station end in ceiling and not inside wall. • Slack shall be rolled neatly in a 2' loop and hanging from a J-hook in ceiling above drop location. • Cat 6 data cables are to be terminated using the T568B standard. • Leviton face plates that support 6 snap in jacks will be used with Leviton snap in blanks in unused slots. • Ensure terminations are at 180 degrees to the jack with no more than ¼" un-twisting and no more than ½" un-jacketing and are in accordance with manufacturer's recommendations. • Ensure terminations have no un-twisting and that tower separators are utilized to separate pairs.

Communications Equipment Room Fittings	
Equipment rack	<ul style="list-style-type: none"> • Free standing equipment rack shall be Chatsworth #55053-703. • Free standing racks shall be sized to accept 19" spaced equipment and handle a total weight load of 1, 000 pounds. • Free standing racks shall have 3" side rails tapped on both sides with universal hole patterns for threaded 12-24 screws. • No substitutions.
Copper Patch panels	<ul style="list-style-type: none"> • Patch panel shall be a Leviton #49255-H24 Quick Port 110 panel with cable management bar. • Patch panel shall have 24 ports taking up 1 rack mount unit. • No substitutions.
Horizontal cable management	<ul style="list-style-type: none"> • Horizontal cable manager shall be a 2 RU Chatsworth part #30130-719. • No substitutions.
Vertical cable management	<ul style="list-style-type: none"> • Vertical cable manager shall be Chatsworth part #30095-703. • No substitutions.
Optical fiber patch panel / enclosure	<ul style="list-style-type: none"> • Optical fiber enclosure shall be Coming LC loaded rack mount panel.

Ladder racking	<ul style="list-style-type: none"> • No substitutions. • Ladder racking shall be Chatsworth #10250-718. • The appropriate Chatsworth mounting hardware shall be used. • No substitutions.
Power protection power strips	<ul style="list-style-type: none"> • PDU's are to be placed in all data racks. • PDU shall have overload protection and easy to reset circuit breaker. • PDU shall be rack mountable. • PDU shall be constructed from 18 AWG steel. • PDU shall have light emitting diodes to indicate "Power On" and "Ground/Polarity OK" feature. • PDU shall be rated for 20 Amps and have a 12' L5-20P plug and ten 5-20R receptacles. • No substitutions.
Free standing racks	<ul style="list-style-type: none"> • Assemble free standing racks according to manufacturer's instructions. Verify that equipment mounting rails are sized properly for rack-mount equipment before attaching the rack to the floor. • All racks must be attached to the floor in four places using appropriate floor mounting anchors. When placed over a raised floor, threaded rods should pass through the raised floor tile and be secured in the structural floor below. • All rack must be secured to the adjacent wall using ladder rack to stabilize the top of the rack and provide a cable pathway from the ceiling to the racks. • Racks shall be grounded to the telecommunications bus bar using #6 AWG green insulated solid copper wire and any necessary attachment hardware provided by the Communications Contractor. • Mount rack mount power strips on rack where active equipment will be placed.
Ladder rack	<ul style="list-style-type: none"> • Ladder rack shall be attached to the top of the rack to deliver cables to the rack. The rack should not be drilled to attach ladder rack. Use appropriate hardware from the ladder rack manufacturer. • Ladder racking shall be supported every 5' with 3/8" threaded rod anchored and secured to permanent ceiling structure. • Loading of cable rack shall not exceed 6" depth and should have retainers every 12" to prevent cables from spilling over the sides. • Where ladder racking butts up against wall the appropriately sized wall mount bracket shall be utilized. • Ladder rack shall extend vertically up wall and through drop ceiling to gain access to cavity above drop ceiling. • Ladder racking shall utilize all appropriate radius drop stringers, corner bends and other devices to maintain cable bend radius when entering and exiting racks, cabinets and drop ceilings • Mating pieces of ladder racking together shall utilize appropriate butt splice and junction splice kits. • All cut and exposed sharp ends shall utilize a plastic end cap to prevent injury.
Cable management	<ul style="list-style-type: none"> • Vertical cable manager shall be installed on every rack vertical rail. Where two rack rails will be butted together there shall be two vertical wire managers between the racks. • Horizontal wire managers shall be utilized above and below every copper and fiber patch panel. • All cables shall sweep in and out of any cable management product without a deformation of cable jacket. • Ensure cables are properly supported when using cable management to ensure cables do not sag. • Utilize Velcro ONLY for securing of cables on cable management.
Copper and Fiber patching panels	<ul style="list-style-type: none"> • Route all cables to backside of termination panels in an asymmetrical orientation to ensure cable bundles are split evenly. • Utilize rear wire management bars for supporting cables into point of termination. • Secure all cables on all panels using Velcro ONLY to prevent cables from pulling away.
End of Section	
Quality Assurance	<ul style="list-style-type: none"> • Install all components as directed by Manufacturer's installation guidelines. • All products shall bear the mark of UL or ETL for performance level. • System installation shall meet all applicable Local/State codes and safety requirements where project is located. • All products shall be new and un-used in original packaging. • Follow and adhere to installation practices specified by the applicable Telecommunications Industry Association standards. • Follow and adhere to installation practices specified by BICSI Information Transport System Installation. • Follow and adhere to installation practices specified by BICSI Telecommunications Distribution Methods. • Follow and adhere to installation practices specified by NFPA-70 National Electric Code. • Follow and adhere to installation practices specified by the Manufacturers. • Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative. • Contractor shall replace all defective components.
Bidder/Installer Qualifications	<ul style="list-style-type: none"> • Bidding Contractor shall be a licensed to install telecommunications systems in the state where work will be performed. • Bidding Contractor shall be Leviton certified for at least one year • Bidding Contractor shall have a minimum of 5 years experience installing structured cabling for telecommunications. • Bidding Contractor shall have the capability to bond project in its entirety. • Bidding Contractor shall be able to provide insurance at the request of the owner. • Installer shall have an onsite supervisor and one technician who are certified by the Manufacturer to install the Manufacturer's telecommunications products. • Communications Contractor shall have an RCDD on staff for at least one year, to certify that the Communications System can support the required applications on the various cabling media.

Delivery, Storage, and Protection	<ul style="list-style-type: none"> • Installer shall have obtained Leviton certification from the Manufacturer within 1 year prior to performing the Work. • Communications Contractor shall ensure that materials delivery to work area shall be coordinated with construction site manager responsible for materials distribution to all trades. • Communications Contractor is responsible for all materials, tools and vehicles left on the job site. • Communications Contractor shall coordinate a disposal bin for the removal of all trash produced by the Communications Contractor personnel during the project. • Communications Contractor shall ensure materials are stored in an environmental area where: <ul style="list-style-type: none"> • Temperature does not exceed 120 degrees Fahrenheit nor below 32 degrees Fahrenheit. • Humidity does not exceed 80 %. • No direct exposure to sunlight. • Follow Manufacturer's recommendations for handling of materials.
Warranty	<ul style="list-style-type: none"> • Communications Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure. • Communications Contractor shall execute a Lifetime Applications Assurance Warranty for parts and labor to support stated applications from the connectivity Manufacturer.
End of Section	

Moore Public Schools Intercom System Specifications	
Part 1 - Equipment	
1.01 System Manufacture	
<ul style="list-style-type: none"> • Intercom System Manufacturer shall be Telecor or Rauland Telecenter U IP. (Match existing system) • Cable Manufacturer shall be Belden or Equivalent 	
Locations where Telecor equipment is required. It may be purchased from the following authorized Telecor dealers Advanced Cabling, Inc - 405-418-4322 High-Tech Tronics, Inc - 405-495-0215	
Locations where TelecenterU equipment is required. It may be purchased from the following authorized TelecenterU dealer Endex of Oklahoma Inc - 405-602-0001	
1.02 Intercom Systems Equipment	
1.02.a Telecor Intercom Equipment	
<ul style="list-style-type: none"> • Intercom call in button shall be momentary close and compatible with existing intercom system. • Intercom ceiling speakers shall be Manufacture Clarity Model # S-522. (Or equivalent approved by MPS must have volume control accessible from the floor) • Intercom outside paging horn shall be Manufacture Rauland Borg 3601. (Or equivalent approved by MPS) • Locations where Telecor equipment is required. It may be purchased from the following authorized Telecor dealers Advanced Cabling, Inc - 405-418-4322 High-Tech Tronics, Inc - 405-495-0215 	
1.02.b Rauland Telecenter U IP Intercom Systems Equipment	
<ul style="list-style-type: none"> • Classroom Intercom Equipment • Call button shall be Part # 603302 Dual Level call switch. • Ceiling speakers shall be Part # BAFKIT2X2L8RJ - 8 Ohm ceiling tile replacement speaker with RJ45 connector. • IP Classroom Module shall be TCC2011 IP Module (*Module required for each classroom, *Requires POE network drop) • Hallway/Commons/Outside Intercom Equipment • TCC2022-IP Zone page module (*Requires POE network drop) • Appropriate size amp for quantity of speakers. • BAFKIT2X2L- 25 volt ceiling tile replacement paging speaker (For all classroom & hallway locations) • Rauland Borg 3601 - Loud paging horn (For all outside & large area locations such as gymnasiums, etc.) • Rauland status light shall be part # TCC2088 • Rauland status light trim ring shall be part # TCC2986 	
Locations where TelecenterU equipment is required. It may be purchased from the following authorized TelecenterU dealer Endex of Oklahoma Inc - 405-602-0001	
End of Section	
Part 2 - Installation	
2.01 Systems Installation	
<ul style="list-style-type: none"> • All non-IP cabling shall be shielded and have a minimum of 5 conductors. • All network IP cabling shall be Cat6 & Purple in color (See Structured Cabling System Specifications for cabling information) • Each room with a call button shall have a status light mounted above the room door on the hallway side. (Rauland Telecenter U IP sites only) • All circuits and cabling shall be labeled at all terminating ends. • All Ceiling mounted devices shall be mounted on non-stainable ceiling tiles • All devices shall be mounted according to the manufacturer's specifications. • All devices shall be properly adjusted and tested prior to job completion. • All non-IP room circuits shall run from the intercom system to the call button then to the room speaker. • All extra speaker wire taps shall be insulated. • All rooms shall be individually wired and terminated at the intercom system on individual points. (No Doubling) • All rooms shall be tested to verify proper room number programming and operation. • All call buttons shall be labeled with their corresponding system point number. • Protective grommets shall be installed on all conduits to protect wire. • All wire shall be run in J hooks above ceiling with a minimum space of 4" from ceiling deck. All wire shall be in separate pathways 6" from other system wiring. No wire ties allowed. No wire shall be run between the red iron and roof deck. • All wire run between building shall be in conduit and shall be direct burial cable. It shall be a minimum of 5 conductor 18 AWG copper. Lighting suppression shall be installed at entry points. • Installer shall supply the electrical and or masonry contractors with specialty back boxes and coordinate with them to ensure that all necessary conduits, back boxes, etc. are installed in the proper locations. • Follow and adhere to installation practices specified by NFPA-70 National Electric Code, Edition 2008. • Follow and adhere to installation practices specified by the Manufacturers. 	
2.02 Quality Assurance	
<ul style="list-style-type: none"> • Install all components as directed by Manufacturer's installation guidelines. • All products shall bear the mark of UL or ETL for performance level. • System installation shall meet all applicable Local/State codes and safety requirements where project is located. • All products shall be new and un-used in original packaging. • Follow and adhere to installation practices specified by the Manufacturers. • Bidding contractor shall have a minimum of 5 years experience installing school intercom • Bidding contractor shall be able to provide insurance at the request of the owner. 	
2.03 Bidder/Installer Qualifications	
<ul style="list-style-type: none"> • Bidding contractor shall have a minimum of 5 years experience installing school intercom • Bidding contractor shall be able to provide insurance at the request of the owner. 	
2.04 Delivery, Storage, and Protection	

<ul style="list-style-type: none"> • Contractor shall ensure that materials delivery to work area shall be coordinated with construction site manager responsible for materials distribution to all trades. • Contractor is responsible for all materials, tools and vehicles left on the job site. • Follow Manufacturer's recommendations for handling of materials. 	2.05 Scheduling
<ul style="list-style-type: none"> • Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager. 	2.06 Warranty
End of Section	
Part 3 - Execution	
3.01 Field Quality Control	
<ul style="list-style-type: none"> • Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative. • Contractor shall replace all defective components. 	
3.02 Adjusting	
<ul style="list-style-type: none"> • No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative. 	
3.03 Protection	
<ul style="list-style-type: none"> • It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials. • Remove all protective covers and protective materials from equipment prior to turnover to Owner. 	
3.04 Schedules	
<ul style="list-style-type: none"> • Coordinate work with Owner's project manager and follow scheduling sequence as established by Owner's project manager. • It is recommended that the Contractor schedule closely with any other systems contractor to ensure turnover date is met. • Contractor bidding will supply the electrical and or masonry contractors with any specialty back boxes such as clock recessed back boxes etc. and coordinate with them to ensure that all necessary conduits, back boxes, etc. are installed in the proper locations. 	
3.05 Submittals	
1.03.01 Prior to installation	
<ul style="list-style-type: none"> • Show compete map of system design for approval by Owner. 	
3.06 System Requirements	
Intercom system shall be capable of communicating to all rooms and shall have adequate number of room points as to not double up on any given point.	
End of Section	

Intercom System Installation Completion Check List	
Part 4 - Check List	NY
	drawn by
	NY
	checked by
	OCTOBER 2024
	date
	revisions

End of Section	

Moore Public Schools Clock System Specifications	
Part 1 - General	
1.01 System Manufacture	
<ul style="list-style-type: none"> • Clock Equipment shall be Telecor, Rauland, Sapling or Primex. See plans for the specific manufacturer required. (No Substitutions) 	
Locations where Telecor equipment is required. It may be purchased from the following authorized Telecor dealers Advanced Cabling, Inc - 405-418-4322 High-Tech Tronics, Inc - 405-495-0215	
1.03 Intercom Clock Systems Equipment Description	
<ul style="list-style-type: none"> • If building has existing clock system, clocks shall be compatible with existing system. • Telecor Digital Clocks shall be hard wired 24v and may not use battery power for its primary power source. Clocks shall be 4 inch. • Telecor Analog Clocks shall be hard wired 24v and may not use battery power for its primary power source. Clocks shall be 12 inch. • Rauland Clock/Msg Board shall be part # TCC3011S • Rauland hallway dual face clock/msg board bracket shall be part # TCC TCC300DFM 	
Sapling clock part number shall be as follows: SMA-3R0-1004-1 Transmitter SBL-31S-25R-4R Digital Clocks SAB-1BD-00S-0 Metal Pole for Double Clocks SAL-4BS-12R-14 12" Analog Clock 24v 3S-MO15 Power Transformer	
<ul style="list-style-type: none"> • If a clock system is not specified and the site does not have an existing working clock system, stand-alone battery powered clocks shall be used. • Stand-alone wall clock shall be American Time E56BAQD304BP • Stand-alone dual face hallway clock shall be American Time E93BAQD204BP • An 110v electric clock receptacle shall be installed at each clock location for future devices. 	

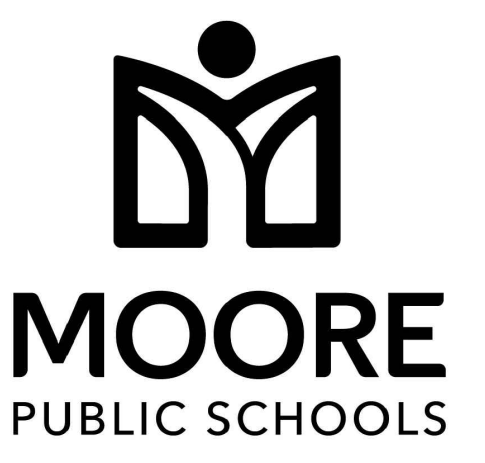
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KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL

NY	_____
drawn by	_____
NY	_____
checked by	_____
OCTOBER 2024	_____
date	_____
revisions	_____



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

T401

OWNERSHIP USE OF DOCUMENTS:
AGP EXPRESSLY RESERVES ITS COPYRIGHT AND OTHER PROPERTY RIGHTS OF ALL PLANS AND DRAWINGS DESIGNED AND/OR PRODUCED. PLANS AND DRAWINGS ARE NOT TO BE REPRODUCED IN ANY FORM OR MANNER WITHOUT THE EXPRESSED WRITTEN CONSENT OF AGP.

Salas O'Brien

2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date : 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

SYSTEMS SPECIFICATIONS

Moore Public Schools Clock System Specifications cont.

1.02 Systems Installation

- All devices shall be mounted according to the manufacture's specifications.
- All Ceiling mounted devices shall be mounted on non-stainable ceiling tiles
- All devices shall be properly adjusted and tested prior to job completion.
- All extra wire taps shall be insulated.
- Protective grommets shall be installed on all conduits to protect wire.
- All wire shall be run in J hooks above ceiling with a minimum space of 4" from ceiling deck. All wire shall be in separate pathways 6" from other system wiring. No wire ties allowed.
- All wire ran between building shall be in conduit and shall be direct burial cable. It shall be a minimum of 5 conductor 18 AWG copper and shall have lightning suppression installed at building entry.
- Installer shall supply the electrical and/or masonry contractors with specialty back boxes such as clock recessed back boxes etc. and coordinate with them to ensure that all necessary conduits, back boxes, etc. are installed in the proper locations.
- Follow and adhere to installation practices specified by NFPA-70 National Electric Code, Edition 2008.
- Follow and adhere to installation practices specified by the Manufacturers.

1.03Quality Assurance

1.03.01 Qualifications

- Install all components as directed by Manufacturer's installation guidelines.
- All products shall bear the mark of UL or ETL for performance level.
- System installation shall meet all applicable Local/State codes and safety requirements where project is located.
- All products shall be new and un-used in original packaging.

1.03.02 Bidder/Installer Qualifications

- Bidding contractor shall have a minimum of 5 years experience installing school intercom systems.
- Bidding contractor shall be able to provide insurance at the request of the owner.

1.04Delivery, Storage, and Protection

- Contractor shall ensure that materials delivery to work area shall be coordinated with construction site manager responsible for materials distribution to all trades.
- Contractor is responsible for all materials, tools and vehicles left on the job site.
- Follow Manufacturer's recommendations for handling of materials.

1.05 Scheduling

- Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager.

1.06 Warranty

- Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure.

Part 3 - Execution

3.01 Field Quality Control

- Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative.
- Contractor shall replace all defective components.

3.02 Adjusting

- No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative.

3.03 Protection

- It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials.
- Remove all protective covers and protective materials from equipment prior to turnover to Owner.

3.04 Schedules

- Coordinate work with Owner's project manager and follow scheduling sequence as established by Owner's project manager.
- It is recommended that the Contractor schedule closely with any other systems contractor to ensure turnover date is met.
- Contractor bidding will supply the electrical and/or masonry contractors with any specialty back boxes such as clock recessed back boxes etc. and coordinate with them to ensure that all necessary conduits, back boxes, etc. are installed in the proper locations.

End of Section

1.04 Submittals

1.04.01 Prior to installation

- Show complete map of system design for approval by Owner.

End of Section

Clock System Installation Completion Check List

Part 1 - General

1.01Section Includes

- Clock System Completion Check List

1.02 Completion Check List

- All Clocks have been tested for proper operation and synchronization.

End of Section

Moore Public Schools Security System Specifications

Part 1 - General

2.01 Manufacturers

- Security System Manufacturer shall be DSC or DMP. See plans for the specific manufacturer required. (No Substitutions)
- Installer shall be certified by manufacturer to install & program the specified systems. (No Substitutions)
- Peripheral device Manufacturers shall be according to equipment list. (No Substitutions)
- Cable Manufacturer shall be Genesis. (Or Equivalent)

Security Systems Equipment

- Security alarm control shall be DSC Model # PC4020 or DMP Model # XR550NL-G. (No Substitutions)
- Security alarm control communicator shall be DSC Model # T-LinkTL250. DPM N/A. (No Substitutions)
- Security alarm keypad shall be DSC Model # LCD4501 or DMP Model # 7873. (No Substitutions)
- Security alarm keypad for all kitchen locations shall be DSC Model # LCD4501 or DMP Model # 7073. (No Substitutions)
- Security alarm 8 zone hardware expander shall be DSC Model # PC4108 or DMP Model # 714-8. (No Substitutions)
- Security alarm 16 zone hardware expander shall be DSC Model # PC4116 or DMP Model # 714-16. (No Substitutions)
- Security alarm power supply shall be DSC Model # PC4204 or DMP systems = Altronix Model # SMP3PMCTX. (No Substitutions)
- Security alarm power supply cabinet shall be DSC Model # PC4051C. DMP N/A. (No Substitutions)
- Security alarm cabinet locks shall be DSC Model # L1 or DMP Model # 301. (No Substitutions)
- Security alarm wireless receiver shall be DMP Model # 1100XH, DSC N/A
- Security alarm wireless transmitter shall be DMP Model # 1103, DSC N/A
- Security alarm 35x35 motion detector shall be Honeywell Model # DT-8035. (No Substitutions)
- Security alarm 50x60 motion detector shall be Honeywell Model # DT-8050. (No Substitutions)
- Security alarm window glass break sensor shall be Honeywell Model # FG-730. (No Substitutions)
- Security alarm hold-up button shall be Potter HUSK-20
- Security alarm door contact shall be GE Model # 1076D-M. Double Pole Double Throw for all doors (No Substitutions)
- Each single door or double door shall be wired with 4 conductor wire.
- DMP systems shall be wired with 2 zones per single door or double door. One zone for Security alarm and one zone for "Door Held Open Alert"
- Security alarm C channel door magnets shall be GRI Model # MC180
- Security alarm surface window contact shall be Aleph Model # PS-1541. (Or equivalent approved by MPS)
- Security alarm overhead door & roof hatch contact shall be Amseco Model # ODC-59A or for rail mount applications Interlogix GE2315AL. (No Substitutions)
- Security alarm indoor siren shall be Ademco Model # WaveZEX. (No Substitutions)
- Security alarm outdoor siren shall be ATW Model # DS301SET. (No Substitutions)
- Security alarm outdoor strobe shall be Amseco Model # SL401C. (No Substitutions)

1.01 Systems Installation

- Keypad zones shall not be used. All zones shall wire to the main control or zone expanders.
- Installer shall be certified by manufacturer to install & program the specified systems.

- Installer shall perform all programming required to complete the installation. Moore Public Schools shall not be required to assist in any part of the installation or programming.

- All alarm junctions and or splices shall be soldered and insulated.
- All circuits and wiring shall be labeled at all terminating ends.

- All devices shall be mounted according to the manufacture's specifications.
- All devices shall be properly adjusted and tested prior to job completion.

- All DSC 4108 & 4116 zone expanders shall be installed with a DSC PC4204 power supply and DSC PC4051C with L1 lock

- All DMP 714-8 & 714-16 zone expanders shall be installed with a power supply Altronix Model # SMP3PMCTX keyed with DMP Model # 301.

- All cabinets shall be labeled outside with their corresponding module and zone numbers and installed with lock.

- All cabinets shall be labeled inside with module number by the corresponding module and zone list definitions.

- If a new DSC main control panel is required, it shall have a T-LinkTL250 installed

- All new DSC or DMP main control panels shall have a Cat 6 cable ran back to the nearest IDF for network connectivity.

- Each expansion cabinets shall have two non-shielded 16 gauge 4 conductor cables ran from the main control to the expansion cabinet.

- All keypads shall be wired individually back to new power supply.

- All sirens shall be wired individually and connected to new power supply.

- All devices such as door contact (double doors wire as one), motion detectors, glass break detectors, etc. shall be hardwired individually on separate zones with end of line resistors at the devices.

- All devices such as motion detectors, glass break detectors, door contacts, keypads, sirens, etc. shall be labeled with their corresponding module and or zone number. Label shall be visible from the floor.

- All motion detectors shall be sealed to prevent air and insects from entering.

- All steel doors shall have wide gap contacts installed.

- All door contacts shall be recessed, and door magnets shall be glued in place.

- All holdup buttons shall be connected via wireless.

- Protective grommets shall be installed on all conduits and enclosures to protect wire.

- All devices shall be wired with **NON-shielded** cable.

- All panels, power supplies and modules shall be grounded.

- All roof hatches shall have an alarm contact installed and connected to the alarm system.

- All wire shall be run in J hooks above ceiling with a minimum space of 4" from ceiling deck. All wire shall be in separate pathways 6" from other system wiring. No wire ties allowed. No wire shall be run between the red iron and roof deck.

- All wire visible from the finished floor shall be covered in decorative wire molding.

- All wire ran between building shall be in conduit and shall be **non-shielded** direct burial cable. It shall be a minimum of 4 conductor 16 AWG copper and shall have lightning suppression installed at building entry.

- Installer shall have a commercial burglar technician on the job site at all times during installation.

- Installer will work closely with the electrical and/or masonry contractors to ensure conduit, back boxes, door frame access conduit, etc. are in the proper locations and accessible.

- Follow and adhere to installation practices specified by NFPA-70 National Electric Code, Edition 2008.

- Follow and adhere to installation practices specified by the Manufacturers.

1.02 Products Installed but not Supplied Under This Section

- All conduit and EMT required for Fire cabling pathway in/out of closets and in/out of wall cavities at the work area. EMT or Conduit for pathways shall have no more than two 90 degree sweeps and no continuous section over 100'.

- All core holes and poke through devices in the floor for the installation of Fire cabling.

- All core holes and EMT sleeves between floors for the routing of Fire cabling.

- Back boxes for the mounting of Fire Devices.

- Drag line or pull string at the back boxes fished through EMT or conduit to the other end for installing Fire Cabling.

1.03 Quality Assurance

1.03.01 Qualifications

- Install all components as directed by Manufacturer's installation guidelines.
- All products shall bear the mark of UL or ETL for performance level.
- System installation shall meet all applicable Local/State codes and safety requirements where project is located.
- All products shall be new and un-used in original packaging.

1.03.02 Bidder/Installer Qualifications

- Bidding contractor shall be a local licensed Commercial Burglar Alarm Company with licensed Commercial Burglar Alarm technician(s) on staff.
- Bidding contractor shall be certified by manufacturer to install & program the specified systems.
- Bidding contractor shall perform all programming required to complete the installation. Moore Public Schools shall not be required to assist in any part of the installation or programming.
- Bidding contractor shall have at least one year experience installing DSC/DMP equipment.
- Bidding contractor shall have a minimum of 5 years experience installing commercial burglar alarms.
- Bidding contractor shall be able to provide insurance at the request of the owner.
- Bidding contractor shall have a commercial burglar technician on the job site at all times during installation.

1.04 Delivery, Storage, and Protection

- Contractor shall ensure that materials delivery to work area shall be coordinated with construction site manager responsible for materials distribution to all trades.
- Contractor is responsible for all materials, tools and vehicles left on the job site.
- Follow Manufacturer's recommendations for handling of materials.

1.05 Project Conditions

1.05.01 Environmental Requirements

- Contractor shall ensure that any pollutants produced during the Work are disposed of according to local, state or national regulations. Follow the most stringent guidelines.
- It is preferred that the Contractor recycle any used or un-used components during the course of the construction project.

1.06 Sequencing

- Contractor shall coordinate with Owner's project manager on sequencing of various trades and construction teams for the lifecycle of the project.

1.07 Scheduling

- Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager.

1.08 Warranty

- Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure. (1 year warranty shall begin at job completion)

Part 2 - Products

2.02 Source Quality Control

- Materials shall be purchased from Distributors authorized by system Manufacturers to sell new and unused components.

Part 3 -

3.01 Field Quality Control

- Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative.

- Contractor shall replace all defective components.

3.02 Adjusting

- No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative.

3.03 Cleaning

- Contractor shall sweep and mop the floors of all equipment rooms or connection point closets prior to turnover to the Owner.

3.04 Protection

- It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials.
- Remove all protective covers and protective materials from equipment prior to turnover to Owner.

3.05 Schedules

- Coordinate work with Owner's project manager and follow scheduling sequence as established by Owner's project manager.

- It is recommended that the Contractor schedule closely with any other systems contractor to ensure turnover date is met.

- Contractor bidding will work closely with the electrical and/or masonry contractors to ensure conduit, back boxes, door frame access conduit, etc. are in the proper locations and accessible.

End of Section

1.02 Submittals

1.03.01 Prior to installation

- Show complete map of system design for approval by Owner.

Security System Installation Completion Check List

Part 1 - General

1.01 Section Includes

- Security System Completion Check List

1.02 Completion Check List

- A map of the entire system showing device numbers and wire routes has been left inside the main control panel and a copy has been given to Jack Phillips with MPS.

- All panel programming has been checked and is correct.

- Panel(s) has been tested for proper operation.

- All zones have been tested to verify proper description at keypad.

- All zones have been tested to verify proper reporting to the monitoring station.

- All zones have been tested to verify they are in their proper partition(s).
- All sirens and strobes have been tested for proper operation.
- All motion detectors have been adjusted for proper sensitivity and have been walk tested.
- All motion detectors have been sealed to prevent air and insects from entering.
- All glass break detectors have been adjusted for proper sensitivity and tested.
- All cabinets are labeled on the outside with module numbers and zone numbers.
- All cabinets are labeled on the inside with module numbers by the corresponding module and zone descriptions.
- All user codes have been programmed and tested for proper partition access.
- The monitoring station has the correct account information such as call list, zone descriptions etc.

End of Section

1.09 References

- NFPA-70 National Electrical Code 2008 edition
- NFPA-72 National Fire Alarm Code
- UL 1666 - Standard for Safety of Flame Propagation Height
- NFPA 262 - Flame Travel and Smoke of Wires and Cables
- Local Authority Having Jurisdiction

1.10 Definitions

- AWG - American Wire Gauge
- BICSI - Building Industry Consulting Service International
- EIA - Electronics Industry Alliance
- FCC - Federal Communications Commission
- NECA - National Electrical Contractors Association
- NFPA - National Fire Protection Agency
- UL - Underwriters Laboratory

Access Control System Specifications

Access Control Equipment

Part 1 - Manufacture

- Access Control Manufacturer shall be Keyscan. (No Substitutions)
- Peripheral device Manufacturers shall be according to equipment list. (No Substitutions)
- Cable Manufacturer shall be Genesis. (Or Equivalent)

1.01 Access Control Equipment Description

- Access Control System Manufacture shall be Keyscan (No Substitutions)
- Access Control Management Software = Aurora (This software is already installed and in use. It is listed for information purposes only)
- Reader Control Panels shall be (No Substitutions) Keyscan CA 4500 = 4 Door Keyscan CA 8500 = 8 Door

- Each Reader Control Panel shall be equipped with (2) 16VAC 40VA Transformer
- Each Reader Control Panel shall be equipped with (1) 12V 7AH Battery
- One 2,4 or 8 Door Reader Control Panel per site shall be equipped with (1) Keyscan Netcom2p module. If the site has an existing 2,4 or 8 Door Control Panel with a Netcom2P already installed, then a Netcom 2P is not needed and CIM or CIM-Link modules shall be used to connect the new Control Panel to the existing Control Panel.
- All Reader Control Panels shall be linked together with either CIM or CIM-Link modules.

- Each new Reader Control Panel shall be capable of 4 doors minimum

Card Readers shall be (No Substitutions)

- HID 40NKS00000000 Signo Wall Mount reader (for use in all locations except where mullion mount reader size is required to fit)
- HID 20NKS00000000 Signo 20 Mullion Reader (For use on mullion mount locations where single gang reader is too large.
- ALL READERS REQUIRE 22/6 STR OAS WIRE.

- Access Control Strikes and locks shall be (No Substitutions unless approved by Moore Public Schools) RCI 0163X32D ½ inch Rim(ONLY USE IF ½ INCH RIM WILL NOT FIT) RCI 0162X32D ½ inch Rim RCI F0162X32D ¾ inch Rim Fire Rated RCI F2164 RECESSED ALL-IN-ONE STRIKE

- Where storm doors are installed, install compatible power motor and power supply to activate door hardware unless installed by door contractor.

- Egress Motions shall be (No Substitutions) BOSCH DS160 OR HONEYWELL IS310

- Door Contacts shall be GE Model # 1076D-M Double Pole Double Throw (To be utilized for Access Control and Security Alarm) (See security alarm specs)

- DOOR LOCK RELEASE BUTTON SHALL BE (NO SUBSTITUTIONS) RCI PART # 909S ROCKER SWITCH

- Power Supply for locking hardware **Power supply in Keyscan Controller is for the Control and Readers only.

- Power Supplies shall be sized to meet requirements of Strikes and locks with a maximum of 80% amp load.
- Power Supply shall have form "C" contacts for supervision that is connected to Keyscan Control Aux Input.
- 24 VDC Securitron- AccuPower- AQM20-8C/16C, AQD5-8C or equal.

2.01 Systems Installation

- All junctions and or splices shall be soldered and insulated.

- All circuits and wiring shall be labeled at all terminating ends.

- All devices shall be mounted in accordance to the manufactures specifications.

- All devices shall be properly adjusted and tested prior to job completion.

- All controllers shall be labeled outside with their corresponding modules and installed with lock.

- All controllers shall have a Cat 6 network cable Blue in color ran from the nearest network cabinet and labeled with drop number.

- All card readers shall be labeled with their corresponding reader number.

- All doors with access control shall have contacts installed for door status indication. Steel doors shall have wide gap door contacts installed.

- All doors with access control shall have egress motions installed to allow system to detect proper egress. (including doors with panic exit hardware.)

- Protective grommets shall be installed on all conduits to protect wire.

- All panels, power supplies and modules shall be grounded.

- All wire shall be run in J hooks above ceiling with a minimum space of 6" from ceiling deck. All wire shall be in separate pathways 6" from other system wiring. No wire ties allowed. No wire shall be run between the red iron and roof deck.
- All wire visible from the finished floor shall be covered in decorative wire molding.
- All wire ran between building shall be in conduit and shall be direct burial cable.
- Installer shall have a licensed Access Control technician on the job site at all times during installation.
- Installer will work closely with the electrical and/or masonry contractors to ensure conduit, back boxes, door frame access conduit, etc. are in the proper locations and accessible.
- Follow and adhere to installation practices specified by NFPA-70 National Electric Code, Edition 2008.
- Follow and adhere to installation practices specified by the Manufacturers.

3.01 Bidder/Installer Qualifications

- Bidding contractor shall be a local licensed Access Control Company with licensed Access Control technician(s) on staff.

- Bidding contractor shall have at least one year experience installing Keyscan Access Control Systems.

- Bidding contractor shall have a minimum of 5 years experience installing commercial Access Control Systems.

- Bidding contractor shall be able to provide insurance at the request of the owner.

- Bidding contractor shall have a commercial Access Control technician on the job site at all times during installation.

3.01.1 Submittals

- Show complete map of system design for approval by Owner.

4.03 Products Installed but not Supplied Under This Section

- All conduit and EMT required for Fire cabling pathway in/out of closets and in/out of wall cavities at the work area shall be installed in accordance with NFPA 70-2020 EMT or Conduit for pathways shall have no more than two 90 degree sweeps and no continuous section over 100'.
- All core holes and poke through devices in the floor for the installation of cabling.
- All core holes and EMT sleeves between floors for the routing of cabling.
- Back boxes for the mounting of Devices.
- Drag line or pull string at the back boxes fished through EMT or conduit to the other end for installing Cabling.

4.04 References

- NFPA-70 National Electrical Code 2008 edition
- NFPA-72 National Fire Alarm Code
- UL 1666 - Standard for Safety of Flame Propagation Height
- NFPA 262 - Flame Travel and Smoke of Wires and Cables
- Local Authority Having Jurisdiction

4.05 Definitions

AWG - American Wire Gauge
 BICSI - Building Industry Consulting Service International
 EIA - Electronics Industry Alliance
 FCC - Federal Communications Commission
 NECA - National Electrical Contractors Association
 NFPA - National Fire Protection Agency
 UL - Underwriters Laboratory

4.06 Delivery, Storage, and Protection

- Contractor shall ensure that materials delivery to work area shall be coordinated with construction site manager responsible for materials distribution to all trades.
- Contractor is responsible for all materials, tools and vehicles left on the job site.
- Follow Manufacturer's recommendations for handling of materials.

4.07 Project Conditions

4.07.1 Environmental Requirements

- Contractor shall ensure that any pollutants produced during the Work are disposed off according to local, state or national regulations. Follow the most stringent guidelines.
- It is preferred that the Contractor recycle any used or un-used components during the course of the construction project.

4.07.2 Field Measurements

- Contractor shall coordinate with electrical engineer on project that the main electrical service ground has a resistance to earth of less than 5 ohms.
- Contractor shall ensure that all field testers have been calibrated from the Manufacturer within 1 year.
- All field test results will be documented and submitted to Moore Public Schools, Technology Department.

4.08 Sequencing

- Contractor shall coordinate with Owner's project manager on sequencing of various trades and construction items for the lifecycle of the project.

4.09 Scheduling

- Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager.

4.10 Warranty

- Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure. (1 year warranty shall begin at job completion)

4.11 Source Quality Control

- Materials shall be purchased from Distributors authorized by system Manufacturers to sell new and unused components.

Part 5 -

5.01 Field Quality Control

- Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative.
- Contractor shall replace all defective components.

5.02 Adjusting

- No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative.

5.03 Cleaning

- Contractor shall sweep and mop the floors of all equipment rooms or connection point closets prior to turnover to the Owner.

5.04 Protection

- It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials.
- Remove all protective covers and protective materials from equipment prior to turnover to Owner.

5.05 Schedules

- Coordinate work with Owner's project manager and follow scheduling sequence as established by Owner's project manager.
- It is recommended that the Contractor schedule closely with any other systems contractor to ensure turnover date is met.
- Contractor bidding will work closely with the electrical and/or masonry contractors to ensure conduit, back boxes, door frame access conduit, etc. are in the proper locations and accessible.

End of Section

Moore Public Schools Fire System Specifications SK & SD Protocol

Part 1 - General
2.01 Manufacturers

- Fire System Manufacturer shall be Silent Knight. (No Substitutions)
- Notification appliance Manufacturer shall be System Sensor. (No Substitutions)
- Device Manufacturer shall be as specified in equipment description. (No Substitutions)
- Cable Manufacturer shall be Genesis. (Or Equivalent)

1.03 Fire Systems Equipment Description

- NOTE:** Contractor shall use SK Protocol devices on all new installations except when the existing system has SD protocol devices connected. In these instances, SD protocol devices shall be used. Contractor shall not combine SD & SK protocol devices to one system.
- Fire alarm control shall be Silent Knight Model # 5820 or 6820. (No Substitutions)
- Fire alarm distributed power module NAC Expansion shall be Silent Knight SK-PS6 / SK-PS10 or Fire-Lite Model #'s FL-PS6 / FL-PS10. (No Substitutions)
- Fire alarm intelligent power supply shall be Silent Knight Model # 5895XL. (No Substitutions)
 NOTE: The 5895XL NAC circuits will not sync with the main control panels NAC circuits. If new NAC circuit synchronization is required with existing NAC circuits, use the SK-PS6/FL-PS6 or SK-PS10/FL-PS10
- Fire alarm remote Annunciator shall be Silent Knight Model # 5860 (Grey) and surface mount trim ring 5860TG (Grey) shall be used if surface mounted. (No Substitutions)
- Fire Alarm signaling line circuit expander shall be Silent Knight Model # 5815XL for SD protocol devices & 6815 for SK protocol devices. (No Substitutions)

SK Protocol Devices Shall Be

- Fire alarm addressable manual pull station shall be Silent Knight Model # SK-PULL-DA. (No Substitutions)
- Fire alarm addressable photoelectric smoke detector shall be Silent Knight Model # SK-PHOTO-W. (No Substitutions)
- Fire alarm addressable heat detector shall be Silent Knight Model # SK-HEAT-W. (No Substitutions)
- Fire alarm base shall be Silent Knight Model # B300-6. (No Substitutions)
- Smoke Detectors in areas that require a CO Detector shall be SK-FIRE-CO-W. (No Substitutions)
- Fire alarm addressable input module shall be Silent Knight Model # SK-MONITOR or SK-MONITOR-2. (No Substitutions)
- Fire alarm addressable relay module shall be a Silent Knight Model # SK-RELAY. (No Substitutions)
- Fire alarm SLC line isolator shall be Silent Knight Model # SK-ISO. (No Substitutions)
- Fire alarm Duct detectors and Duct Detector Remote Test Stations shall be Silent Knight Model #'s SK-DUCT and RTS151KEY. If a Form-C relay is required, please add an SK-RELAY. (No Substitutions)

SD Protocol Devices Shall Be

- Fire alarm addressable manual pull station shall be Silent Knight Model # SD500-PSDA. (No Substitutions)
- Fire alarm addressable photoelectric smoke detector shall be Silent Knight Model # SD505-PHOTO. (No Substitutions)
- Fire alarm addressable heat detector shall be Silent Knight Model # SD505-HEAT. (No Substitutions)
- Fire alarm base for Silent Knight Model #'s SD505-PHOTO and SD505-HEAT shall be Silent Knight Model # SD505-6AB. (No Substitutions)
- CO Detector shall be System Sensor Model # CO1224T. (No Substitutions) An SD500-AIM shall be installed on each CO1224T and shall be accessible and visible from the finished floor.
- Fire alarm addressable input module shall be Silent Knight Model # SD500-AIM. (No Substitutions)
- Fire alarm addressable relay module shall be a Silent Knight Model # SD500-ARM. (No Substitutions)
- Fire alarm SLC line isolator shall be Silent Knight Model # SD500-LIM. (No Substitutions)
- Fire alarm Duct detectors and Duct Detector Remote Test Stations shall be Silent Knight Model #'s SD505-DUCTR and SD505-DTS-K. (No Substitutions) Remote test station shall be accessible and visible from the finished floor.
- Fire alarm Horn / Strobe signaling device shall be System Sensor Model # P2WL. (Model PC2WL can be substituted if mounted on non-stainable ceiling tile. No other Substitutions)
- Fire alarm Strobe signaling device shall be System Sensor Model # SWL. (Model SCWL can be substituted if mounted on non-stainable ceiling tile. No other Substitutions)
- Fire alarm strobe synch module shall be System Sensor Model # MDL3. (Not needed on version 9 panels or newer) (No Substitutions)
- Fire alarm Outdoor strobe signaling device shall be System Sensor Model # P2RK. (No Substitutions)
- Fire alarm Speaker / Strobe signaling device shall be System Sensor Model # SPSWL. (Model SPSCWL can be substituted if mounted on non-stainable ceiling tile. No other Substitutions)
- Fire alarm Speaker signaling device shall be System Sensor Model # SPWL. (No Substitutions)
- Fire alarm 50-watt Voice Evac system shall be as needed Silent Knight SKE-450 (Single Zone), SKE-450-ZN4 (4 Zone) or SKE-450-ZN6 (6 Zone). (No Substitutions)

1.01 Systems Installation

- All fire alarm junctions and or splices shall be soldered and insulated.
- All Ceiling mounted devices shall be mounted on non-stainable ceiling tiles.
- All circuits and wiring shall be labeled at all terminating ends.
- All fire system wiring shall be RED in color and non-shielded.
- All devices shall be mounted according to the manufacture's specifications.
- All devices shall be properly adjusted and tested prior to job completion.
- All fire pulls shall be dual action.
- All Initiating Devices shall be labeled with their corresponding module and point number. Smoke detector label shall be on smoke detector and smoke detector base and be clearly visible from the finished floor.
- Each Initiating Device Circuits (IDC) shall have Line Isolator Modules installed at the SLC Head End.
- All Initiating Device Circuits (IDC) shall be wired Class B (NFPA Style B).
- All Initiating Device Circuits (IDC) shall be wired with minimum 18 AWG gauge red **NON-Shielded cable.**

- All duct detectors shall be connected to fire system and shall have remote test stations installed accessible and visible from the finished floor. They shall be labeled with their corresponding module and point number.
- All duct detector ARM / AIM shall be installed adjacent to the remote test stations and shall be accessible and visible from the finished floor. They shall be labeled with their corresponding module and point number. (ARM/AIM should not be needed when using SD505-DUCTR duct det.)
- Each CO 1224T detectors shall have an SD500 AIM installed (No doubling). All CO1224T & SD500 AIM shall be labeled with their corresponding module and point number and shall be accessible and visible from the finished floor.
- All modules shall have their corresponding module number.
- All notification devices shall be wall mounted where possible. Where wire is exposed decorative wire molding shall be installed from the ceiling to the device. If ceiling mount devices are used, they shall be mounted on a non-stainable ceiling tile.
- All notification devices shall be labeled with their corresponding module, circuit number and device number. Label shall be on the base and be clearly visible from the finished floor. EOL Device shall be labeled as such.
- All horn / strobes and strobes shall be synchronized.
- All Notification Appliance Circuits (NAC) shall be wired Class B (NFPA Style Y).
- All Initiating Appliance Circuits (NAC) shall be wired with minimum 16 AWG gauge red **NON-Shielded cable.**
- Protective grommets shall be installed on all conduits to protect wire.
- All SBUS and SLC circuits shall be wired with red **NON-shielded cable.**
- All wire shall be run in J hooks above ceiling with a minimum space of 6" from ceiling deck. All wire shall be in separate pathways 6" from other system wiring. No wire ties allowed. No wire shall be run between the red iron and roof deck.
- Main control panel shall have a CAT 6 cable ran between the main control and the phone company DMARC for monitoring purposes.
- All wire ran between building shall be in conduit and shall be **Non-shielded** direct burial cable. It shall be a minimum of 4 conductor 16 AWG copper.
- Installer shall have a commercial fire technician on the job site at all times during the installation.
- Installer shall supply the electrical and/or masonry contractors with specialty back boxes such as remote annunciator recessed back boxes etc. and coordinate with them to ensure that all necessary conduits, back boxes, etc. are installed in the proper locations.
- Follow and adhere to installation practices specified by the applicable NFPA 72 standards.
- Follow and adhere to installation practices specified by NFPA-70 National Electric Code, Edition 2008.
- Follow and adhere to installation practices specified by the Manufacturers.

1.02 Products Installed but not Supplied Under This Section

- All conduit and EMT required for Fire cabling pathway in/out of closets and in/out of wall cavities at the work area. EMT or Conduit for pathways shall have no more than two 90-degree sweeps and no continuous section over 100'.
- All core holes and poke through devices in the floor for the installation of Fire cabling.
- All core holes and EMT sleeves between floors for the routing of Fire cabling.
- Back boxes for the mounting of Fire Devices.
- Drag line or pull string at the back boxes fished through EMT or conduit to the other end for installing Fire Cabling.

1.03 Quality Assurance

- 1.03.01 Qualifications**
- Install all components as directed by Manufacturer's installation guidelines.
- All products shall bear the mark of UL or ETL for performance level.
- System installation shall meet all applicable Local/State codes and safety requirements where project is located.
- All products shall be new and un-used in original packaging.
- 1.03.02 Bidder/Installer Qualifications**
- Bidding contractor shall be a local licensed Commercial Fire Alarm Company with licensed Commercial Fire Alarm technician(s) on staff.
- Bidding contractor shall have a minimum of one year experience installing Silent Knight Addressable fire panels.
- Bidding contractor shall have a minimum of 5 years experience installing commercial fire alarms.
- Bidding contractor shall be able to provide insurance at the request of the owner.
- Bidding contractor shall have a commercial fire technician on the job site at all times during the installation.

1.04 Sequencing

- Contractor shall coordinate with Owner's project manager on sequencing of various trades and construction teams for the lifecycle of the project.

1.05 Scheduling

- Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager.

1.06 Warranty

- Contractor shall provide a 1-year parts and labor warranty against defective workmanship and/or system component failure. (1-year warranty shall begin at job completion)

Part 2 - Products
2.02 Source Quality Control

- Materials shall be purchased from Distributors authorized by system Manufacturers to sell new and unused components.

Part 3 -
3.01 Field Quality Control

- Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative.
- Contractor shall replace all defective components.

3.02 Adjusting

- No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative.

3.03 Protection

- It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials.
 - Remove all protective covers and protective materials from equipment prior to turnover to Owner.
- End of Section**
- 1.04 Submittals**
- 1.04.01 Prior to installation**
- Show compete map of system design for approval by Owner.
- 1.04.02 Prior to final acceptance**
- Provide a soft CAD copy As-Built showing layout of panel, initiating devices, notification devices and all mounted equipment upon Substantial Completion.
 - Ensure all warranties specify that the Owner is entitled to all rights guaranteed by the warranty for various components.

Fire System Installation Completion Check List

Part 1 - General
1.01 Section Includes

- Fire System Completion Check List

1.02 Completion Check List

- A map of the entire system showing device numbers and wire routes has been left inside the main control panel and a copy has been given to Jack Phillips with MPS.
- All panel programming has been checked and is correct.
- Panel(s) has been tested for proper operation.
- All zones have been tested to verify proper description at keypad.
- All zones have been tested to verify proper reporting to the monitoring station.
- All points have been tested to verify proper description at the keypad.
- All horns/strobes and strobes have been tested for proper operation.
- All smoke detectors have been tested and dust covers removed.
- All devices have been tested for proper operation.
- All cabinets are labeled on the outside with module numbers and point numbers.
- All cabinets are labeled on the inside with module numbers by the corresponding module and point descriptions.
- The monitoring station has the correct account information such as call list, zone descriptions, etc.

End of Section

IP camera Specifications

Moore Public Schools
IP camera Specifications

IP CAMERA MANUFACTURE IS AVIGILON (NO SUBSTITUTIONS).

AVIGILON EQUIPMENT
INDOOR DOME SINGLE HEAD CAMERA REQUIRED EQUIPMENT LIST

- 4.0C-H5A-D1-IR
- ACC7-ENT LICENSE - 1 per camera

INDOOR MULTI-HEAD 3 HEAD CAMERA REQUIRED EQUIPMENT LIST

- 9C-H4A-3MH-180 (3x3MP)
- POE-INI2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-CEIL1
- H4AMH-DC-COVR1

INDOOR MULTI-HEAD 4 HEAD CAMERA REQUIRED EQUIPMENT LIST

- 12C-H4A-3MH-360 (4x3MP)
- POE-INI2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-CEIL1
- H4AMH-DC-COVR1

OUTDOOR DOME SINGLE HEAD CAMERA REQUIRED EQUIPMENT LIST

- 6.0C-H5A-D03-IR
- ACC7-ENT LICENSE - 1 per camera

OUTDOOR MULTI-HEAD 3 HEAD CAMERA CORNER MOUNT REQUIRED EQUIPMENT LIST

- 15C-H4A-3MH-270 (3x5MP)
- POE-INI2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-PEND1
- H4AMH-DO-COVR1
- H4AMH-AD-IRI11
- H4-MT-CRNR1

OUTDOOR MULTI-HEAD 3 HEAD CAMERA WALL MOUNT REQUIRED EQUIPMENT LIST

- 15C-H4A-3MH-180 (3x5MP)
- POE-INI2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-PEND1
- H4AMH-DO-COVR1
- H4AMH-AD-IRI11
- IRPTZ-MNT-WALL1

INSTALLATION

- Install cameras on adjacent walls were possible. If it must be mounted on ceiling, it shall be on a water-resistant non-stainable ceiling tile. **MPS to have final determination of camera location and field of view) (Call Jack Phillips for final location and view phone 473-5225)**
- Any cameras installed on ceiling shall be mounted on a water-resistant non-stainable ceiling tile. (BIDDING CONTRACTOR SHALL PROVIDE NON-STAINABLE TILE)
- Each installed camera needs a camera license.
- All network drops shall be connected with patch cords to a switch at each rack location.
- No Substitutions.

Horizontal Cabling
Requirements

- See MPS Structured Cabling Specifications for camera network cabling installation, labelling and testing requirements.

Warranty

- Communications Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure.
- Communications Contractor shall execute a Lifetime Applications Assurance Warranty for parts and labor to support stated applications from the connectivity Manufacturer.

Audio Visual Systems for Instructional Spaces Specifications
Part 1 - General

1.01 Instructional Spaces

- Reference technology drawings and detail sheet T504 for classroom configuration and part numbers.

1.02 Special Spaces

- Reference technology drawings and one line diagrams.

1.03 Flat Panel Displays

- All non interactive Flat Panel displays shall be 43" Samsung BE Series.
- Bio Lab 37 displays shall be ceiling mounted.
- Career Tech 12 and Career Tech 15 displays shall be wall mounted 55" AFF to center of display.

End of Section



201 N. BROADWAY
 SUITE 210
 MOORE, OK. 73160
 405.735.3477
 AGP@theAGP.net
 www.theAGP.net

KFC ENGINEERING

STRUCTURAL

SALAS O'BRIEN

MECHANICAL / ELECTRICAL

NY

drawn by

NY

checked by

OCTOBER 2024

date

revisions



CHILD CARE FACILITY
 201 N. EASTERN AVE.

sheet no:

T403

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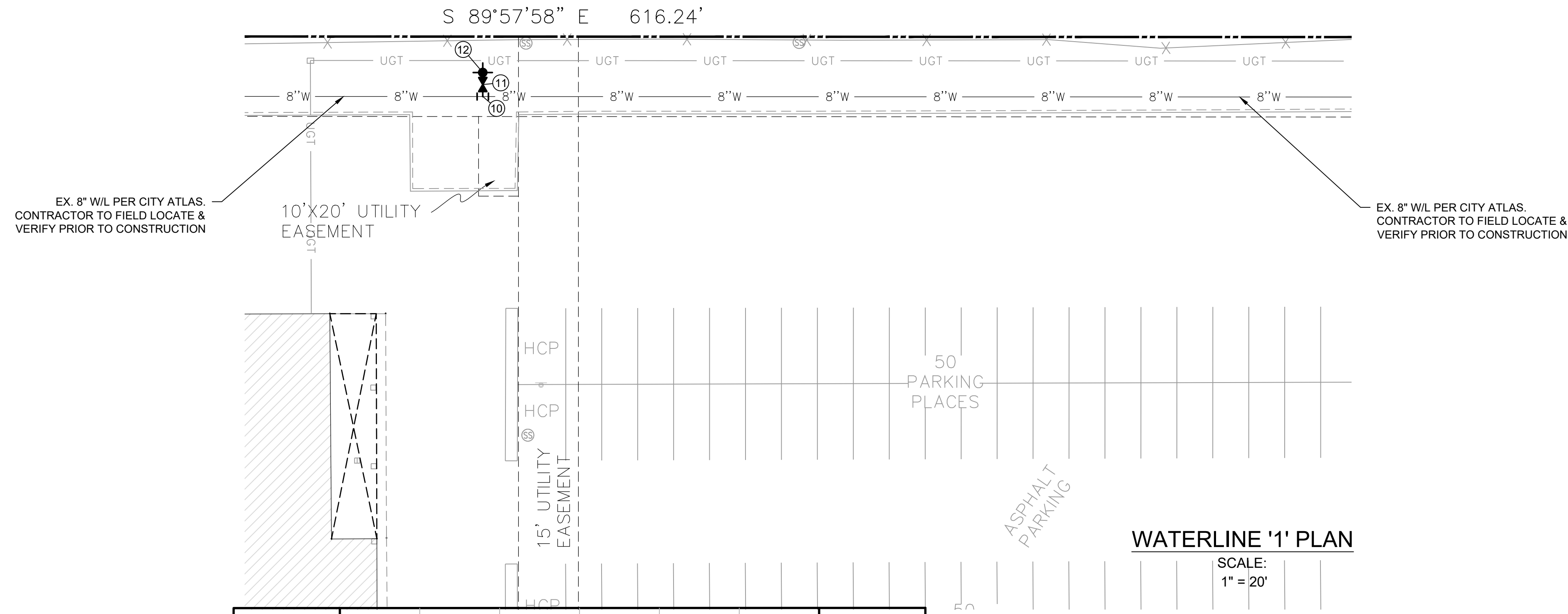
Salas O'Brien
 2900 S. Telephone Road, Suite 120
 Moore, OK 73160
 Salas O'Brien Registration: CA# 7058
 Expiration Date: 6/30/2025
 Salas O'Brien Project Number: 2450-70304-00

WATERLINE '1'

⑩ STA. 10+00.00
CONST. (1) 8" X 6" CUT IN TEE W/
MECHANICAL JOINTS
FL = 1241.37

⑪ STA. 10+03.00
CONST. (1) 6" GATE VALVE & BOX
FL = 1241.37

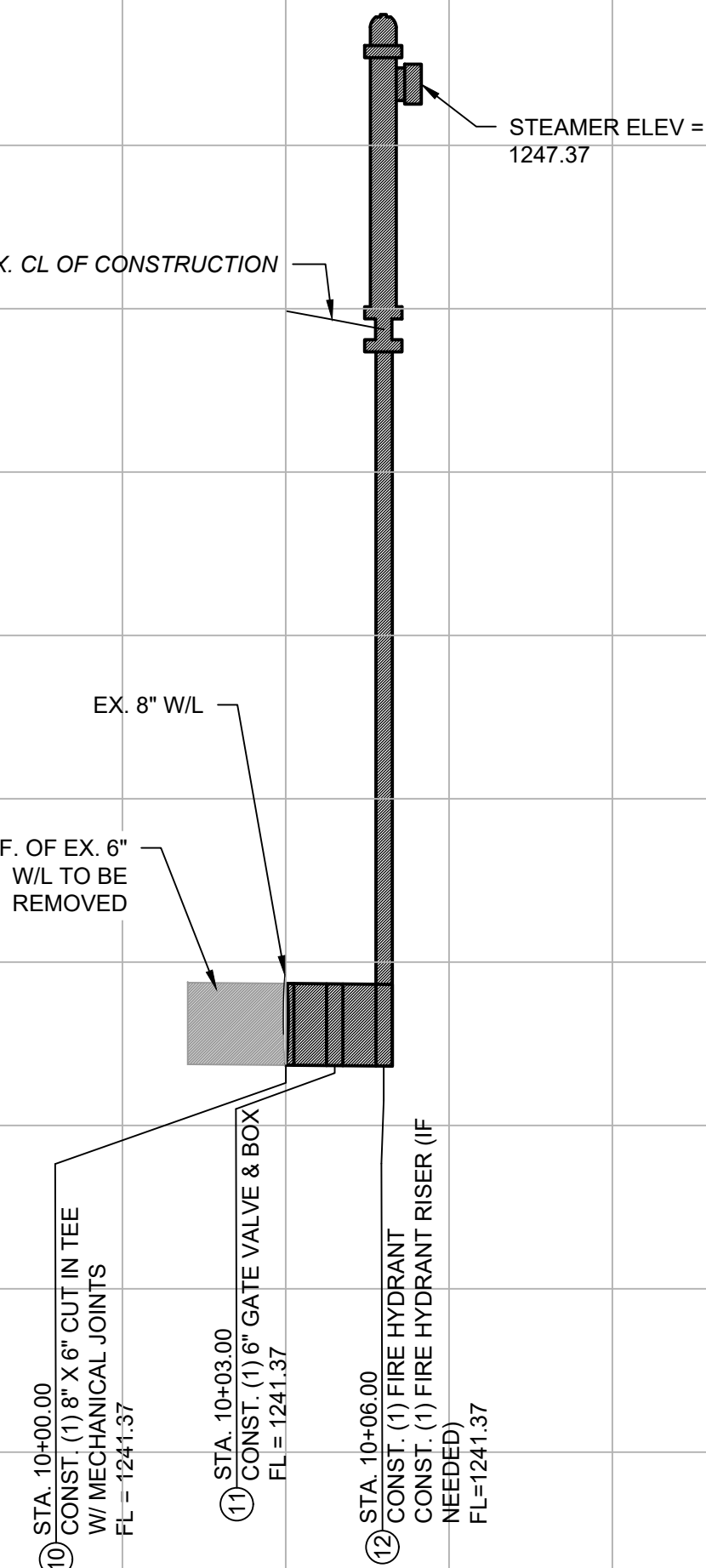
⑫ STA. 10+06.00
CONST. (1) FIRE HYDRANT
CONST. (1) FIRE HYDRANT RISER (IF
NEEDED)
FL=1241.37



WATERLINE '1' PLAN

SCALE:
1" = 20'

WATERLINE '1' PROFILE		
CONST. (1) 6 L.F. OF 6" W/L (C-900)		
SCALE: HORIZ: 1" = 10' VERT: 1" = 1'		
1249		1249
1248		1248
1247		1247
1246	EX. CL OF CONSTRUCTION	1246
1245		1245
1244		1244
1243	EX. 8" W/L	1243
1242	18.21 L.F. OF EX. 6" W/L TO BE REMOVED	1242
1241		1241
1240		1240
1239		1239
1238		1238



⑩ STA. 10+00.00
CONST. (1) 8" X 6" CUT IN TEE
W/MECHANICAL JOINTS
FL = 1241.37

⑪ STA. 10+03.00
CONST. (1) 6" GATE VALVE & BOX
FL = 1241.37

⑫ STA. 10+06.00
CONST. (1) FIRE HYDRANT
CONST. (1) FIRE HYDRANT RISER (IF
NEEDED)
FL=1241.37

- NOTES:**
- WHERE FILL MATERIAL IS INDICATED SUCH MATERIAL SHALL BE PLACED AND COMPACTED IN SIX (6) INCH LIFTS FOR HAND-TAMPED EQUIPMENT AND THIRTY (30) INCH LIFTS FOR POWER-DRIVEN EQUIPMENT TO 95% STANDARD PROCTOR DENSITY PRIOR TO TRENCHING.
 - CONTRACTOR SHALL FIELD LOCATE AND VERIFY UTILITY CROSSINGS PRIOR TO CONSTRUCTION.

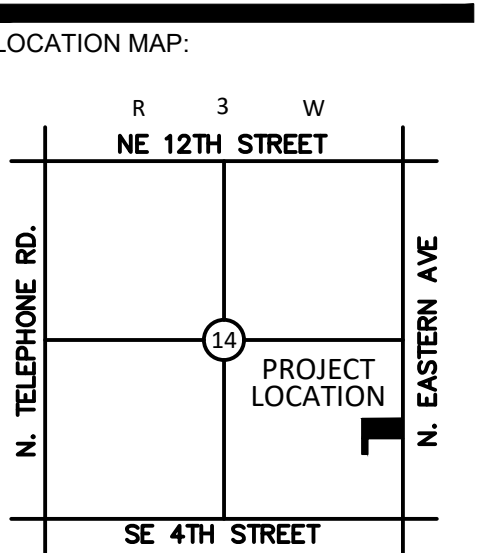
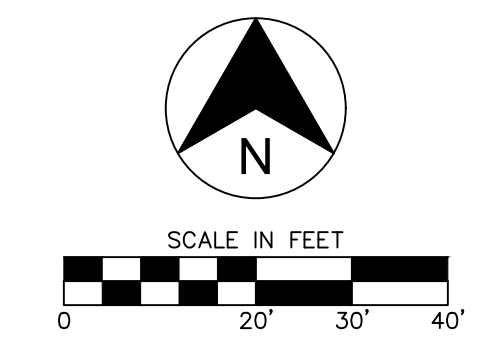
WATER NOTES

- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH CITY OF MOORE STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
- ALL FIRE HYDRANTS & VALVE BOXES TO BE SET TO PROPOSED FINAL GRADE WITH 4 1/2" STEAMER NOZZLE A MINIMUM AT 18" & A MAXIMUM OF 24" ABOVE GROUND LEVEL. ALL FIRE HYDRANTS TO HAVE DUCTILE IRON LEADS.
- ALL EXISTING WATER MAINS BEING ABANDONED BY THIS PROJECT ARE TO REMAIN THE PROPERTY OF THE CITY OF MOORE AND SHALL BE SALVAGED BY THE WATER/WASTEWATER DEPARTMENT AT THEIR DISCRETION. HOWEVER, ITEMS IN THE WAY OF CONSTRUCTION MAY BE REMOVED AND DELIVERED TO THE WATER DEPARTMENT WAREHOUSE.
- IN CASES WHERE MINIMUM HORIZONTAL AND VERTICAL SEPARATION FROM ADJACENT SANITARY SEWER LINES (SEE OAC 252.626-19) CANNOT BE MAINTAINED, CONTRACTOR SHALL ENCLOSE WATER MAIN IN APPROPRIATELY SIZED STEEL CASING. CASING SHALL EXTEND A MINIMUM OF 10-FT IN EITHER DIRECTION FROM WHERE HORIZONTAL OR VERTICAL SEPARATION IS LESS THAN MINIMUM ALLOWED BY OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ) REGULATIONS.
- WHEN CROSSING STREETS, DRIVEWAYS SUBJECT TO HEAVY TRAFFIC, ALLEYS AND STRUCTURES, ETC., PIPE SHALL BE INSTALLED WITH COMPACTED ODOT TYPE 'A' BACKFILL. ALL OTHER PIPE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS OR CITY SPECIFICATION.
- SET END OF MAIN STUBS IN CUL-DE-SACS AT A POINT 5.0' OFF PROPERTY LINE. THIS POINT BEING IN LINE WITH SIDE PROPERTY LINE.
- IN INSTANCES WHERE FLOW LINES ARE NOT INDICATED ON THE DRAWINGS, MAIN SHALL BE CONSTRUCTED WITH A MINIMUM OF 4' COVER OR AS DIRECTED BY THE CITY'S DESIGNATED REPRESENTATIVE.
- ALL STAKING FOR ALIGNMENT AND GRADE WILL BE DONE UNDER THE SUPERVISION OF LAND SURVEYOR REGISTERED IN THE STATE OF OKLAHOMA. GRADE STAKES WILL BE MARKED AND CUT SHEETS WILL BE FURNISHED TO THE CITY'S DESIGNATED REPRESENTATIVE ON THE PROJECT PRIOR TO CONSTRUCTION.
- UNLESS SPECIFICALLY AUTHORIZED, ALL GATE VALVES ARE TO BE LOCATED AT P.C. OR P.T. OF STREET CURB. WHEN FIRE HYDRANTS ARE REQUIRED THEY SHALL BE LOCATED WITHIN 5' OF GATE VALVES.
- POLY WRAP ALL CAST OR DUCTILE STEEL FITTINGS PRIOR TO BACKFILLING.



GENERAL NOTES

DETAIL NO.
300
APPROVED
09/18/2023



NOT TO SCALE

PROJECT:

MPS DAYCARE

201 N. EASTERN
MOORE OK

PROJECT NUMBER: 24110
DRAWING DATE: 11.05.24
ISSUE DATE: 11.05.24

SEAL:



SUBMITTAL:
PERMIT SET

REVISIONS:

MARK DATE DESCRIPTION

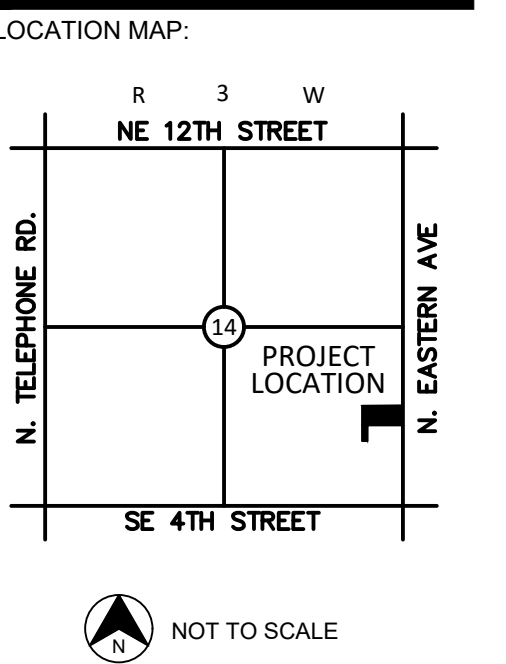
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DRAWING TITLE:

**WATERLINE '1'
PLAN &
PROFILE**

SHEET:

C2.00



PROJECT:
MPS DAYCARE
 201 N. EASTERN
 MOORE OK
 PROJECT NUMBER: 24110
 DRAWING DATE: 11.05.24
 ISSUE DATE: 11.05.24

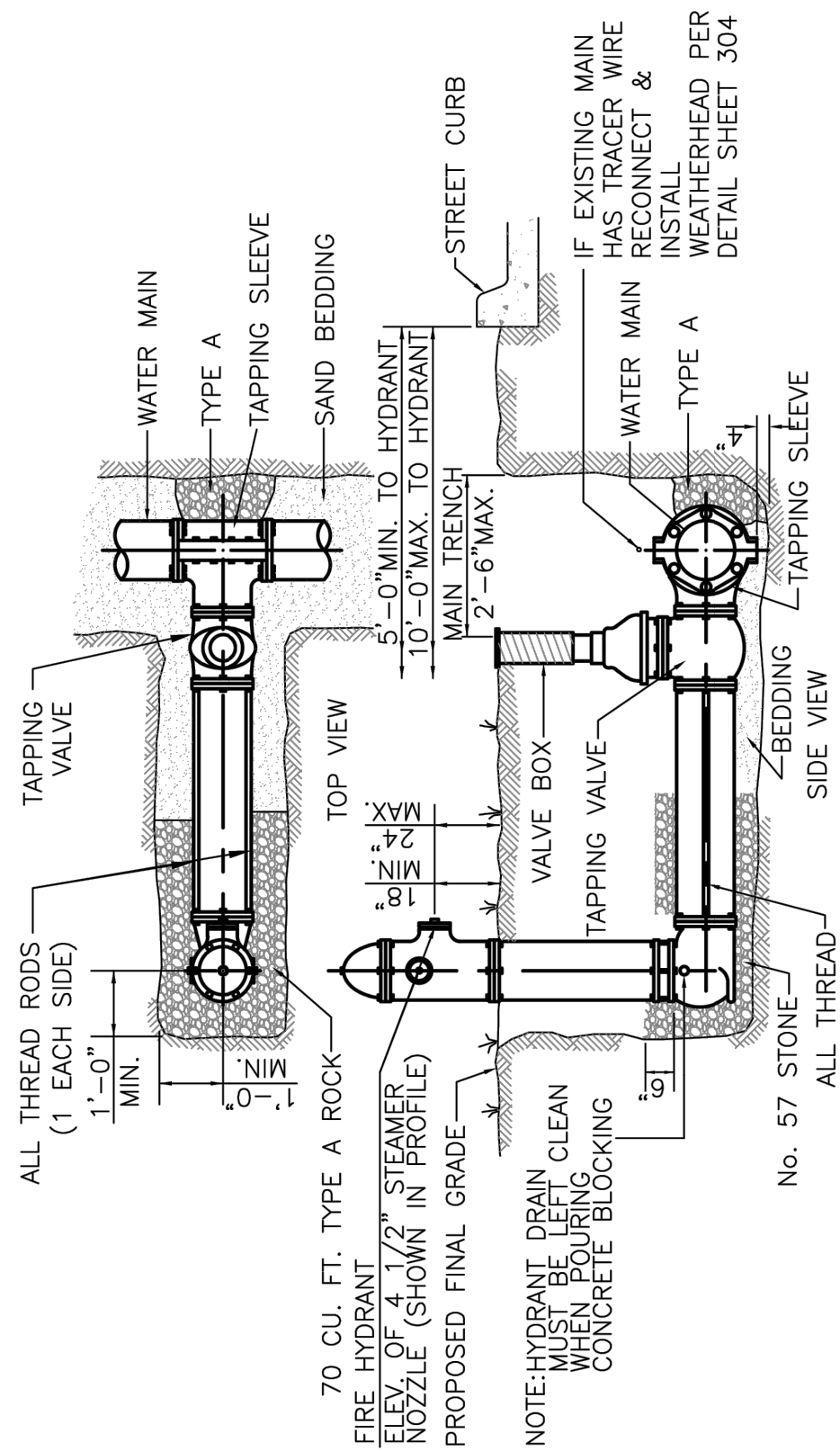
SEAL:

 SUBMITTAL:
PERMIT SET
 REVISIONS:

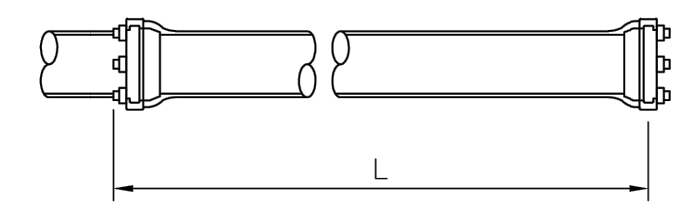
MARK	DATE	DESCRIPTION

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 DRAWING TITLE:

**WATERLINE
 DETAILS**
 SHEET:
C2.01



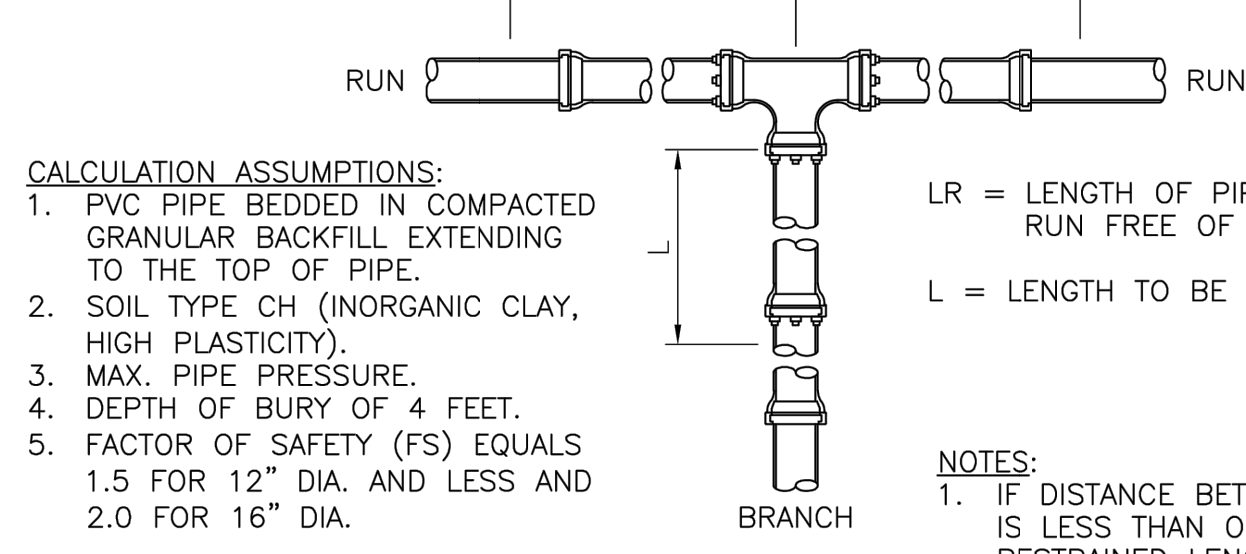
301-1
 INSTALLATION OF HYDRANT ON EXISTING MAIN
 APPROVED 09/18/2023



L = LENGTH TO BE RESTRAINED.

PIPE SIZE (INCH)	RESTRAINED LENGTH (FT)
6	90
8	118
12	167
16	222

316-2
 RESTRAINED JOINT DETAILS (2 OF 5)
 APPROVED 09/18/2023

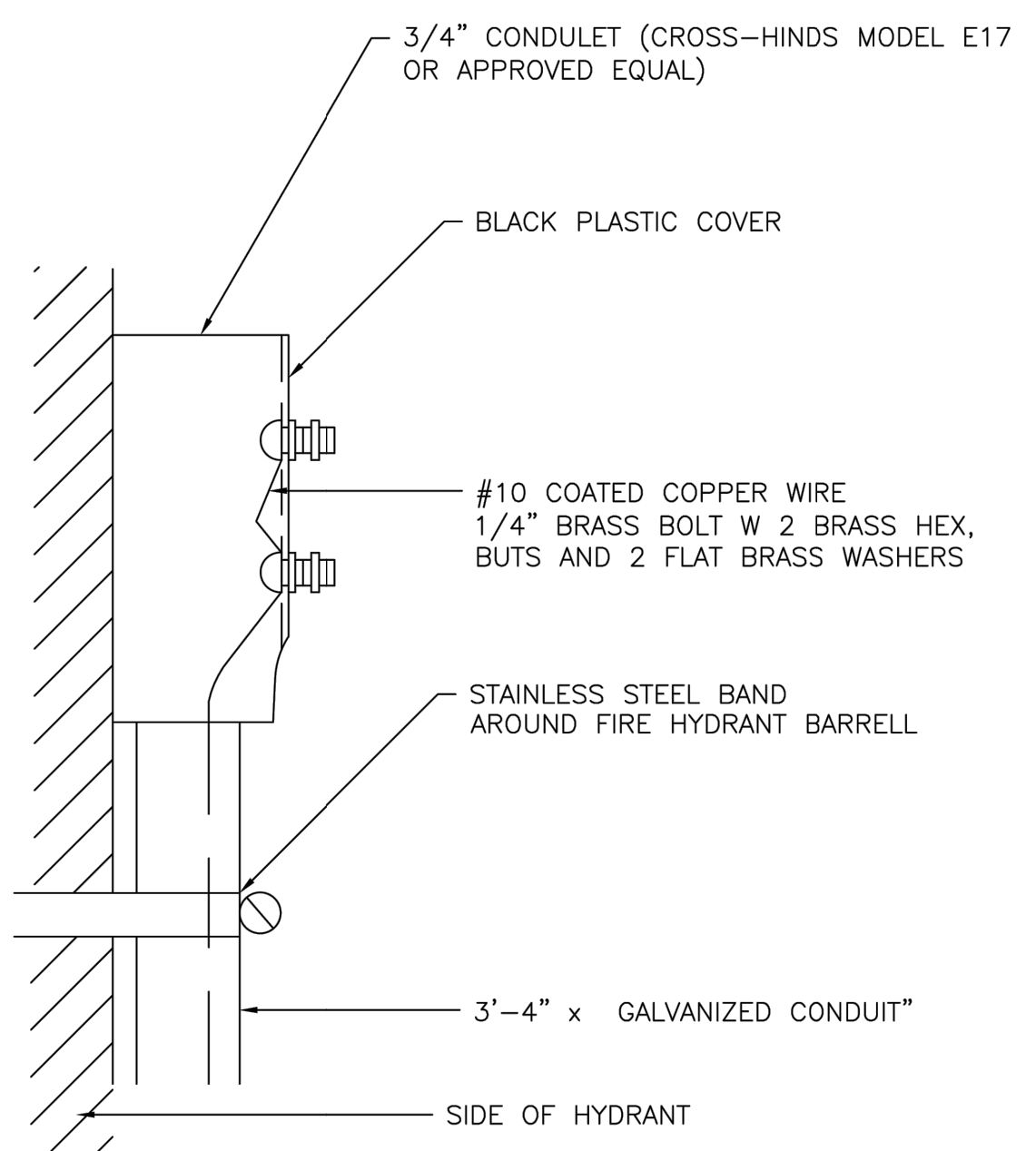


- CALCULATION ASSUMPTIONS:**
- PVC PIPE BEDDED IN COMPACTED GRANULAR BACKFILL EXTENDING TO THE TOP OF PIPE.
 - SOIL TYPE CH (INORGANIC CLAY, HIGH PLASTICITY).
 - MAX. PIPE PRESSURE.
 - DEPTH OF BURY OF 4 FEET.
 - FACTOR OF SAFETY (FS) EQUALS 1.5 FOR 12" DIA. AND LESS AND 2.0 FOR 16" DIA.

PIPE SIZE (IN.)	BRANCH SIZE (IN.)	LR (FT.)	RESTRAINED LENGTH, L (FT.)
6	6	0	90
6	6	5	64
6	6	10	38
6	6	15	12
6	6	20	1
8	6	0	90
8	6	5	56
8	6	10	22
8	6	15	1
8	8	0	118
8	8	5	92
8	8	10	66
8	8	15	40
8	8	20	14
12	6	0	90
12	6	5	38
12	6	10	1
12	8	0	118
12	8	5	78
12	8	10	38

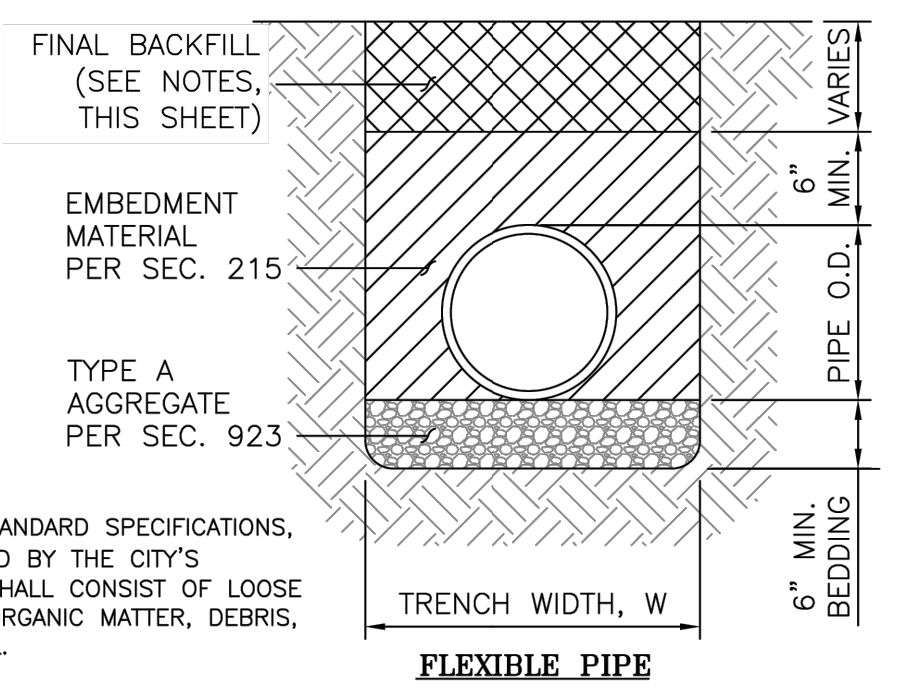
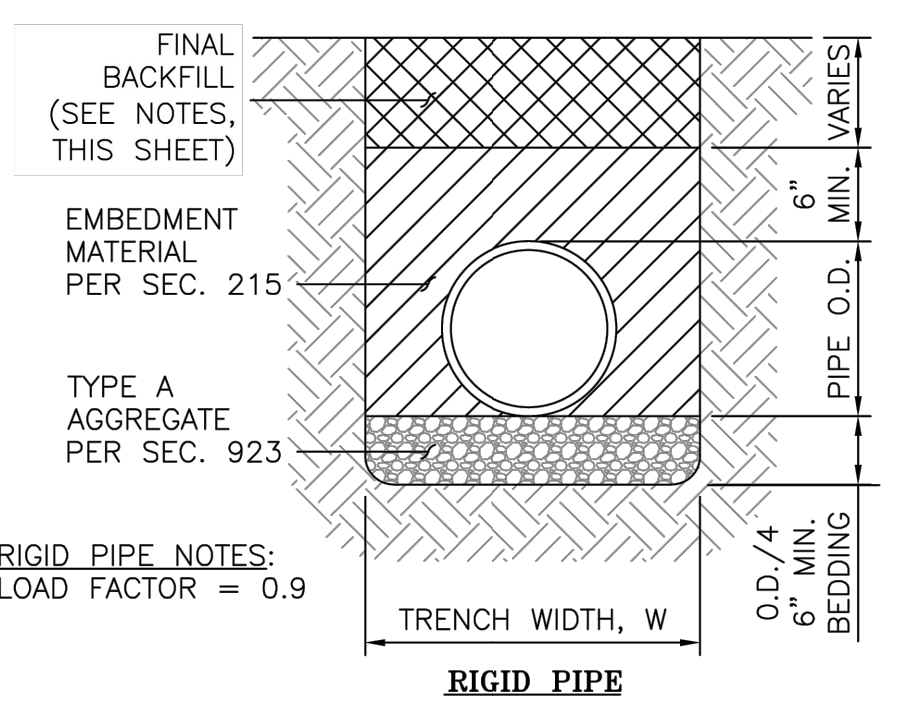
PIPE SIZE (IN.)	BRANCH SIZE (IN.)	LR (FT.)	RESTRAINED LENGTH, L (FT.)
12	8	15	1
12	12	0	167
12	12	10	114
12	12	15	88
12	12	20	61
16	6	0	92
16	6	5	1
16	12	0	172
16	12	5	123
16	12	10	75
16	12	15	26
16	12	20	1
16	16	0	222
16	16	5	186
16	16	10	150
16	16	15	114
16	16	20	78

316-1
 RESTRAINED JOINT DETAILS (1 OF 5)
 APPROVED 09/18/2023



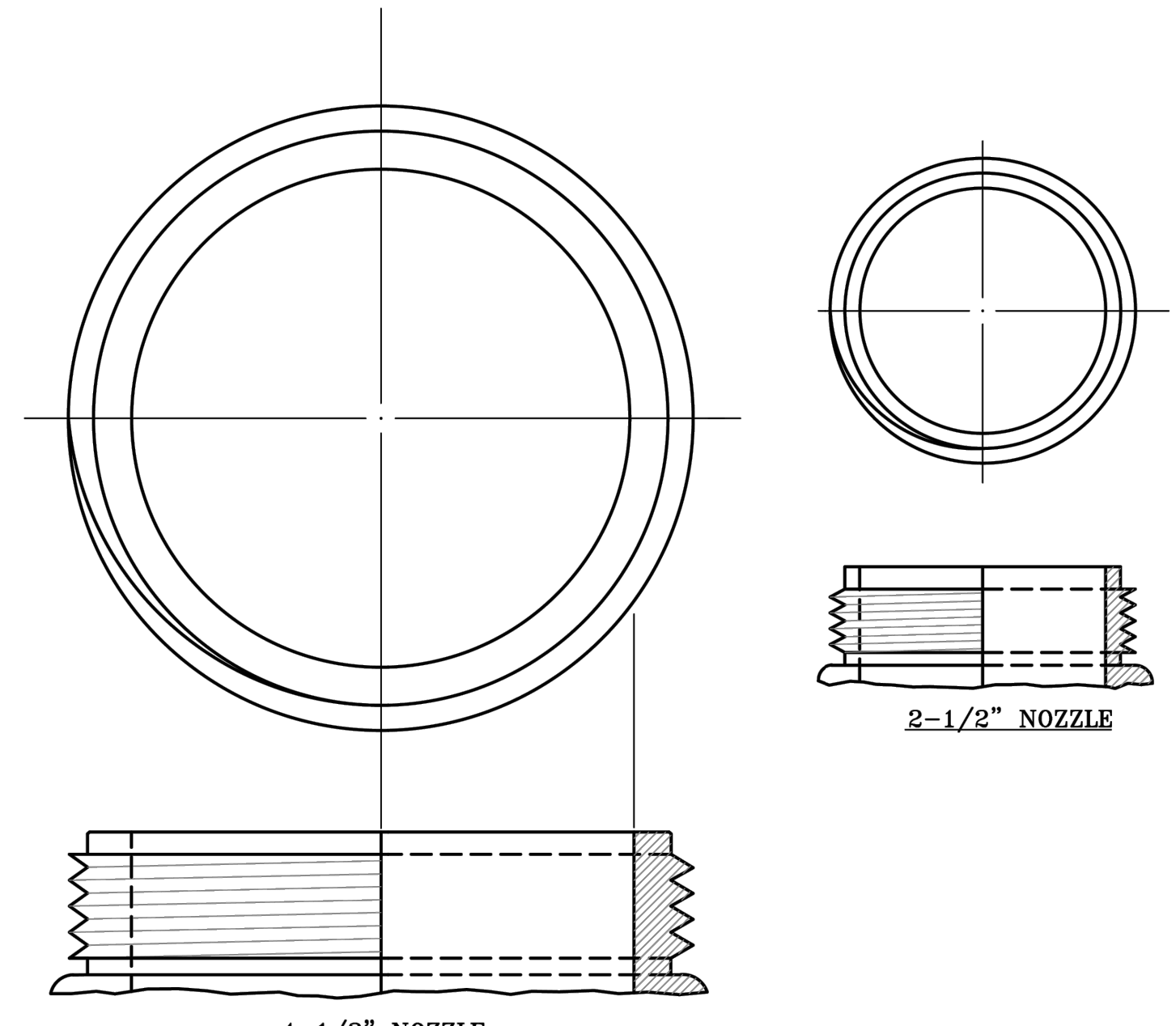
304
 TRACER WIRE WEATHER HEAD DETAILS
 APPROVED 09/18/2023

NOM. PIPE DIA. (IN.)	TRENCH WIDTH (FT.)	
	MIN.	MAX.
.....	3.00	5.00
15	3.25	5.00
18	3.50	5.00
21	3.75	5.25
24	4.00	6.00
27	4.25	6.25
30	4.50	6.75
33	4.75	8.25
36	5.25	9.00
42	6.25	9.50
48	7.00	10.00
54	8.00	10.50
60	9.00	11.00
66	9.75	11.50
72	10.50	12.00
78	10.50	12.50
84	11.00	13.00
90	11.50	13.50
96	12.00	14.00
102	12.50	14.50

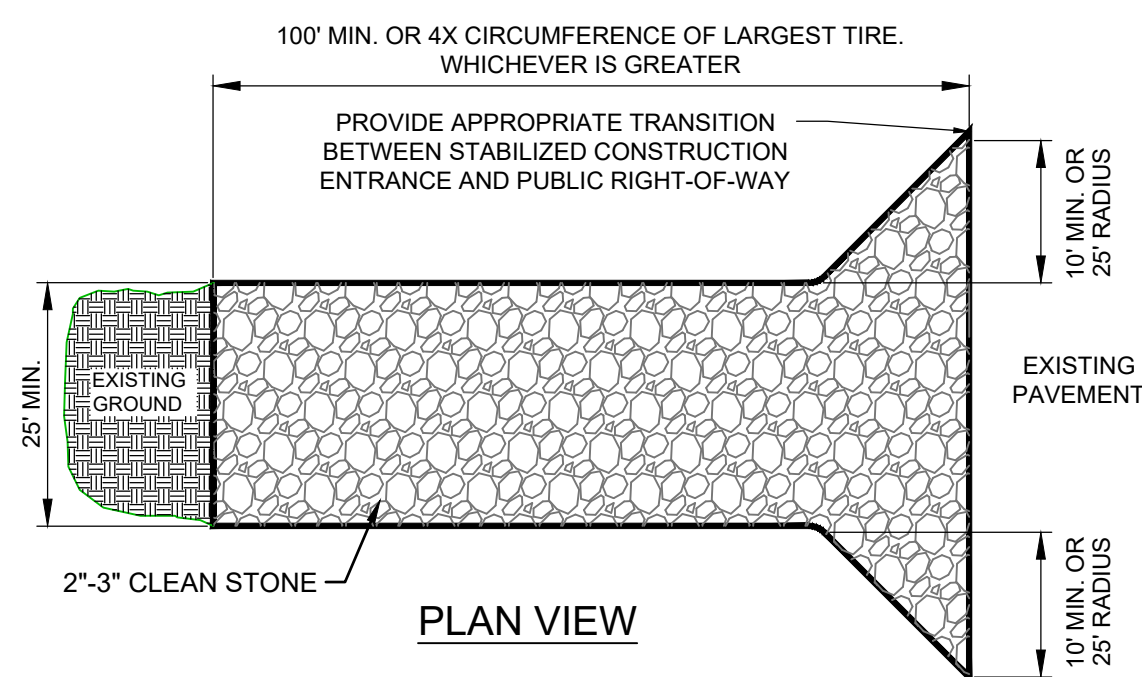
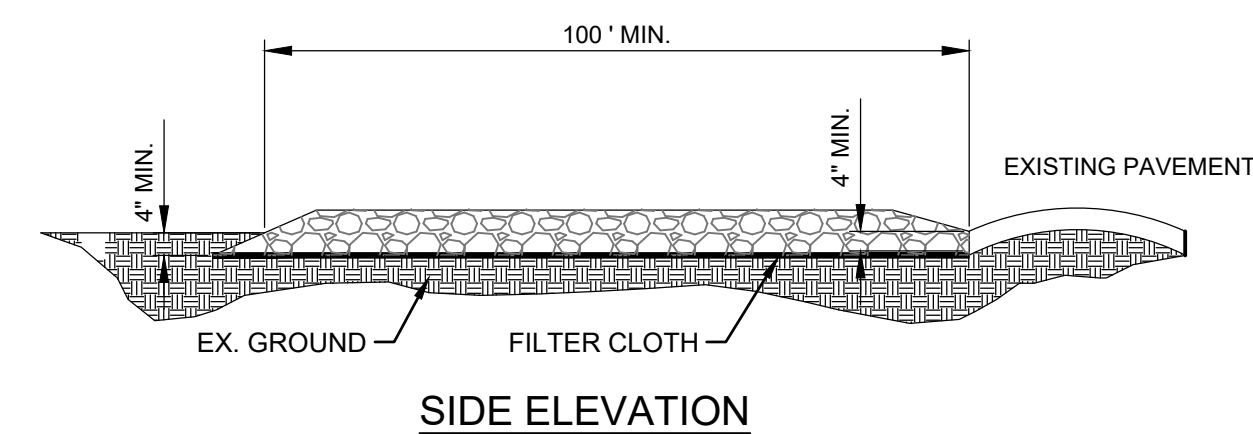


- GENERAL NOTES:**
- PER SECTION 212.04.04 OF THE STANDARD SPECIFICATIONS, FINAL BACKFILL SHALL BE APPROVED BY THE CITY'S DESIGNATED REPRESENTATIVE AND SHALL CONSIST OF LOOSE EARTH, FREE OF CLODS, STONES, ORGANIC MATTER, DEBRIS, OR OTHER OBJECTIONABLE MATERIAL.
 - FOR INSTALLATIONS BENEATH ROADWAYS AND OTHER PAVED AREAS, FINAL BACKFILL SHALL BE TYPE A AGGREGATE PER SECTION 923 OF THE STANDARD SPECIFICATIONS.

102
 TRENCH DETAILS
 APPROVED 09/18/2023



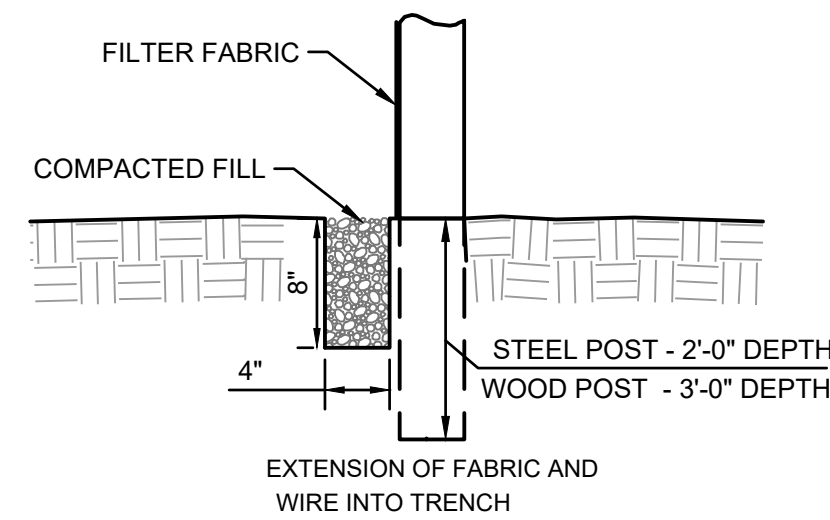
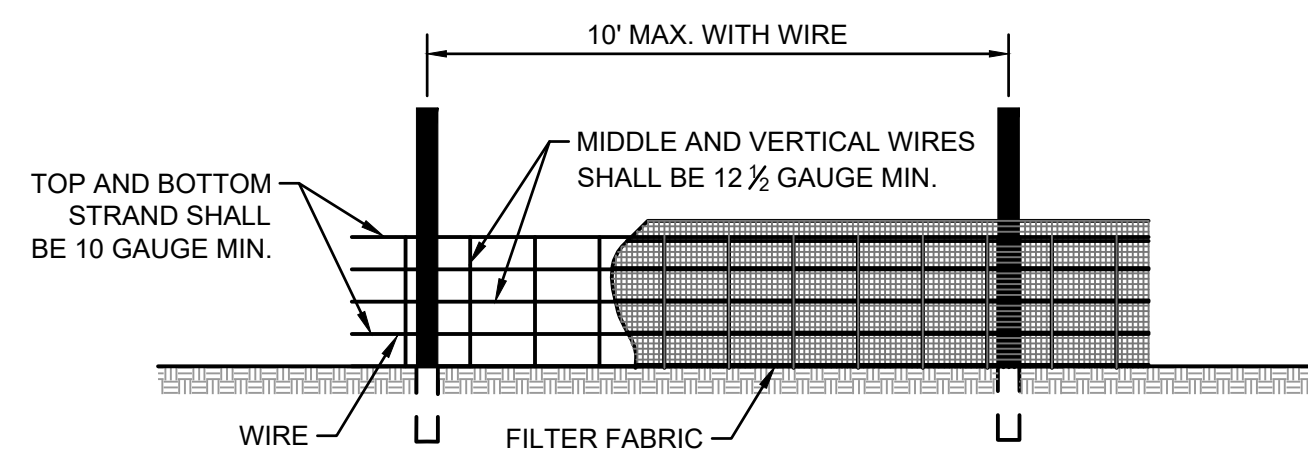
303
 FIRE HYDRANT NOZZLE THREADS
 APPROVED 09/18/2023



- NOTES:
1. STONE - USE COARSE AGGREGATE (2 - 3 INCH STONE)
 2. LENGTH - AS EFFECTIVE, BUT NOT LESS THAN 100 FEET.
 3. THICKNESS - NOT LESS THAN EIGHT (8) INCHES.
 4. WIDTH - NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
 5. WASHING - WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, BOARDS OR OTHER APPROVED METHODS.
 6. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
 7. 12" X 24" METAL GRATE MAY BE USED. GRATE SHALL BE 25' AWAY FROM PAVEMENT AND APPROPRIATE SEDIMENT CONTROL TRAPPING DEVICE SHALL BE USED AT GRATE OUTLET POINT.

STABILIZED CONSTRUCTION ENTRANCE

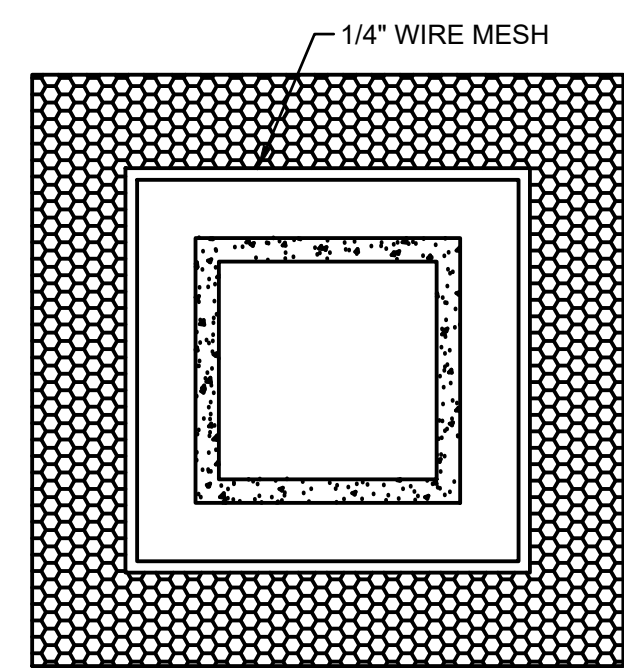
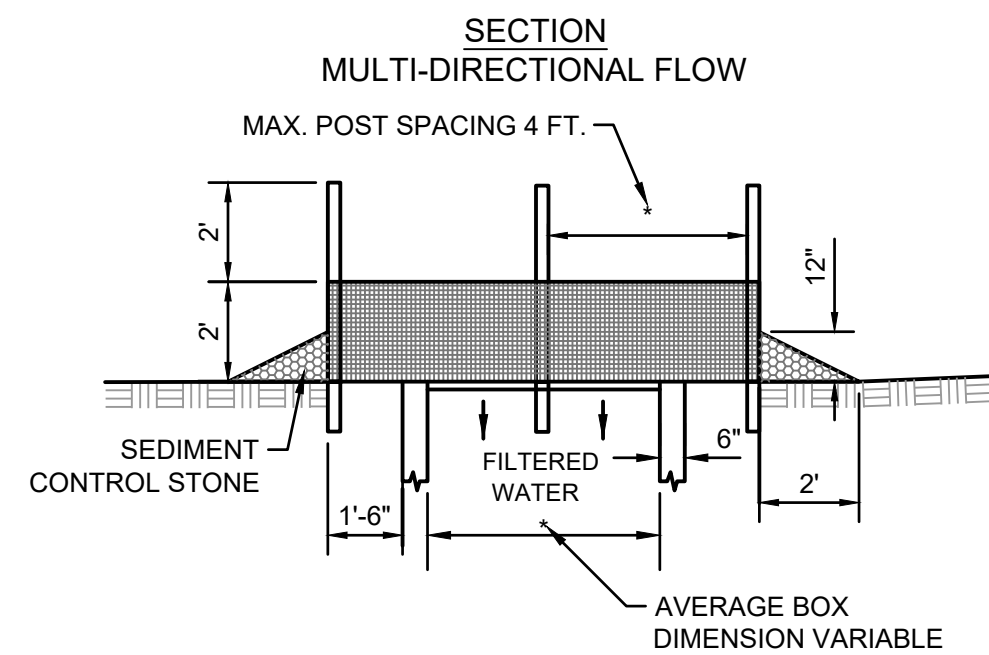
NOT TO SCALE



- NOTES:
1. WIRE SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
 2. FILTER FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED ADEQUATELY TO THE WIRE.
 3. STEEL POST SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
 4. WOOD POST SHALL BE 6'-0" IN HEIGHT AND 3" IN DIAMETER.

SILT FENCE DETAIL

NOT TO SCALE



INLET PROTECTION DETAIL

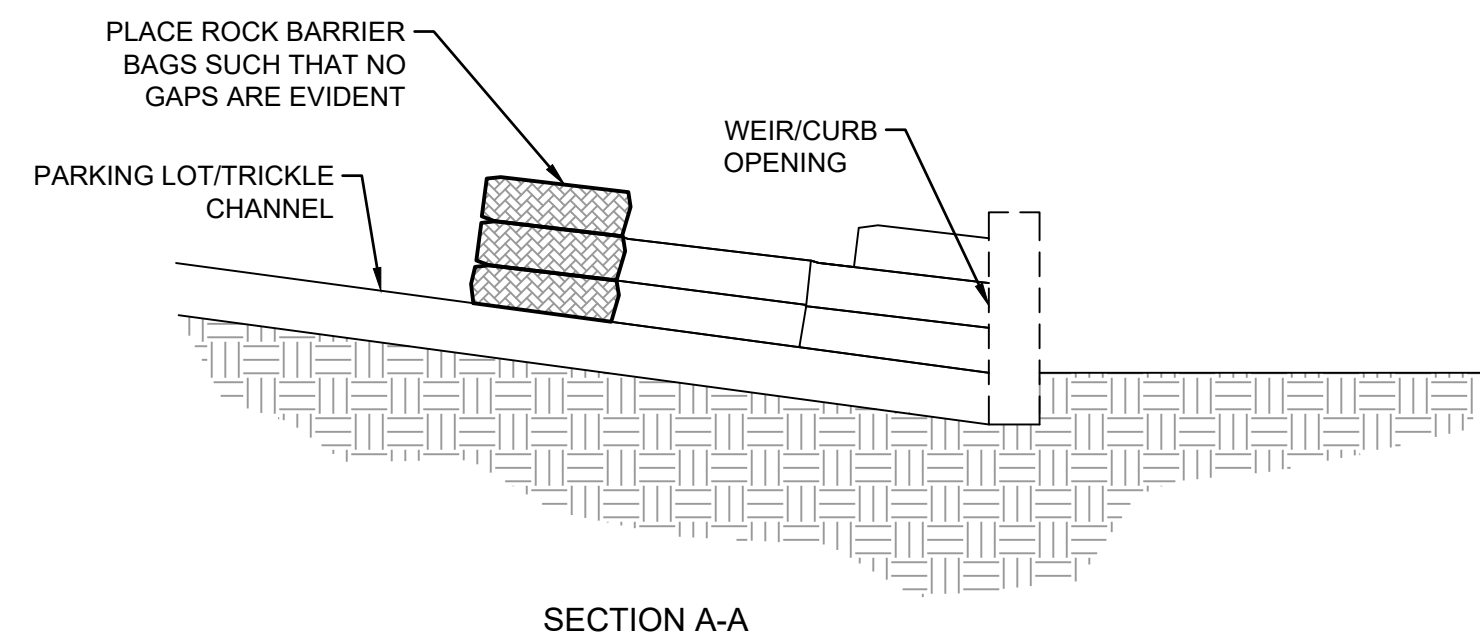
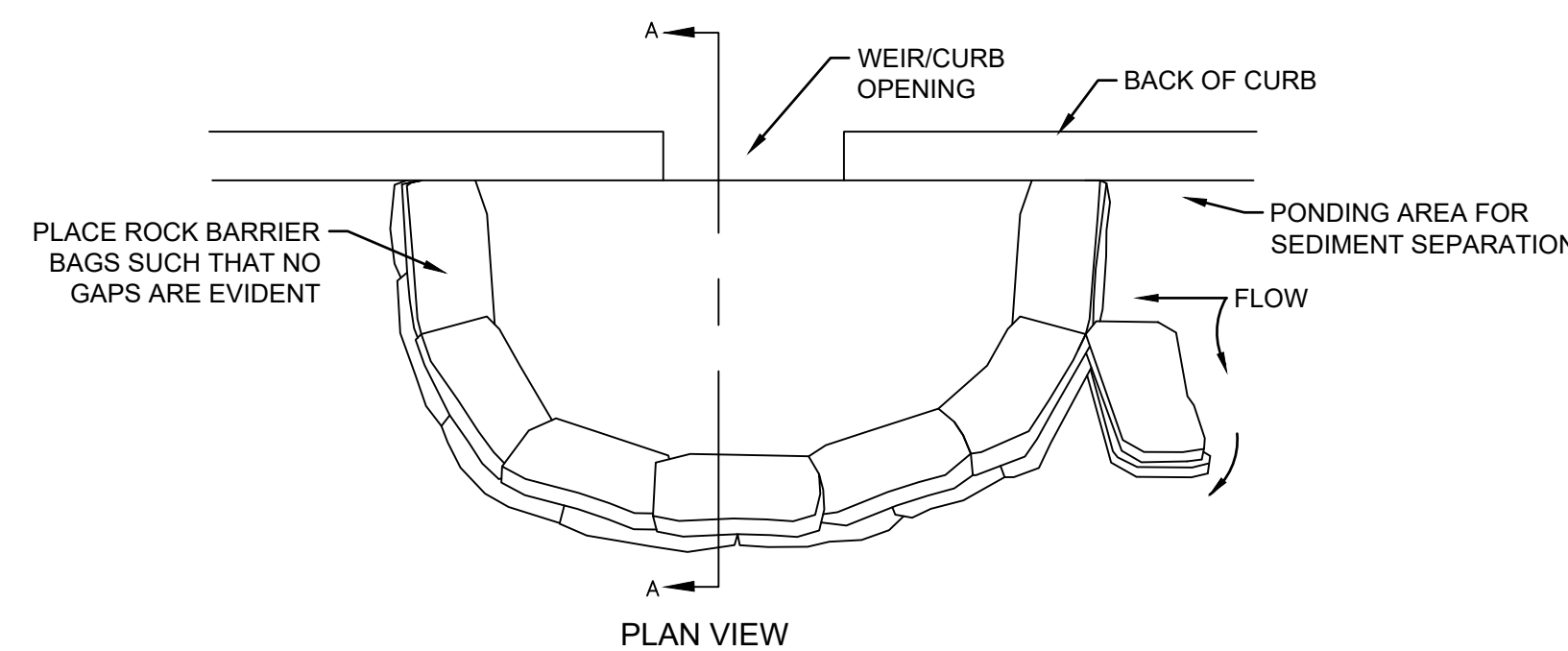
NOT TO SCALE

- NOTES:
1. SEDIMENT CONTROL STONE SHALL BE 3/4" WASHED STONE.
 2. WIRE MESH SHALL BE HARDWARE CLOTH 23 GAUGE MIN. AND SHALL HAVE 1/4" MESH OPENINGS.
 3. TOP OF WIRE MESH SHALL BE A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR ANY DIVERSION POINT.
 4. STEEL POST SHALL BE 5 FT. IN HEIGHT, BE INSTALLED 1.5 FT. DEEP MINIMUM, AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
 5. WOOD POST SHALL BE 6 FT. IN HEIGHT, BE INSTALLED TO 1.5 FT. DEEP MINIMUM, AND BE 3 INCHES IN DIAMETER.
 6. POST SPACING SHALL BE A MAXIMUM OF 4 FT.

CONCRETE WASHOUT DETAIL

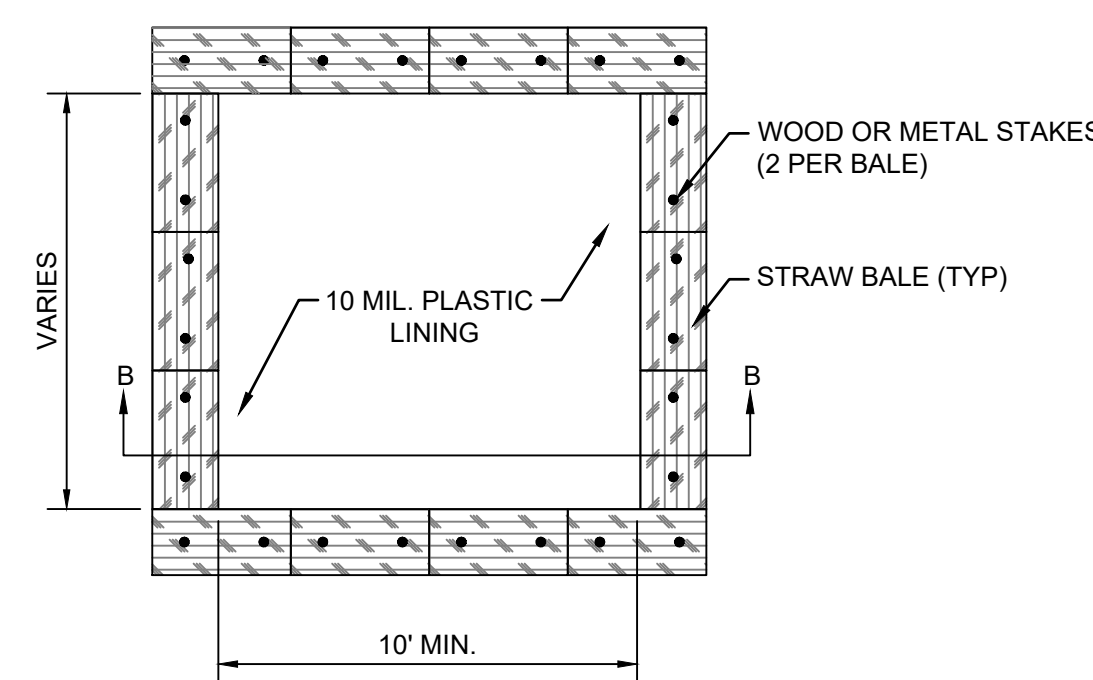
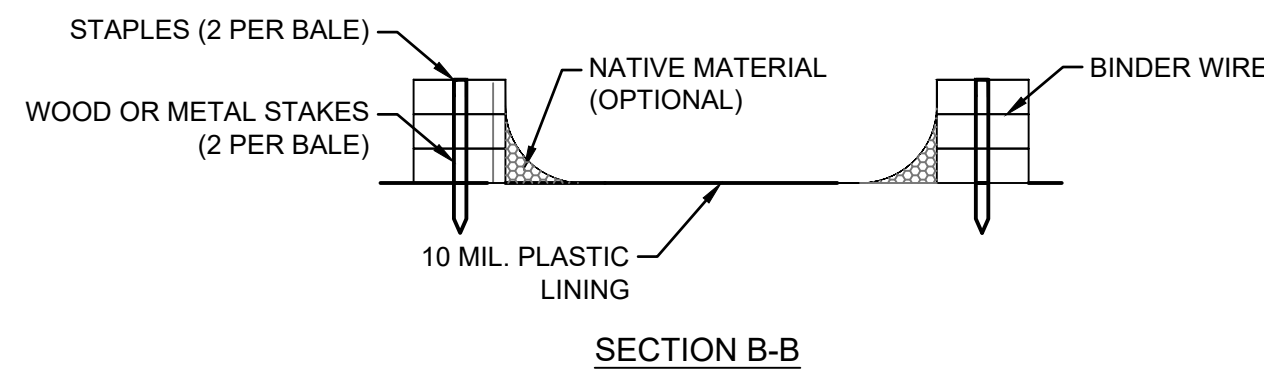
CONCRETE WASHOUT DETAIL

NOT TO SCALE

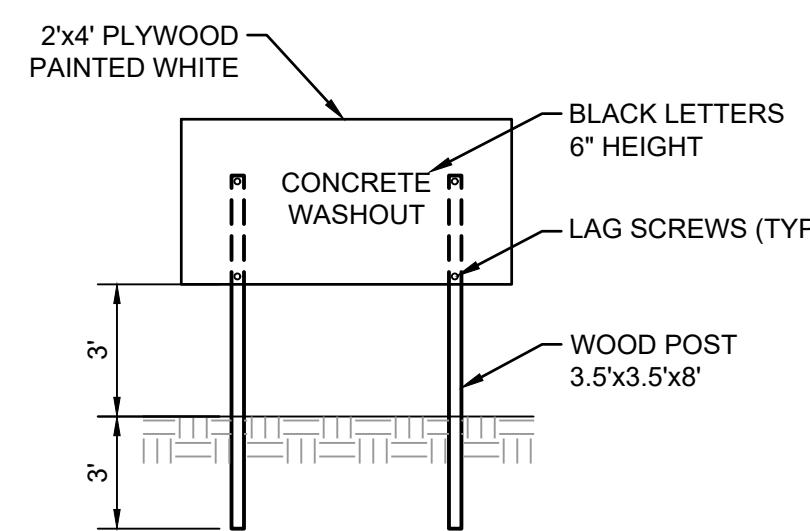


CURB INLET PROTECTION DETAIL

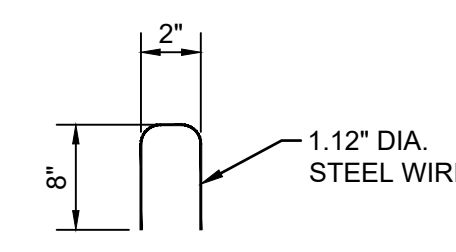
NOT TO SCALE



TYPE 'ABOVE GRADE' WITH STRAW BALES

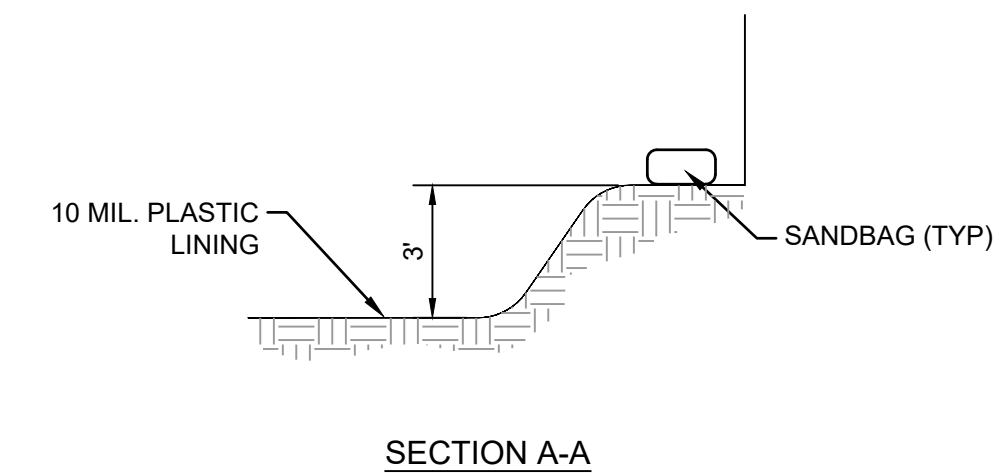


CONCRETE WASHOUT SIGN DETAIL

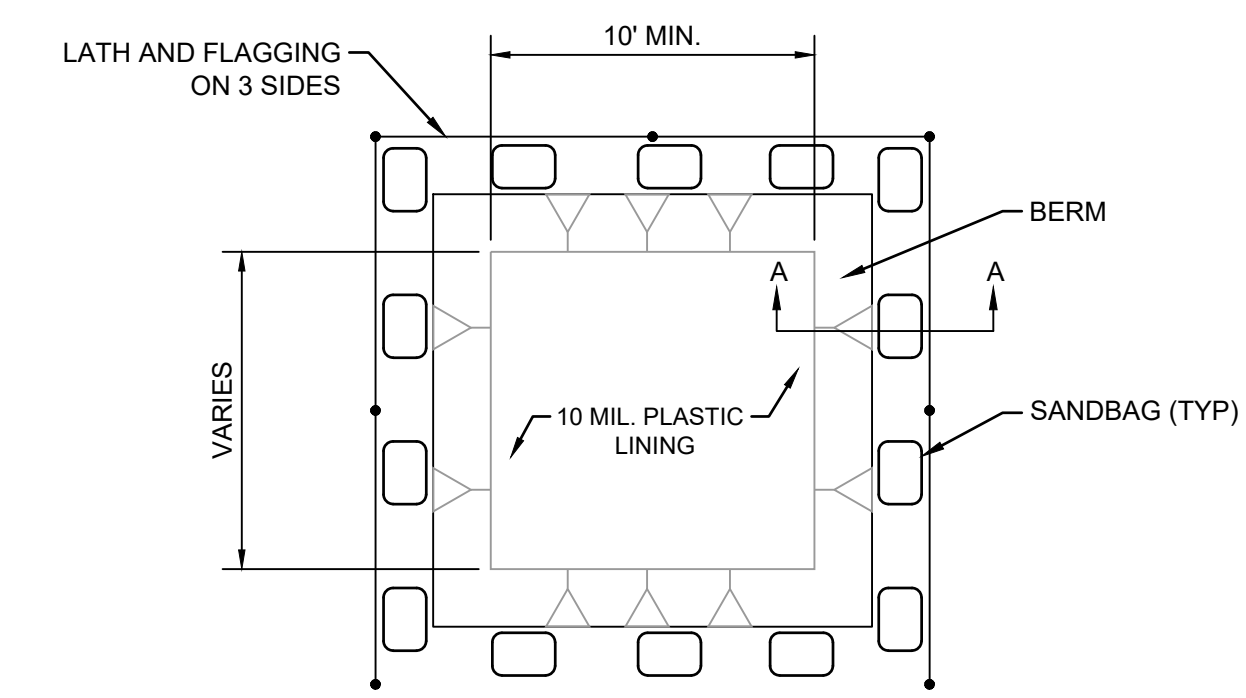


STAPLE DETAIL

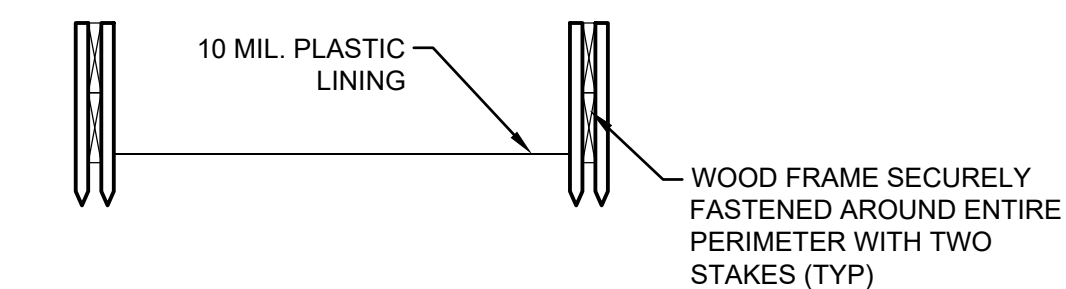
- NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
 2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
 3. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
 4. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED AND STABILIZED TO PREVENT EROSION.



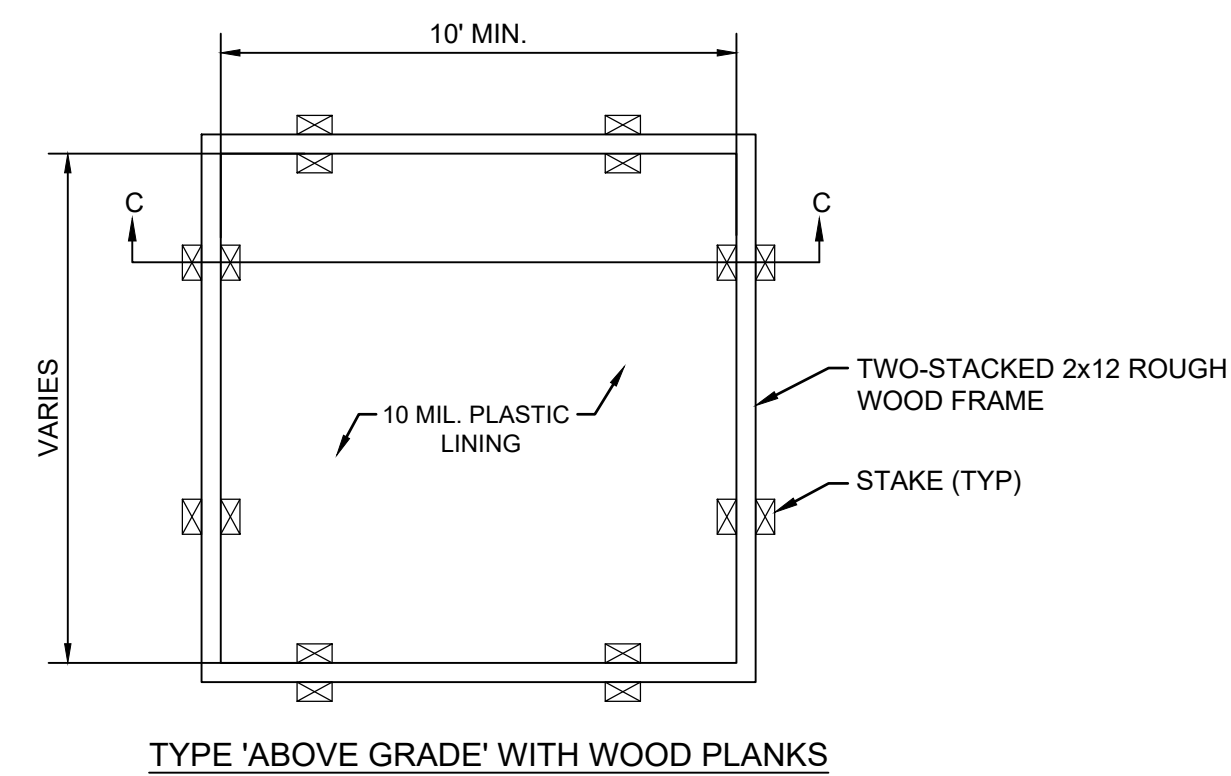
SECTION A-A



TYPE 'BELOW GRADE'

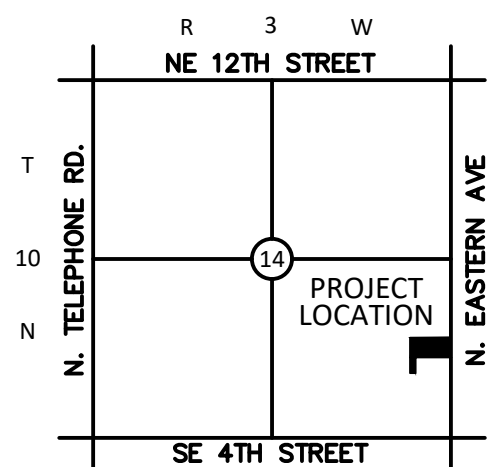


SECTION C-C



TYPE 'ABOVE GRADE' WITH WOOD PLANKS

LOCATION MAP:



NOT TO SCALE

PROJECT:

MPS DAYCARE

201 N. EASTERN
MOORE OK

PROJECT NUMBER: 24110
 DRAWING DATE: 11.05.24
 ISSUE DATE: 11.05.24

SEAL:



SUBMITTAL:

PERMIT SET

REVISIONS:

MARK DATE DESCRIPTION

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DRAWING TITLE:

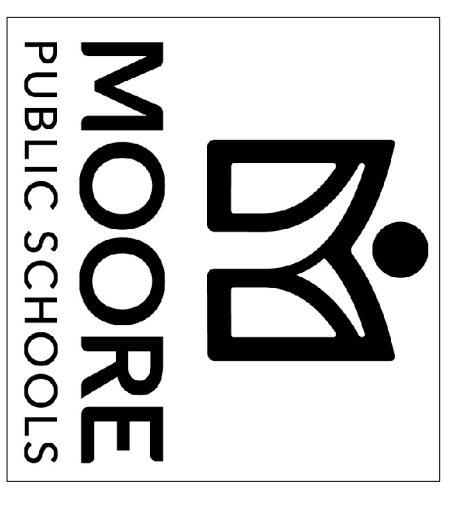
EROSION CONTROL DETAILS

SHEET:

C3.01

CEDAR CREEK
OHL
KFC ENGINEERING
STRUCTURAL
SALUS O'BRIEN
MECHANICAL/ELECTRICAL

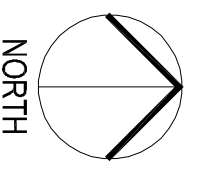
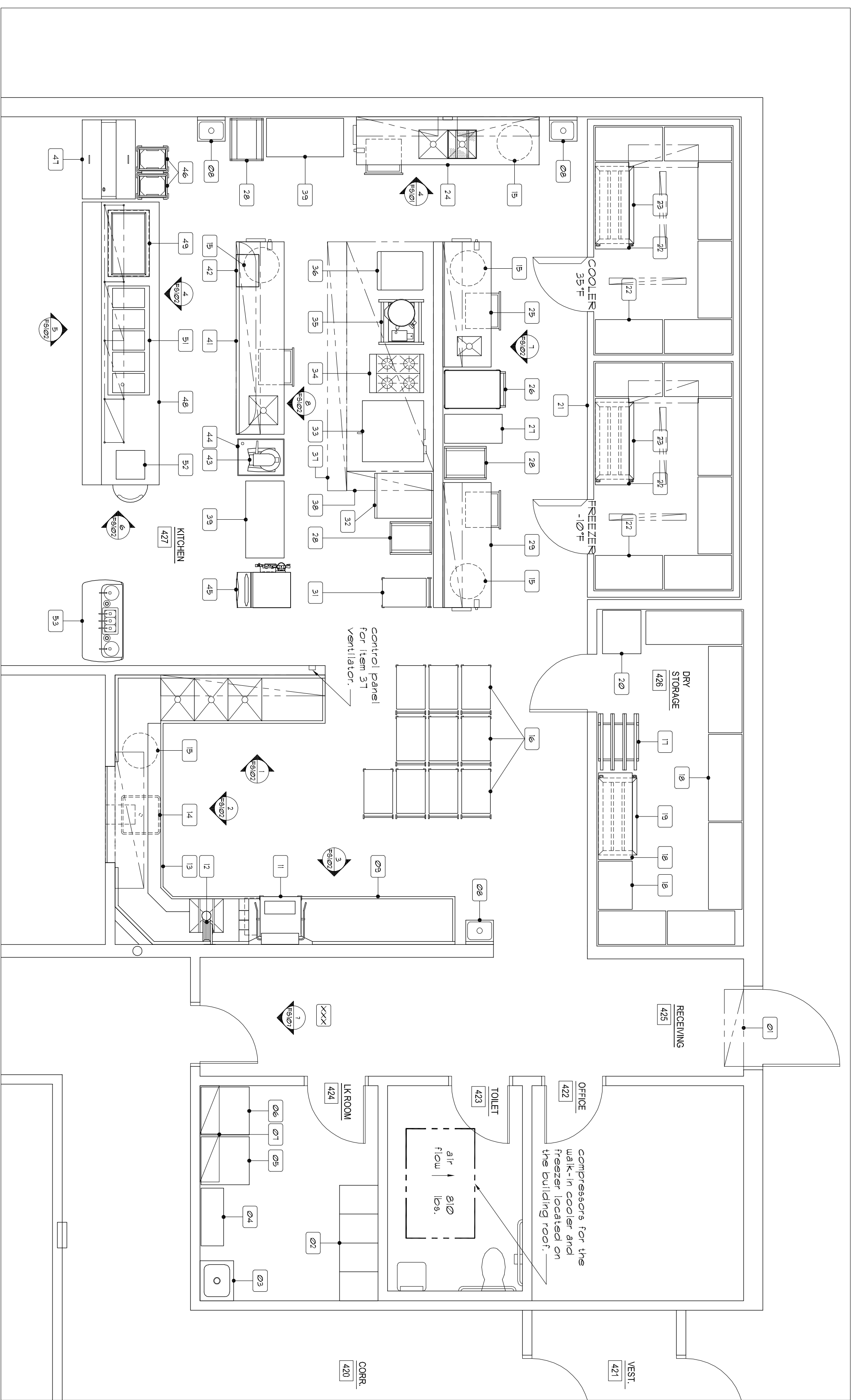
RS
drawn by
RS
checked by
10/29/2024
date
revisions
Addendum #1 11/20/2024



CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No:
FS101

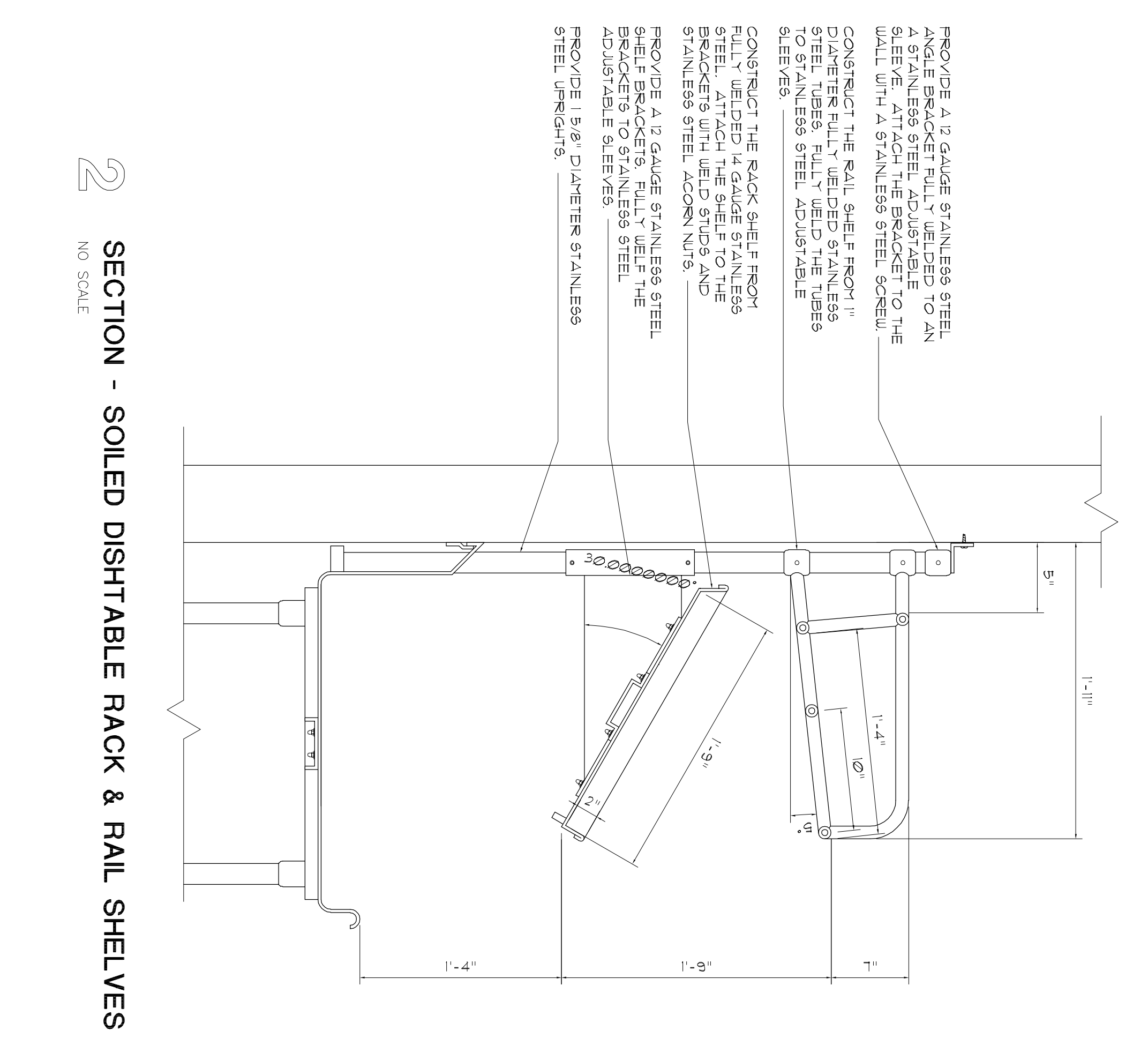
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1

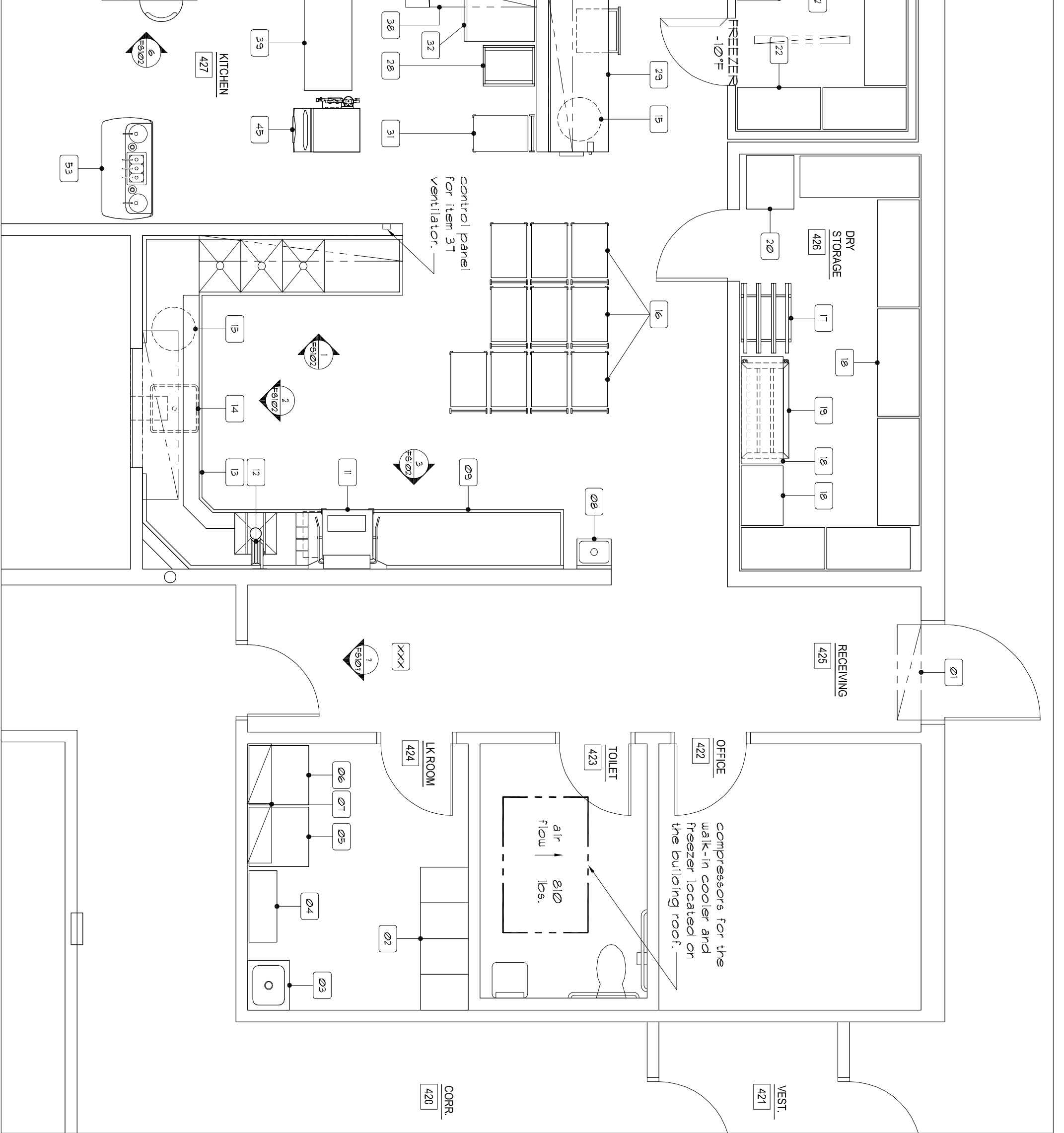
FOODSERVICE EQUIPMENT ARRANGEMENT PLAN
1/4" = 1'-0"

NO.	DESCRIPTION - PHASE I
01	AIR CURTAIN
02	LOCKERS
03	HOCKERS
04	CHEMICAL STORAGE SHELVING
05	WASHER BY THE QUINER
06	DRYER BY THE QUINER
07	WALL MOUNTED LINEN SHELVES
08	CAN DISH
09	CAN DISH TABLE
10	NUMBER NOT USED
11	VENTILATED DISHWASHER WITH BOOSTER HEATER
12	SOLEID DISHTABLE
13	WALL MOUNTED HOSE REEL
14	TOILET SINK
15	TOILET SINK
16	MEAL TRANSPORT CARTS
17	CAN RACK
18	STORAGE SHELVING
19	MOBILE DINNAGE RACK
20	MOBILE BECAD RACK BY THE VENDOR
21	WALK IN STORAGE SHELVING
22	WALK IN STORAGE SHELVING
23	MOBILE DINNAGE RACK
24	FREEZE TABLE
25	ALLEGEY LOCK TABLE
26	ALLEGEY LOCK TABLE
27	ALLEGEY LOCK TABLE
28	MEAL ASSEMBLY TABLE
29	NUMBER NOT USED
30	NUMBER NOT USED
31	MOBILE UTILITY CART
32	MOBILE FOOD/HOT CABINET
33	MOBILE COOLING RACK
34	MOBILE RANGE
35	12 GALLON TILTING KETTLE
36	CONVECTION STEAMER
37	VENTILATOR
38	ME BUREAU
39	ME BUREAU
40	NUMBER NOT USED
41	NUMBER NOT USED
42	COOKS TABLE
43	MICROWAVE
44	20 QUART MIXER
45	MEAL SERVER STAND
46	MOBILE TRAY DISPENSER
47	MOBILE MILK COOLER
48	SERVING COUNTER
49	DROPPIN COLD FOOD WELLS
50	DROPPIN COLD FOOD WELLS
51	POS BY THE QUINER
52	MOBILE CONDIMENT COUNTER
53	MOBILE CONDIMENT COUNTER



2

SECTION 2 - SOILED DISHTABLE RACK & RAIL SHELVES
NO SCALE



3

SECTION 3 - SERVING COUNTER
NO SCALE

SQUEEZE GUARD PER THE DRAWINGS AND SPECIFICATIONS, ATTACH THE SQUEEZE GUARD TO THE COUNTER PER THE MANUFACTURERS REQUIREMENTS.

PROVIDE A FULLY WELDED 14 GAUGE STAINLESS STEEL COUNTER TOP. PROVIDE A 2" TURN DOWN WITH A TIGHT HEM AT ALL THE EXPOSED SIDES.

HOT FOOD WELLS PER THE SPECIFICATIONS. MOUNT THE UNITS WITH STAINLESS STEEL FASTENERS PER THE MANUFACTURERS REQUIREMENTS.

PROVIDE A FULLY WELDED 1 1/2" X 1 1/2" X 1/8" ANGLE FRAME.

PROVIDE A FULLY WELDED 14 GAUGE STAINLESS STEEL TRAY SLIDE WITH 1/4" HIGH EDGES. PROVIDE A 2" TURN DOWN WITH A TIGHT HEM AT ALL THE EXPOSED SIDES.

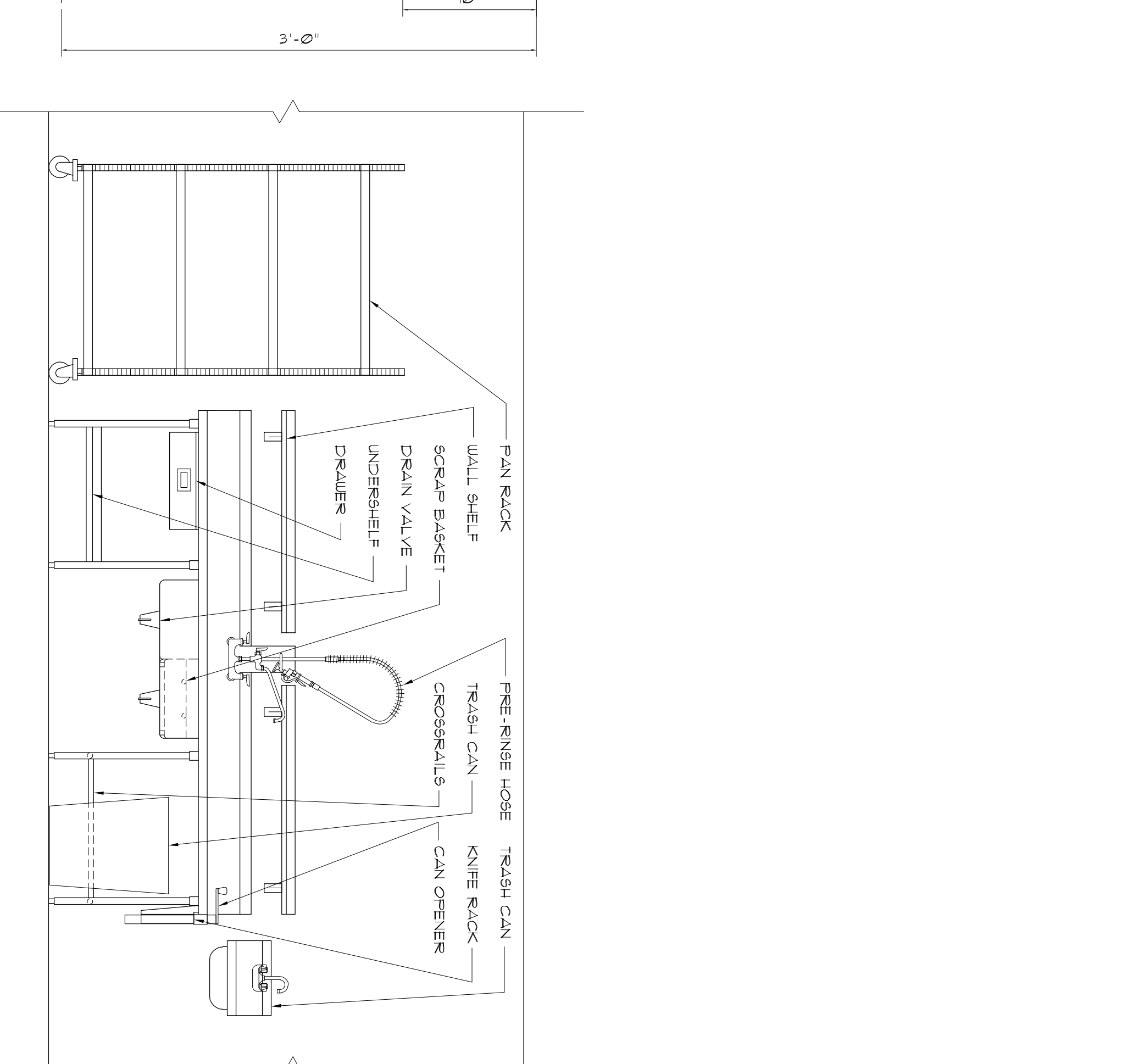
PROVIDE A STAINLESS STEEL REMOVABLE ACCESS PANEL AT THE HOT FOOD WELL'S. ATTACH THE PANELS WITH STAINLESS STEEL SCREWS.

PROVIDE 18 GAUGE FULLY WELDED STAINLESS STEEL REMOVABLE PANELS PER THE SPECIFICATIONS. ATTACH THE PANEL EDGES.

PROVIDE A FULLY WELDED 18 GAUGE STAINLESS STEEL COUNTER BODY.

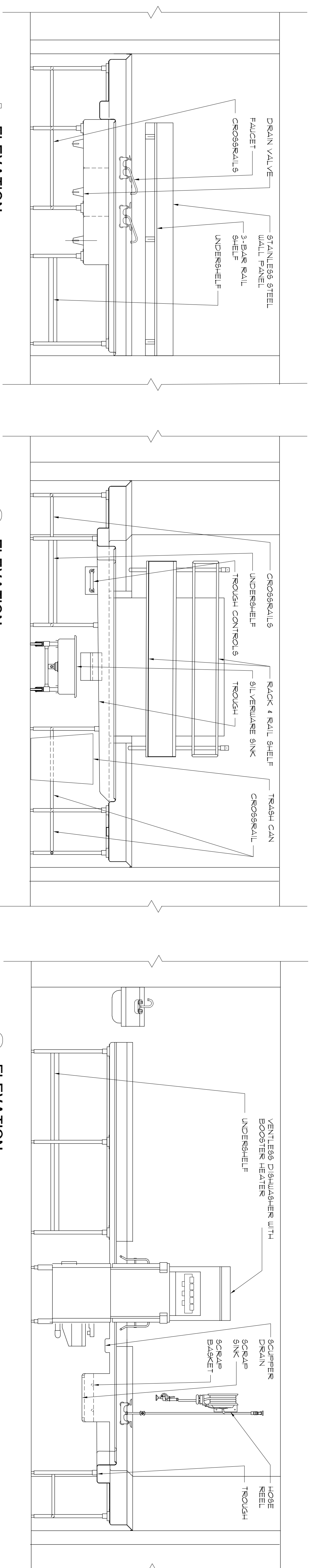
PROVIDE A 18 GAUGE STAINLESS STEEL FULLY WELDED UNDERSHELF. FULLY WELD THE SHELVES TO THE COUNTER BODY.

PROVIDE FULLY WELDED 12 GAUGE STAINLESS STEEL CURB WELD THE CURB TO THE ANGLE FRAME.



4

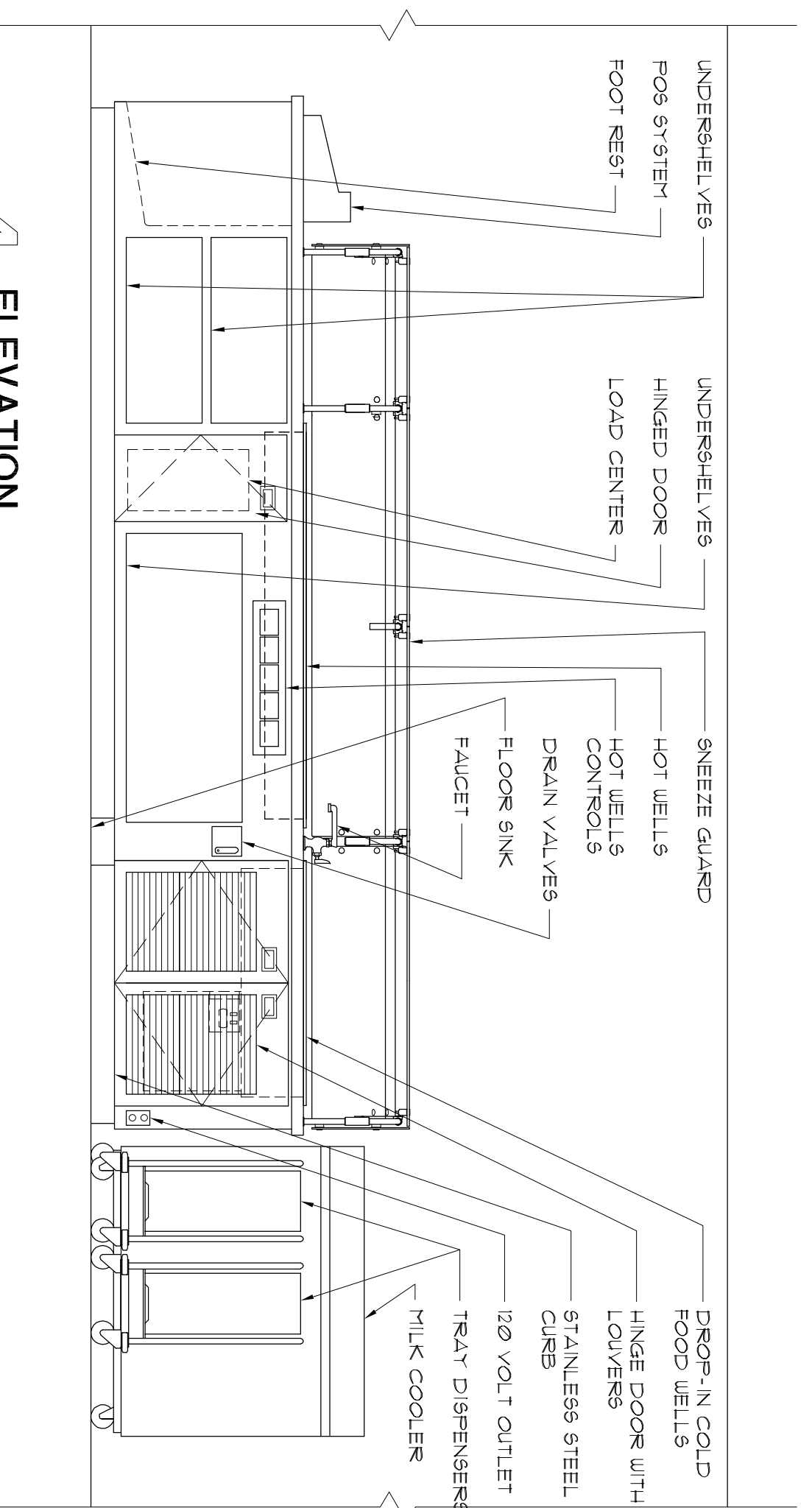
ELEVATION
NO SCALE



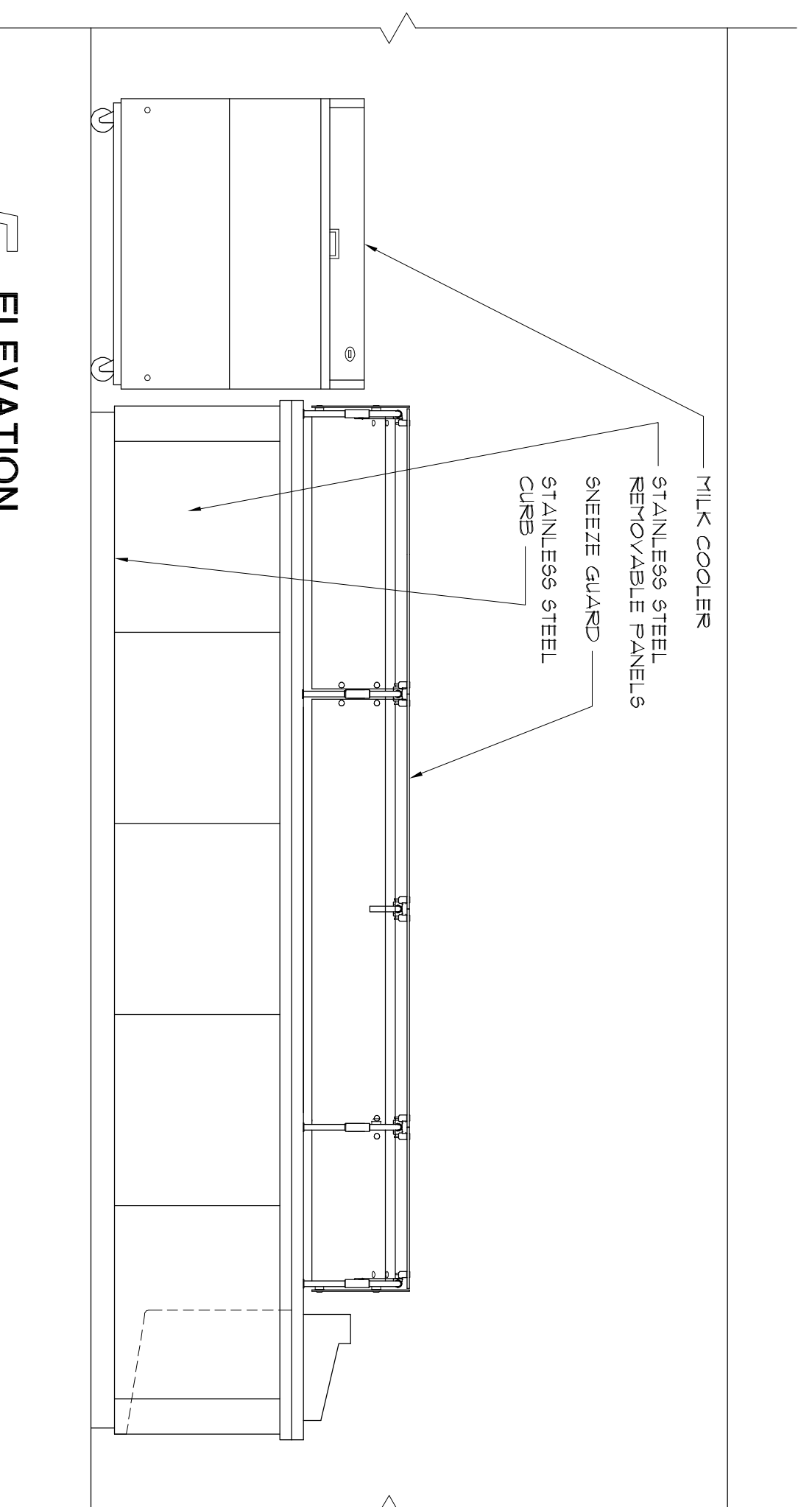
1 ELEVATION
NO SCALE

2 ELEVATION
1/2" = 1'-0"

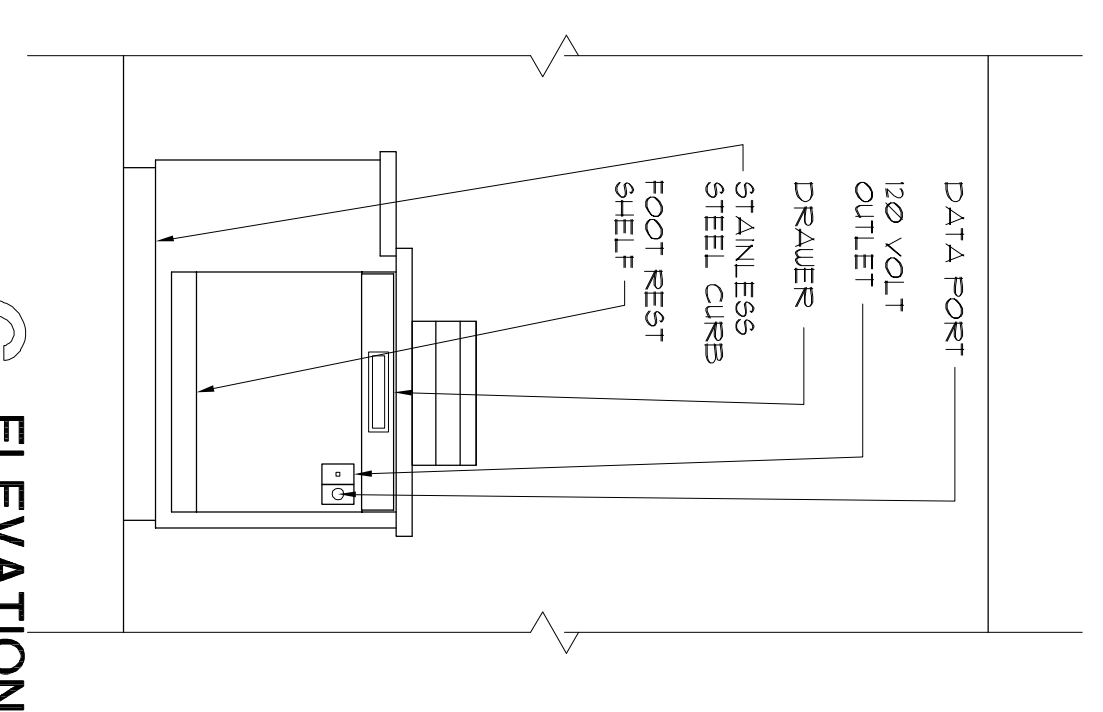
3 ELEVATION
1/2" = 1'-0"



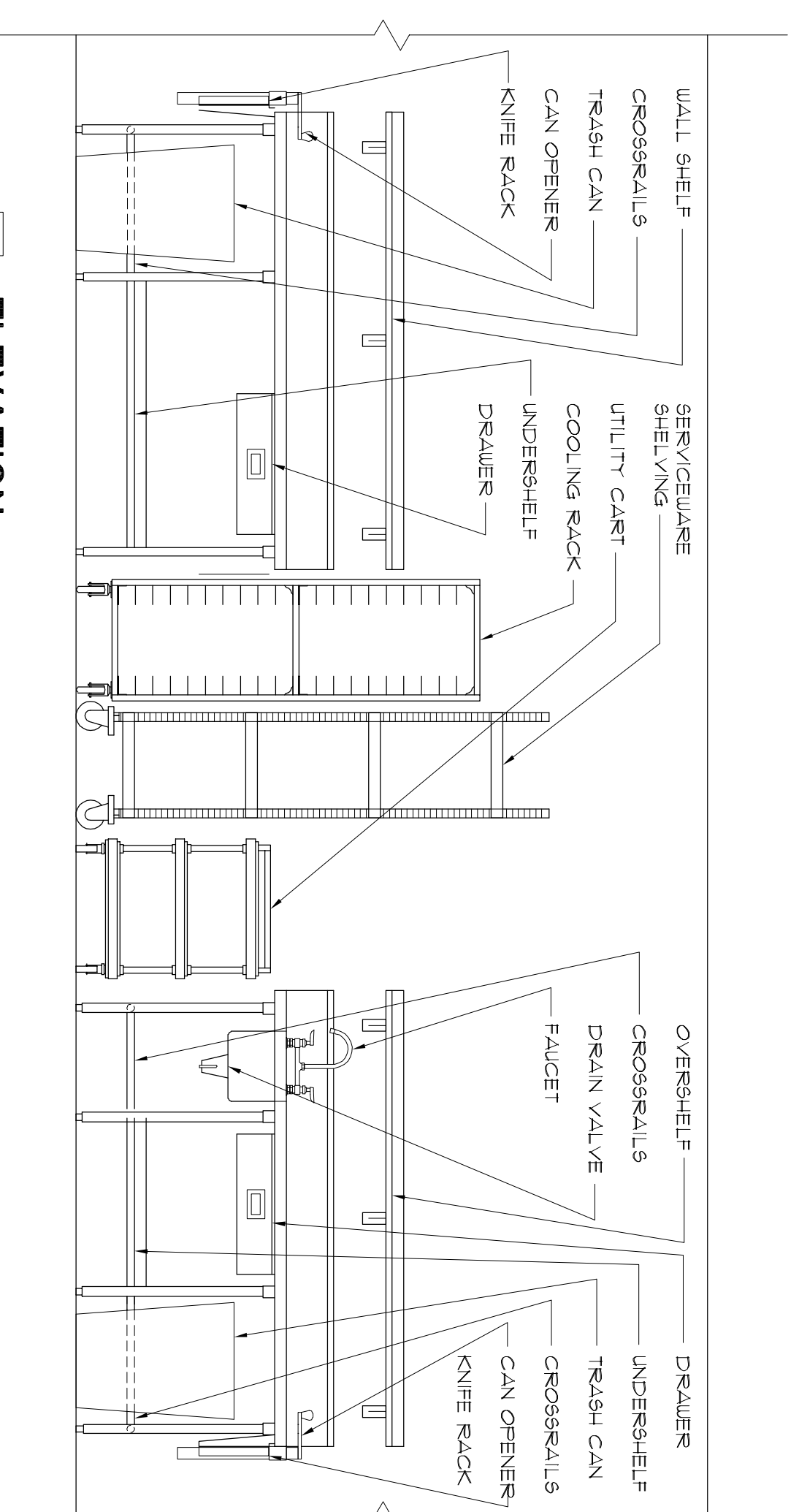
4 ELEVATION
1/2" = 1'-0"



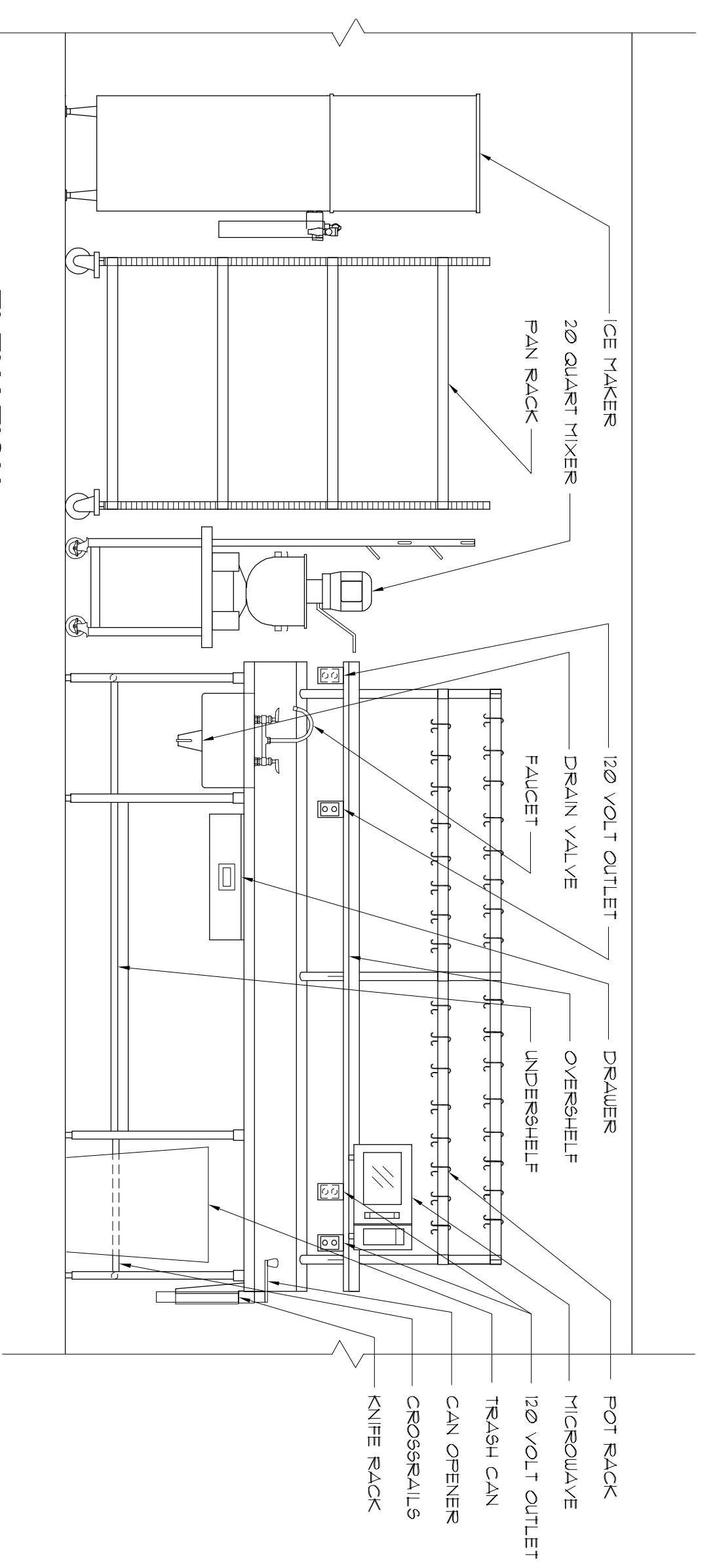
5 ELEVATION
1/2" = 1'-0"



6 ELEVATION
1/2" = 1'-0"




7 ELEVATION
1/2" = 1'-0"



8 ELEVATION
NO SCALE

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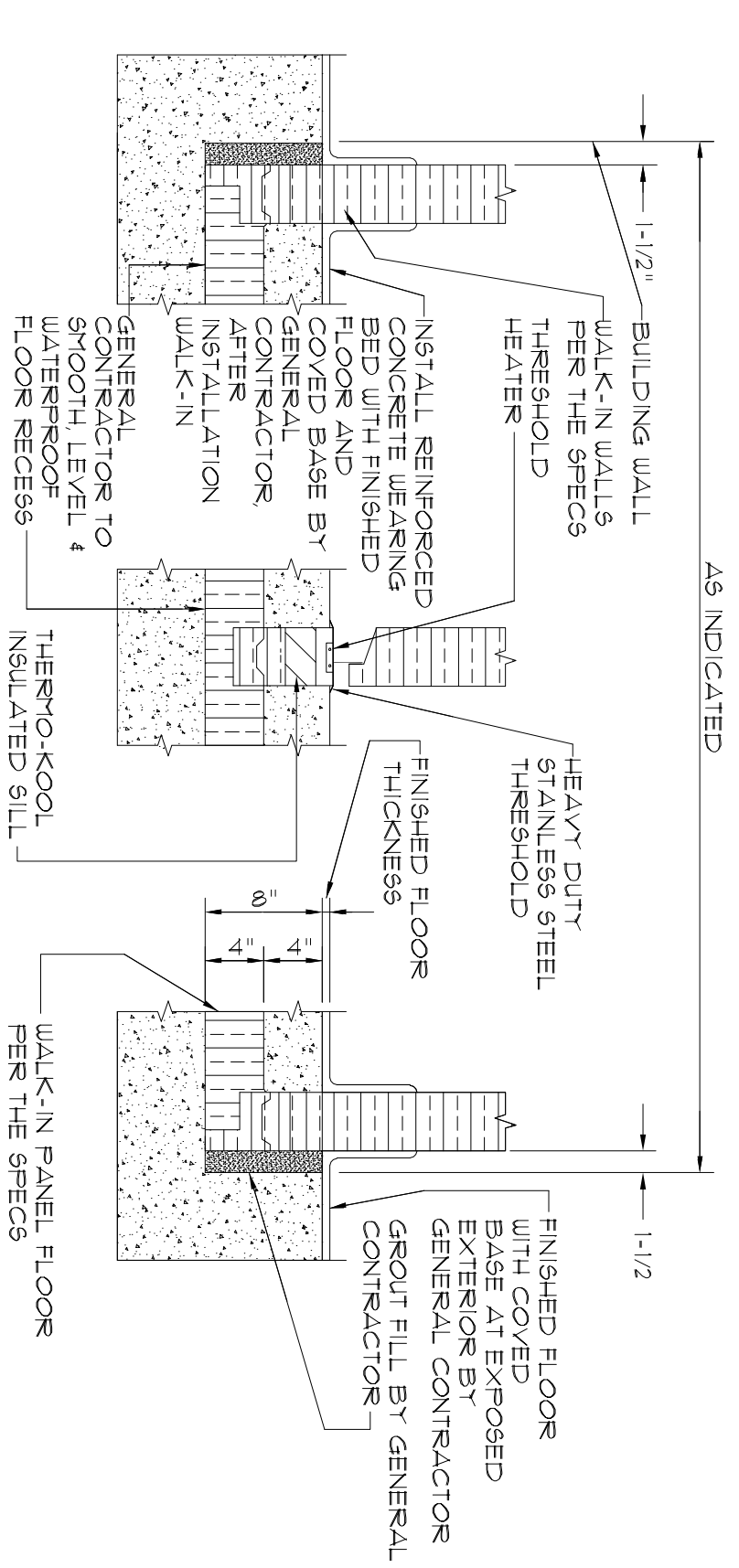
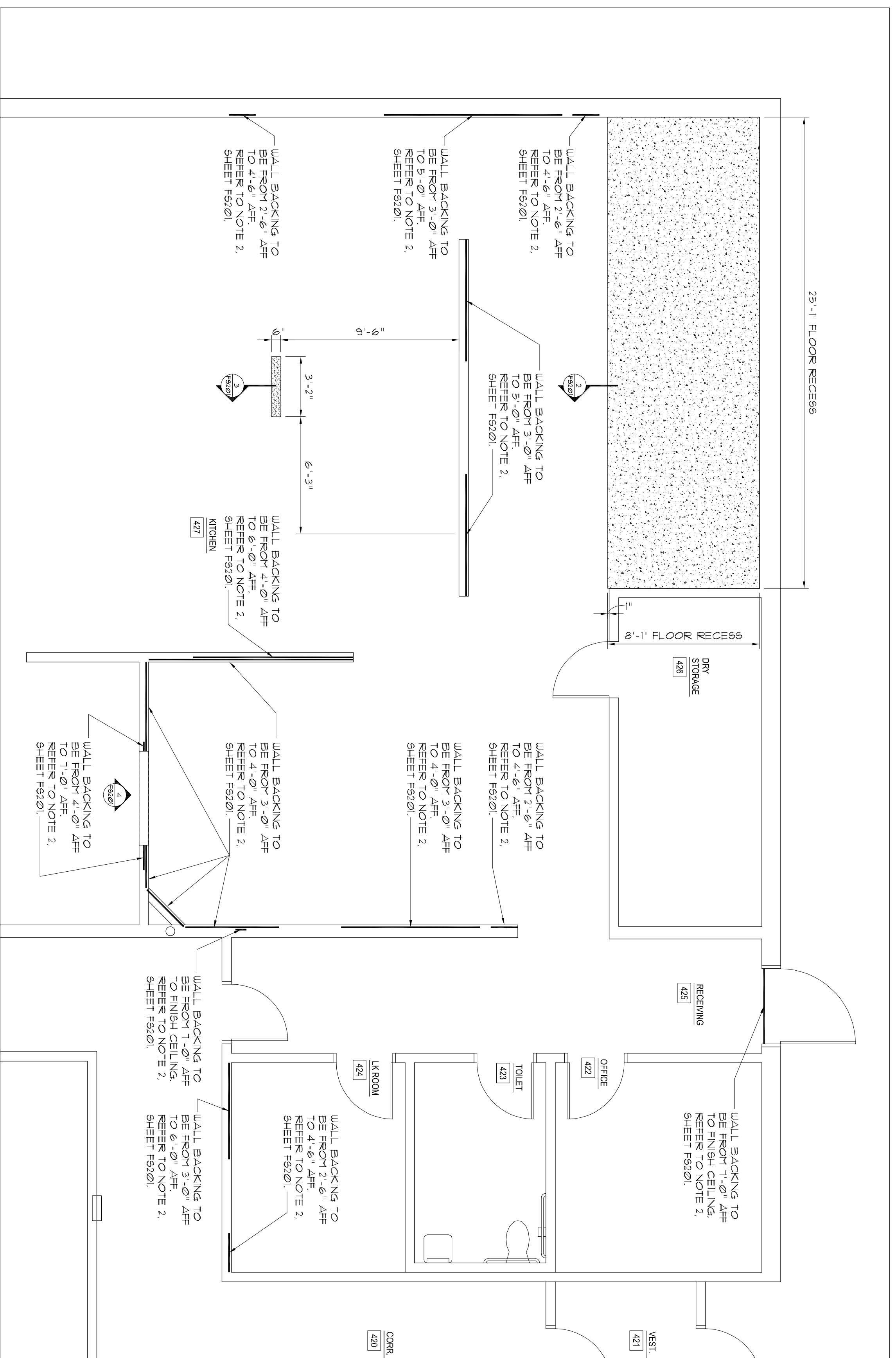

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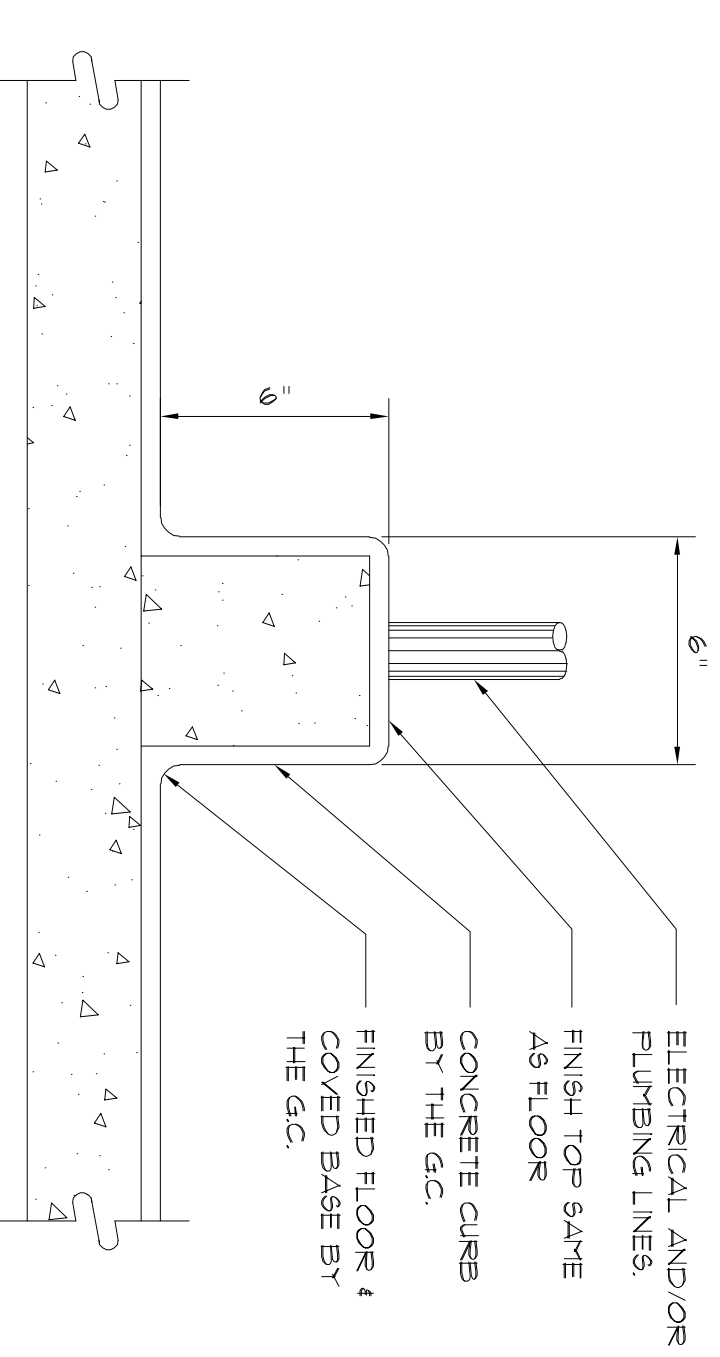
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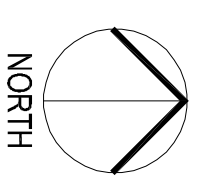
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10/29/2024	date	
	revisions	
11/20/2024	Addendum #1	



2 DETAIL - WALK-IN RECESS @ COOLERS & FREEZERS
NO SCALE



3 SECTION - UTILITY CURB
NO SCALE

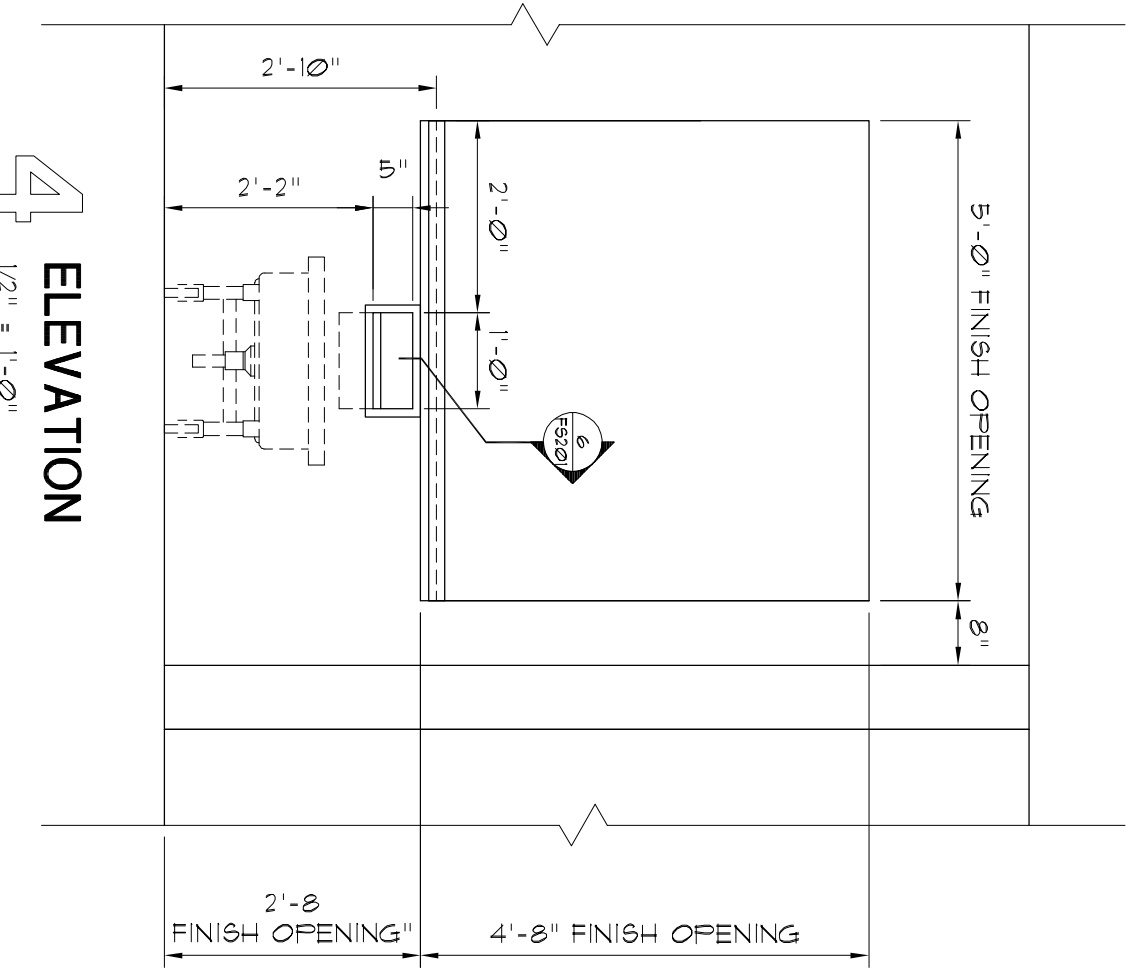


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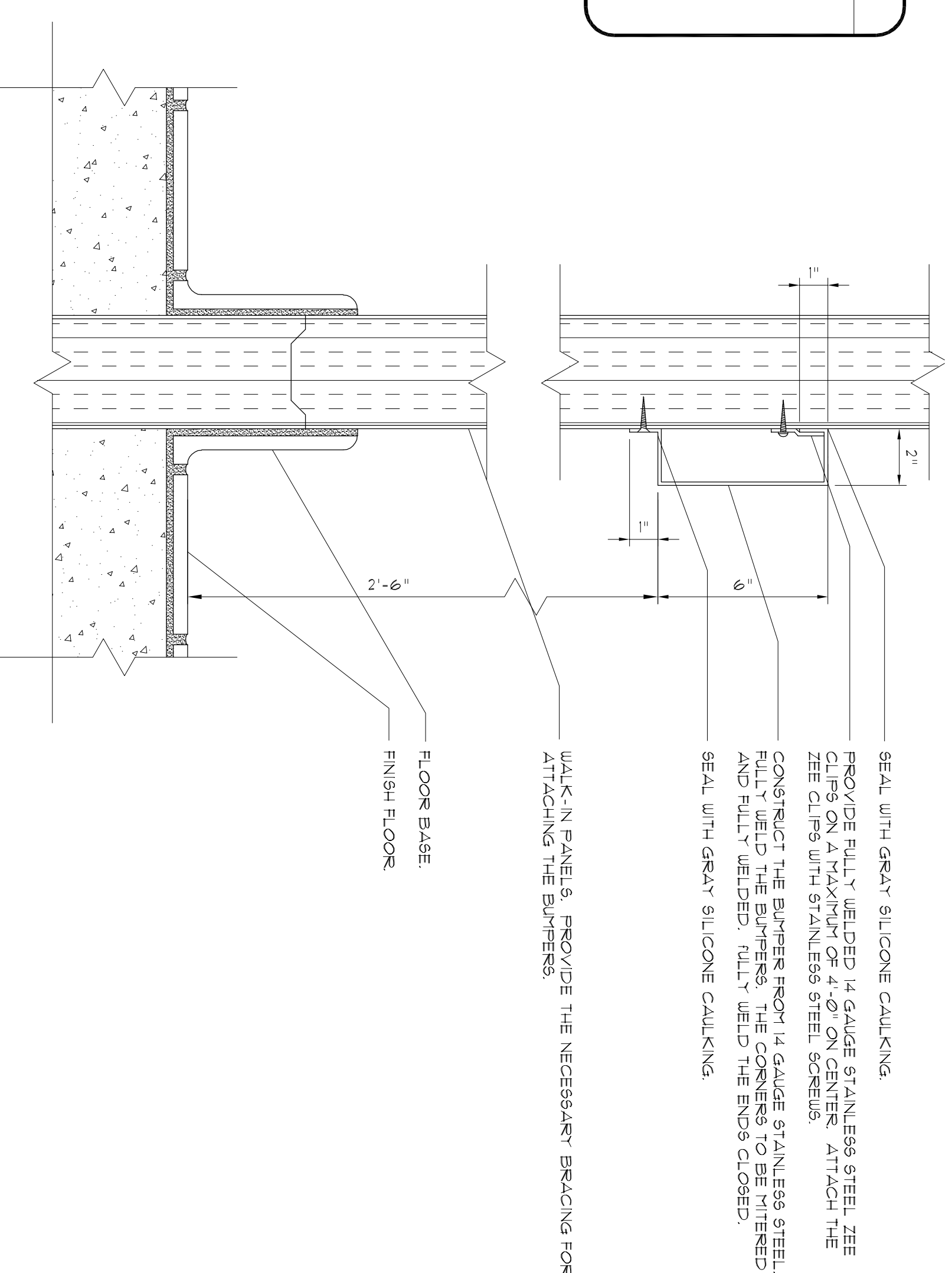
FOODSERVICE EQUIPMENT SPECIAL CONDITIONS PLAN
1/4" = 1'-0"

GENERAL NOTES

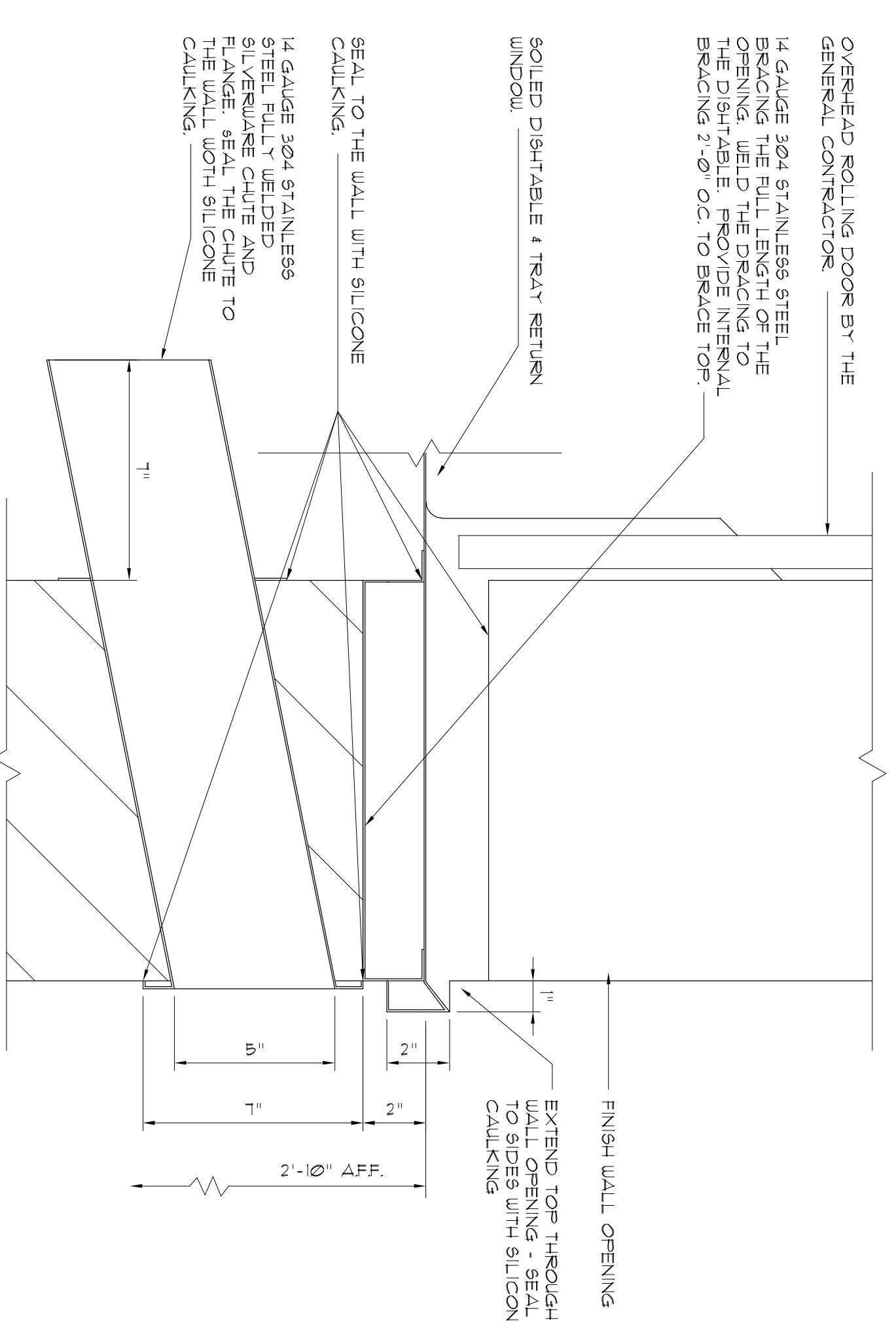
1. THE FOODSERVICE CONTRACTOR MUST COORDINATE AND VERIFY ALL DIMENSIONS WITH THE FOODSERVICE EQUIPMENT SHOP DRAWINGS AND THE PURPOSER ONLY.
2. THE GENERAL CONTRACTOR TO PROVIDE AND INSTALL 3/4" THICK WOOD BACKING IN THE WALL FOR THE MOUNTING OF THE EQUIPMENT FINISHED BY THE FOODSERVICE CONTRACTOR. THE FOODSERVICE CONTRACTOR TO FINISH EXACT DIMENSIONED LOCATIONS.
3. THE WALK-IN DOORS MUST BE LEFT OPEN UNTIL THE INTERIOR CONCRETE WALK-IN FLOOR CURES. FAILURE TO DO SO MAY DAMAGE THE INTERIOR OF THE WALK-IN REQUIRING THE UNIT TO BE REPLACED.



4 ELEVATION
1/2" = 1'-0"



5 DETAIL - BUMPER RAILS AT THE WALK-INS
NO SCALE



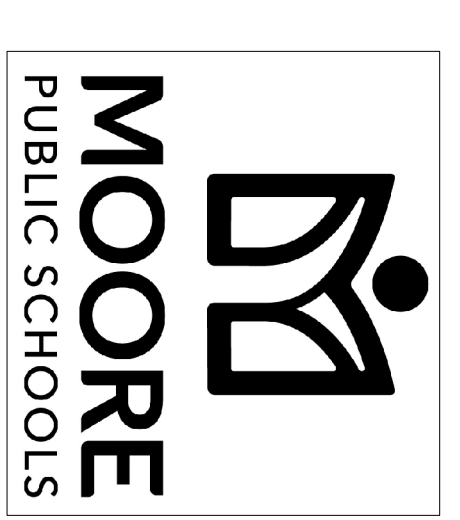
6 SECTION - TRAY RETURN COUNTER
NO SCALE

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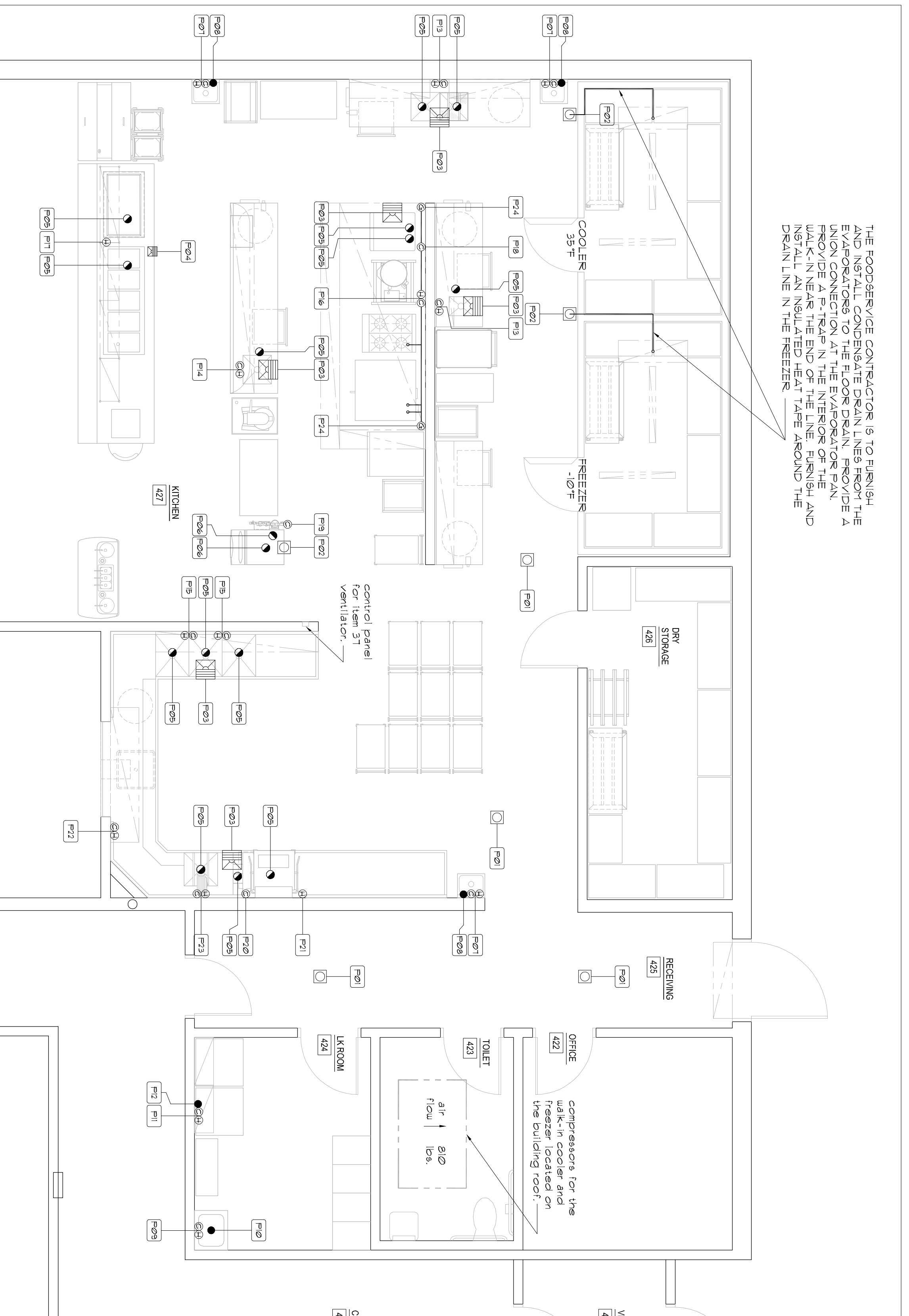
revisions
Addendum #1 11/20/2024



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FSS201

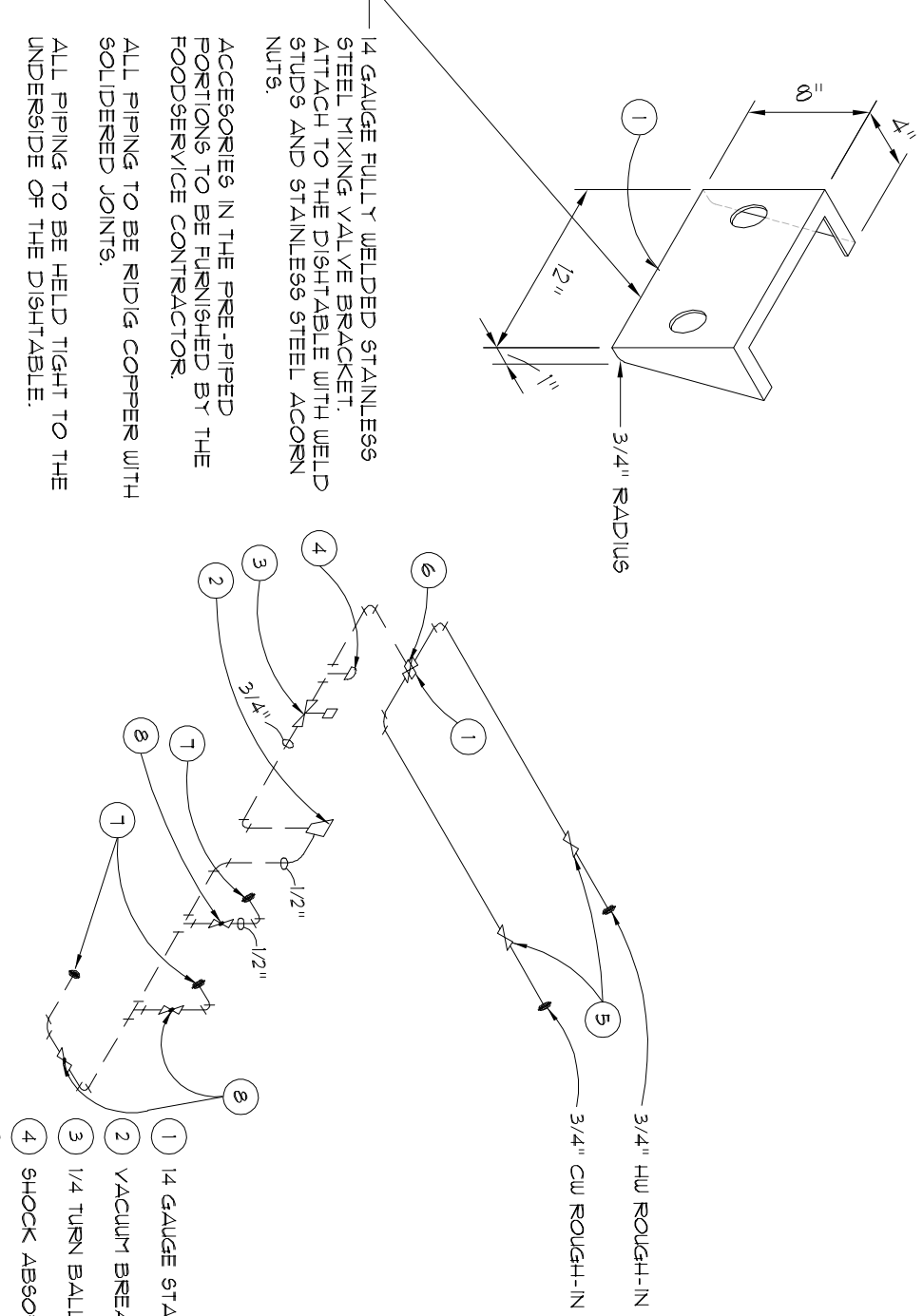
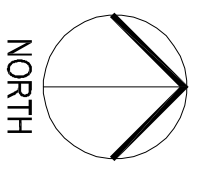
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THE FOODSERVICE CONTRACTOR IS TO FURNISH AND INSTALL CONDENSATE DRAIN LINES FROM THE EXTRACTORS TO THE FLOOR DRAIN. PROVIDE A MINIMUM OF 1/2" CLEARANCE FROM THE DRAIN. PROVIDE A P-TAPE IN THE INTERIOR OF THE WALK-IN NEAR THE END OF THE LINE. FURNISH AND INSTALL AN INSULATED HEAT TAPE AROUND THE DRAIN LINE IN THE FREEZER.

1 FOODSERVICE EQUIPMENT PLUMBING CONNECTIONS PLAN

1/4" = 1'-0"



1/4" GAUGE FULLY WELDED STAINLESS STEEL WINKING VALVE BRACKET ATTACH TO THE DISHABLE WITH WELD STUDS AND STAINLESS STEEL ACORN NUTS

PIPED BY PLUMBING CONTRACTOR

PIPED BY FOODSERVICE CONTRACTOR

2 TROUGH PIPING DETAIL

NO SCALE

- 1 1/4" GAUGE STAINLESS WINKING VALVE BRACKET
- 2 VACUUM BREAKER PER THE SPECIFICATIONS
- 3 1/4" TURN BALL VALVE TO TURN WATER ON / OFF
- 4 SHOCK ABSORBERS
- 5 GATE VALVE (STOP) BY THE PLUMBING CONTRACTOR
- 6 1" x 1/2" MODEL B-3025 WINKING VALVE
- 7 WATER INLETS PER THE SPECIFICATIONS
- 8 1/4" TURN BALL VALVE

PLUMBING CONNECTIONS SCHEDULE

NO.	ITEM NO.	SIZE	DESCRIPTION	LOCATION	APP.	SERVICE TO	REMARKS
F01	21, 45	---	FD	FLOOR	0'	---	AREA DRAIN
F02	4, 48	---	FD	FLOOR	0'	---	THE PLUMBING CONTRACTOR IS TO EXTEND THE EQUIPMENT DRAIN TO THE FD.
F03	11, 13, 24, 25, 4, 26	1 1/2" S.O.	FL. SINK	FLOOR	0'	---	THE PLUMBING CONTRACTOR IS TO EXTEND THE EQUIPMENT DRAIN TO THE FL. SINK. FURNISH WITH A 1/2" GRATE.
F04	48	6" S.O.	FL. SINK	FLOOR	0'	---	THE PLUMBING CONTRACTOR IS TO EXTEND THE EQUIPMENT DRAIN TO THE FL. SINK. FURNISH WITH A 1/2" GRATE.
F05	11, 13, 21, 24, 25, 36, 4, 48	---	W	EQUIP.	---	---	THE PLUMBING CONTRACTOR IS TO FURNISH AND INSTALL THE LINE. DO NOT HANG/OLD MULTIPLE SINKS TOGETHER.
F06	45	---	W	EQUIP.	---	---	THE PLUMBING CONTRACTOR IS TO FURNISH AND INSTALL THE LINE. DO NOT HANG/OLD THIS LINE WITH ANY OTHER LINE.
F07	08	1/2"	H & CW	WALL	24"	FAUCET	BTIC
F08	08	1/2"	H & CW	FLOOR	9"	SINK	BTIC
F09	03	1/2"	H & CW	WALL	36"	FAUCET	BTIC
F10	03	1/2"	H & CW	FLOOR	36"	WATER SINK	BTIC
F11	05	1/2"	DR	WALL	42"	WASHER	BTIC
F12	05	2"	DR	WALL	18"	FAUCET	BTIC
F13	24 & 25	1/2"	H & CW	FLOOR	9"	FAUCET	BTIC
F14	41	1/2"	H & CW	FLOOR	18"	FAUCET	BTIC
F15	14	3/4"	H & CW	WALL	12"	FILL FAUCET	BTIC
F16	25	1/2"	H & CW	WALL	12"	FILL FAUCET	BTIC
F17	36	1/2"	CW	WALL	12"	CONVECTION STRAHER	BTIC
F18	36	1/2"	CW	WALL	48"	ICE MAKER	BTIC
F19	45	1/2"	CW	WALL	12"	DRAIN WATER TEMPERING KIT	BTIC
F20	11	1/2"	CW	WALL	12"	DISPENSER	BTIC
F21	11	3/4"	CW	WALL	12"	DISPENSER	BTIC
F22	12	1/2"	H & CW	WALL	18"	WATER SINK	BTIC
F23	12	1/2"	H & CW	WALL	18"	WATER SINK	BTIC
F24	33 & 34	---	GAS	---	---	55# BUTANE CONV. OVEN 135000 TOTAL BUTANE	BTIC

PLUMBING/MECHANICAL NOTES

1. DIMENSIONS INDICATED ARE TO BE VERIFIED BY THE FOODSERVICE CONTRACTOR AND ADJUSTED AS REQUIRED BY THE FOODSERVICE EQUIPMENT OR FIELD CONDITIONS.
 2. VENTILATE REFRIGERATION "MACHINE" ROOM'S TO PROVIDE 95% MAXIMUM AMBIENT TEMPERATURE.
 3. EXHAUST DUCTS AND FANS CONNECTED TO EXHAUST HOODS SHALL NOT SERVE ANY OTHER AREA OR APPLIANCE.
 4. DUCTS OF MULTIPLE EXHAUST HOODS WITH COMMON CONTROL PANEL MUST BE INTEGRATED FOR USE WITH A SINGLE EXHAUST FAN.
- THE FOLLOWING WORK IS BY THE PLUMBING CONTRACTOR. REFER TO THE PLUMBING DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL INFORMATION:
5. FIELD INSTALLATION OF ACCESSORIES & FITTINGS PROVIDED LOOSE WITH THE FOODSERVICE EQUIPMENT.
 6. SERVICE SINKS, LAVATORIES AND DRINKING FOUNTAINS.
 7. GREASE PROOF EXHAUST DUCTS FROM VENT CONNECTIONS OF THE EXHAUST HOODS.
 8. FLUSHING/OUT OF ALL PIPING AND DRAINAGE SYSTEMS PRIOR TO CONNECTION TO FOODSERVICE EQUIPMENT.

PLUMBING SYMBOLS

HW	HOT WATER
CW	COLD WATER
G	GAS SUPPLY
DR	DRAIN
IWD	INDIRECT WASTE (EXTEND TO FD)
FD	FLOOR DRAIN
F8	FLOOR SINK - 1/2 GRATE
AF8	ABOVE FINISHED FLOOR BTIC BRANCH TO CONNECTION
FD4	DRAIN FROM ABOVE

NOTES

THE PLUMBING CONTRACTOR TO ROUGH-IN FROM THE FOODSERVICE CONTRACTORS ROUGH-IN DRAWINGS ONLY. THE PLUMBING CONTRACTOR WILL TAKE FULL RESPONSIBILITY FOR THE ROUGH-IN LOCATIONS IF THE FOODSERVICE AND/OR PLUMBING DRAWINGS ARE USED FOR THIS WORK.

the Abba Griffin Partnership L.L.C.

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10/29/2024
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Sheet No.
FS301

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PATENT NUMBERS
 EXHAUST HOODS ND-2/BD-2/SD-2 (CANADA) - CA PATENT 2520435 C

HOOD INFORMATION - JOB#7165196

HOOD TAG	MODEL	MANUFACTURER	LENGTH	DEPTH	MAY CODING	TYPE	APPLIANCE DUTY	DESIGN EXH CFM	TOTAL WIDTH	TOTAL LENGTH	HOOD CONSTRUCTION	HOOD END TO END
1	6624 ND-2	CAPTIVARE	11' 11"	11"	600 DEG	1	HEAVY	210	2500	430 SS	ALDNE	ALDNE

HOOD INFORMATION

HOOD TAG	TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	EXHAUST PLENUM		HOOD CONSTRUCTION	HOOD END TO END
								WIDTH	LENGTH		
1	CAPTIVARE SOLID FILTER	8	16"	16"	95% SPEC	6	RECESSED ROUND	4"	16"	430 SS	ALDNE

HOOD OPTIONS

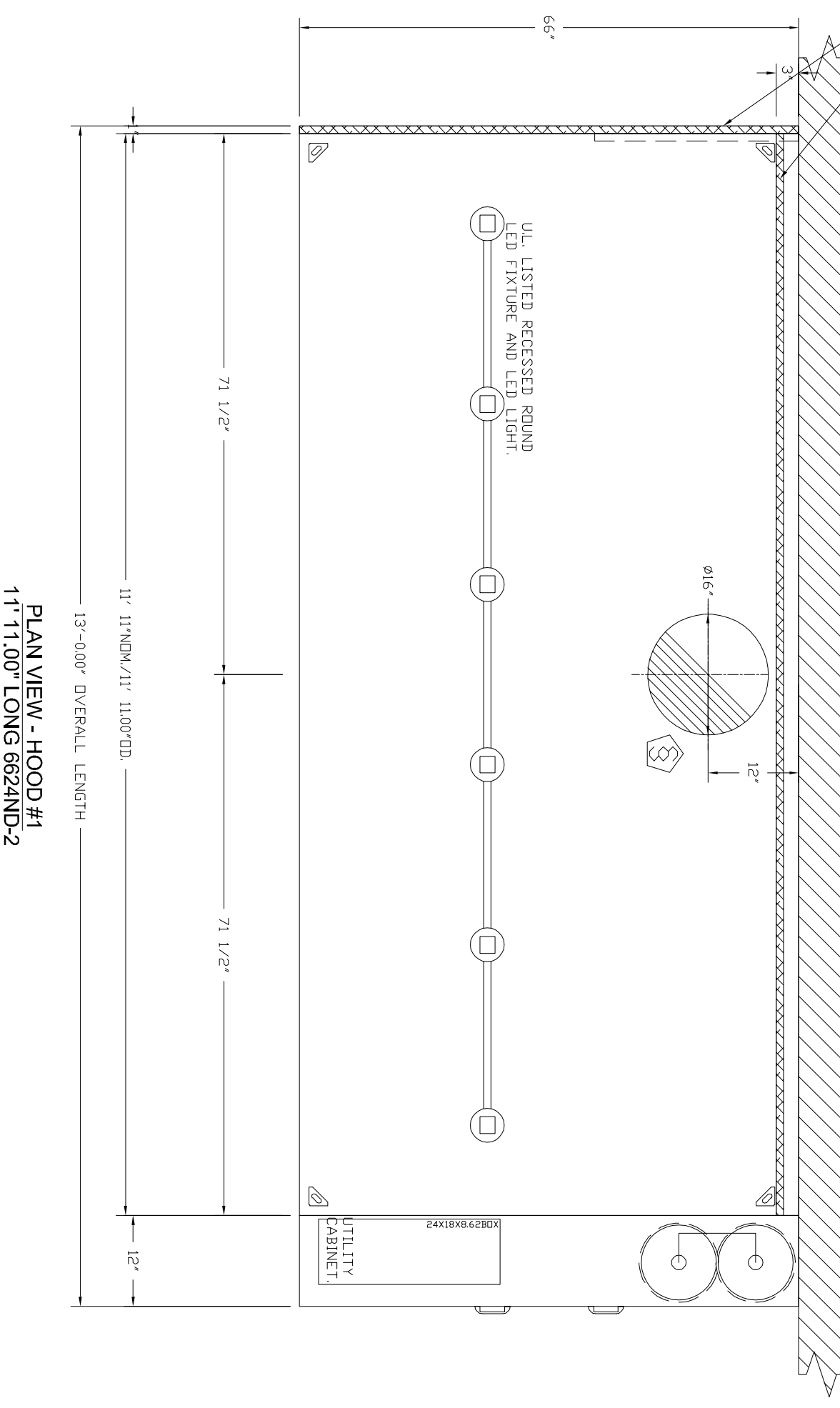
HOOD TAG	FIELD WRAPPER	1800" HIGH FRONT, LEFT, RIGHT	22800" LONG	430 SS VERTICAL
1	BACKSLASH 18200" HIGH X 22800" LONG	1"	66" LONG	INSULATED
	INSULATION FOR TOP OF HOOD			
	INSULATION FOR BACK OF HOOD			
	LEFT VERTICAL END PANEL	27"	TOP WIDTH, 21"	BOTTOM WIDTH, 80" HIGH
	SS			INSULATED 430

CLEARANCE TO COMBUSTIBLES

HOODS #	SURFACE	*CLEARANCE
1	TOP	0"
1	FRONT	0"
1	BACK	0"
1	LEFT	0"
1	RIGHT	0"

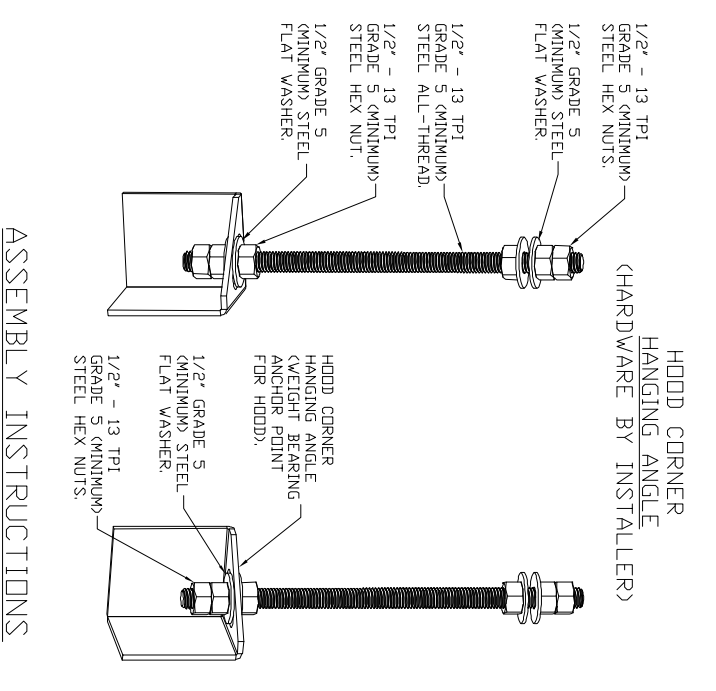
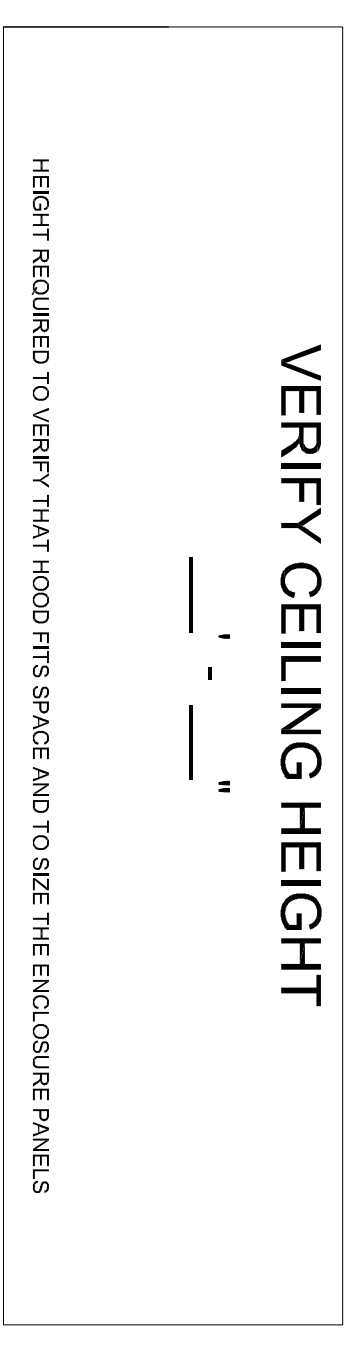
- *0" CLEARANCE TO COMBUSTIBLES CONFORMS TO UL710 STANDARD.
 - HOOD MOUNTED UTILITY CABINETS REQUIRE 36" SERVICE CLEARANCE.

1" LAYER OF INSULATION FACTORY INSTALLED MEETS 8 INCH REQUIREMENTS FOR CLEARANCE TO COMBUSTIBLES FOR ALL HOODS.
 1" LAYER OF INSULATION FACTORY INSTALLED IN HOOD STANDOFF PROTECTS COMBUSTIBLE SURFACES TO COMBUSTIBLE SURFACES.

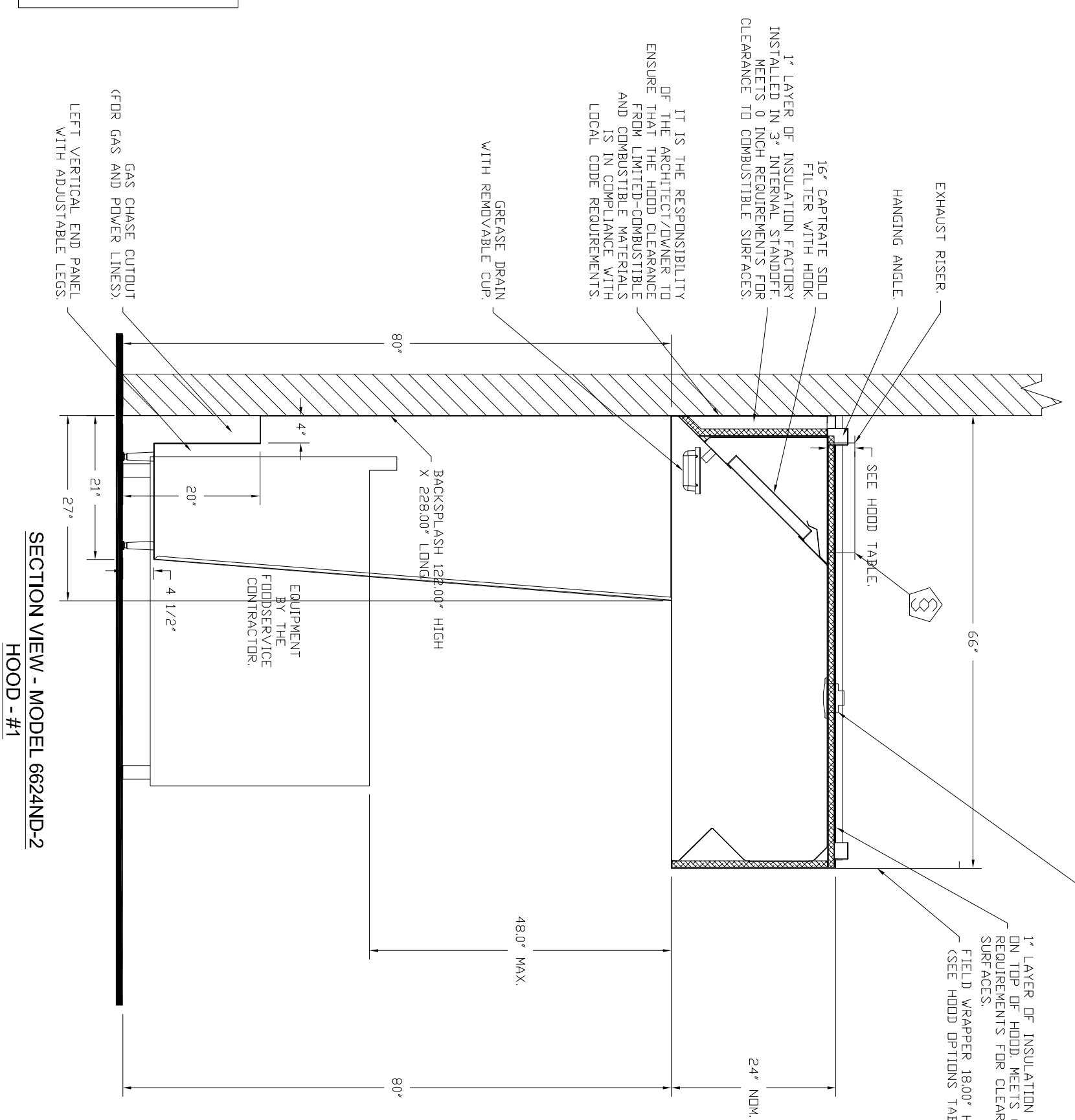


PLAN VIEW - HOOD #1
 11' 11.00\"/>

VERIFY CEILING HEIGHT



HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TP1 GRADE 5 GRIPNUTS ALL-THEAD, SANDWICH HANGING ANCHORS AND CEILING ANCHOR PLATES WITH 1/2" GRADE 5 (409) HEX NUTS. GRADE 5 GRIPNUTS AND GRADE 5 DOUBLE HEX NUT CONFIGURATION BEHIND HOOD HANGING ANCHORS AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BETWEEN BOTTOM HEX NUTS. TIGHTEN ALL HEX NUTS TO 57 FT-LBS.



Moore Public Schools Child Care
 201 North Eastern Avenue,
 Moore, OK, 73160



Tulsa Office
 12101 East 51st Street, Suite 101A, Tulsa, OK, 74146 PHONE: (918) 258 - 0291 FAX: 9182275947 EMAIL: reg80@captiveware.com

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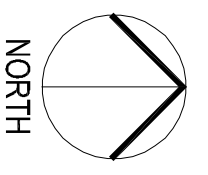
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11/20/2024	Adrianum #1	

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FOODSERVICE EQUIPMENT VENTILATOR PLAN
 NO SCALE

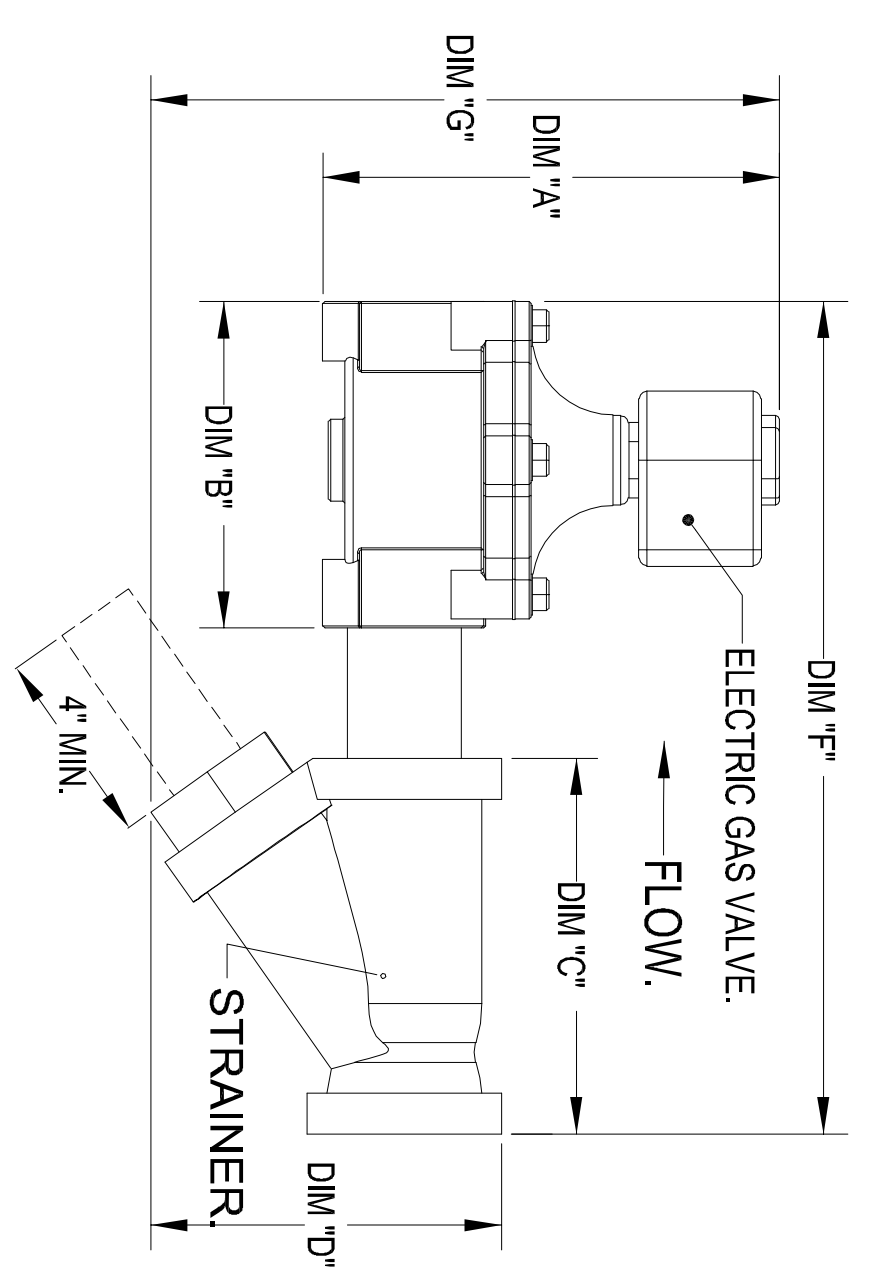
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FIRE SYSTEM INFORMATION - JOB#7165196				INSTALLATION	
FIRE SYSTEM TAG	TYPE	SIZE	MAX FP	DESIGN FP	SYSTEM LOCATION
1	TANK F.S.	4.0/4.0	40	37	FIRE CABINET RIGHT
					RIGHT, HOOD 1

GAS VALVES(S)			
FIRE SYSTEM TAG	TYPE	SIZE	SUPPLIED BY
1	SC ELECTRICAL	2.000	CAPTIVEAIR SYSTEMS

FIRE SYSTEM PARTS LIST KEY		KEY NUMBER - PART DESCRIPTION		QTY BY FACTORY	QTY BY DIST.
0-0-0	TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.			1	0
0-0-0	TANK FIRE SUPPRESSION MAINTENANCE GUIDE UTILITY CABINET LABEL SHEET.			1	0
0-0-0	12-F28291-22144-01-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. ND.			1	0
	CLOSE DN TEMP. RISE #1 360°F. (40094310).				
0-0-0	32-0002 QUIK SEAL - 1/2" (QU).			1	0
0-0-0	4429K153 1/2" MALE NPT TO 1/2" FEMALE NPT ELBOW, BRASS.			2	0
0-0-0	4429K422 1/2" X 1/4" BRASS REDUCING BUSHING.			1	0
0-0-0	79580 1/2" X 1/2" BRQ-PRESS. ELBOW WITH 1/2"NPT FEMALE CONNECTION, VIEGA.			1	0
0-0-0	79580 1/2" X 1/2" BRQ-PRESS. TEE X 1/2"NPT FEMALE CONNECTION, VIEGA.			2	0
0-0-0	87-12042-001 SECONDARY ACTUATOR VALVE (SVA) - SINGLE ACTUATOR, REQUIRES PRIMARY RELEASE ACTUATOR, TANK FIRE SUPPRESSION.			1	0
0-0-0	87-12045-001 HOSE, SECONDARY ACTUATOR HOSE, 75" BRAIDED STAINLESS STEEL, TANK FIRE SUPPRESSION.			1	0
0-0-0	87-30001-001 TANK - PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION ASSEMBLY, ONE NEEDED PER FIRE SYSTEM, SUPERVISED, TANK FIRE SUPPRESSION.			2	0
0-0-0	87-30030-001 PRIMARY ACTUATOR KIT (PAK) - ACTUATOR AND RELEASE SOLENOID ASSEMBLY, ONE NEEDED PER FIRE SYSTEM, SUPERVISED, TANK FIRE SUPPRESSION.			1	0
0-0-0	87-30032-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.			8	0
0-0-0	9055455PC PRD PRESS 1/2" PRESS X PRESS 90 ELBOW LD.			7	0
0-0-0	9097200PC PRD PRESS PEGH 1/2" PRESS TEE LD.			7	0
0-0-0	986944115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.			4	0
0-0-0	A0034322 JUNCTION BOX FOR MANUAL PULL STATION, 15" DEEP BACK BOX, RED COILDR.			1	0
0-0-0	A31484 1/4" NPT SCRAPPER VALVE AND CAP, JB INDUSTRIES, 1/4" FLARE X 1/4" NPT HALT UNION, USED ON TANK SERVICE POINT.			1	0
0-0-0	B145 3/8" BLACK IRON 90 ELL.			3	0
0-0-0	DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.			2	0
0-0-0	TANK STRAP TANK STRAP - USED FOR TANK FIRE SUPPRESSION.			6	0
0-0-0	TFS-UTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.			2	0
0-0-0	WK-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.			2	0
0-0-0	79210 1/2" X 3/8" NPT MALE ADAPTER, VIEGA.			8	0
0-0-0	DL-F NOZZLE - TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLDV DFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE).			8	0
0-0-0	OSA-3/8 QUIK SEAL - 3/8" (QU).			8	0
0-0-0	A0034321 ZAVDC SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL STATION) WITH PROTECTIVE COVER, ONE (1) NORMALLY OPEN CONTACT, RED COILDR.			1	0

GAS VALVE SIZING				GAS VALVE DIMENSIONS				INSTALLATION		PART NUMBERS								
TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE (0 IN.W.C.)	MAX. INLET PRESSURE (5.98 IN.W.C.)	FLOW AT 1 IN.W.C. DROP NATURAL GAS (2.98/500 BTUHR)	FLOW AT 1 IN.W.C. DROP PROPANE (1.068/648 BTUHR)	DM "A"	DM "B"	DM "C"	DM "D"	DM "E"	DM "F"	DM "G"	DM "H"	MOUNTING ORIENTATION	GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
ELECTRICAL	2"	120 VAC					7.58"	6.48"	7.14"	7.13-16"	15.58"	13-15-16"		HORIZONTAL	8214280	4417K68	(S)E/GV2	



ELECTRIC GAS VALVES ONLY:
 3/4\"/>

ALL GAS VALVE/STRAINERS:
 PROPER CLEARANCE MUST BE PROVIDED IN ORDER TO SERVICE THE STRAINERS. A MINIMUM OF 4\"/>

CALCULATIONS:
 TO CALCULATE GAS FLOW FOR OTHER THAN 1 IN.W.C. PRESSURE DROP NEW BTUHR = (BTUHR AT 1 IN.W.C. PRESSURE DROP) X NEW PRESSURE DROP
 TO CALCULATE GAS FLOW FOR OTHER THAN 0.88 SPECIFIC GRAVITY NEW BTUHR = (BTUHR AT 0.88) X (NEW SPECIFIC GRAVITY)^{0.88}

Moore Public Schools Child Care
 201 North Eastern Avenue,
 Moore, OK, 73160



REVISIONS	DATE

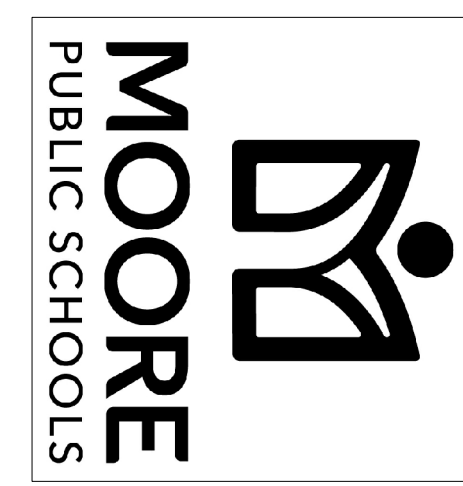
DATE: 11/13/2024
 DWG.#: 7165196
 DRAWN BY: RJH-80
 SCALE: 3/4\"/>

MASTER DRAWING
 SHEET NO. 3

AGP
 the Abila Griffin Partnership L.L.C.
 313 S. E. 5th Street
 MOORE, OK, 73160
 405.735.3477
 ACP@theAGP.net
 www.theAGP.net

CEGAR CREEK
 OHL
 KFC ENGINEERING
 STRUCTURAL
 SALAS O'BRIEN
 MECHANICAL/ELECTRICAL

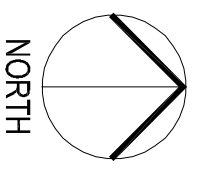
RS
 drawn by
 RS
 checked by
 10/29/2024
 date
 revisions
 Addendum #1 11/20/2024



CHILD CARE FACILITY
 201 N. EASTERN AVE.

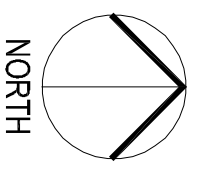
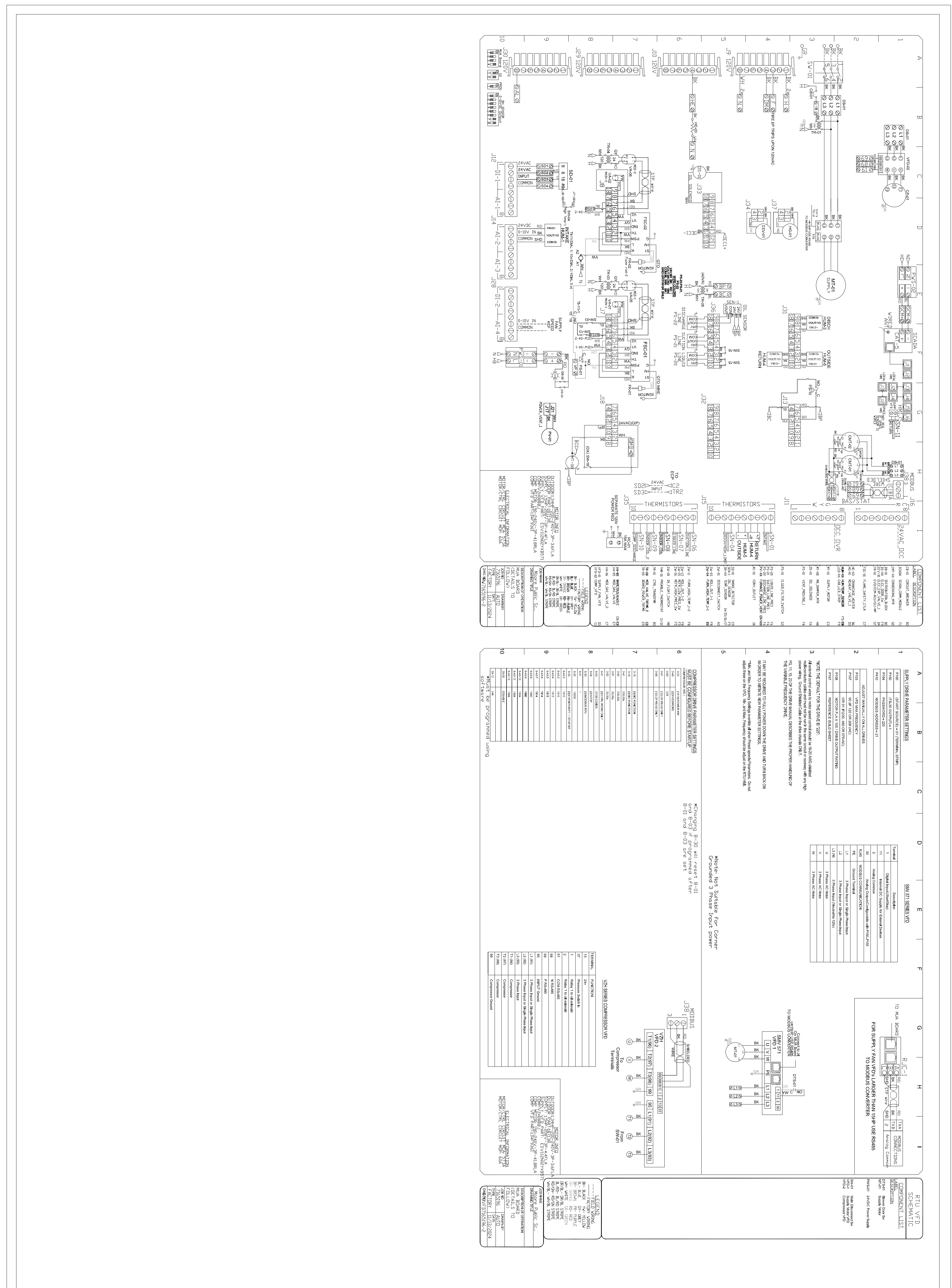
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1

FOODSERVICE EQUIPMENT VENTILATOR PLAN
 NO SCALE

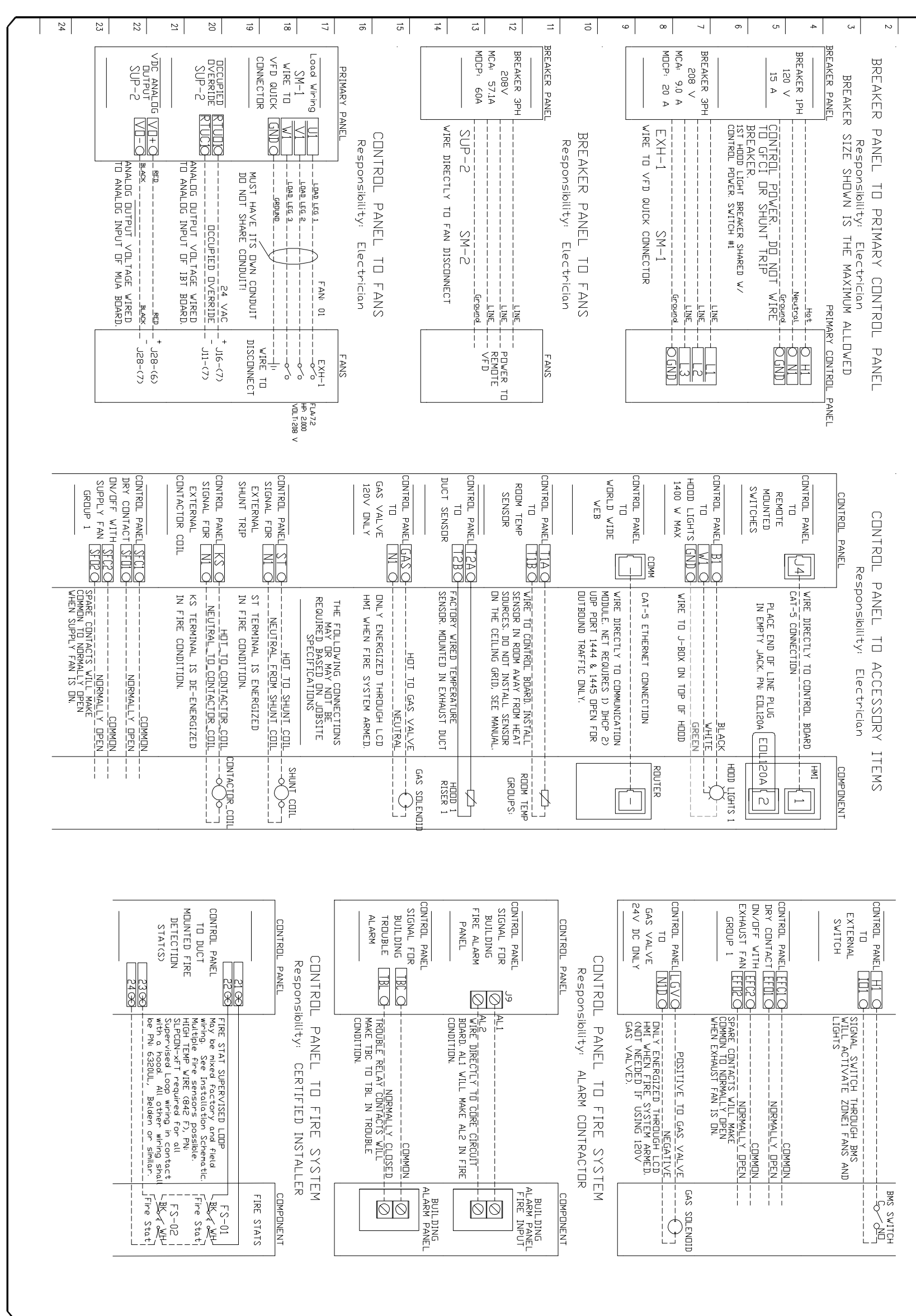


1

FOODSERVICE EQUIPMENT VENTILATOR PLAN
NO SCALE

ELECTRICAL PACKAGE - JOB#7165196							
NO	TAG	PACKAGE #	LOCATION	SWITCHES	QUANTITY	OPTION	FANS CONTROLLED
1		SC-311109A	UTILITY CABINET RIGHT	SHIP LOOSE V/ PREFABR	1 LIGHT 1 FAN	SMART CONTROL S, THERMOSTATIC CONTROL V/ RELAY DIV/IFF WITH SUPPLY	EXHAUST 3 12000 208 7.2 SUPPLY 3 15001 208 4.4

JOB NO	7165196	MODEL NUMBER	SC-311109A	DESCRIPTION OF OPERATION
JOB NAME	Moore Public Schools Child Care	DATE	11/13/2024	REVISED



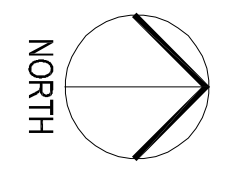
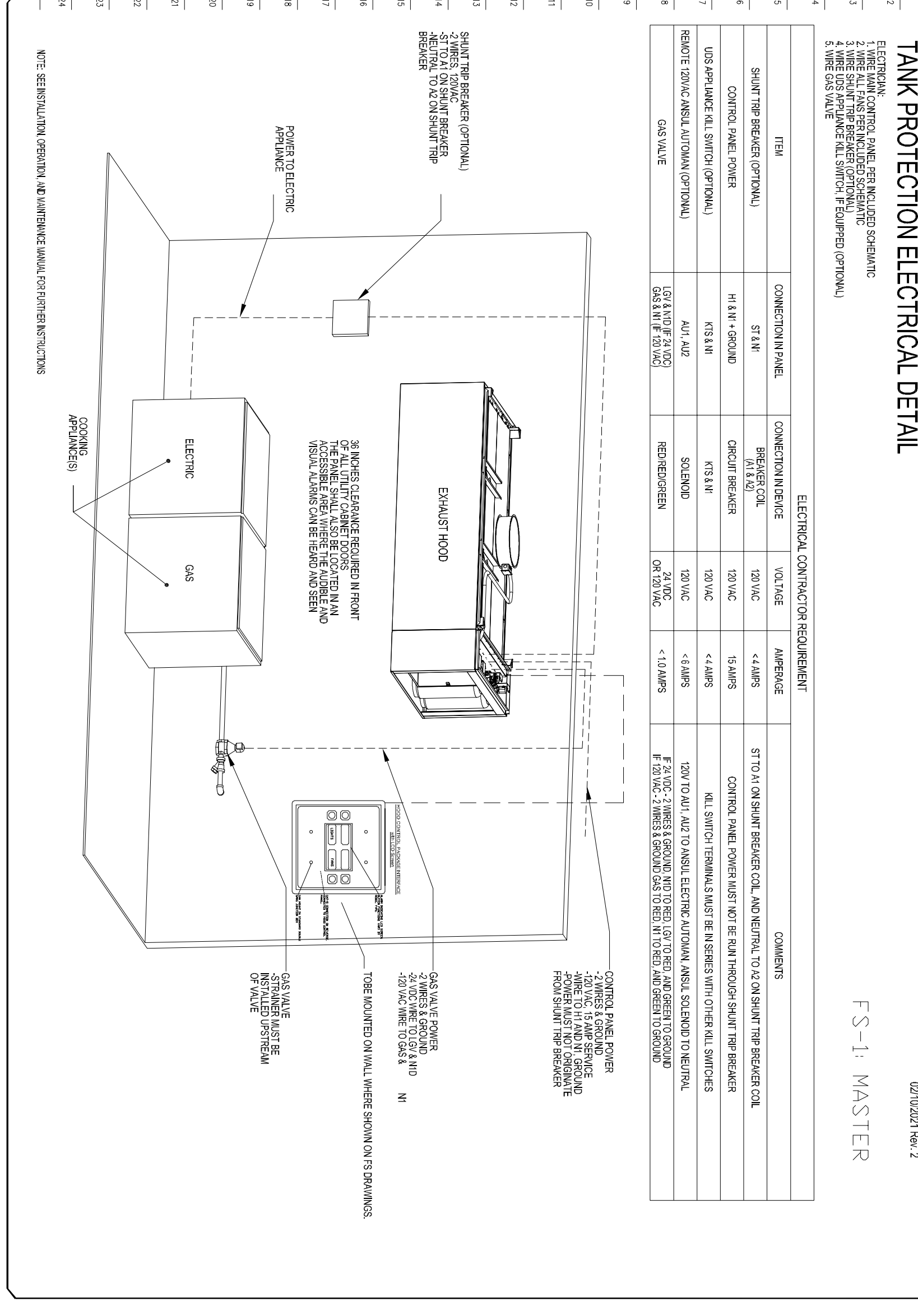
SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, GAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE. ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF GAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, GAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

JOB NO 7165196							
NO	TAG	PACKAGE #	LOCATION	SWITCHES	QUANTITY	OPTION	FANS CONTROLLED
1		SC-311109A	UTILITY CABINET RIGHT	SHIP LOOSE V/ PREFABR	1 LIGHT 1 FAN	SMART CONTROL S, THERMOSTATIC CONTROL V/ RELAY DIV/IFF WITH SUPPLY	EXHAUST 3 12000 208 7.2 SUPPLY 3 15001 208 4.4

JOB NO	7165196	MODEL NUMBER	SC-311109A	DESCRIPTION OF OPERATION
JOB NAME	Moore Public Schools Child Care	DATE	11/13/2024	REVISED



1

FOODSERVICE EQUIPMENT VENTILATOR PLAN
NO SCALE

REVISIONS	DATE



Moore Public Schools Child Care
201 North Eastern Avenue,
Moore, OK, 73160

DATE:	11/13/2024
DWG#:	7165196
DRAWN BY:	RJH-80
SCALE:	3/4" = 1'-0"
MASTER DRAWING	
SHEET NO.	9

AGP
the Abba Griffin
Partnership L.L.C.
313 S. E. 5th Street
MOORE, OK, 73160
405.735.3477
ACP@theAGP.net
www.theAGP.net

CEDAR CREEK
CME
KFC ENGINEERING
STRUCTURAL
SALAS O'BRIEN
MECHANICAL/ELECTRICAL

RS
drawn by
RS
checked by
10/29/2024
date
revisions
Addendum #1 11/20/2024

MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
201 N. EASTERN AVE.

FS506

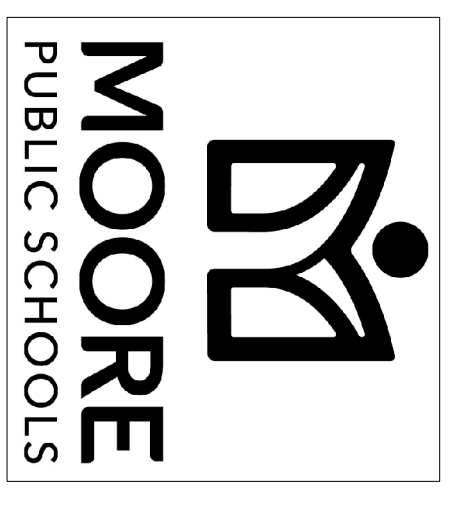
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RS
drawn by
RS
checked by
10/29/2024
drlb
revisions
Addendum #1 11/20/2024

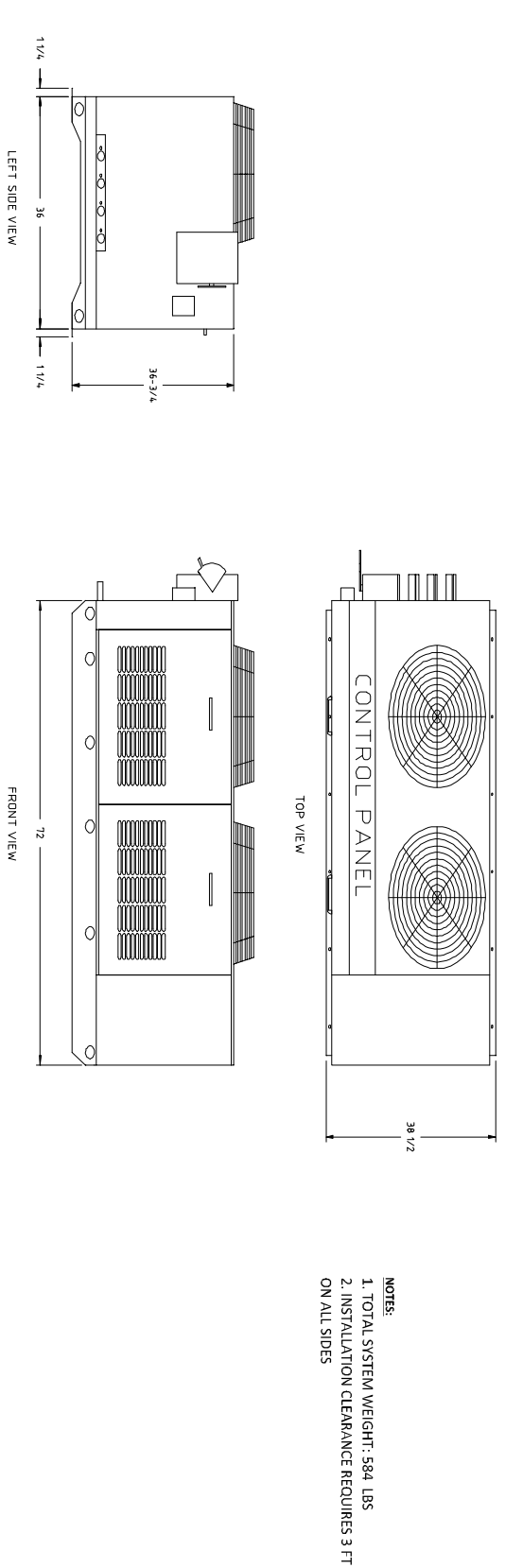


CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No: **FS701**

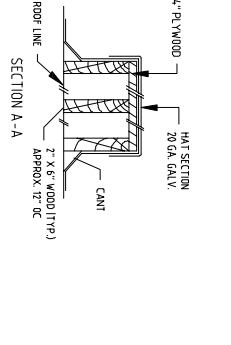
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A REFRIGERATION PACK OUTLINE DRAWING
R-1 MPI-2

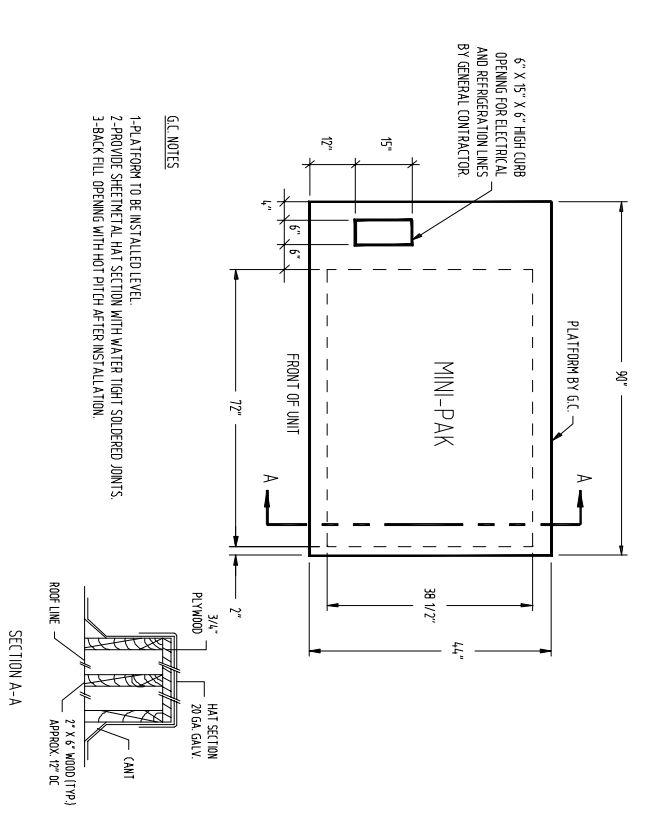


1. TOTAL SYSTEM WEIGHT 548 LBS ON ALL SIZES

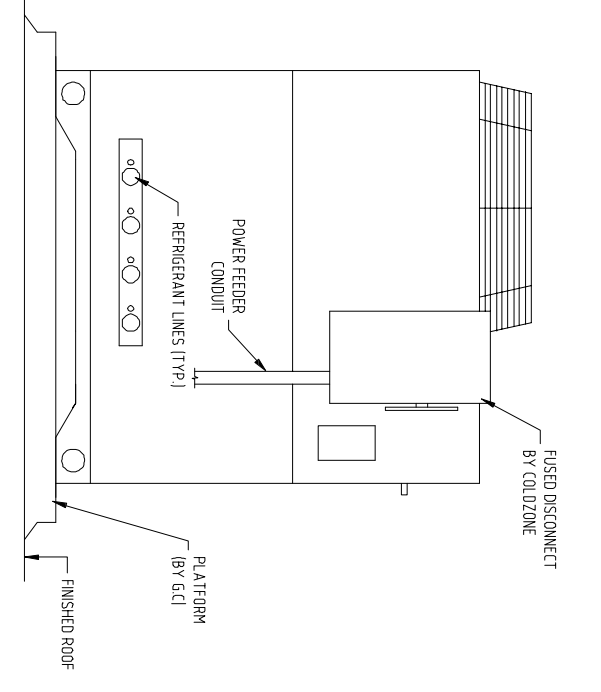
B SUGGESTED ROOF PAD DETAILS
R-1 MPI-2



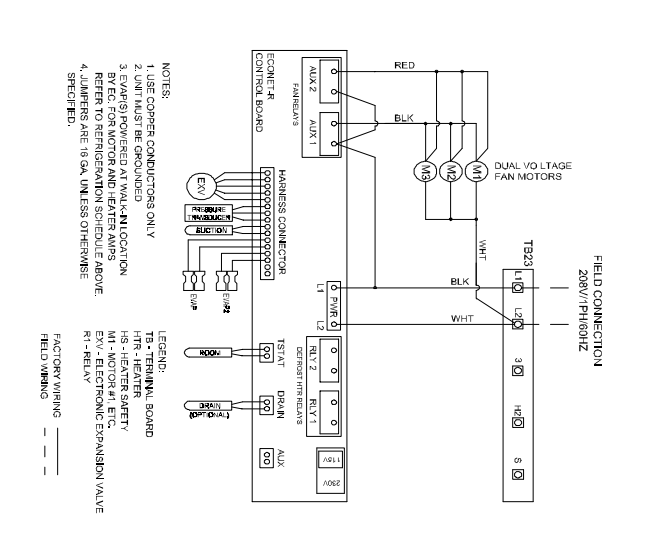
G.C. NOTES
1. FLASHING TO BE INSTALLED LEVEL.
2. REMOVE SHEET PILING AND SECTION WITH WATER TIGHT FLOORED JOINTS.
3. SEAL THE OPENING WITH 1/2\"/>



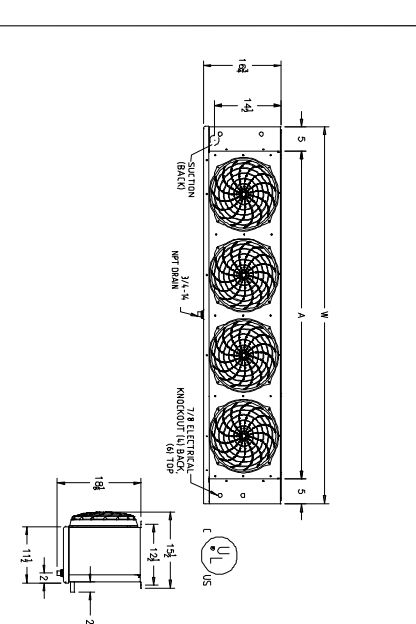
C ELECTRICAL INSTALLATION
R-1



F WIRING DIAGRAM FOR R-1 W/ COOLER EVAPORATOR COIL

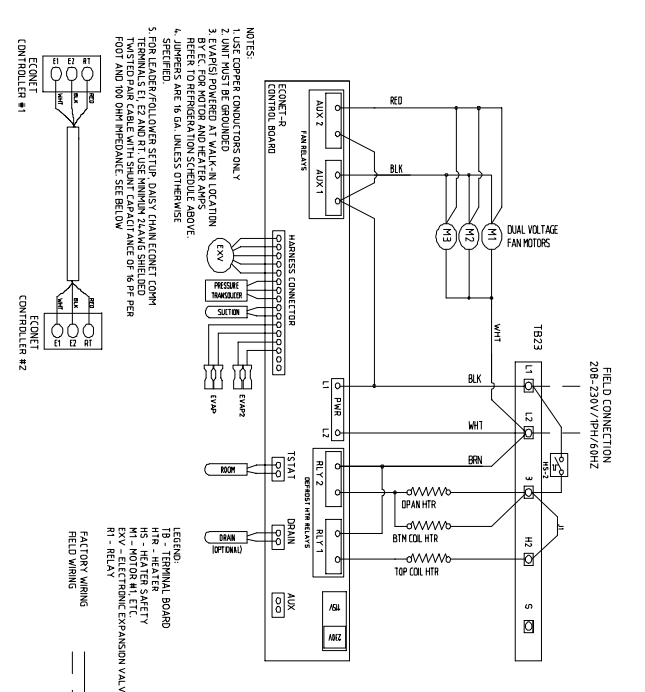


D COOLING EVAPORATOR COIL
R-1 LOW PROFILE

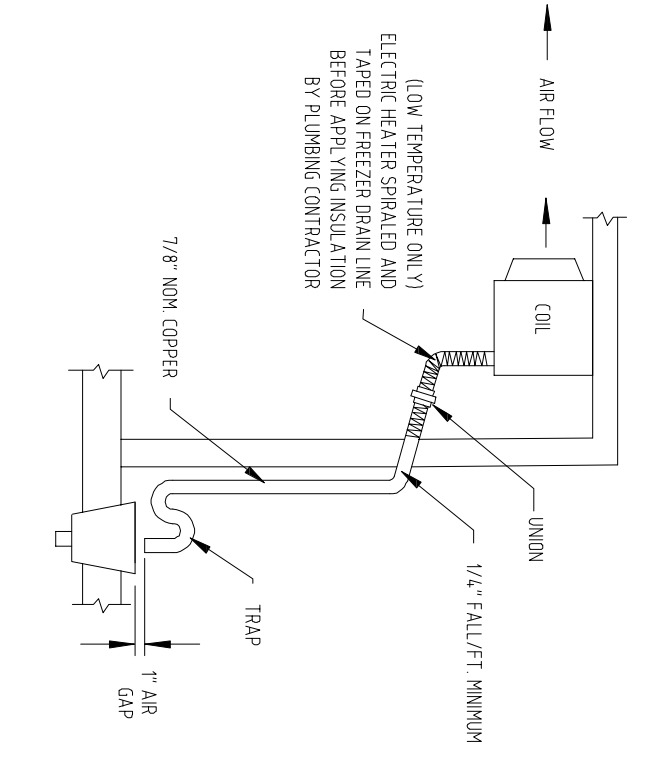


MODEL NUMBER	QTY	FIGURE	NO. OF FANS	W	A	WEIGHT LBS. EACH
CL3500A01	1	2	43.5/8"	14.5/8"	62	
CL3500A02	1	2	43.5/8"	14.5/8"	62	

G WIRING DIAGRAM FOR R-1 W/ FREEZER EVAPORATOR COIL

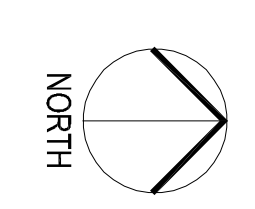


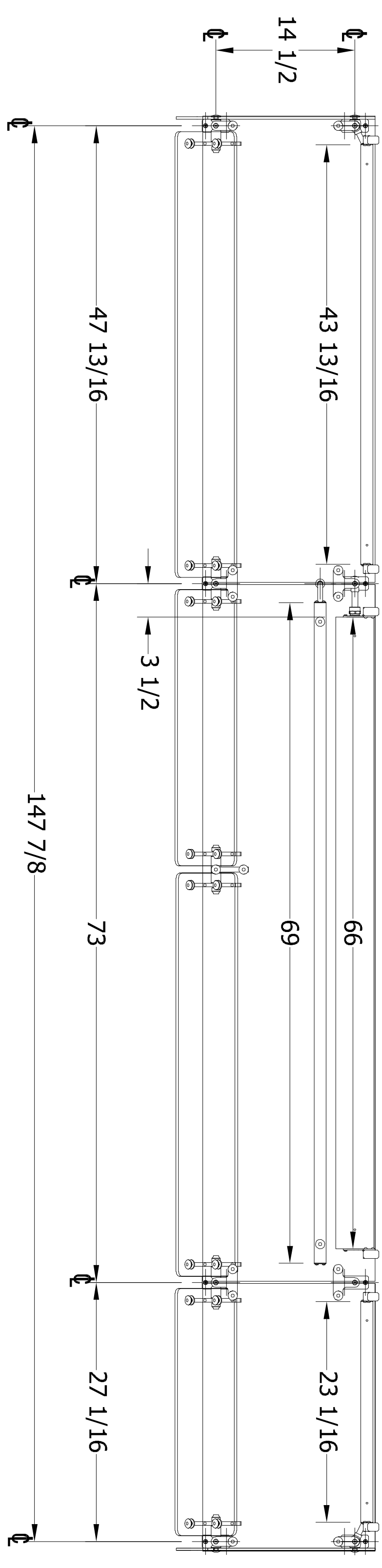
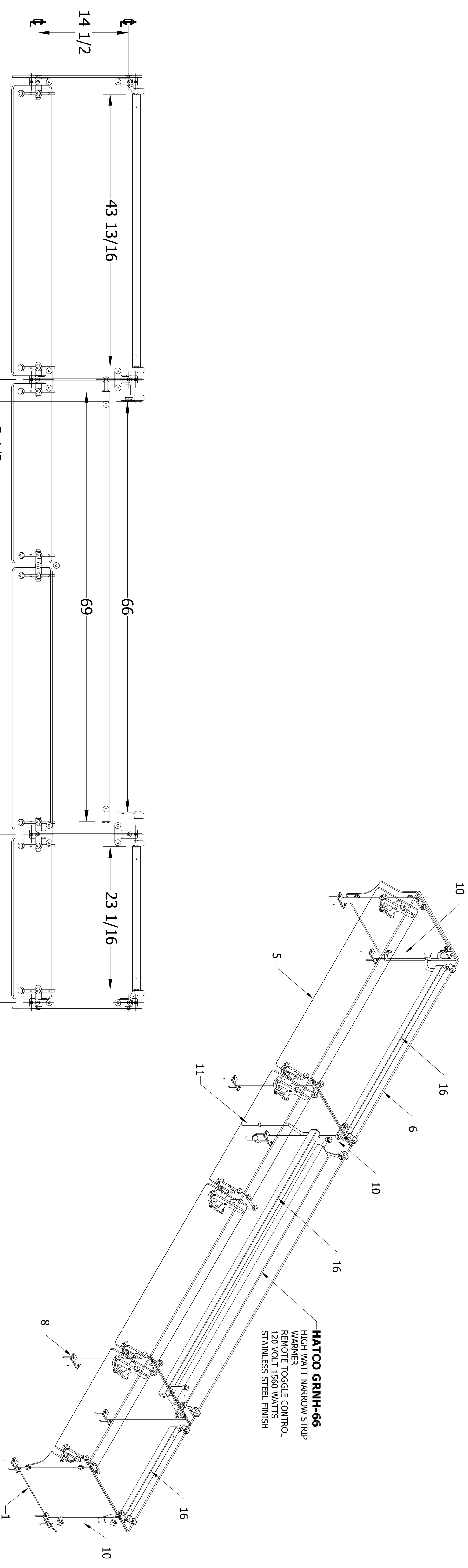
H DRAIN LINE DETAIL
R-1



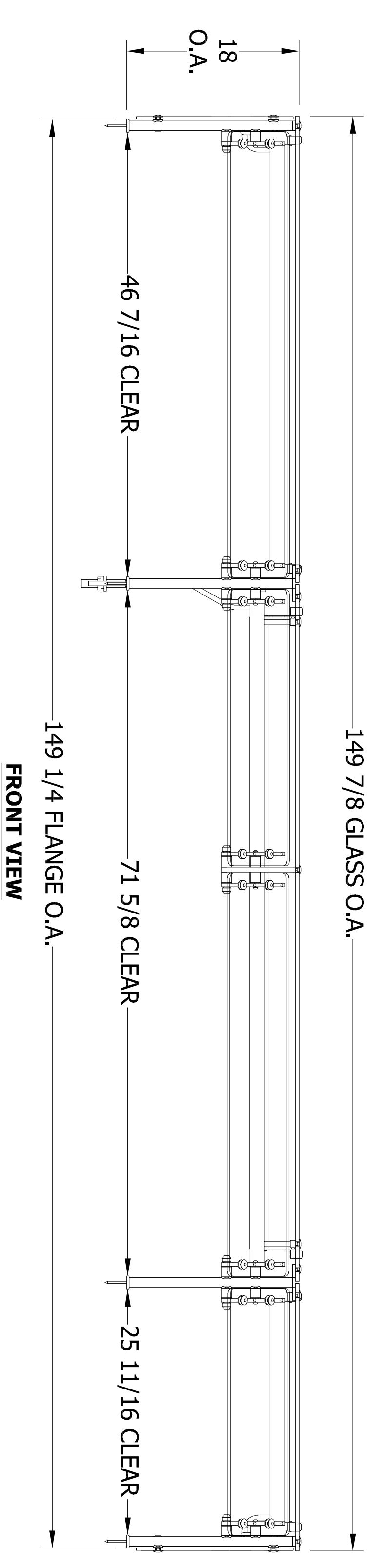
SYSTEM ITEM NO.	DESCRIPTION	UNITED	FACILITY	SUCT.	REFRIG. R.	COMPRESSOR MODEL NUMBER	H.P.	RECEIVER CAPACITY LBS. (@ 90%)	% OF LOAD CAPACITY	ELECTRICAL CHARACTERISTICS	COOLING CAPACITY (BTUH) AT 105 AMBIENT	DEFROST *	QUANTITY	MODEL NO.	NOMINAL CAPACITY TOTAL	EVAPORATOR COILS		HEATERS		TOTAL SYSTEM AMPS	CONNECTION SIZE **	SUCTION	LIQUID	DRAIN FITTING - NPT	DEFROST OPTION NO.	CIRCUIT WITH DEFROST TIME CLOCK	HEATED AND INSULATED RECEIVER	SUCTION ACCUMULATOR	SUCTION FILTER	OIL SEPARATOR	FURNISHED BY (SEE CODE)	REMARKS	
																MIN.	FAN PHM	PH	V														AMP
1	CONDENSER FAN 2	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN	CONDENSER FAN

ITEM NO.	QTY	DESCRIPTION	VOLTAGES/PH	AMPS	INCH	AMPD
1	1	CONDENSER FAN 2	208-230/1/60	27	27	40

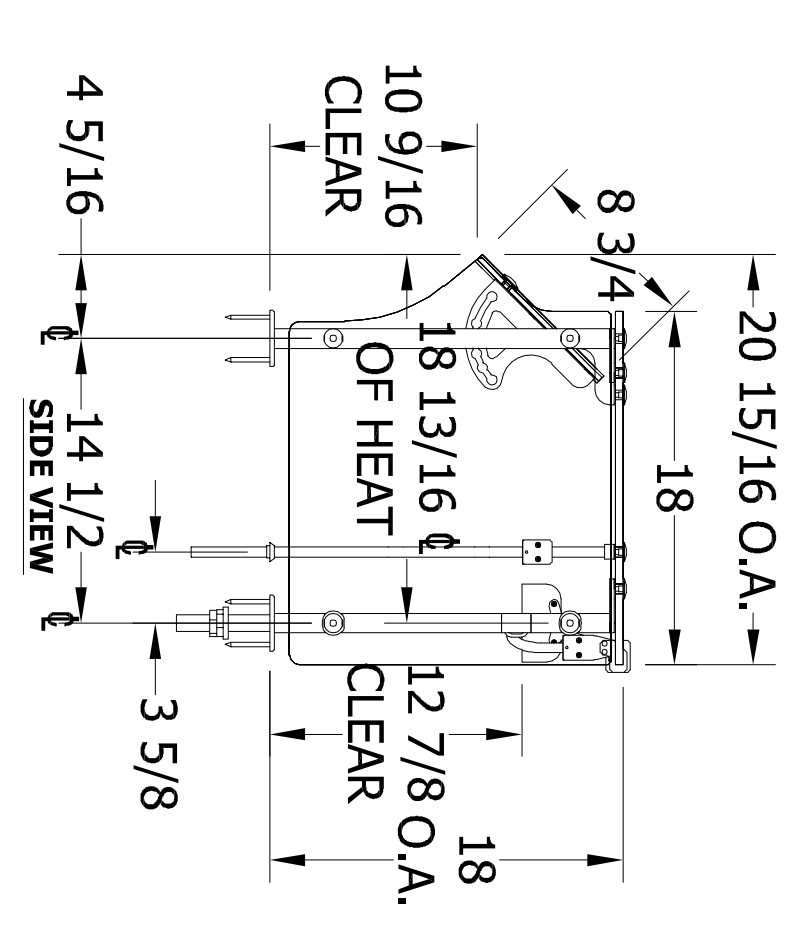




PLAN VIEW



FRONT VIEW



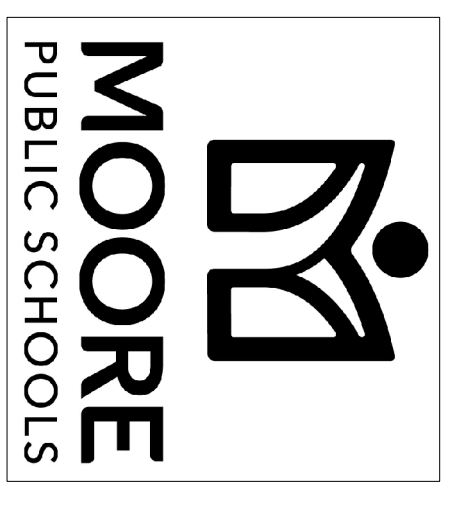
SIDE VIEW

V-G
by Versa-Gard®
3663 Southland Drive
Flowerly Branch, Ga 30542
PH: 678-730-4155
FX: 678-730-2919

MODEL/ITEM: **1-#48A-VG3-SK-HTLED**
FINISH: **SATIN CLEAR ANODIZED ALUMINUM**

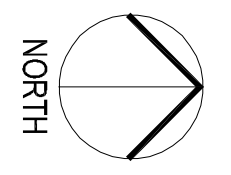
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PROJECT: MOORE PUBLIC SCHOOLS CHILDCARE	CLIENT:	QTY.:	DRAWN BY:	DATE:	APPROVED BY:
	CUSTOMER PO:	1	KW	11/07/24	
	STURM CONSULTING		REVISED BY:	REV. DATE:	SHEET NO.:
	LOI				1 OF 2



CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No:
FS801



1

FOODSERVICE EQUIPMENT SNEEZE GUARD PLAN
NO SCALE

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SECTION 11 40 00
KITCHEN EQUIPMENT

PART 1 – GENERAL

1.01 SCOPE

- A. Include the work specified, shown or reasonably inferred as part of the foodservice equipment. Portions of the work may be subcontracted to those qualified to do the work as required by jurisdictional trade agreements and restrictions.
- B. Kitchen equipment furnished and installed by the Foodservice Contractor In the base bid.
- C. Provide itemized pricing providing both each pricing and total pricing for every item specified with a bid grand total.

1.02 RELATED SECTIONS

- A. Division 15 – Mechanical rough-ins, inter-connections of the equipment as required and final connections.
- B. Division 16 – Electrical rough-ins, inter-connections of the equipment as required and final connections.

1.03 QUALITY ASSURANCE

- A. All equipment and associated work must comply with all applicable laws, statutes, building codes and regulations of public authorities and comply with the following:
 - a. NSF (National Sanitation Foundation). All the equipment must bear the NSF label.
 - b. NEC (National electric Code).
 - c. UL (Underwriter’s Laboratories, Inc.).
 - d. AGA (American Gas Association Laboratories).
 - e. NFPA (National Fire Protection Association).
- B. The following are approved fabricators for providing the fabricated food service equipment:

Jero Manufacturing, Inc.
5117 South 100th East Avenue
Tulsa, Oklahoma 74115

Stainless Innovations
1110 Carnall
Fort Smith, Arkansas 72901

1.04 SUBSTITUTIONS

- A. Equipment items and the components specified are intended to be the basis of the bid. All other manufactures, including manufactures which may be listed as “alternates” or “approved equals” must conform with the specifications, size, accessories, etc. of the original manufacture specified.
- B. Proposed substitutions will be substituted no later then fourteen (14) days prior to the bid date. Submit the proposed substitutions with the manufactures specification or catalog sheets, shop drawings, etc. indicating all modifications required to conform to the specified items.

- C. Approved substitutions will be addressed in an addendum(s). Approved substitutions will be noted on the bid form as a substitution. All costs and fees for any design and engineering services required to make adjustments to the space, systems, utilities, etc. will be the responsibility of the successful bidder. All costs incurred for modifications of the utilities or construction or professional services will be the responsibility of the successful bidder.
- D. The Owner reserves the right to accept or reject any or all of the substitutions proposed before the execution of the contract.

1.05 DOCUMENT INTERPERTATION

- A. An addendum(s) will be issued addressing questions and comments from contractors, suppliers or vendors pertaining to the intent or clarity of the construction documents.
- B. All questions and comments will be submitted in writing by the contractors, suppliers and vendors for review.

1.06 SUBMITTALS

- A. Submit brochure books, rough-in drawings, fabrication shop drawings and manufactures shop drawings. Refer to the general specifications for the required quantities.
 - a. Brochures:
 - 01 Provide with a front and rear cover. Label the front cover with the project name.
 - 02 Provide a cover sheet for each item number. The cover sheet will indicate the item number, the item name, the quantity, the manufacture, all optional equipment and accessories, specified modifications, the utility requirements and any special instructions.
 - 03 The manufactures catalog specification sheets.
 - b. Submittal drawings:
 - 01 Indicate all equipment shown on the contract documents drawn at a 1/4" scale.
 - 02 The contract documents are not to be traced or reproduced.
 - 03 Provide an equipment schedule indicating all the equipment shown on the contract documents.
 - 04 Drawings to be submitted on the same size drawing sheet as the Contract Documents in a PDF format. Provide the necessary required hard copies of the reviewed/stamped document to the General Contractor. Submit the drawings separately from the Brochure Book.
 - c. Rough-in drawings:
 - 01 Indicate all equipment shown on the contract documents drawn at a 1/4" scale.
 - 02 indicate all general use and convenience utilities indicated on the contract documents.
 - 03 Include utilities shown on the contract documents but connected to equipment not furnished in this section.
 - 04 Fully dimension all the utilities for the plumbing, electrical and mechanical from the finished room surface to the point of the stub-up through the floor and the stub-out through the wall or ceiling.
 - 05 Drawings to be submitted on the same size drawing sheet as the Contract Documents in a PDF format. Provide the necessary required hard copies of

the reviewed/stamped document to the General Contractor. Submit the drawings separately from the Brochure Book.

- d. Manufacture's and fabricators shop drawings:
 - 01 Indicate all equipment shown on the contract documents drawn at a 3/4" scale for the plan views and elevations. All sections and details to be drawn at a minimum of 1 1/2" scale.
 - 02 Include the equipment name, the item number and the quantity on the drawings.
 - 03 Include all required and necessary sections, details and elevations to reflect the drawings and the specifications.
 - 04 Indicate all adjacent equipment, walls and columns.
 - 05 Include all necessary plumbing and electrical schematic drawings.
 - 06 Include any ventilation or access panels as required by the manufactures of the built-in equipment.
 - 07 Drawings to be submitted on the same size drawing sheet as the Contract Documents in a PDF format. Provide the necessary required hard copies of the reviewed/stamped document to the General Contractor. Submit the drawings separately from the Brochure Book.

1.07 COORDINATION OF THE PROJECT AND DATA

- A. Review the contract documents, rough-in drawings, shop drawings and brochure books for accuracy and completeness.
 - a. Notify the Architect of any conflicts and required adjustments in writing.
 - b. Coordinate the work with this section with the other sub-contractors on the job.
 - c. Submit paint, stain, plastic laminate, vinyl coated surfaces, molded plastic, natural stone, man-made stone and solid surface material to the Owner for approval.
 - d. Obtain serviceware samples for sizing and weight information from the Owner for coordination of all self-leveling equipment.
 - e. Coordinate all mobile equipment will go through doors, wall openings and roll-in/roll-thru equipment. Notify the Architect of all conflicts or deviations from the approved submittals in writing.

1.08 FIELD VERIFICATION OF THE PROJECT AND DATA

- A. Review the contract documents, rough-in drawings, shop drawings and brochure books for accuracy and completeness.
 - a. Field verify all the under-slab rough-in locations and quantities before the concrete slab is poured. Notify the Architect in writing of all conflicts or omissions of the rough-ins.
 - b. Field verify all the in-slab recess locations, sizes, depths and quantities before the concrete slab is poured. Notify the Architect in writing of all conflicts or omissions of the in-slab recess.
 - c. Field verify all the in-wall rough-in locations and quantities before the drywall is installed. Notify the Architect in writing of all conflicts or omissions of the rough-ins.
 - d. Obtain actual field dimensions or guaranteed measurements from the general contractor to insure the proper fit of the equipment at the job site. The dimensions shown in the contract documents are approximate. The dimensions are for the bidding process only.
 - e. Field check all dimensions, measurements job site conditions before the fabrication and/or delivery of equipment to the job site. Notify the Architect of all conflicts or deviations from the approved submittals in writing.

1901-30 Kitchen Equipment 11 40 00 - 4

- f. Coordinate any exterior wall openings required for the delivery of all oversized equipment with the general contractor. The equipment must be manufactured to fit through standard door openings if this cannot be done.

1.09 WARRANTY

- A. Provide manufacture's warranty on each piece of specified equipment.
- B. The warranty period will be for one year after acceptance from the Owner for parts and labor.
- C. The warranty period will be for five years after acceptance from the Owner for compressor bodies for refrigeration equipment.
- D. The warranty period will be for ten years after acceptance from the Owner for the walk-in panels.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Stainless steel.
 - a. All stainless steel to 18-8, type 304, polished to a 180 grit number 4 finish unless noted otherwise in the item specifications or in the drawings.
 - b. All seams and joints are to be heli-arc welded completely and free of flaws and pits. Grind the welds smooth and polish to a number 4 finish.
 - c. The grain of the stainless steel is to run the length of the equipment including the backsplash. Provide a polished miter look where the tops form a corner.
- B. Galvanized iron.
 - a. All seams and joints are to be heli-arc welded completely and free of flaws and pits. Grind the welds.
 - b. Thoroughly clean the welded and polished areas and prime and paint with Rustoleum in a color to match the metal.
- C. Sound deadening.
 - a. Apply 1/2" wide Schnee Butyl sealant rope continuously between all bracing/frame members and the underside of the table/counter tops, overshelves, wall shelves and undershelves.
 - b. Weld stud bolts to the underside of the tops, overshelves, wall shelves and undershelves. Tighten the stud bolts for maximum compression of the sound deadening. Trim any excess that extends from out of the bracing.
- D. Shop and field joints.
 - a. Field joints are to be used only when the equipment size must be limited for access into the building.
 - b. Indicate the field joint locations on the shop drawings.

PART 3 – EXECUTION

3.01 INSPECTION

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- A. Verify and test that all equipment is plumbed, wired correctly, true and in good working order. Do not use until turned over to the Owner.
- B. Protect all appliances from construction dirt until the project is turned over to the Owner.

3.02 DELIVERY

- A. Coordinate with the construction progress and the Owner's operation schedule. Unless otherwise instructed by the general contractor or the Owner, the following procedures apply.
 - a. Items that integrate into the building, such as, walk-in coolers and freezers, ventilators, hoods, equipment supports, ceiling mounted utensil racks, etc. will be sent to the job site after the building is water tight and directed by the general contractor. Protect the equipment as required after installation is complete.
 - b. All the additional fixed equipment and mobile equipment requiring plumbing and electrical final connections will be delivered to the job site after the completion of the finished floor, wall finish, ceiling grid and tile or drywall and paint and the lighting system.
 - c. The remaining mobile equipment will be delivered to the job site after the equipment can be inventoried and secured in a lockable area. If a secured area is not available, deliver the equipment when the job site when the installation is completed and the equipment clean-up process have been completed.
 - d. Small counter item, pans, flatware containers, etc. will be delivered only when the Owner is ready to receive and inventory the items.

3.03 INSTALLATION

- A. Provide a competent supervisor at the job site during the entire installation process.
- B. Install the equipment per the manufacture's recommendations. Install the equipment square and level. All equipment shall be ready for the final connections.
- C. Protect the equipment after the installation process is complete.
 - a. Protect the custom fabricated equipment with fiberboard or plywood taped to the tops and exposed body surfaces.
 - b. Protect the buy-out equipment with fiberboard or plywood taped to the tops and exposed body surfaces.
 - c. The general contractor must insure the equipment is not used by other sub-contractors as work tables, scaffolding, tool and material storage, etc.
- D. Provide and install 18 gauge stainless steel trim at all gaps between the equipment and the walls and/or other high equipment when the gap is larger than 7/16 of an inch wide. Turn the trim down 90 degrees at the equipment splashes, top and/or turn downs. Attach the trim with hidden fasteners and seal with silicone caulking.

3.04 CLEAN AND ADJUST

- A. Leave the work area clean and free of debris.
- B. Remove or replace panels, parts or frames that are bowed, warped, dented or scratched as a result of manufacturing defects, shipping and delivery to the job site.
- C. The Foodservice Contractor is to deliver the foodservice equipment to the job sits, uncrate the equipment, remove all packing materials from the equipment, set the equipment into place per the floor plan and the job site conditions, level the equipment and make ready for

final connection by the Mechanical, Plumbing and/or Electrical Contractor. All crating materials are to be removed from the job site by the Foodservice Contractor.

- D. The Foodservice Contractor will final clean (not sanitizing) the foodservice equipment and seal the fixed foodservice equipment to the adjacent walls and/or fixed equipment with silicone caulking after all the utilities have been connected. The caulking will be neat, smooth and level with the foodservice equipment. Concaved caulking will be rejected. Remove any smeared caulking from the foodservice equipment and adjacent surfaces.

3.05 SERVICE MANUAL

- A. Provide manufacture's warranties and operating manuals on all appliances over to the Owner.
- B. Each appliance shall have operating instructions and maintenance information.
- C. The Foodservice Contractor will furnish to the Owner three (3) copies of an owner's and operations manual. The manual will be in three ring binders. The manuals will include a cover sheet for each equipment item, warranty information sheets, manufactures specification sheets and the service agent's name, address and telephone number.
- D. All warranties are not to begin until after the Owner accepts successful completion of the Start-up Demonstration and the kitchen.

3.06 EQUIPMENT DEMO AND START UP

- A. The Foodservice Contractor must test, adjust and regulate all the equipment per the manufacturer's instructions.
- B. The Foodservice Contractor will schedule, at the Owner's convenience, a date and time to demonstrate the foodservice equipment to the Owner. The Foodservice Contractor will start up and check out the foodservice equipment before the equipment is demonstrated to the Owner.

PART 4 – EQUIPMENT

ITEM NO. 01 - AIR CURTAIN (1 REQUIRED)

Mars Air Systems model NH248-1UA-TS with all the standard features. Mount with stainless screws per the manufactures requirements.

Accessories

- 1 ea. 120 volts, single phase with a cord and plug.
- 1 ea. Model 99-014 level 1 control package.
- 1 lot Model J2272 filter kit.

ITEM NO. 02 - LOCKERS BY THE GENERAL CONTRACTOR

ITEM NO. 03 - MOP SINK (1 REQUIRED)

Eagle Group model F1916-12 floor mounted stainless steel mop sink with all the standard features.

Accessories

- 1 ea. T & S model B-0665-BSTR faucet.
- 1 ea. Model 312689 mop hanger.

1 ea. Model 321561 hose & hanger.

ITEM NO. 04 - CHEMICAL STORAGE SHELVING (1 LOT REQUIRED)

Quantum model WIRE storage shelves. Locate the bottom shelf at 10" above the finish floor. Verify the location of the remaining four (4) shelves with the Owner prior to assembly.

Accessories

5 ea. Model 1236C shelves.
4 ea. Model P86C posts.

ITEM NO. 05 - WASHER BY THE OWNER

ITEM NO. 06 - DRYER BY THE OWNER

ITEM NO. 07 - LINEN WALL SHELVING (4 REQUIRED)

Quantum model WC34-CB1460P with all the standard features. Mount the bottom shelves at 48" above the finished floor and the upper shelves at 54" with stainless steel screws.

ITEM NO. 08 - HAND SINK (3 REQUIRED)

Eagle Group model HSA-10 with all the standard features.

Accessories

3 ea. Model 300886 drain assembly.
3 ea. Model LRS left and right hand splash on the sinks.
3 ea. Component Hardware Group, Inc. model KL45-4002-RE1 faucets.
3 ea. Component Hardware Group, Inc. model KN91-0100 quik-wash faucet control. Install on the faucets.

ITEM NO. 09 - CLEAN DISHTABLE (1 REQUIRED)

Custom fabricated clean dishtable to be constructed per drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under top with fully welded closed ends where they are exposed. Sound deadened between top and underbracing.

Features:

- 01 Provide with a 10" high x 2" thick backsplash at walls. Attach back splash to wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 3" high rolled rim at exposed sides. Locate top of rolled rim 3'-1" above finish floor.
- 03 Provide type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel bullet feet. Fully weld the leg sockets the underbracing.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at rear and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.

ITEM NO. 10 - NUMBER NOT USED

ITEM NO. 11 - DISHWASHER WITH BOOSTER HEATER (1 REQUIRED)

CMA Dishmachines model 180-VL with standard features.

Accessories:

- 1 ea. 208 volts, three phase.
- 1 ea. Built-in booster heater.
- 1 ea. Electric heat.
- 1 ea. Provide with a 3/4" brass pressure regulator.
- 1 ea. Model 117009 shock arrestor.
- 1 ea. Model 116751 drain water tempering kit.

ITEM NO. 12 - SOILED DISHTABLE & POT SINK (1 REQUIRED)

Custom fabricated soiled dishtable & pot sink to be constructed per drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing. Extend the top through the pass-through window. Provide a 1" high marine edge at the opening.

Features:

- 01 Provide with a 10" high x 2" thick backsplash at walls. Attach back splash to wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 3" high rolled rim at exposed sides. Locate top of rolled rim 3'-1" above finish floor.
- 03 Provide a 1'-9" x 1'-9" x 12" deep 14 gauge type 304 stainless steel scrap sink welded integrally into top and 12 gauge type 304 stainless steel fully welded rack guide.
- 04 Provide an 8" wide x depth per drawings scrap trough at scrap sink. Slope the trough to collector per drawings. Provided a hinged silver saver in trough located near scrap sink. Pre-pipe trough per drawings.
- 05 Provide a 6" wide x 2" deep 14 gauge type 304 stainless steel scupper drain welded integrally into top. Provide a removable fully welded stainless steel basket with a perforated bottom. Full weld two (2) 1/4" stainless steel grab rods across the width in two places.
- 06 Provide three (3) 26 1/2" front-to-back x 21" x wide x 11" deep sink compartments constructed with 14 gauge type 304 stainless steel fully welded integrally into the top.
- 07 Provide type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel bullet feet. Fully weld the leg sockets the underbracing.
- 08 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at rear and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 09 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 07 Provide trash can space under top per drawings.
- 08 Provide a 7'-1" long cantilevered 16 gauge type 304 stainless steel slanted rack shelf with a 7'-1" long x 1" diameter rail fully welded stainless steel cantilevered rack storage shelf. Provide adjustable socket mounts on uprights for shelves. Attach uprights to wall at upright top. Mount slant rack shelf 1'-4" above rolled rim and mount rack storage shelf 1'-9" above slanted rack shelf.

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- 09 Provide 1'-1" wide x length indicated on the drawing x 1" diameter fully welded stainless steel three-bar wall shelf at the sinks. Mount the rail shelf 1'-9" above the work surface.
- 10 Support the shelf with 12 gauge type 304 stainless steel angled brackets fully welded to the uprights
- 11 Provide a 14 gauge type 304 stainless steel wall panel behind the shelf per the drawings. Attach the panel to the wall with industrial adhesive.

Accessories:

- 1 ea. Component Hardware model E38-1012 basket drain in scrap sink.
- 1 ea. Component Hardware model E18-1822 basket drain in scupper drain.
- 3 ea. Fisher model 2906 water inlets.
- 1 ea. Fisher model 2905 water inlet.
- 2 ea. T & S model B-0290 faucets.
- 3 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 3 ea. Component Hardware model J19-4962 brackets.

ITEM NO. 13 - HOSE REEL (1 REQUIRED)

T & S Brass model B-1433-01M-QDS hose reel with standard features. Mount to wall with stainless steel fasteners near ceiling per manufacturer's requirements. Center spray valve over scrap sink.

Accessories:

- 2 ea. Model B-CVH1-2 check valves. Provide to plumbing contractor for installation into water lines.
- 2 ea. Model B-0109-01 wall brackets. Mount to wall with stainless steel screws.

ITEM NO. 14 - MOBILE SILVERWARE SOAK SINK (2 REQUIRED)

Piper Products/Servolift Eastern model 337-3474 with all the standard features.

ITEM NO. 15 - TRASH CAN (5 REQUIRED)

CFS Brands model 34103223 trash can in a gray color. NSF listed.

Accessories

- 5 ea. Model 34103323 GY lid for in a gray color. NSF listed.
- 5 ea. Model 3691003 dolly in a black color.

ITEM NO. 16 - MEAL TRANSPORT CARTS (4 REQUIRED)

Renfro Industries Inc. model SUCER1827-3 with all the standard features.

ITEM NO. 17 - CAN RACK (1 REQUIRED)

New Age model 1250CK with all the standard features.

ITEM NO. 18 - STORAGE SHELVING (1 LOT REQUIRED)

Quantum model WIRE storage shelves. Locate the bottom shelf at 10" above the finish floor and the remaining four (4) shelves at 17" O.C. at the balance of the shelving.

Accessories

- 5 ea. Model 2130P shelves.
- 6 ea. Model 2142P shelves.
- 18 ea. Model 2154P shelves.
- 5 ea. Model 2160P shelves.
- 32 ea. Model P86P posts.
- 4 ea. Model FP foot plates. Mount the foot plates to the floor with stainless steel fasteners. Locate the foot plates on the units at the ingredient bins.

ITEM NO. 19 - MOBILE DUNNAGE RACKS (1 REQUIRED)

New Age mobile dunnage racks with all the standard features.

Accessories

- 1 ea. Model 1206 with all the standard features.
- 1 set. Provide with all swivel polyurethane tired casters with brakes.
- 1 ea. Model 1174 handles. Shorten the handle to 42" above the finished floor installed height.

ITEM NO. 20 - MOBILE BREAD RACK BY THE VENDOR

ITEM NO. 21 - WALK-IN COOLER & FREEZER (1 REQUIRED)

The walk-in cooler & freezer to be manufactured by Thermo-Kool. The walk-in cooler & freezer to be 24'-10" x 7'-11" x 9'-3" high per the drawings and proposal number Q44596-55. Provide a 4" thick insulated panel floor. Provide stucco aluminum on the exterior and interior of the unit and white stucco aluminum on the ceiling.

Features

- 01 Provide two (2) hinges on the doors.
- 02 Two (2) vapor proof lights.
- 03 Foot treadle at the doors.
- 04 One (1) 14" x 24" heated peep window in each door.
- 05 Two (2) pressure relief vents.
- 06 EC motors on the evaporator coils.
- 07 Provide wall trim and a closure panel constructed of stucco aluminum.
- 08 Provide all necessary refrigeration lines (hard copper), refrigerant and labor from the evaporator to the refrigeration rack system located on the ground.
- 09 All refrigerant line runs to be on the exterior of the walk-in with short runs only from the evaporators to above the ceiling. Seal the holes for the lines with a spray foam insulation to make an air-tight seal. Provide stainless steel or chrome covers at all exposed penetrations.
- 10 14 Gauge fully welded stainless steel bumper rails pre drawings and details on the exposed exterior walls and doors.
- 11 Provide 14 Gauge fully welded stainless steel trim pre drawings and details around the opening in the building and the walk-in box.

Accessories

- 1 ea. ColdZone model MPL-2 refrigerated rack system per proposal number 24-1140. Locate the rack on the building roof. Verify the location at the job site.
- 1 ea. 208 volts, three phase.

- 2 ea. Berner model ASD36078 swing door. Install per the Manufactures requirements with stainless steel screws.
- 4 ea. Kason model 1810LCT40048" LED light fixtures with bulbs as located per the drawings. Conduit shall not be run on the interior of the units except what is required to connect to the lights. Seal the holes for the conduit and inside the conduit with a spray foam insulation to make an air-tight seal.

ITEM NO. 22 - WALK-IN SHELVING (1 LOT REQUIRED)

Quantum model WIRE storage shelves. Locate the bottom shelf at 10" above the finish floor and the remaining four (4) shelves at 17" O.C. at the balance of the shelving.

Accessories

- 36 ea. Model 2142P shelves.
- 20 ea. Model 2148P shelves.
- 5 ea. Model 2154P shelves.
- 16 ea. Model P74P posts.
- 40 ea. Model P86P posts.
- 8 ea. Model FP foot plates. Mount the foot plates to the floor with stainless steel fasteners. Locate the foot plates on the units at the ingredient bins.

ITEM NO. 23 - MOBILE DUNNAGE RACKS (2 REQUIRED)

New Age mobile dunnage racks with all the standard features.

Accessories

- 2 ea. Model 1206 with all the standard features.
- 2 sets. Provide with all swivel polyurethane tired casters with brakes.
- 2 ea. Model 1174 handles. Shorten the handle to 42" above the finished floor installed height.

ITEM NO. 24 - PREP TABLE (1 REQUIRED)

Custom fabricated prep table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features

- 01 Provide with a 10" high x 2" thick backsplash at the rear and high equipment. Attach the back splash to the wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a marine edge with a 2" turn down with a tight hem at the exposed sides.
- 03 Extend splash at pre-rinse faucet per drawings. Extend counter bracing up to top of extension. Fully weld bracing to counter bracing. Provide with a removable finished back where exposed.
- 04 Provide two (2) 18" x 18" x 10" deep 14 gauge type 304 stainless steel sinks fully welded into the top.
- 05 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel feet. Fully weld the leg sockets the underbracing.
- 06 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at rear. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304

- 07 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing. Provide type 304 stainless steel crossrails in the locations shown by the drawings. Fully weld the crossrails to the legs.
- 08 Provide two (2) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshelf. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws. Extend the back turn up of the shelves over the top of the overshelves of item 28 1/2" 90 degrees.

Accessories

- 1 ea. T & S model B-0133 pre-rinse faucet.
- 1 ea. T & S model B-0230-K installation kit.
- 1 ea. T & S model B-0156 add-on faucet.
- 1 ea. T & S model B-0109-01 wall bracket. Mount the bracket to the top extension with stainless steel screws.
- 2 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.

ITEM NO. 25 - ALLERGY WORK TABLE (1 REQUIRED)

Custom fabricated allergy table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features

- 01 Provide with a 8" high x 1" thick backsplash at the rear and high equipment. Attach the back splash to the wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 2" turn down with a tight hem at the exposed sides.
- 03 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel flanged feet. Fully weld the leg sockets the underbracing. Anchor the feet to the floor with stainless steel fasteners.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at walls and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.

- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 06 Provide one (1) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshelf. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws.

Accessories

- 1 ea. T & S model B-0320 faucets.
- 1 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.

ITEM NO. 26 - ALLERGY MOBILE CART (1 REQUIRED)

Metro model MY2030-34AP with all the standard features.

ITEM NO. 27 - MOBILE CLASSROOM SERVICEWARE SHELVING (1 REQUIRED)

Quantum Model mobile pan rack. Provide each unit four (4) shelves with 74" high posts. Mount the bottom shelf at 10" above the finish floor. Mount the remaining shelves at 17" on center.

Accessories

- 4 ea. Model 1836P shelves.
- 4 ea. Model P74P posts.
- 4 ea. Model WR-00HS casters with brakes.

ITEM NO. 28 - MOBILE COOLING RACKS (3 REQUIRED)

New Age model 1306 with all the standard features.

Accessories

- 3 sets Provide with polyurethane tired casters with brakes.
- 3 sets Model PB - Perimeter bumpers.

ITEM NO. 29 - MEAL ASSEMBLY TABLE (1 REQUIRED)

Custom fabricated meal assembly table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

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Features

- 01 Provide with an 8" high x 1" thick backsplash at the rear and high equipment. Attach the back splash to the wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 2" turn down with a tight hem at the exposed sides.
- 03 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel flanged feet. Fully weld the leg sockets the underbracing. Anchor the feet to the floor with stainless steel fasteners.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at walls and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 06 Provide one (1) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshelf. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws.

Accessories

- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.

ITEM NO. 30 - NUMBER NOT USED

ITEM NO. 31 - MOBILE UTILITY CART (1 REQUIRED)

Renfro Industries Inc. model SUCER1827-3 with all the standard features.

ITEM NO. 32 - MOBILE PROOF/HOT CABINET (1 REQUIRED)

CresCor model 121-PH-UA-11D with all the standard features.

Accessories

- 1 ea. 120 volts, single phase.
- 1 ea. Model 1405-135 perimeter bumper
- 1 set Provide with 5" polyurethane casters with brakes on all the casters.

ITEM NO. 33 - CONVECTION OVEN (1 REQUIRED)

Blodgett Oven model DFG-100 DOUBLE with all the standard features. Provide with separate gas connections.

Accessories

- 1 ea. Natural gas.
- 1 ea. 120 volts, single phase.
- 2 ea. Model SSI-M controls.
- 1 set Polyurethane casters with brakes.
- 1 ea. Dormont model 1675KIT2S48 gas connector hose kit. Provide to the plumbing contractor for installation.
- 1 ea. Dormont model 1675KIT2S48PS gas connector hose kit. Provide to the plumbing contractor for installation.

ITEM NO. 34 - MOBILE RANGE (1 REQUIRED)

Imperial model IHPA-4-24 with all the standard features.

Accessories

- 1 ea. Natural gas
- 1 ea. 3/4" gas regulator.
- 1 ea. Model STAND-24 mobile equipment stand.
- 1 ea. Polyurethane tired casters with brakes.
- 1 ea. Dormont model 1675KIT2S48PS gas connector hose kit. Provide to the plumbing contractor for installation.

ITEM NO. 35 - 12 GALLON TILTING KETTLE (1 REQUIRED)

Groen model TDB-48C with standard features.

Accessories:

- 1 ea. Two year parts and labor warranty.
- 1 ea. 208 volts, three phase.
- 1 ea. Model 155237 316 stainless steel liner.
- 1 ea. Model Z005186 lip strainer.
- 1 ea. Model 128002 lift off cover.
- 1 ea. Provide with etch marks in gallon increments in kettle.
- 1 ea. Model FL FOOTKIT flanged feet. Attach to the floor with stainless steel anchors.
- 1 ea. T & S model B-0176 faucet.
- 1 ea. T & S model B-0970-01 back flow preventer.

ITEM NO. 36 - CONVECTION STEAMER (1 REQUIRED)

AccuTemp model E32081E060 DBL with standard features.

Accessories:

- 1 ea. 208 volts, single phase.
- 1 ea. Model SNH-20-07 support stand.
- 1 ea. Drain water tempering kit..

ITEM NO. 37 - VENTILATOR (1 SECTIONSREQUIRED)

Compensating wall canopy ventilator per Captive-Aire proposal number 7165196. Construct from type 430 stainless steel where exposed.

Features

- 01 Provide stainless steel baffle filters with handles.
- 02 Six (6) LED light fixtures with bulbs.
- 03 Half pint grease cups.

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- 04 Provide a gas pipe chase in the corner per the drawings.
- 05 Seal the ventilator to the wall with silicone caulking.
- 06 Provide written test and balance forms to the Architect and Sturm Consulting, Inc.
- 07 Model SC-311110MA electrical controls. Locate in the fire suppression system cabinet.
- 08 Provide a touch screen control panel located per the drawings.

Accessories

- 1 ea. Provide a stainless steel enclosure extending from the top of the ventilator to the finish ceiling.
- 1 ea. Provide a stainless steel wall splash extending at the rear from 1" above the bottom of the ventilator to the finish floor or the wall base.
- 1 ea. Hang the ventilator from the roof structure above with 1/2" diameter all-thread rods per the manufactures requirements.
- 1 ea. Provide the labor to hang the ventilator per local codes and the manufactures requirements. Install the ceiling closure panels. Seal the ventilator and ceiling closures to the wall with clear silicone caulking in a neat manner. Seal the intersections of stainless steel with gray silicone caulking in a neat manner.
- 1 ea. The electrical connections will be by the electrical contractor.
- 1 ea. The ducts, curbs and fans will be by the mechanical contractor.

ITEM NO. 38 - FIRE SUPPRESSION SYSTEM (1 REQUIRED)

Ansul Fire Protection Model tank-SP-1 fire suppression system from Captive-Aire with all the standard features per Captive-Aire proposal number 7165196.

Features

- 1 ea. Mount the fire suppression in a cabinet against the ceiling at the location per the drawings.
- 1 ea. Install the fire suppression system per the current codes.
- 1 ea. Provide chrome-plated drops at the required locations.
- 1 ea. Locate the remote pull per all current codes.

Accessories

- 1 ea. Mechanical gas valve. Verify the size valve required and provide the valve to the plumbing contractor for installation.

ITEM NO. 39 - MOBILE PAN RACK (2 REQUIRED)

Quantum Model mobile pan rack. Provide each unit four (4) shelves with 74" high posts. Mount the bottom shelf at 10" above the finish floor. Mount the remaining shelves at 17" on center.

Accessories

- 8 ea. Model 2448P shelves.
- 8 ea. Model P74P posts.
- 8 ea. Model WR-00HS casters with brakes.

ITEM NO. 40 - NUMBER NOT USED

ITEM NO. 41 - COOK'S TABLE (1 REQUIRED)

Custom fabricated cook's table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel

channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features

- 01 Provide with a 8" high x 2" thick backsplash at the rear.
- 02 Provide a 16 gauge type 304 stainless steel finished back on the exposed backsplash. Attach the finished back to the backsplash in a concealed manner with stainless steel fasteners.
- 03 Provide with a 2" turn down with a tight hem at the exposed sides.
- 03 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel flanged feet. Fully weld the leg sockets the underbracing. Anchor the feet to the floor with stainless steel fasteners.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at walls and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 06 Provide one (1) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshef. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws.

Accessories

- 1 ea. T & S model B-0320 faucets.
- 1 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 1 ea. Advance Tabco model SWT-120 wall mounted pot rack. Modify the length per the drawings. Attach to the wall with stainless steel screws.
- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.
- 4 ea. Component Hardware Model R58-1010 electrical outlet box at the microwave oven. Attach the boxes to the overshef with stainless steel fasteners per the manufacturer's requirements. Provide with stainless steel cover plates. Provide and install conduit in an unexposed manner from the box through the shelf upright to a 4x4 junction box mounted below the table top.

ITEM NO. 42 - MICROWAVE OVEN (1 REQUIRED)

ACP model RMS10TSA with all the standard features.

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Accessories
1 ea. 120 volts, single phase.

ITEM NO. 43 - 20 QUART MIXER (1 REQUIRED)

Globe model SP20 with all the standard features.

Accessories
1 ea. 120 volts, single phase.

ITEM NO. 44 - MOBILE MIXER STAND (1 REQUIRED)

Jero Manufacturing model JSS-2831 with all the standard features.

ITEM NO. 45 - ICE MAKER (1 REQUIRED)

Scotsman model MC0522SA-1-32 with all the standard features.

Accessories
1 ea. 120 volts, single phase.
1 ea. Model B322S bin.
1 ea. Model KLP8S stainless steel legs.
1 ea. Everpure model EV932422 water filter assembly. Mount on the side of the ice maker and bin with stainless steel screws.
1 pk. Everpure model EV9534-26 EC210 replace cartridge.

ITEM NO. 46 - MOBILE TRAY DISPENSERS (2 REQUIRED)

Piper Products/Servolift Eastern model PT/1014MO with all the standard features. Verify the Owner's tray size before the unit is ordered.

Accessories
2 sets Model WB brakes.
2 ea. Model PB perimeters bumpers.
2 sets Polyurethane casters.

ITEM NO. 47 - MOBILE MILK COOLERS (1 REQUIRED)

True Mfg. model TMC-49-S-SS-HC with all the standard features.

Accessories
1 ea. 120 volts, single phase.
1 ea. Model 882506 corner bumpers.
1 ea. Provide with 5" polyurethane casters with brakes on all the casters.

ITEM NO. 48 - SERVING COUNTER (1 REQUIRED)

Custom fabricated serving counter to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top with a 2" drop down at the cashier stand. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features
01 Provide with a 2" turn down with a tight hem at the sides.

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- 02 Provide a 16 gauge type 304 stainless steel fully welded counter body with a 16 gauge type 304 stainless steel fully welded undershelves per the drawing elevations. Provide 12 gauge type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing. Notch the undershelf around the floor sink.
- 03 Provide a 16 gauge type 304 stainless steel double pan hinged doors per the elevations. Fully weld the corners on the panels.
- 04 Provide a 16 gauge type 304 stainless steel double pan hinged doors with fully welded louvers per the elevations. Fully weld the corners on the panels.
- 05 Provide a Component Hardware Group, Inc. model P46-1012 pull at the doors. Attach with stainless steel screws.
- 06 Provide a Component Hardware Group, Inc. model M32-2401 magnetic catches at the doors. Install the catch per the manufactures requirements.
- 07 Provide steel j-boxes on the counter body per the drawings and elevations for switches and controls. Provide with stainless steel cover plates. Weld the j-boxes to the counter.
- 08 Provide removable 18 gauge stainless steel panels on the counter fronts and side per the elevations. Provide a 6" x 6" one piece panel at the corners. Attach the panels to the counter with 14 gauge stainless steel Z-clips at the bottom of the panels.
- 09 Provide a quarter-turn ball valve drain valve in an 18 gauge fully welded stainless steel recess per the drawings. Pre-pipe the hot well drain to the valve and the drain line to the floor drain per current codes.
- 10 Provide polyurethane tired casters with brakes.

Accessories

- 1 ea. T & S model B-0208 faucet. Provide a hot water indicator on the handle.
- 1 Lot Versa-Gard sneeze guards per quote # Q016904 the drawings in a brushed stainless steel finish. Provide an undercounter mount. Install into the counter top per the manufactures requirements.

ITEM NO. 49 - DROP-IN COLD FOOD WELLS (1 REQUIRED)

Low Temp Industries model DI-TA-20-03 with all the standard features.

Accessories

- 1 ea. 120 volts, single phase.

ITEM NO. 50 - NUMBER NOT USED

ITEM NO. 51 - DROP-IN HOT FOOD WELLS (1 REQUIRED)

Low Temp Industries model DI-TW-DW-20-05 with all the standard features.

Accessories

- 1 ea. 208 volts, single phase.

ITEM NO. 52 - POS BY THE OWNER

ITEM NO. 53 - MOBILE CONDIMENT COUNTER (1 REQUIRED)

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Lakeside Manufacturing model 70410 with all the standard features. Verify the Owner's top/cutout requirements before the unit is ordered. Verify the Owner's laminate choices requirements before the unit is ordered.

END OF SECTION

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Part 1 - General

1.01 Work Included:

- A. All materials, labor services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Finish Carpentry - Section 06200
- B. Custom Casework - Section 06410
- C. Metal Doors and Frames - Section 08100
- D. Wood Doors - Section 08200

1.03 Quality Assurance:

- A. This material shall be procured from a source of supply approved by the Architect as having a member of their firm registered by the American Society of Contracting Architectural Hardware Consultants, and with a proven record of several years of satisfactory experience in contract builder's hardware, both in furnishing material and properly servicing jobs. The supplier also must be an established contract builder's hardware firm who meets all the above requirements, and who maintains and operates an office, display room and stock.

1.04 Submittals:

- A. Prepare a complete schedule including all items processed for each opening and other miscellaneous items and submit four copies to the Architect for approval within 30 days submitted within that time, the supplier shall furnish the hardware specified by catalog number.
- B. Indicate on schedule name of manufacturer after each item.
- C. Upon receiving the approved schedule, the hardware supplier shall immediately forward a copy to the metal frame suppliers, when applicable; and as soon as they receive approved shop drawings, they will immediately forward a complete set to the hardware supplier who can then check the applications and make any necessary minor revisions. If revisions are necessary, notify Architect immediately.
- D. Mark each item of hardware for opening on which it is to be used and deliver a complete schedule to the contractor when hardware is delivered.

1.05 Schedule:

- A. This specification describes the quality, character and function that is required of items of hardware; however, it is not intended to mention each particular item.
- B. It is the responsibility of the supplier to thoroughly detail the entire project to assure that the items specified will properly function in the indicated locations and **meet the requirements of the Owner.**
- C. Quantities shall be determined by the bidder. Part 2, following, indicates the type and function of material applicable to the typical opening. Should an unlisted opening require different type of function of hardware than that specified, for similar opening, notify the Architect, and provide hardware for unlisted openings within the bid.

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Part 2 - Products

2.01 Finish Hardware:

A. Standards of Quality:

1. Codes, specifications and published recommendations, latest editions of the following are hereby made part of this section of the specifications in so far as they apply to the material or work called for.
 - a. National Builders Hardware Association (NBHA)
 - b. American Society for Testing Materials (ASTM)
 - c. Underwriters Laboratories (UL)
 - d. National Fire Protection Association (NFPA)
 - e. Code of Ethics of ASAH & NBHA
 - f. Federal Emergency Management Agency (FEMA)
2. Federal Specification, (ANSI Specifications):
 - a. Hinges: FF-H-116C (ANSI A156.1)
 - b. Locks and Door Trim: FF-H-106A (ANSI A 156.2)
 - c. Auxiliary Locks: FF-H-106A (ANSI A 156.5)
 - d. Exit Devices: FF-H-106A, FF-H-111B, FF-L486 (ANSI A156.3).
 - e. Door Closers: FF-H-121C (ANSI A 156.4)
 - f. Shelf and Miscellaneous Hardware: FF-H-00116 (ANSI A156.6).
 - g. All Door hardware: Comply with ADAAG where applicable.

B. General:

1. All hardware relating to hollow metal doors and frames shall be to standard templates of each respective hardware manufacturer for items furnished.
 - a. The related suppliers such as hollow metal doors and frames and such others as may be required will furnish the hardware supplier one copy of each of their approved shop drawings for proper coordination of their work and the finish hardware.

C. Manufacturers and Requirements:

1. Hardware manufacturers and brand names are for a guide as to type and standard required and all such hardware furnished must meet these standards as far as quality, weight, finish and design.

D. Keying:

1. All locks and cylinders to be masterkeyed as directed by the Architect/Owner.
2. Keys: Furnish the following keys:
 - a. 2 change keys each lock or cylinder
 - b. 6 masterkeys
 - c. **all EXTERIOR locks and cylinders shall be Primus Schlage Key System and keyed to Owner's Primus Master Key system. All remaining interior locks and cylinders shall be Classic Schlage and keyed to the Owner's Primus Master Key System.**

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

2.02 Hardware Sets:

Hardware Group No. 001: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA PIVOT SET	7215 SET	626	IVE
2	EA PIVOT	7215 INT	626	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA DOOR SWEEP	C627A LENGTH AS REQUIRED	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQUIRED	AL	NGP
1	MEETING STYLE SEAL BY DOOR MANUFACTURER			
1	PERIMETER SEAL BY DOOR MANUFACTURER			
	REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.			

Hardware Group No. 002: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PRIVACY SET	L9444 03N	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 003: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
6	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	SET AUTO FLUSH BOLT	FB31P OR FB41P AS REQUIRED	630	IVE
1	EA DUST PROOF STRIKE	DP2	626	IVE
1	EA STOREROOM LOCK	L9080T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA COORDINATOR	COR X FL X MTG BRKTS X HW PREPS X LENGTH AS REQ	628	IVE
1	SET ASTRAGAL	9605A HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AL	NGP
2	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
2	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	SET SEALS	5050BR H & J (USE SILENCERS @ NON-RATED DOORS)	CLR	NGP

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Hardware Group No. 004: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA STOREROOM LOCK	L9080T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
1	SET SEALS	5050BR H & J (USE SILENCERS @	NON-RATED DOORS)	
			CLR	NGP

Hardware Group No. 005: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
1	EA CONTINUOUS HINGE	224HD HEIGHT AS REQUIRED	628	IVE
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED		
			626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
1	EA MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA PRIMUS CORE ONLY	20-740	626	SCH
1	EA OFFSET DOOR PULL	8190-0-0	630	IVE
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	EA DOOR SWEEP	C627A LENGTH AS REQUIRED	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQUIRED	AL	NGP

Hardware Group No. 006: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA STORE LOCK	L9466T 03N	626	SCH
2	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 007: Provide each PR doors with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQUIRED	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED		
			626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED		
			626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

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Hardware Group No. 008: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA LOCK	ND66T TRL	626	SCH
1	EA OVERHEAD STOP	904S	630	GJ
1	EA SURFACE CLOSER	4040SE MTG BRKTS, SPCRS & PLATES AS REQ (MAX DEGREE HOLD OPEN)	689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA CLASSIC CORES	23-030	626	SCH
1	SET SEALS	5050B H & J	BLK	NGP

Provide ALL connections required to the fire alarm and electrical systems necessary for a fully functioning device meeting all applicable codes. REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

Hardware Group No. 009: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA CLASSROOM LOCK	L9070T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA SURFACE CLOSER	4041H OR P4041H MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	SET SEALS	5050B H & J	BLK	NGP

Hardware Group No. 010: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA PUSH PLATE	8200 4" X 16"	630	IVE
1	EA PULL PLATE	8303EZ-0 4" X 16"	630	IVE
1	EA SURFACE CLOSER	4041H OR P4041H MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 011: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

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Hardware Group No. 012: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PASSAGE SET	L9010T 03N	626	SCH
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE

Hardware Group No. 013: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQ	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQ	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA SURFACE CLOSER	4040XP SHCUSH MTG BKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	700SA H & J (INSTALL PRIOR TO OTHER HARDWARE)	AL	NGP
2	EA DOOR SWEEP	C627A LENGTH AS REQ	AL	NGP
1	EA OVERHEAD RAIN DRIP	16A DW + 4"	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQ	AL	NGP

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION, ETC.

Hardware Group No. 014: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN

Hardware Group No. 015: Provide each PR doors with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQUIRED	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PUSH PLATE	8200 4" X 16"	630	IVE
1	EA PULL PLATE	8303EZ-0 4" X 16"	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	5050B H & J	BLK	NGP

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SECTION 08700 - FINISH HARDWARE

Hardware Group No. 016: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

The following list of products and manufactures are acceptable for this project.

<u>Product</u>	<u>Manufacture and Approved Equals</u>
1. Hinges	A. Ives B. Hager C. Bommer
2. Continuous Hinges	A. Pemko B. Roton C. Select
3. Key System	A. Schlage (No substitutions)
4. Lock/Latch	A. Schlage (No substitutions)
5. Closers	A. LCN (No substitutions)
6. Exit Devices	A. Von Duprin (No substitutions)
7. Push/Pull/Plates	A. Ives B. Rockwood C. Trimco
8. Misc. Stop, Bolts, etc.	A. Ives B. Glynn-Johnson C. Rockwood
9. Door Seal/Thresholds	A. National Guard B. Pemko C. Reese

Each Product, by category, shall be the product of one manufacture. Complete lockset, including keyed lock cylinder, shall be the product of one manufacturer unless noted otherwise.

Part 3 - Execution

3.01 Installation:

- A. Install all finish hardware in strict accordance with the

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

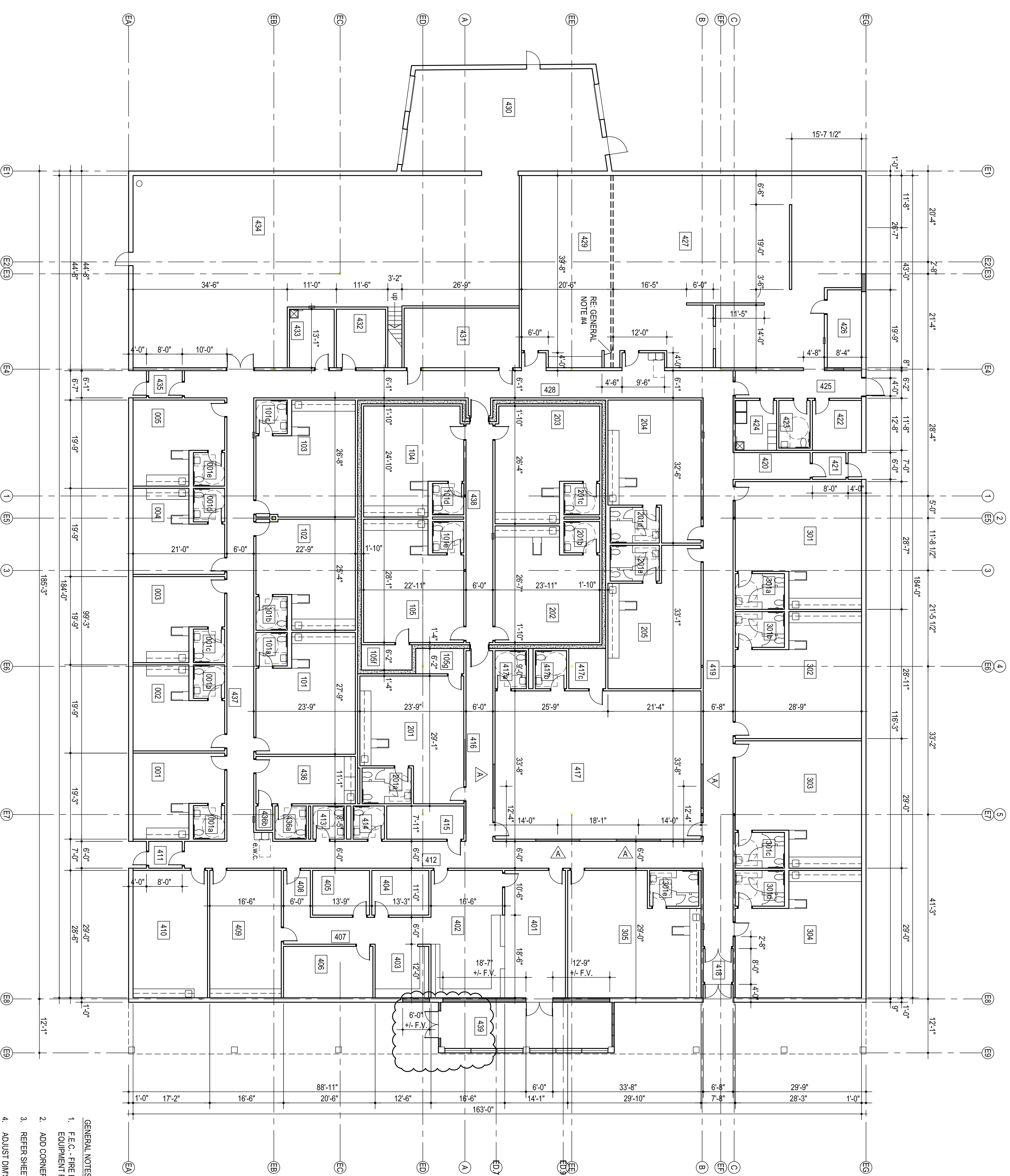
manufacturer's recommendations and printed instructions. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item. Do not install surface mounted items until finishes have been completed on the substrate.

- B. All hardware relating to hollow metal and aluminum doors and frames shall be to standard templates of each respective hardware manufacturer for items furnished.
 - C. Mounting Heights: Mount Hardware units at heights recommended by the National Builders Hardware Association, except as specifically indicated or required to comply with governing regulations, or as may be otherwise directed by the Architect.
- 3.02 Prior to the Final Inspection:
- A. The supplier shall check all closers for proper operation after they have been installed and adjusted by the Contractor. He shall verify the keying to ensure proper location of locksets and shall assist the Contractor in correcting faulty operation of any locks.
 - B. Within 30 days after the acceptance of the entire project, the Contractor shall be responsible for this supplier meeting with the maintenance custodian at the job site for the purpose of instructing him thoroughly in the proper repair and adjustment of all finish hardware items, and items, and shall present to the custodian a full complement of tools to be used.

End of Section

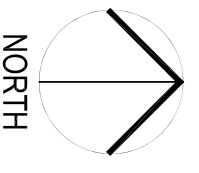


- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. ADJUST DIMS AS REQUIRED FOR MOVEABLE PARTITION SUPPLIED



DIMENSION PLAN

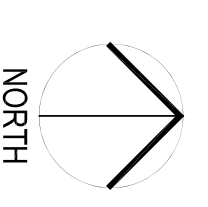
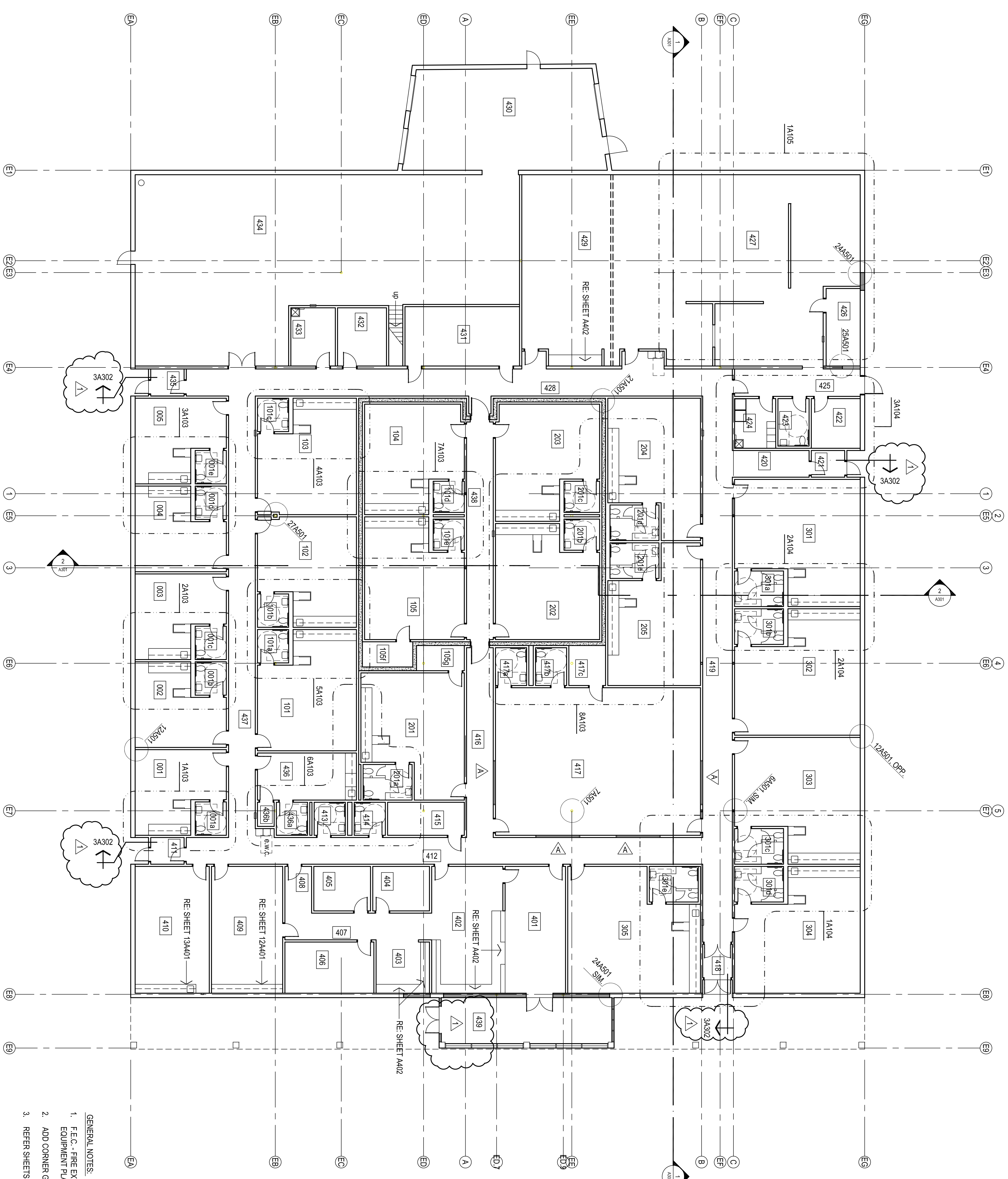
3/32" = 1'-0"



NORTH



- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS



REFERENCE PLAN
3/32" = 1'-0"

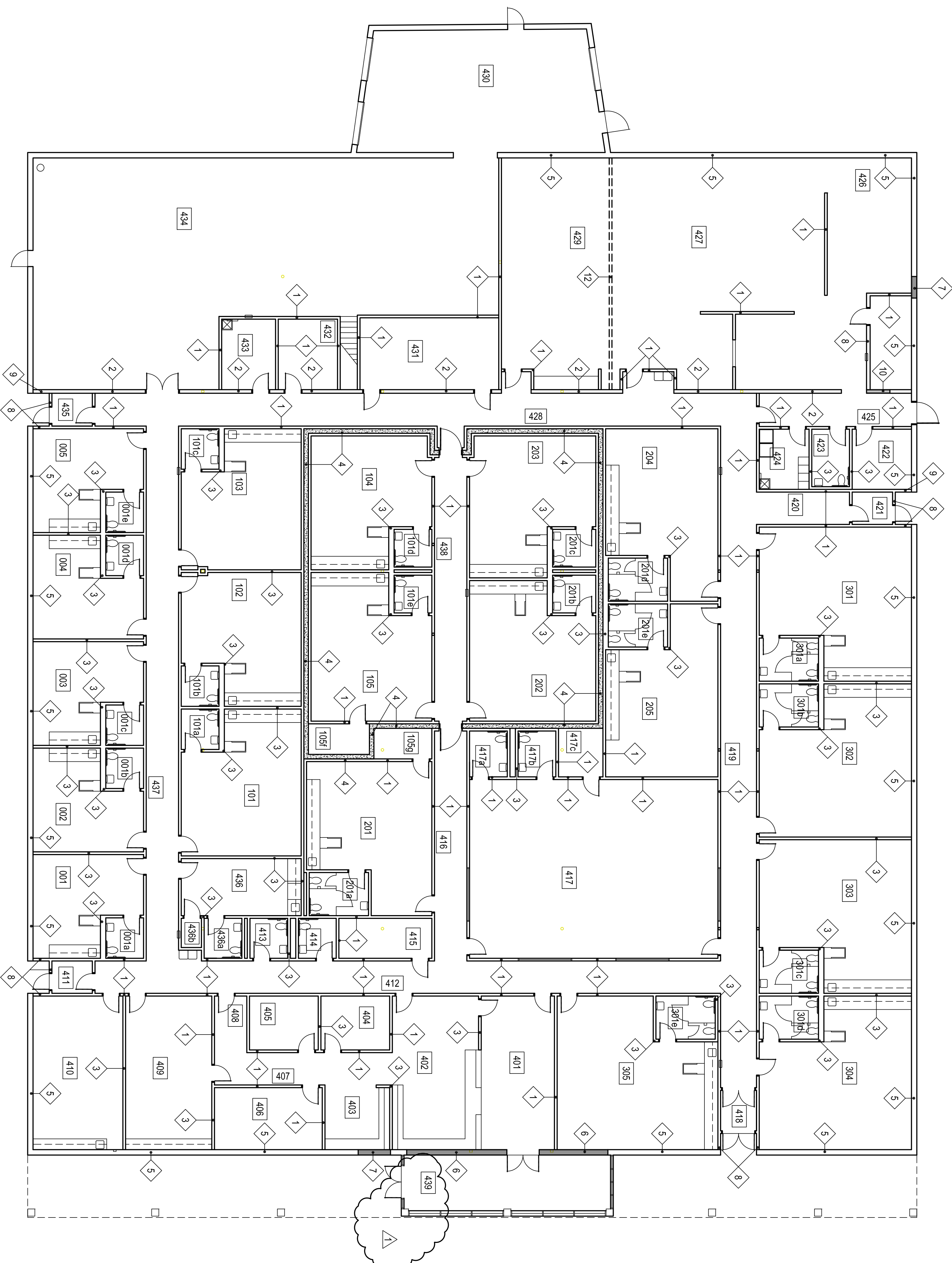


WALL / PARTITION LEGEND

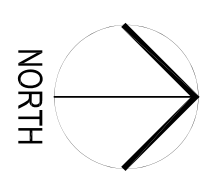
- 1 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 2 EXISTING LOAD BRNG, 6" CMU WALL
1 LAYER FIRE RATED GYP. BD. EA.SIDE ON 7/8" FURRING STRIPS
HEIGHT: 6" ABOVE CEILING
PROVIDE FIRE STOPPING AS REQUIRED AT TOP OF EXISTING CMU WALL
- 3 STUD WALL / CHASE WALL (12" CLEAR)
1 LAYERS GYPSUM BOARD EACH SIDE, 3.58" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
- 4 SHELTER WALL
1 LAYER GYP. BD. EA. SIDE ON 3/8" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
10" CONC. WALL TO SLAB ABOVE - 12'-6", RE. STRUCT.
- 5 EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. ON 2" FURRING STRIPS W/ 2" BATT INSULATION
HEIGHT: SLAB TO 6" ABOVE CEILING
- 6 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO MATCH
EXISTING CMU WIDTH
HEIGHT: SLAB TO DECK ABOVE
- 7 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. AND EXTERIOR SHEATHING ON METAL STUDS TO
MATCH EXISTING CMU WIDTH. MATCH EXISTING E.F.I.S. THICKNESS
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 8 STUD WALL / METAL WALL PANEL
1 LAYERS GYPSUM BOARD, 6" METAL STUDS, EXTERIOR SHEATHING W/
METAL WALL PANELS
HEIGHT: 6" STUDS AND GYP. BD. SLAB TO DECK ABOVE. SHEATHING
AND METAL WALL PANEL TO SOFFIT ABOVE
- 9 EXISTING CMU WALL / METAL WALL PANEL
7/8" FURRING STRIPS, EXTERIOR SHEATHING W/ METAL WALL PANELS
HEIGHT: SHEATHING AND METAL WALL PANEL TO SOFFIT ABOVE
- 10 NEW STUD IN-FILL AT EXISTING 8" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO
MATCH EXISTING CMU WIDTH.
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 11 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 12 MOVABLE PARTITION
REFER SPECIFICATIONS

REFER ROOM FINISH SCHEDULE, COLOR SCHEDULE,
INTERIOR ELEVATIONS & SPECIFICATIONS FOR ADDITIONAL
WALL FINISH INFORMATION

CONSTRUCTION MANAGER & SUBCONTRACTORS SHALL
COORDINATE FINAL CONSTRUCTION OF ALL WALLS
PRIOR TO BEGINNING WORK



WALL TYPE PLAN
3/32" = 1'-0"





CONSTRUCTION DATA (TABLE 603):

CONSTRUCTION TYPE -	E & I-4
TYPE II - B	
BASIC ALLOWABLE AREA -	E - 58,000 S.F. / I-4 - 52,000 S.F. PER FLOOR
ALLOWABLE STORIES -	3 / 3
ACTUAL STORIES -	1 / 1
ACTUAL HEIGHT -	23'-4"

BUILDING SIZES:
BUILDING : 1 STORY @ 32,200 S.F.

STRUCTURAL FIRE PROTECTION (TABLE 601):	0 HOUR
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
COLUMNS	0 HOUR
BEAMS	0 HOUR
PERMANENT PARTITIONS	NONCOMBUSTIBLE
FLOOR ASSEMBLIES	0 HOUR
ROOF ASSEMBLIES	0 HOUR
EXTERIOR OPENINGS	N/A

PASSIVE FIRE SAFETY SYSTEM:
PORTABLE FIRE EXTINGUISHERS (REF: SHEETS A104)
TRAVEL DISTANCE = 250'-0" MAX.
ACTUAL MAX. TRAVEL DISTANCE = 170'-0"
DEADEND - 50'-0" MAX.
ACTUAL DEADEND - NONE

ACTIVE FIRE SAFETY SYSTEMS (EXISTING & NEW ADDITION):
FIRE SPRINKLER SYSTEM THROUGHOUT
FIRE ALARM SYSTEM
SMOKE DETECTION
AUTOMATIC AIR HANDLING EQUIP. SHUTDOWN
EXIT LIGHTS/EMERGENCY LIGHTS BATTERY

CODES/REGULATIONS USED: (CITY OF MOORE):
2018 IBC - INTERNATIONAL BUILDING CODE
AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE
2009 ENERGY CONSERVATION CODE
ASSOCIATED SUPPLEMENTS TO EACH CODE

OCCUPANT LOAD (TABLE 1004.1.1.1):

BUILDING RENOVATION: 278 CHILDREN
12 ADMIN / STAFF
40 TEACHERS
330 TOTAL OCCUPANTS

EGRESS WIDTH:

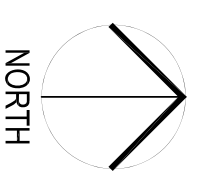
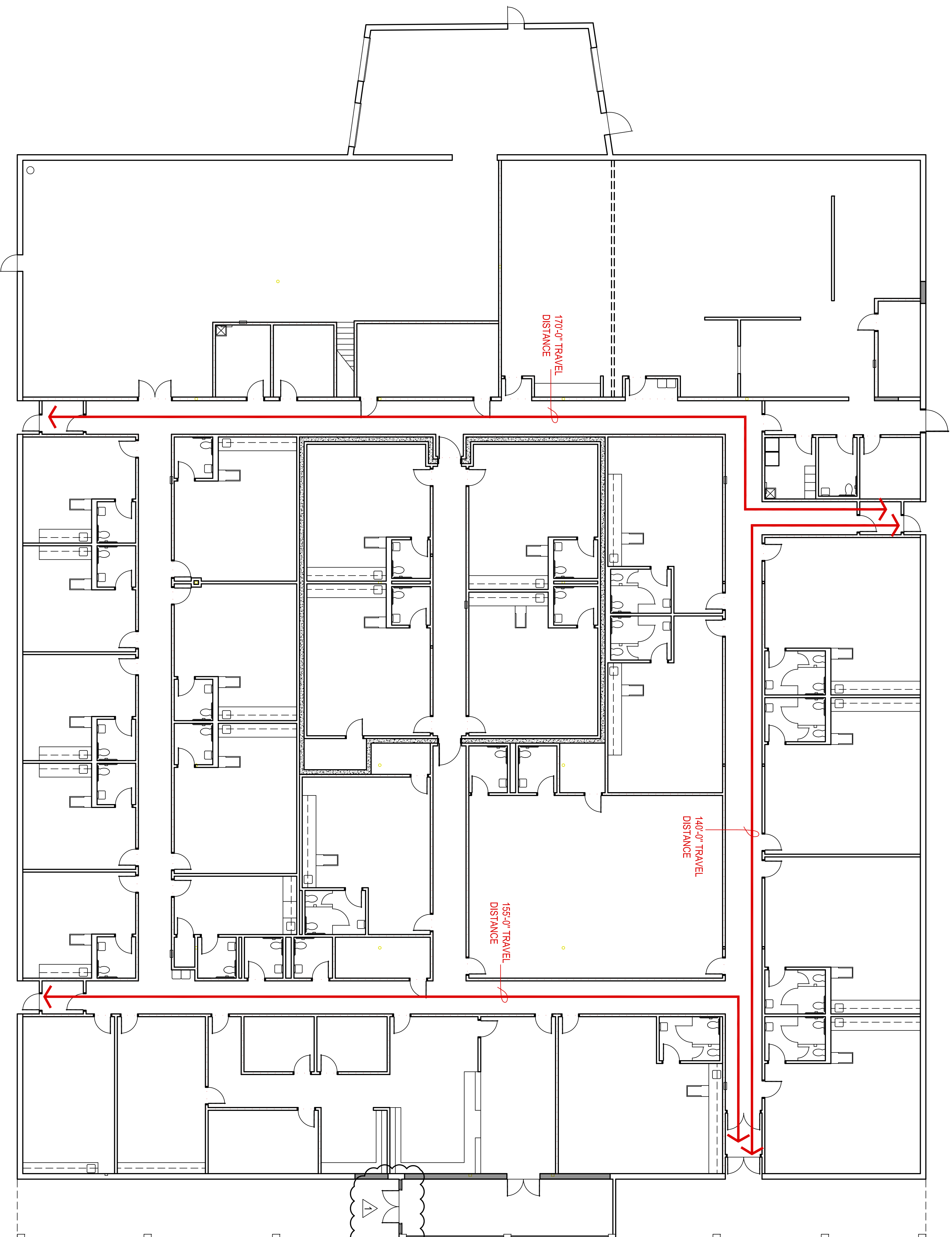
BUILDING RENOVATION: REQUIRED 66"
BUILDING RENOVATION: PROVIDED 432"

PLUMBING FIXTURES (TABLE 2902.1):

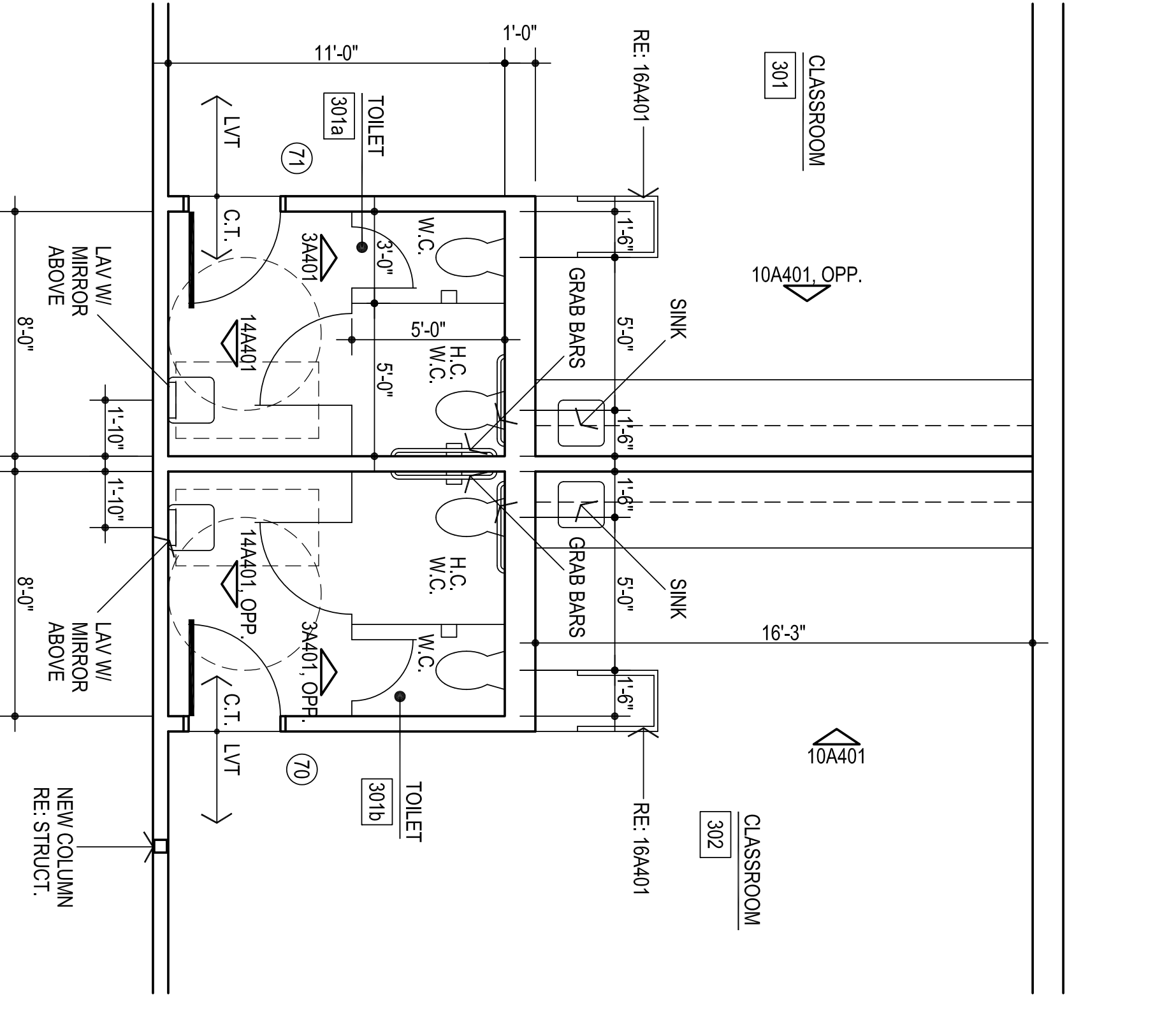
TOTAL OCCUPANT LOAD (INSTITUTIONAL) = 330

TOTAL REQUIRED:	TOTAL PROVIDED
WATER CLOSETS = 22	WATER CLOSETS = 34
LAVATORIES = 22	URINALS = 0
DRINKING FOUNTAINS = 4	LAVATORIES = 49
SERVICE SINKS = 1	DRINKING FOUNTAINS = 4
	SERVICE SINKS = 2

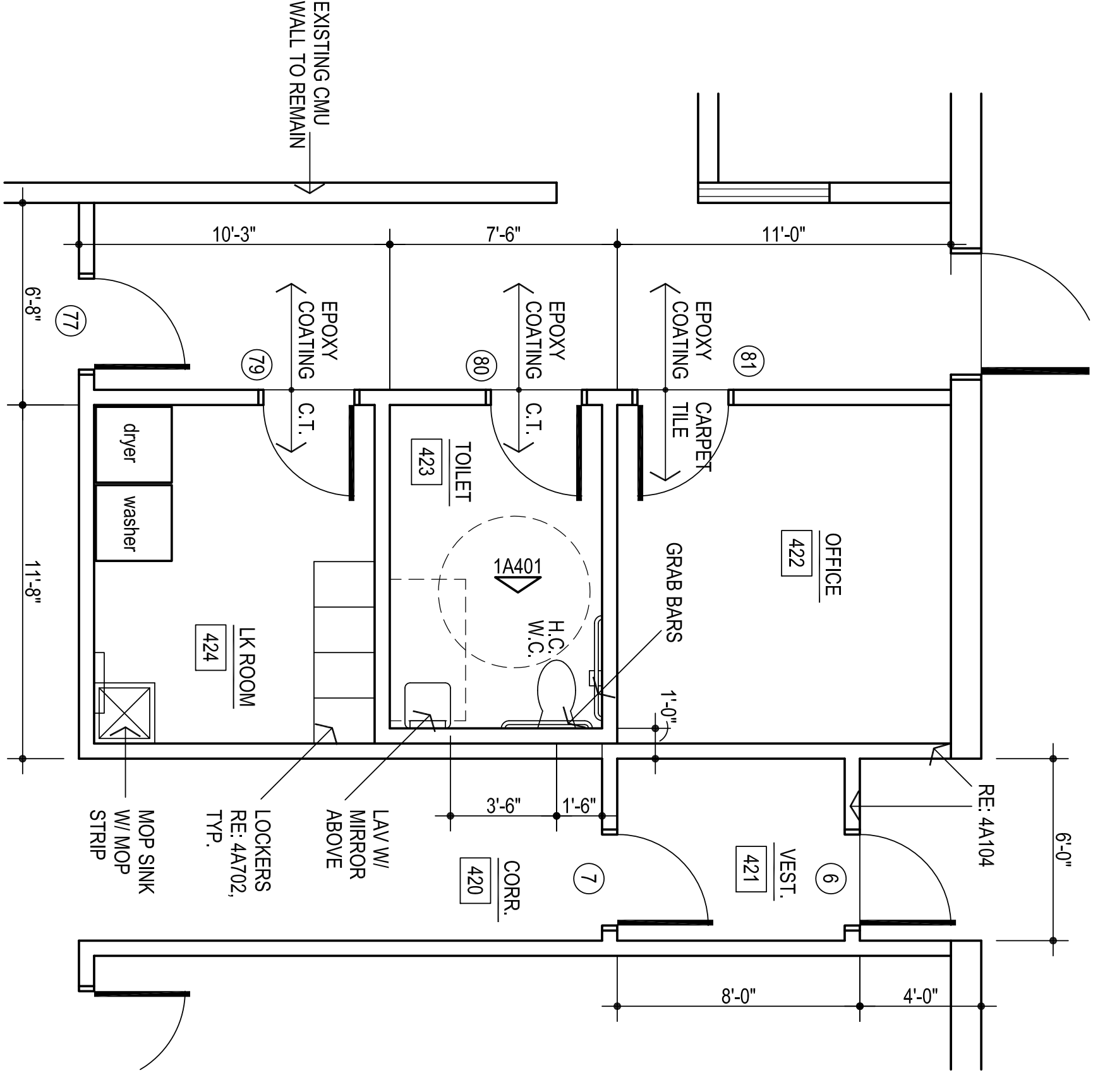
DEVOTES 1 HR. RATED PARTITIONS CLOSE-OUT TO
BOTTOM OF DECKING - CLOSE-OUT PARTITIONS TO
BE CMU WHERE INDICATED ON STRUCTURAL FOR
LOAD BEARING CONDITIONS. ALL OTHER INDICATED
LOCATIONS TO BE CONSTRUCTED OF 1 LAYER
OF 5/8" FIRE RATED GYP. BOARD EACH SIDE
ON 6" METAL STUDS @ 16" O.C. STAGGER ALL
JOINTS & PROVIDE FIRE TAPE SEAL ALL PENETRATIONS
W/ CONTINUOUS FIRE STOPPING INSULATION
& OR SEALANT.



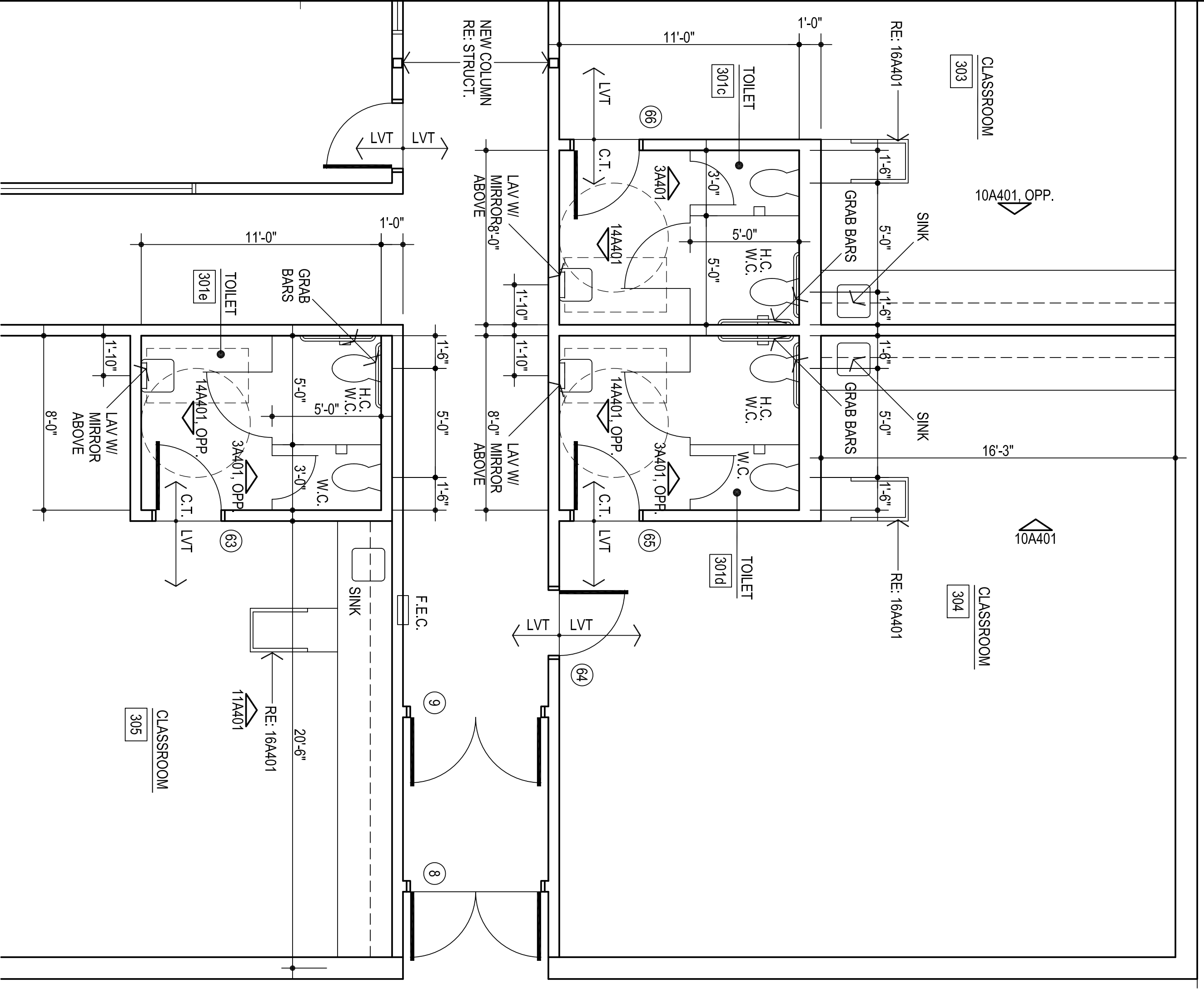
1 LIFE SAFETY PLAN
3/32" = 1'-0"



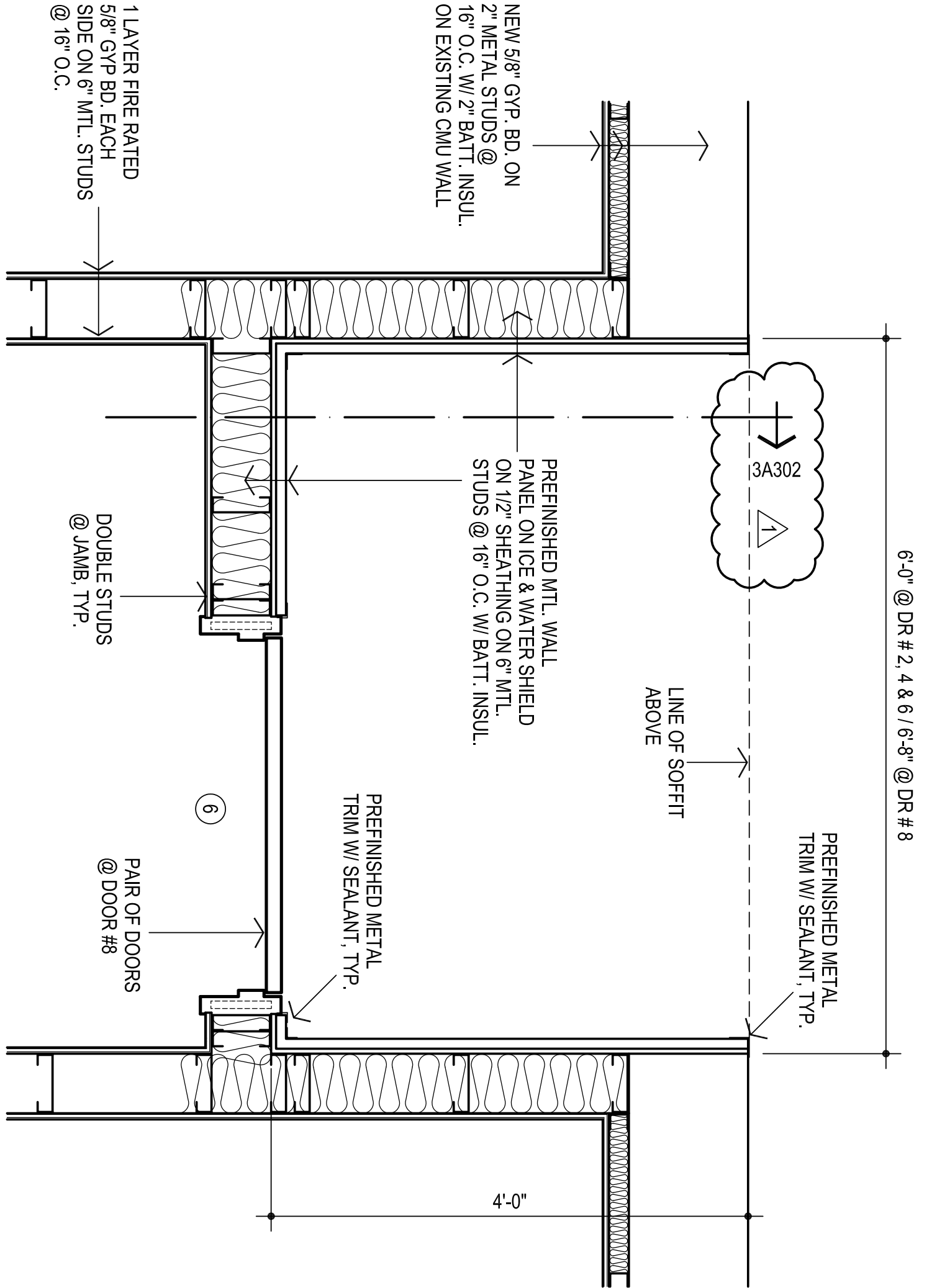
2
ENLARGED FLOOR PLAN
ROOM # 301, 302, 301a, & 301b
1/4" = 1'-0"



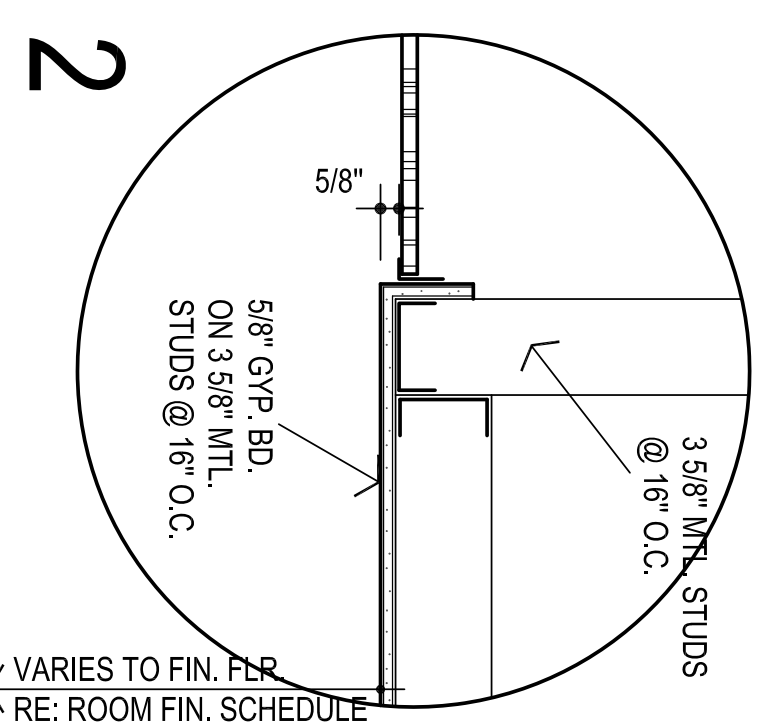
3
ENLARGED FLOOR PLAN
ROOM # 420, 421, 422, 423 & 424
1/4" = 1'-0"



1
ENLARGED FLOOR PLAN
ROOM # 303, 304, 305, 301c, 301d & 301e
1/4" = 1'-0"



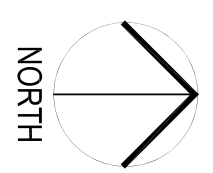
4
TYPICAL NEW EXT. DOOR & VESTIBULE
1" = 1'-0"



LEGEND:

- MECHANICAL OPENINGS
- ELECTRICAL FIXTURES
- ⊙ CEILING MOUNTED SMOKE DETECTOR, RE: ELEC
- INDICATES AREA / ROOM TO RECEIVE GYP. BD. CEILING
- INDICATES AREA / ROOM TO RECEIVE 2X2 LAY-IN CEILING
- INDICATES AREA / ROOM TO RECEIVE 2X2 LAY-IN CEILING

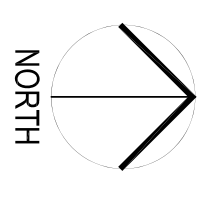
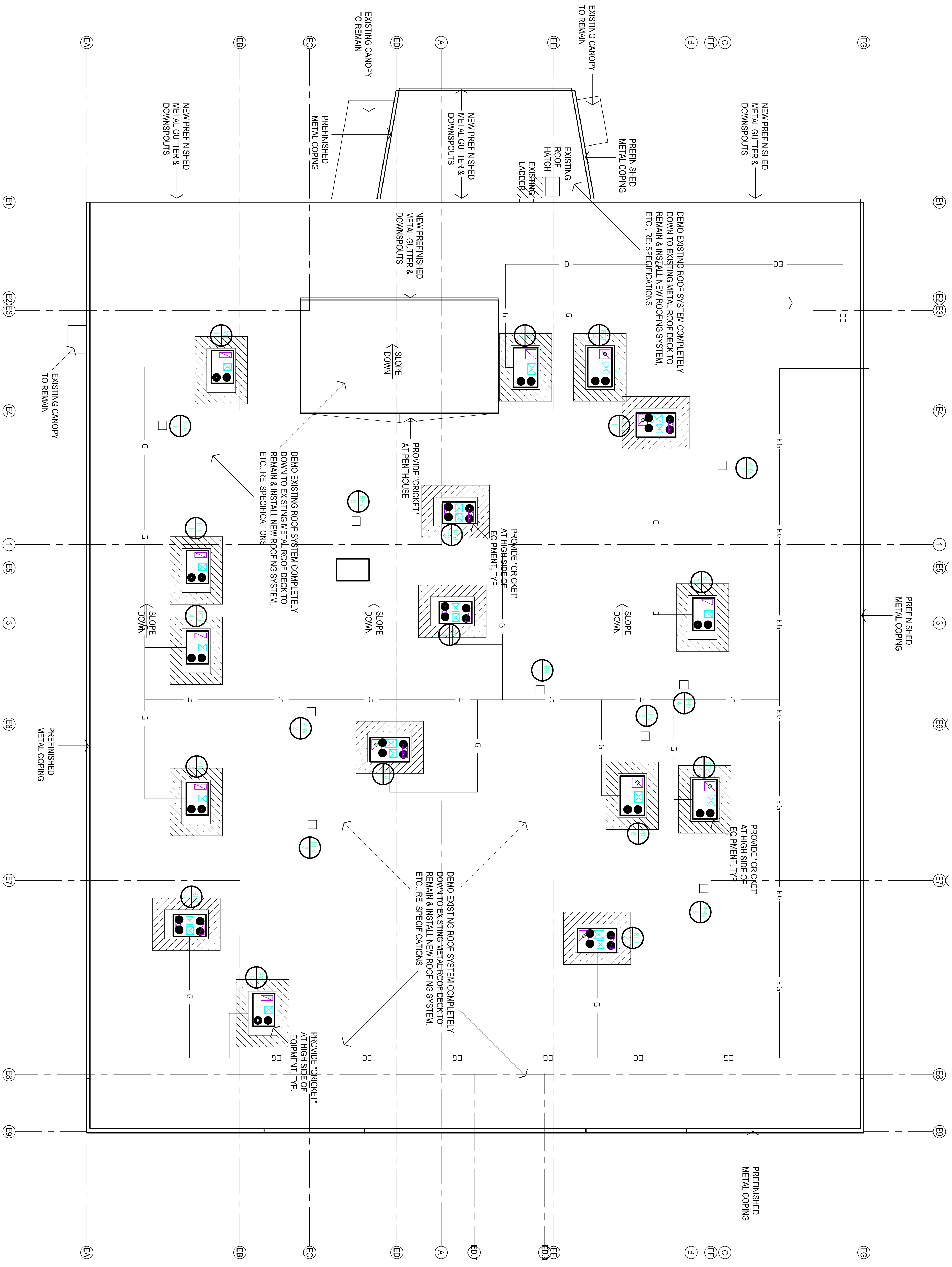
- NOTES:**
- REFER MECHANICAL & ELECTRICAL FOR ANY ADDITIONAL CEILING MOUNTED FIXTURES
 - REFER TO SHEET A100 FOR LOCATIONS OF FIRE-RATED WALLS



1

REFLECTED CEILING PLAN
3/32" = 1'-0"

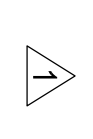
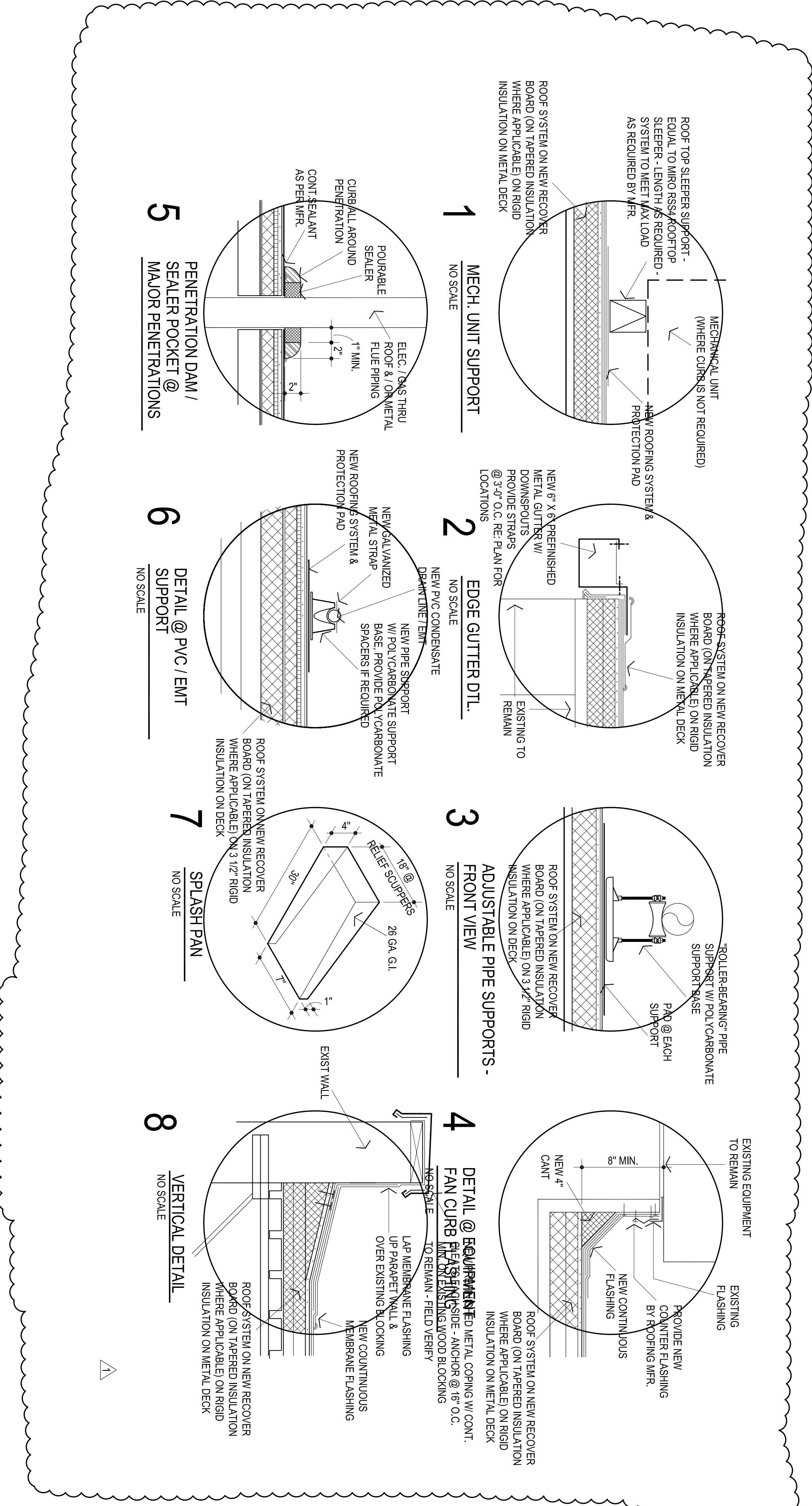
- NOTES:**
- ALL CEILINGS TO BE LOCATED AT 9'-0" A.F. UNLESS NOTED OTHERWISE.
 - THESE DRAWINGS INDICATE THE LIMITS OF FINISHES FOR AREAS THAT HAVE MULTIPLE TYPES AND COLORS. REFER ROOM FINISH SCHEDULE FOR CEILING MATERIAL AND COLOR DESIGNATIONS NOT SHOWN ON THIS SHEET.
 - ALL FURDOWNS SHALL BE PAINTED UNLESS NOTED OTHERWISE.
 - ALL CEILING FURDOWNS SHALL BE BRACED WITH LIGHT GAUGE FRAMING TO PREVENT SWAYING.
 - ALL CEILINGS, FURDOWNS, PIPES, DUCTS, EQUIPMENT, ETC. SHALL BE SUSPENDED FROM STRUCTURAL STEEL ABOVE. DO NOT SUPPORT ITEMS FROM METAL DECK ONLY. REFER STRUCTURAL FOR REQUIREMENTS OF ATTACHMENT TO STEEL.
 - MECHANICAL AND ELECTRICAL DISCIPLINES ARE SHOWN FOR INFORMATION PURPOSES ONLY. REFER TO CONSULTANT SHEETS FOR EXACT FIXTURE LOCATIONS.
 - COORDINATE LOCATION OF ANY CONTROL JOINTS NOT SHOWN WITH THE ARCHITECT PRIOR TO INSTALLATION.
 - PROVIDE DRYWALL CONTROL JOINTS AT WALLS, CEILINGS AND SOFFITS, FURRINGS, ETC. WHERE SHOWN ON DRAWINGS, AND THE FOLLOWING LOCATIONS (SHOWN OR NOT):
 - AT OTHER LOCATIONS WHERE STRUCTURAL SUPPORT FOR FRAMING CHANGES LEVEL OR MATERIAL, OR WHERE DIFFERENTIAL MOVEMENT IS LIKELY TO OCCUR.
 - AT LOCATIONS WHERE CEILING FRAMING MEMBERS CHANGE DIRECTION.
 - AT 30" MAX SPACING IN ANY UNINTERRUPTED STRAIGHT PLANE OR CURVE FOR WALLS, CEILINGS AND SOFFITS (IN TWO DIRECTIONS).
 - AT DOORS, WINDOWS AND OPENINGS LESS THAN OR EQUAL TO 4'-0" WIDE FROM ONE EDGE OF FRAME, TO TOP OF WALL, AND TO FLOOR IF OPENING DOES NOT EXTEND TO FLOOR.
 - AT DOORS, WINDOWS AND OPENINGS GREATER THAN 4'-0" WIDE FROM BOTH EDGES OF FRAME, TO TOP OF WALL, AND TO FLOOR IF OPENING DOES NOT EXTEND TO FLOOR.
 - AT BUILDING CONTROL JOINTS, SEISMIC JOINTS AND EXPANSION JOINTS.
 - AT LOCATIONS OF EXTREME DIFFERENCE IN THE DIMENSIONS OF ADJACENT DRYWALL AREAS.
 - REFER TO SHEET A100 FOR LOCATIONS OF FIRE-RATED WALLS

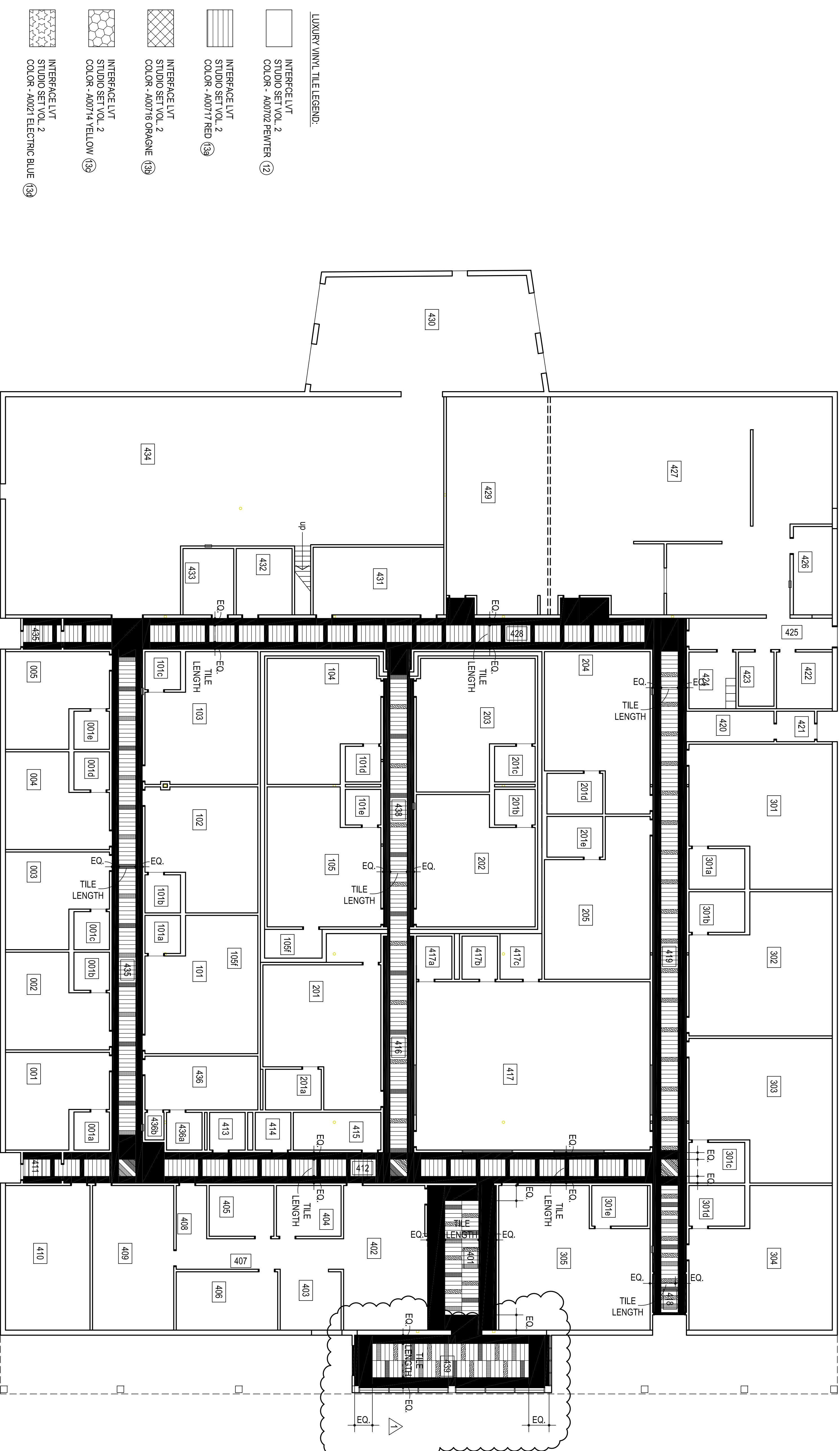


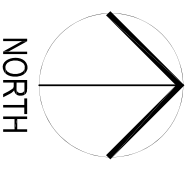
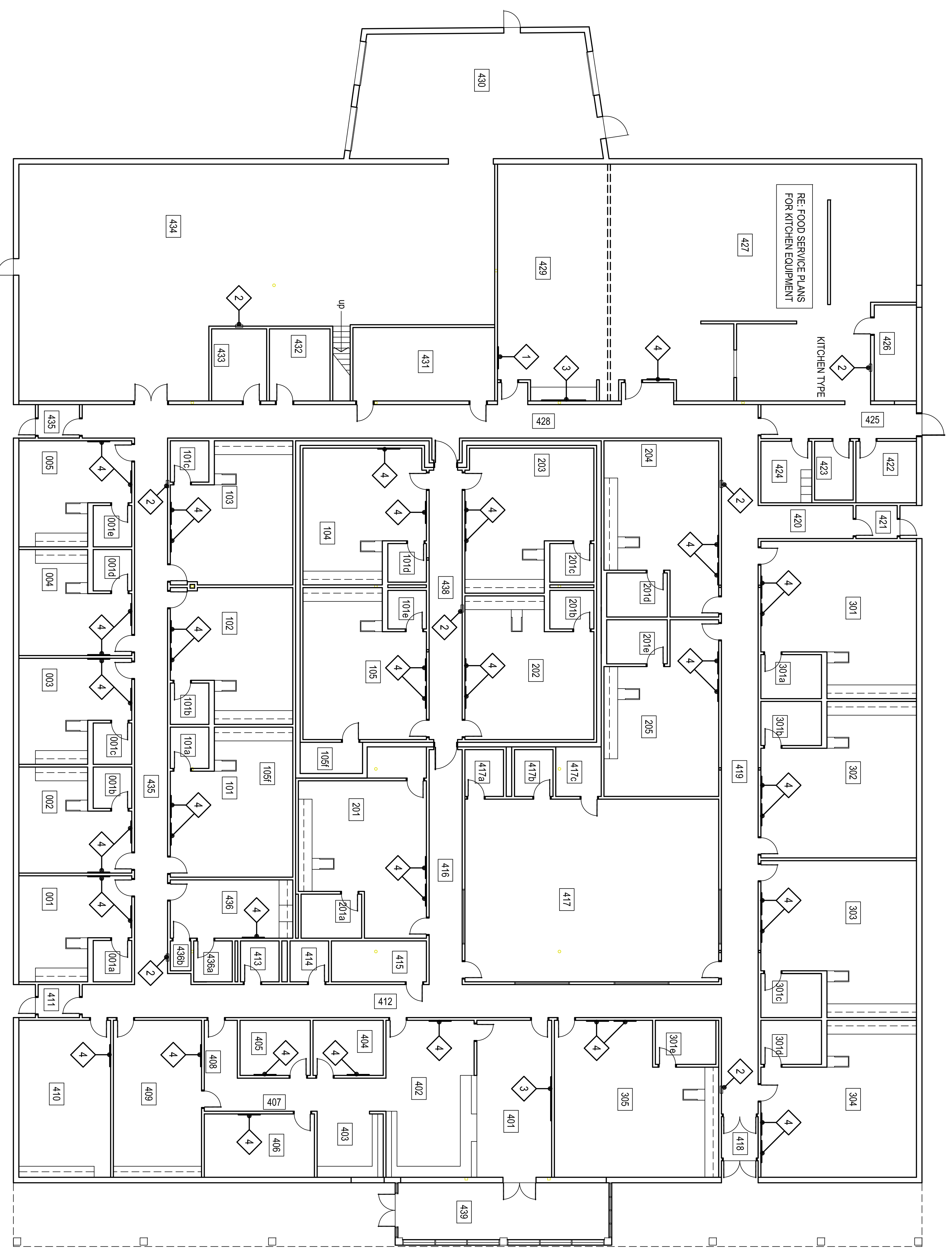
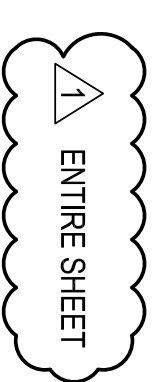
1
ROOF PLAN
3/32" = 1'-0"

NOTES:

1. RE: MECH & ELEC. FOR ADDITIONAL ROOF MOUNTED ITEMS. CONTRACTOR TO COORDINATE ALL ROOF MOUNTED ITEMS & PENETRATIONS W/ APPLICABLE TRADES
2. CONTRACTOR TO COORDINATE ROOF VENT PENETRATIONS W/ ARCHITECT.
3. INDICATES NEW WALKWAY PAD LOCATIONS - CUT PADS INTO 5'-0" MAX LENGTHS & PLACE 2" APART TO COVER AREAS INDICATED.
4. PROVIDE @ ALL ROOF PENETRATIONS - PENETRATION DAM / SEALER POCKETS AS PER SHEET A107A
5. MECHANICAL ROOF TOP EQUIPMENT IDENTIFICATION, COORDINATE W/ MECHANICAL DRAWINGS







1 EQUIPMENT FLOOR PLAN
3/32" = 1'-0"

ONE ITEM EACH ROOM
ROOM # 001a thru 001e
ROOM # 200b & 201c
ROOM # 413, 414, 417a, 417b, 423 & 438a

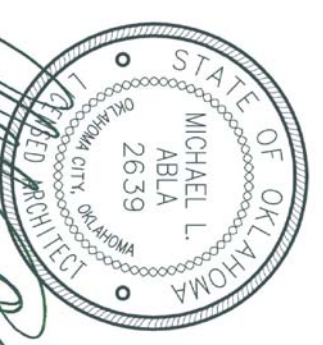
TWO ITEMS EACH ROOM
ROOM # 201a, 201d & 201e
ROOM # 301a THRU 301e

ITEM NO.	QTY	OF	CI	DESCRIPTION	MANUFACTURER	MODEL NO.	REMARKS
1	●			MARKERBOARD - 4'-0"	BEST-RITE CHALKBOARD CO.	RE: SPECS	W/ CHALK RAIL
2	●			FIRE EXTINGUISHER & CABINET	J.I. INDUSTRIES	RE: SPECS	
3	●			TACKBOARD - 8'-0"	BEST-RITE CHALKBOARD CO.	RE: SPECS	
4	●			TACKBOARD - 4'-0"			
5	●			WALL MOUNTED DISPLAY			RE: TECHNOLOGY PLANS
6	●			TOILET PAPER HOLDER			
7	●			PAPER TOWEL DISPENSER			
8	●			SOAP DISPENSER			

2 EQUIPMENT SCHEDULE

- LEGEND:**
- ◊ CONTRACTOR FURNISHED AND INSTALLED (CFI)
 - ◊ OWNER FURNISHED AND INSTALLED (OFI)
 - ◊ OWNER FURNISHED AND CONTRACTOR INSTALLED (OF/CI)

NOTE:
ALL CHALKBOARDS & TACKBOARDS MOUNTED @ EXTERIOR WALLS SHALL HAVE STAND-OFF MOUNTING BRACKETS TO PREVENT CONDENSATION BEHIND BOARDS.
PRIOR TO INSTALLATION OF MARKERBOARDS & TACKBOARDS VERIFY LOCATIONS WITH MPS PERSONAL & ARCHITECT.



Michael L. Salas
10/22/24

CG	drawn by
MA	checked by
OCTOBER 2024	date
revisions	
ADDENDUM #1	

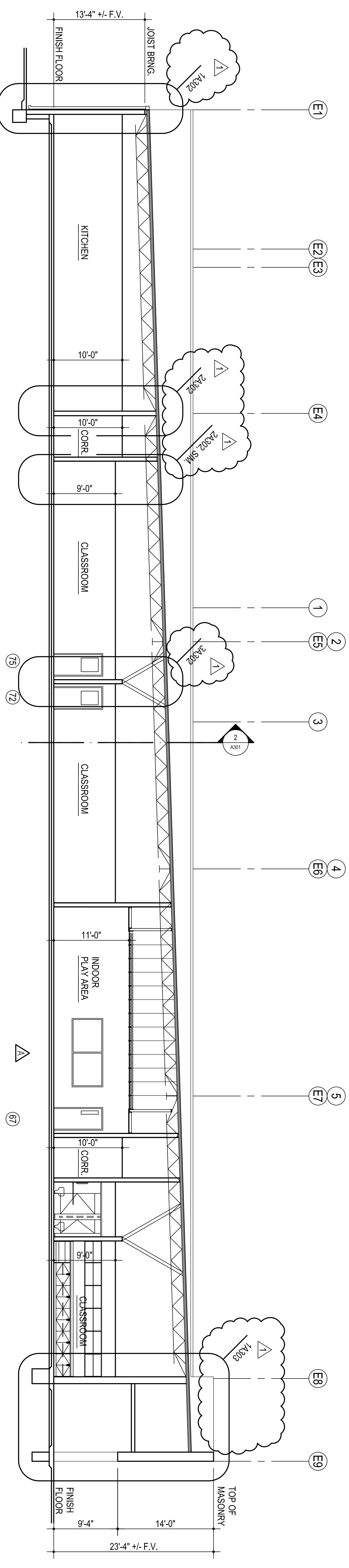


MOORE
PUBLIC SCHOOLS

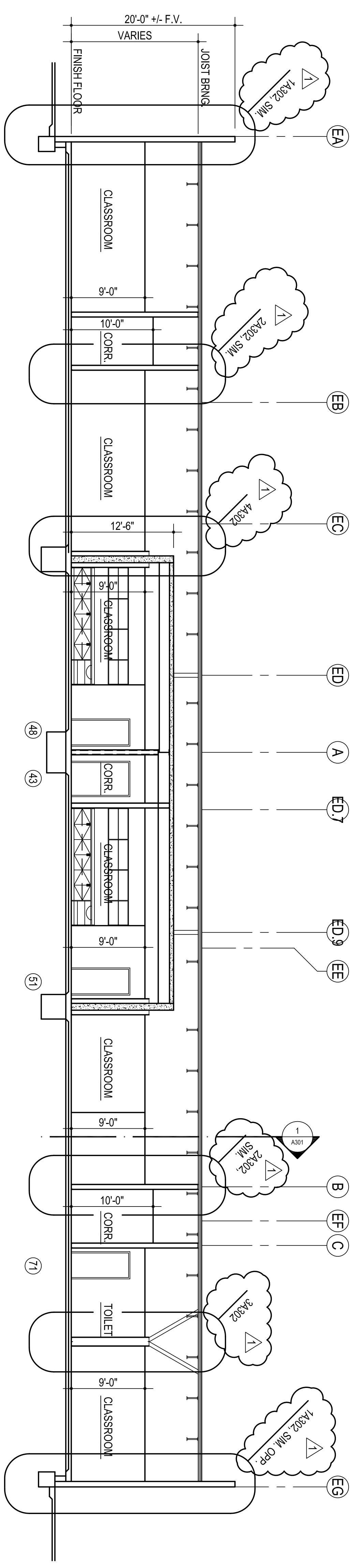
CHILD CARE FACILITY
201 N. EASTERN AVE.

A301

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1
BUILDING SECTION
1/8" = 1'-0"



2
BUILDING SECTION
1/8" = 1'-0"



10/22/24

CG
drawn by
MA
checked by
OCTOBER 2024
date

revisions
ADDENDUM #1

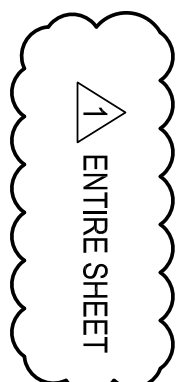


MOORE
PUBLIC SCHOOLS

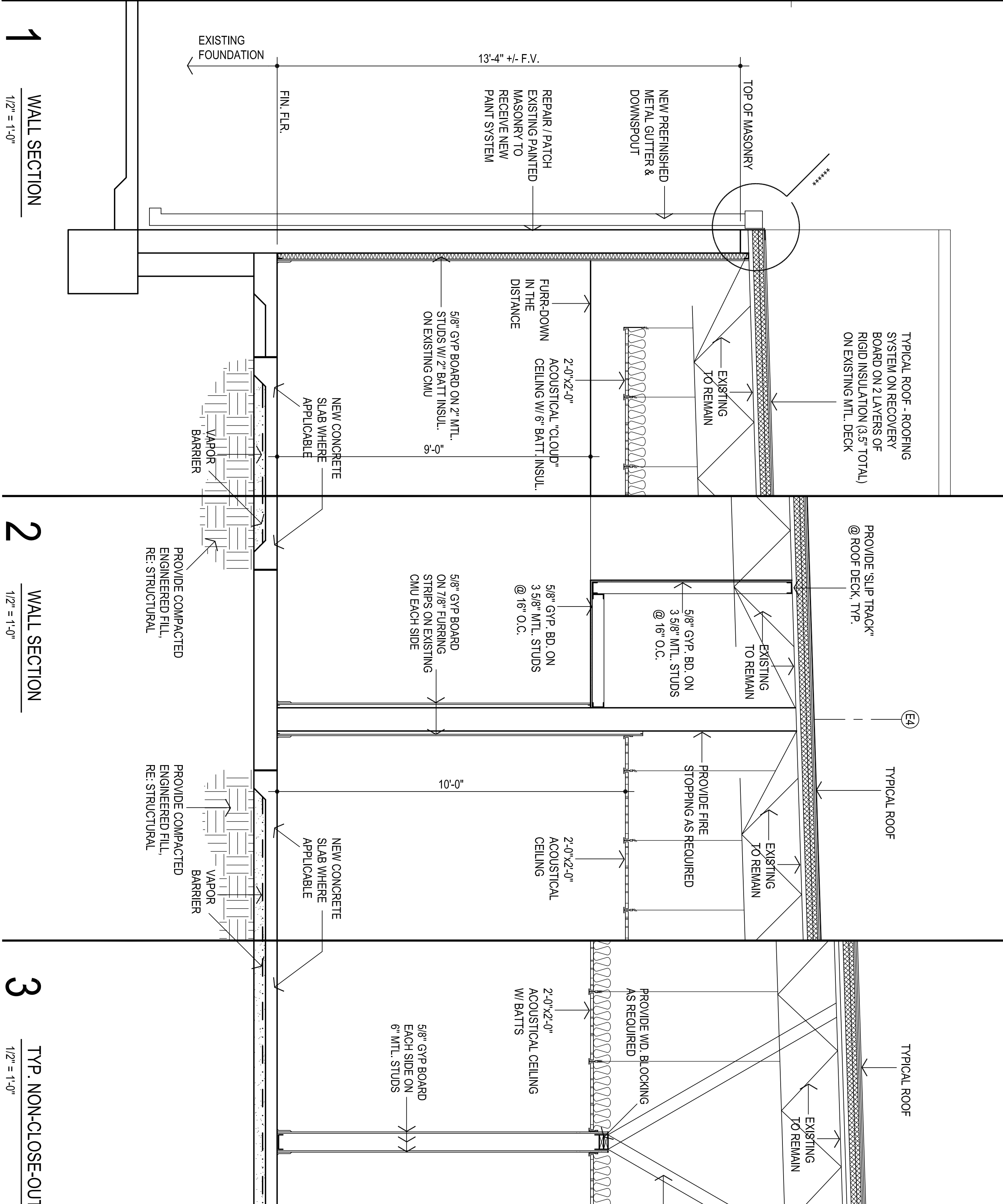
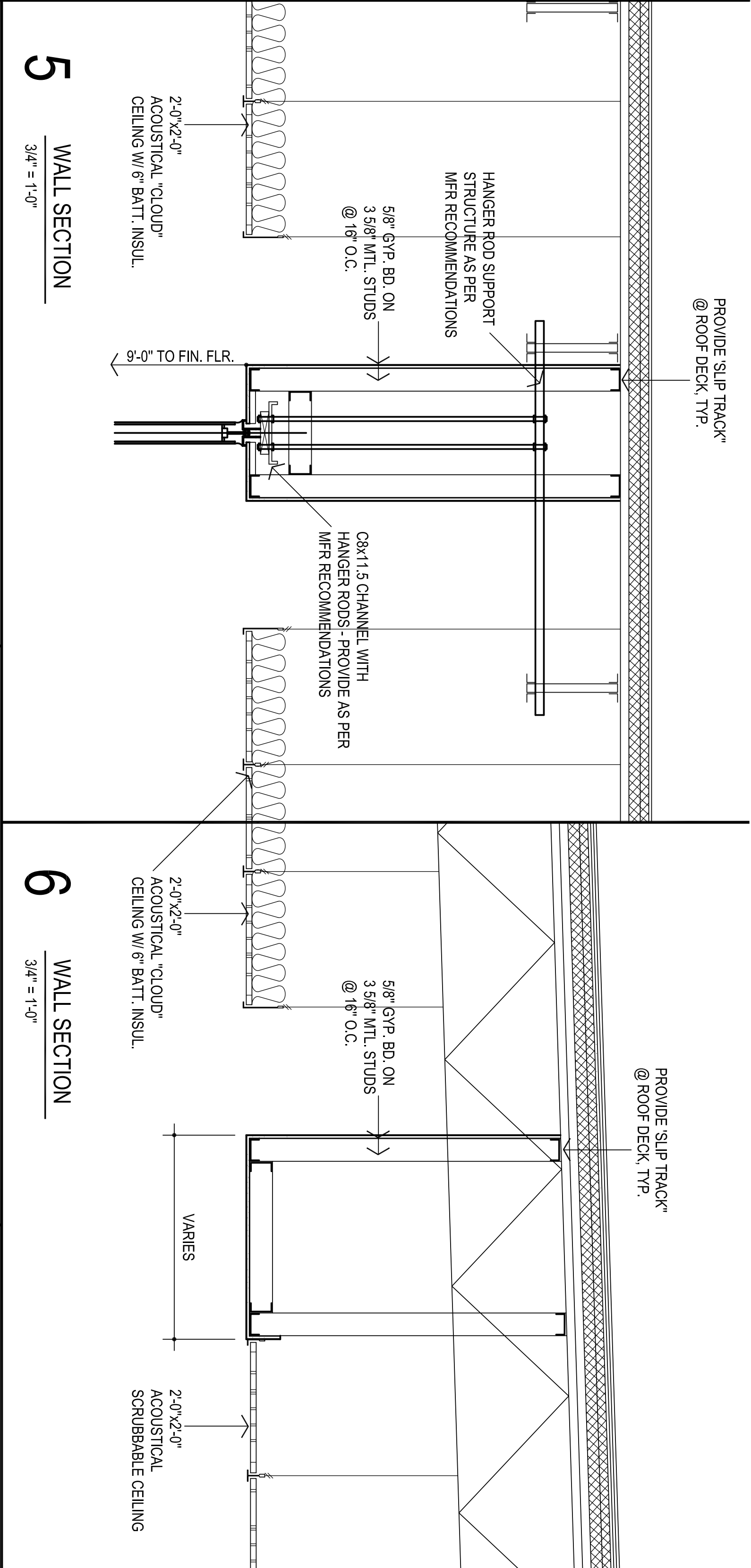
CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No.:

A302

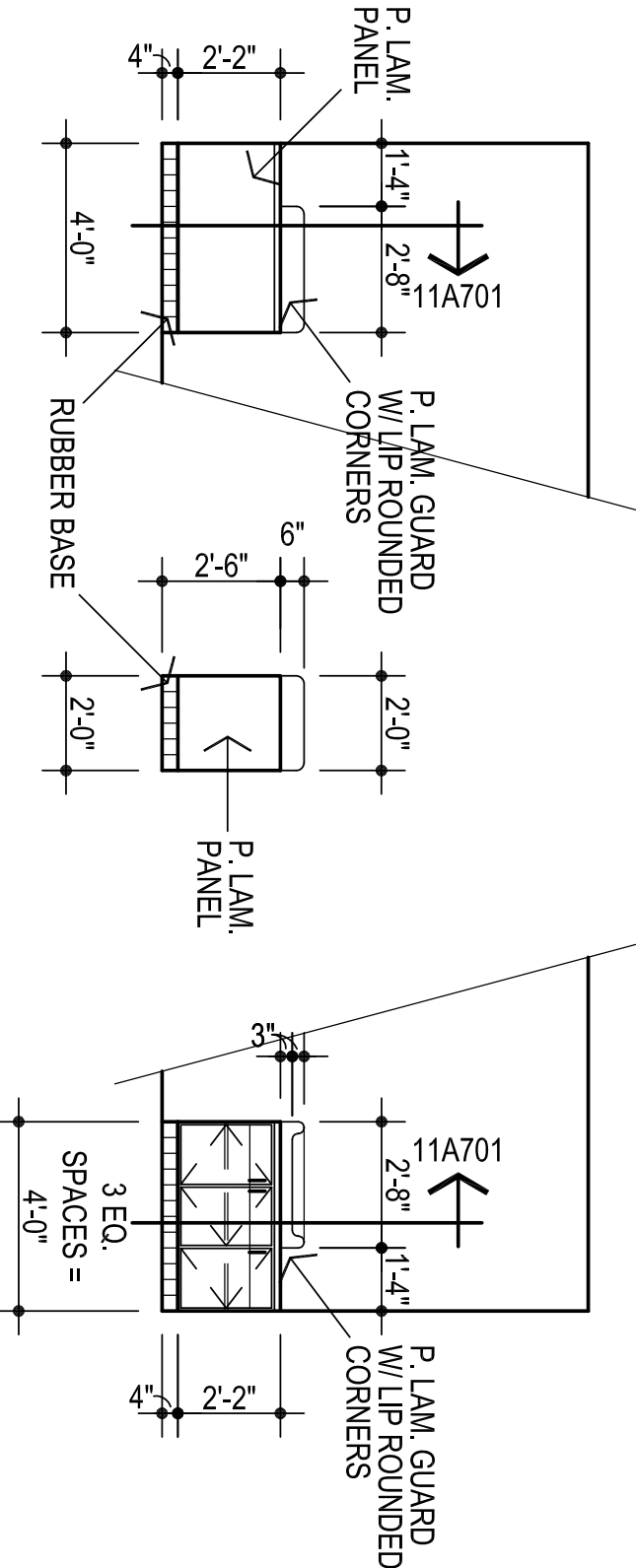
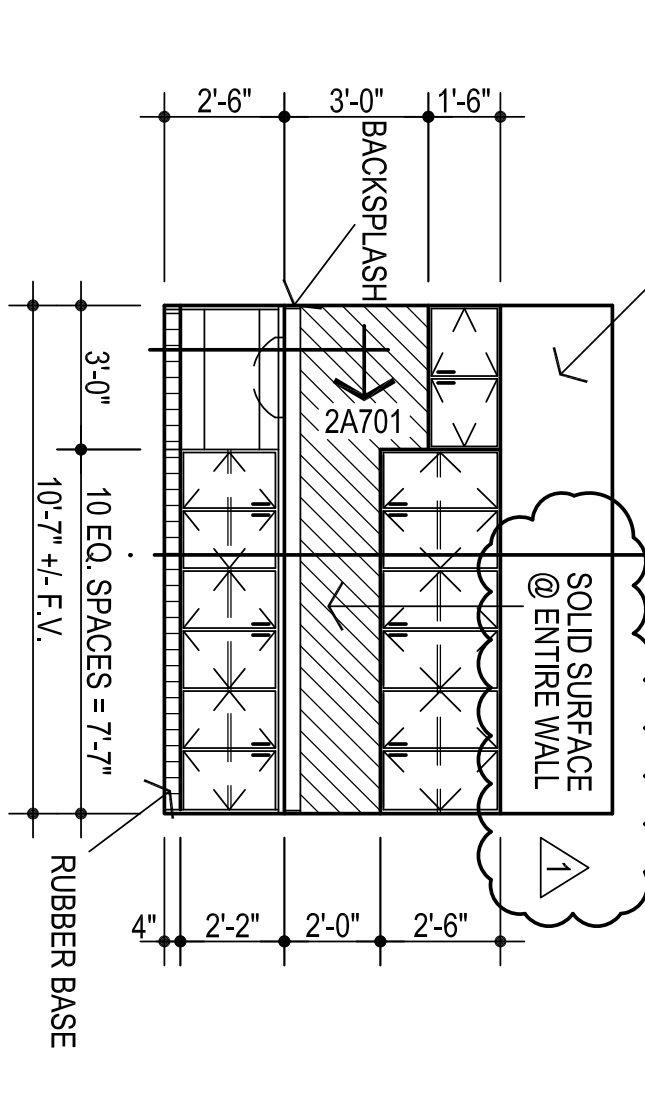
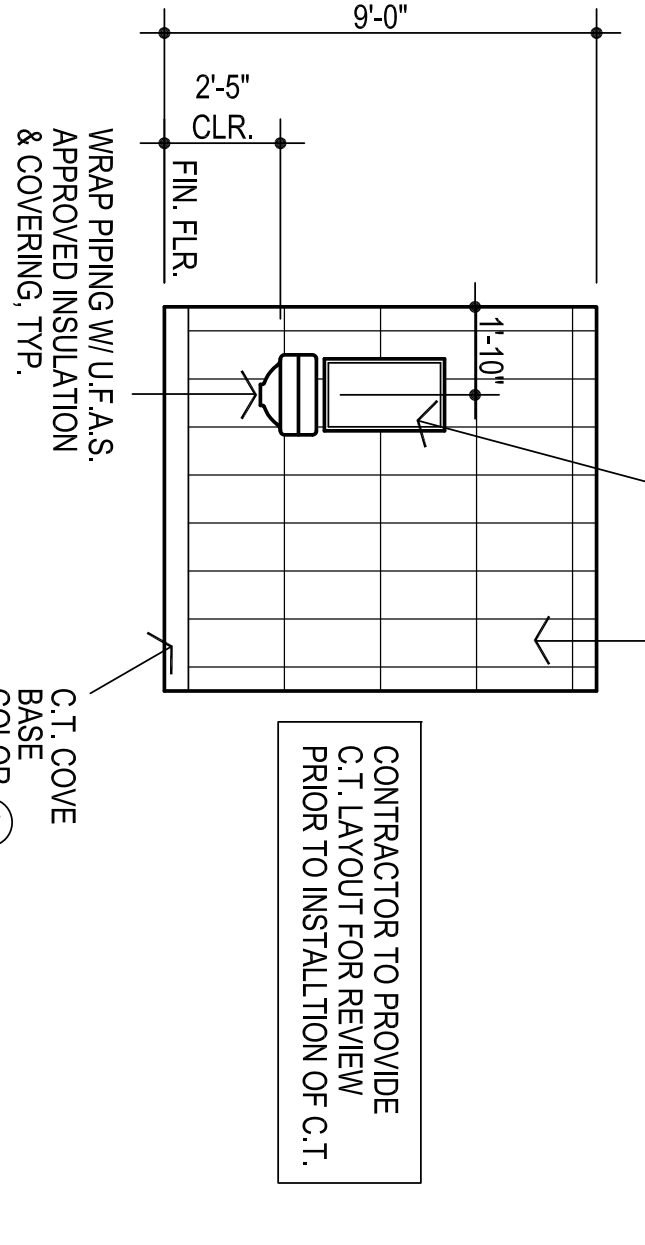
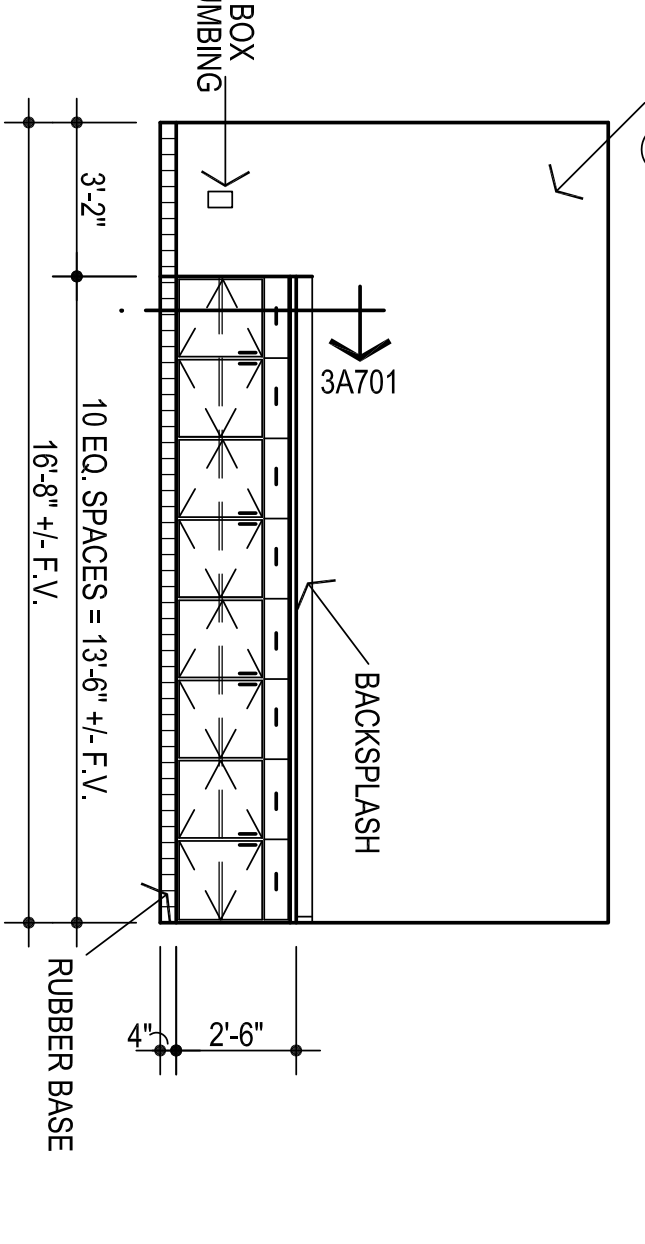
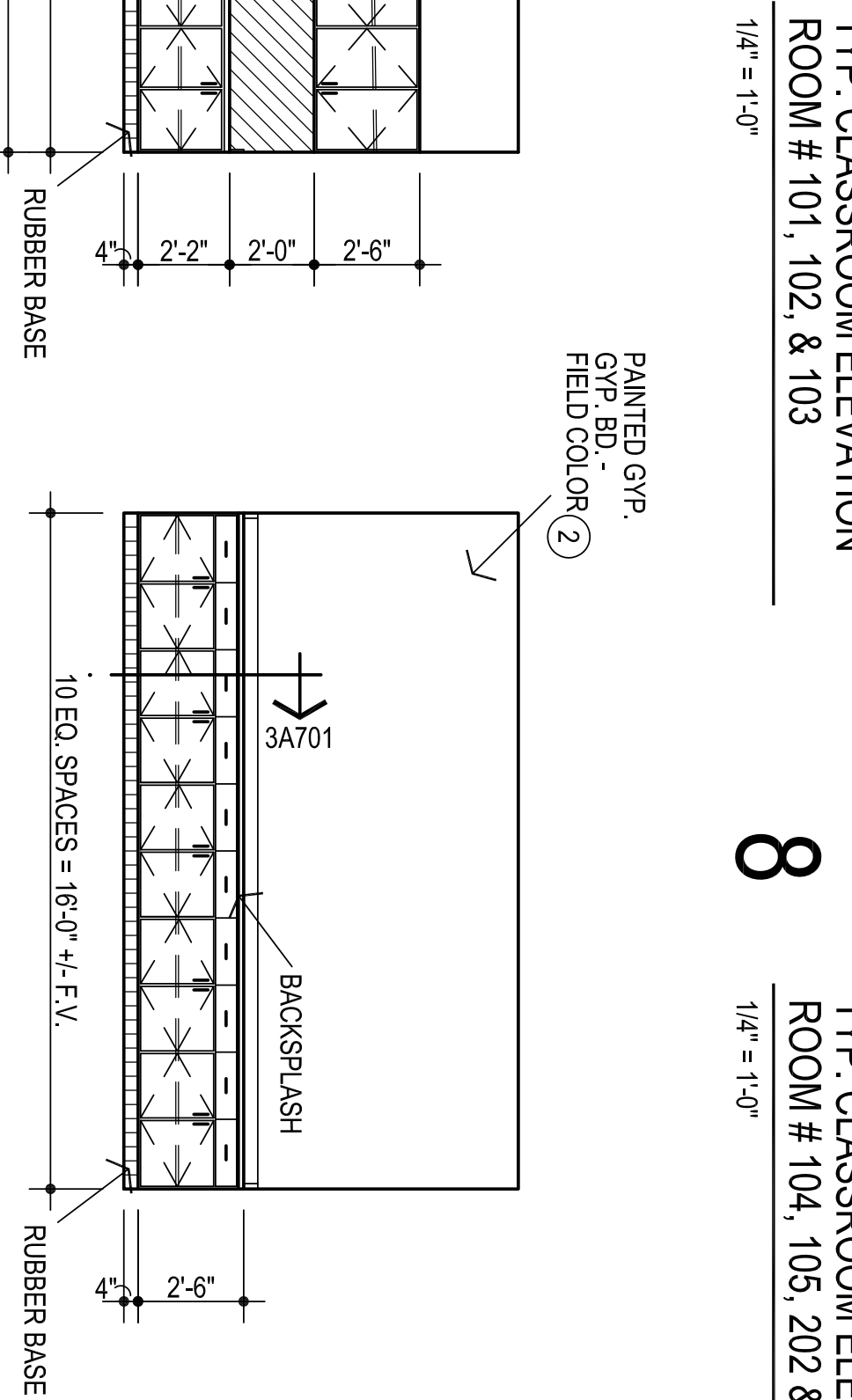
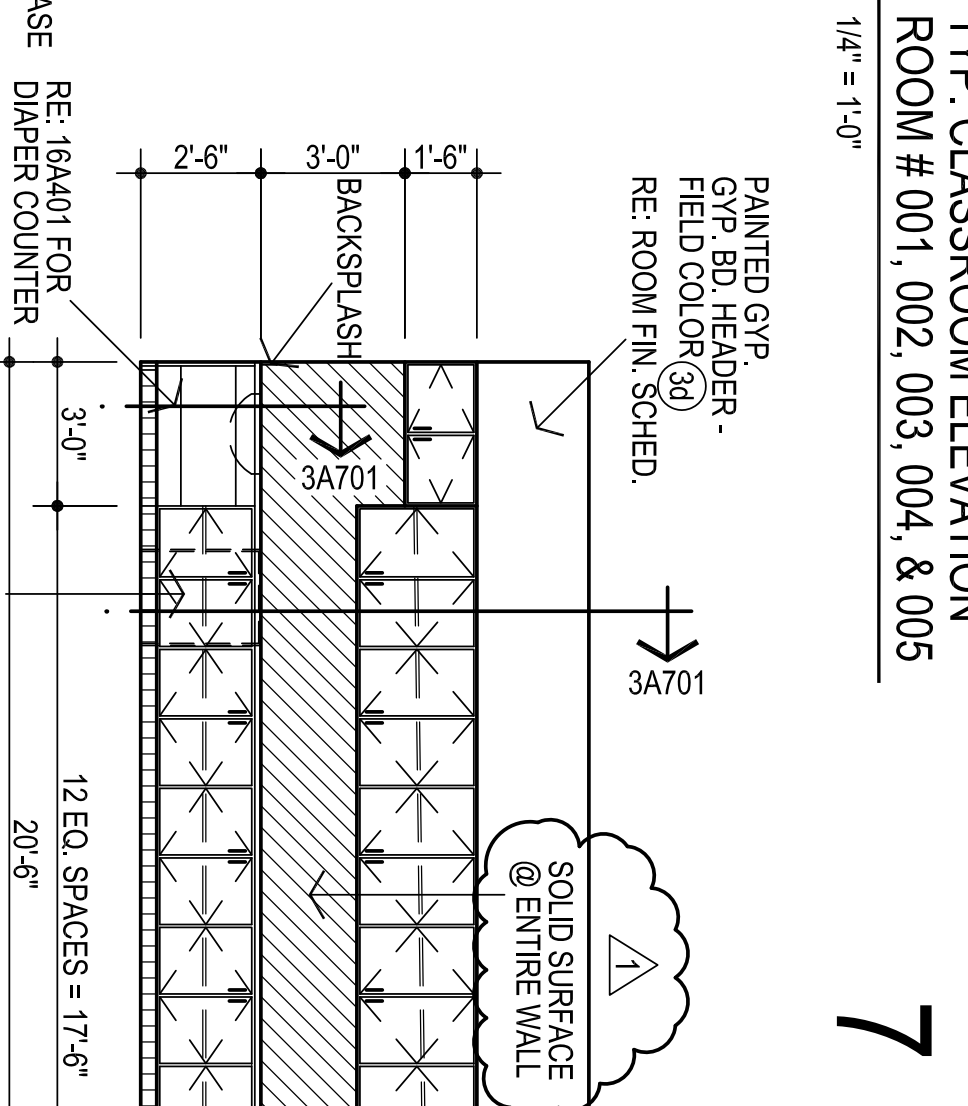
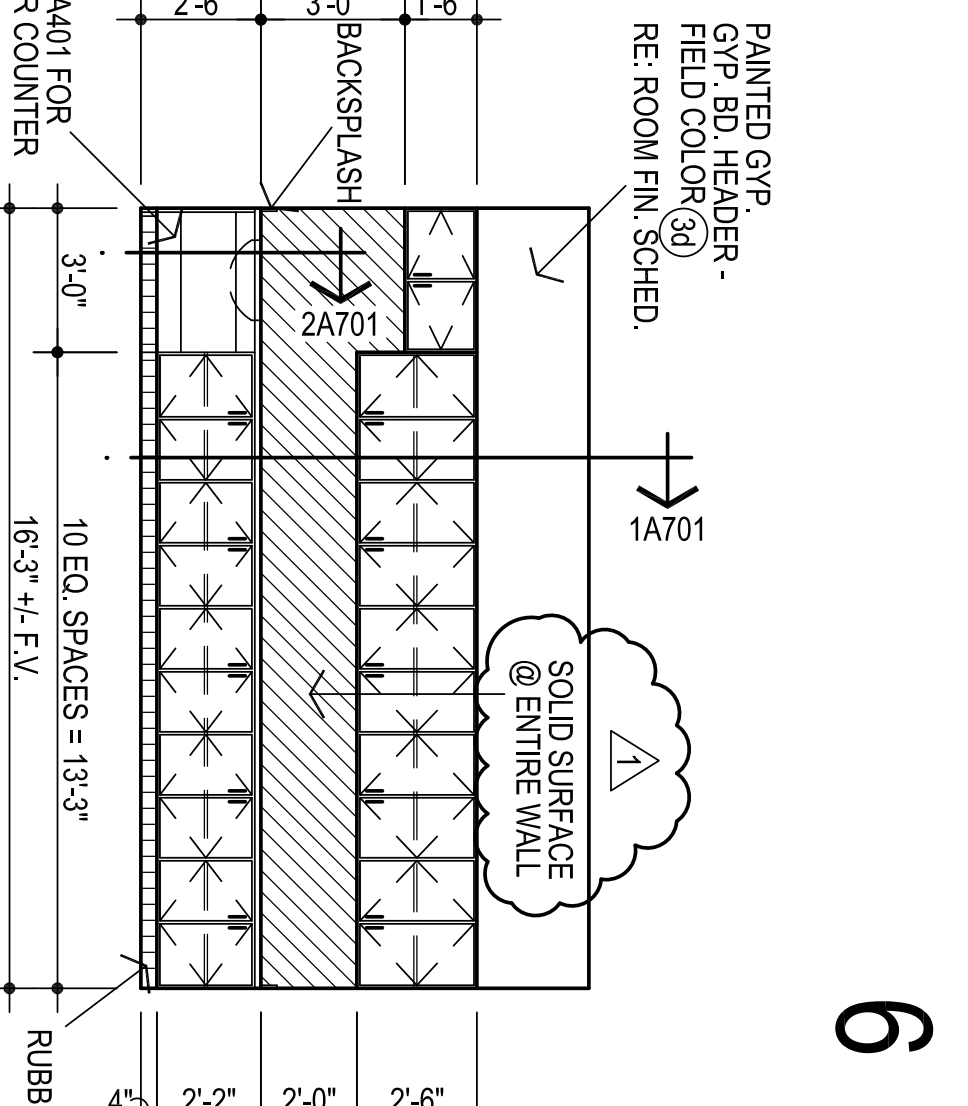
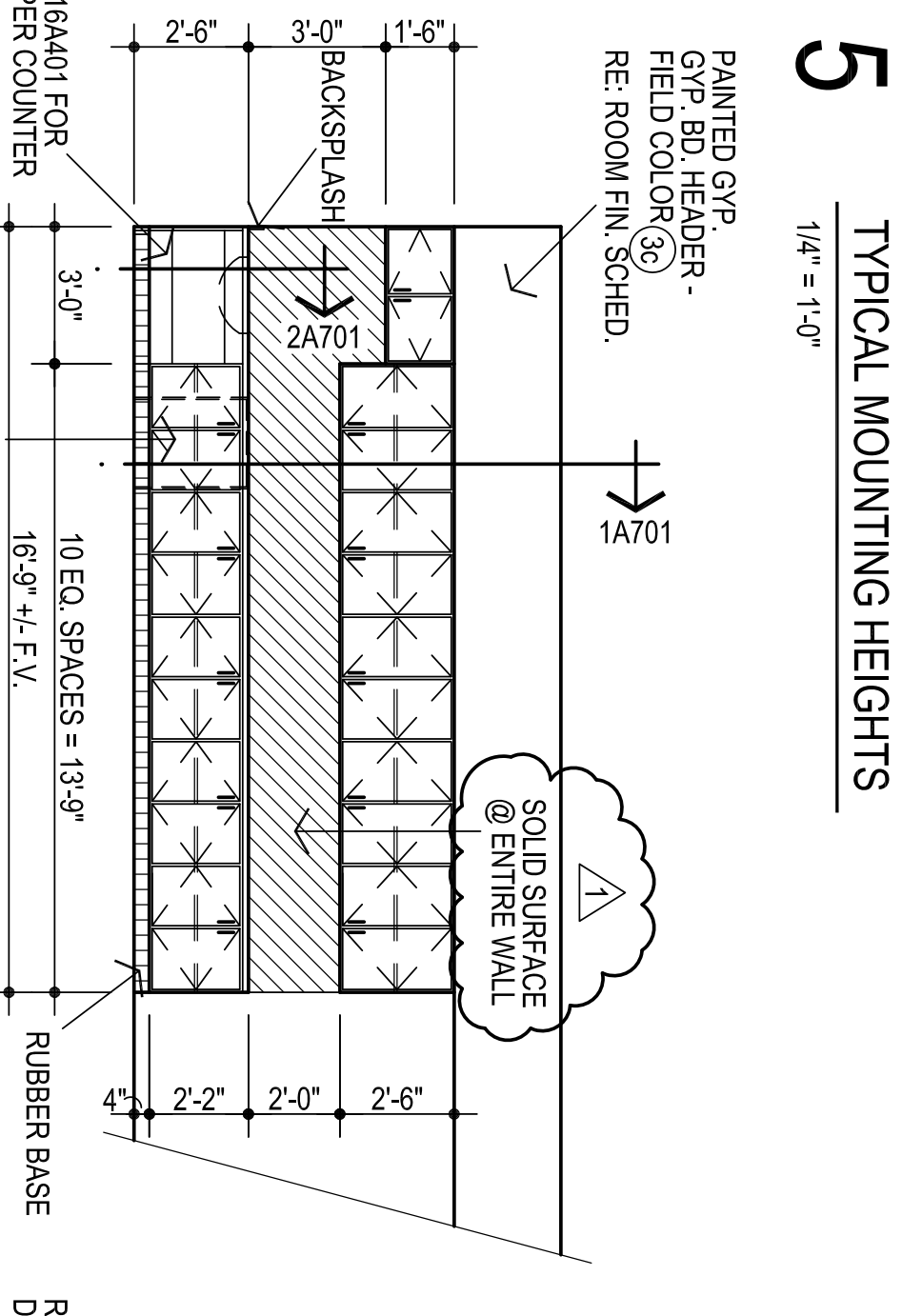
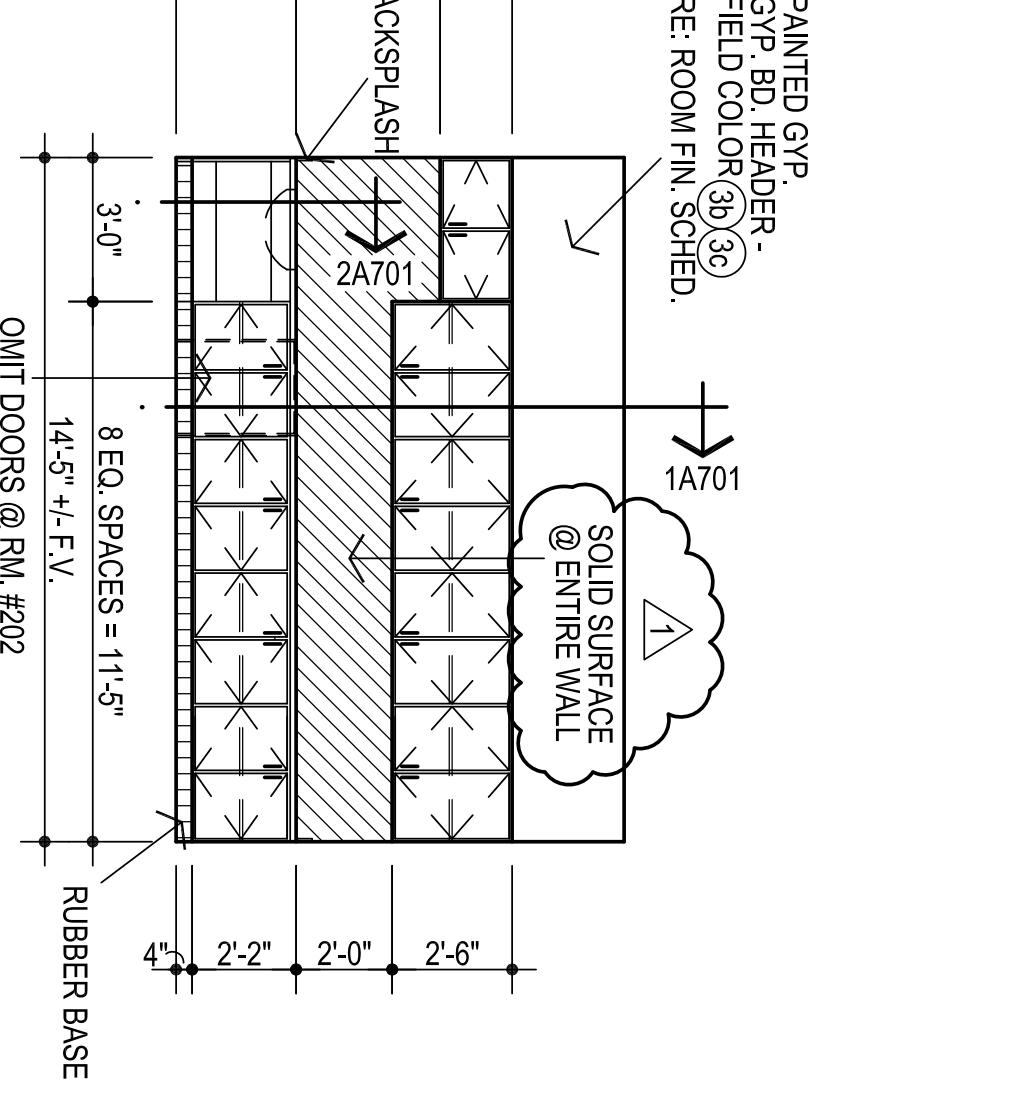
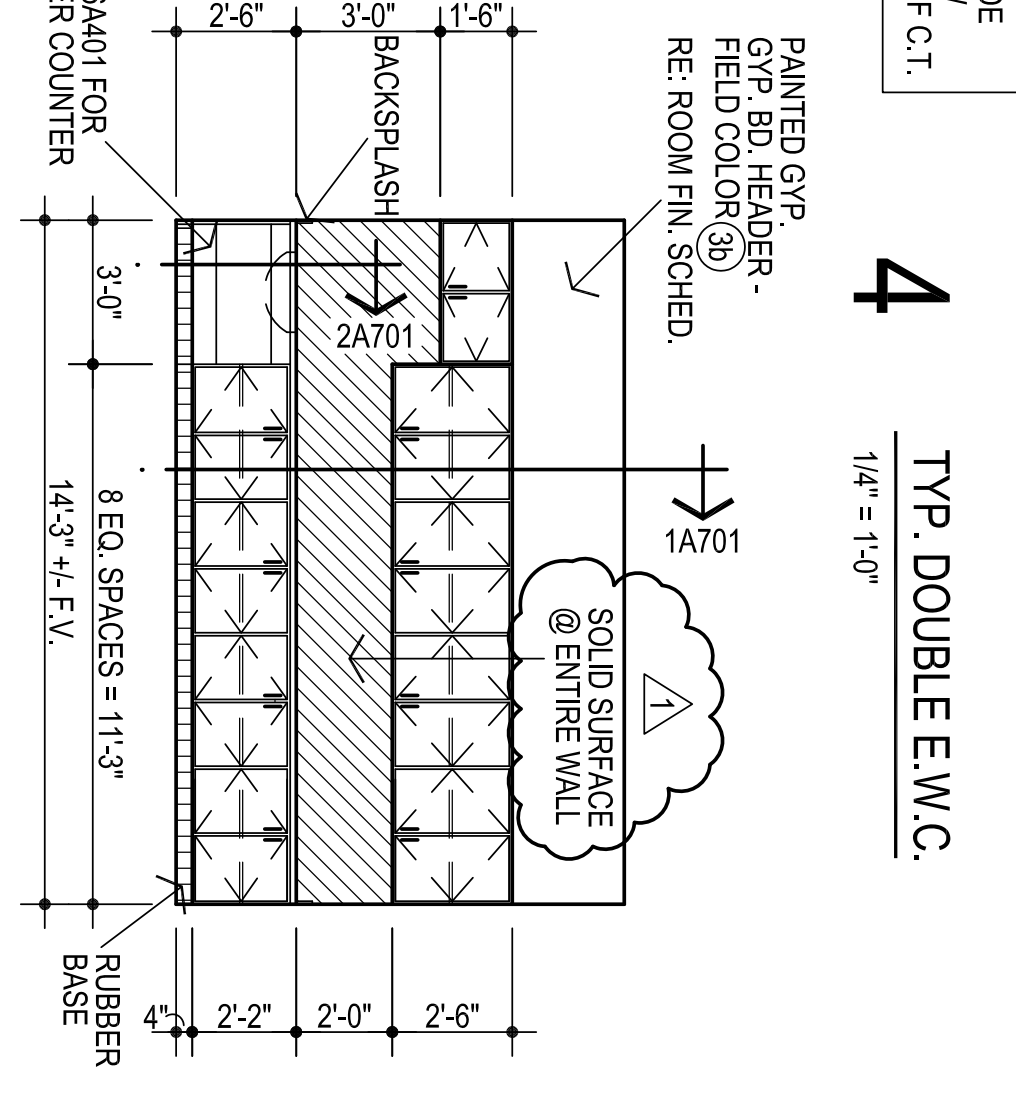
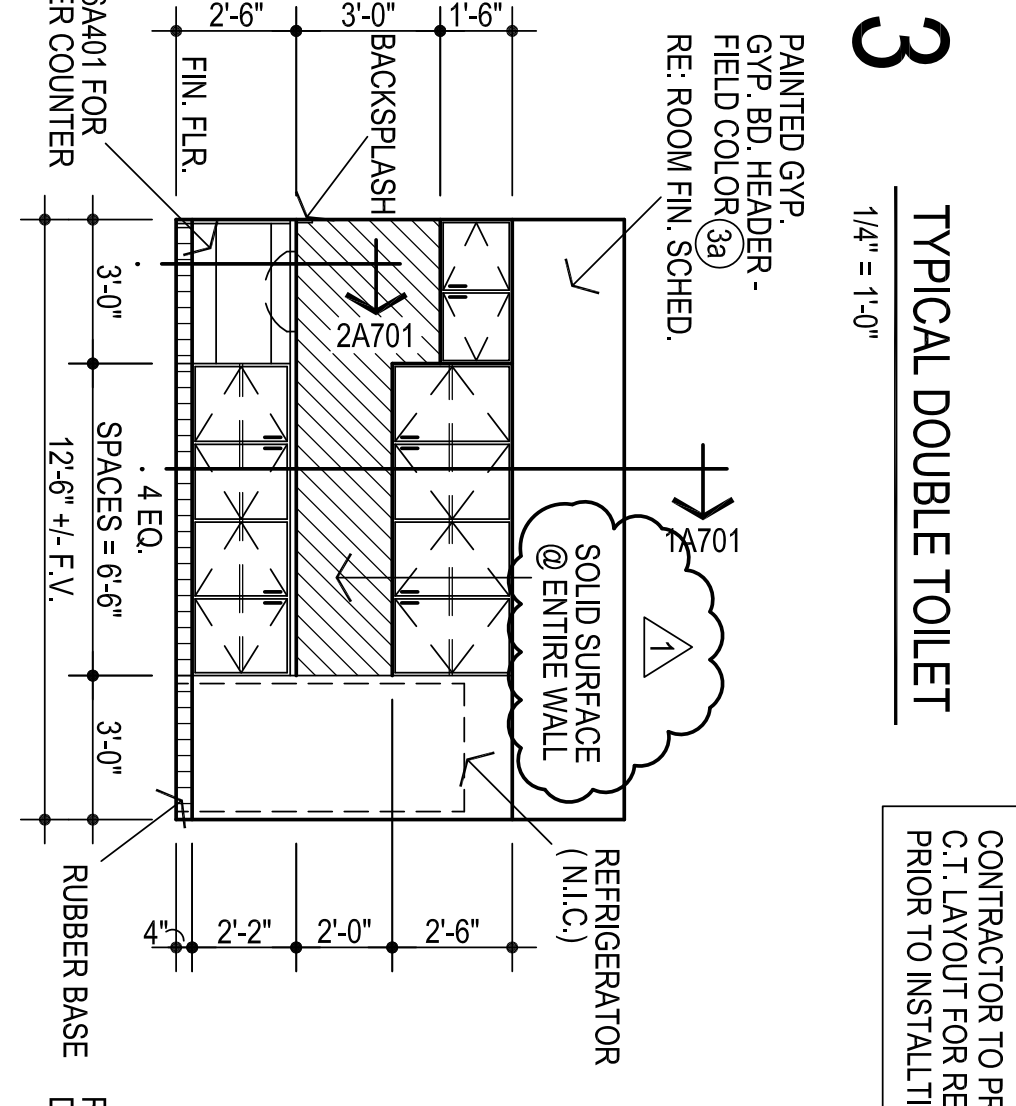
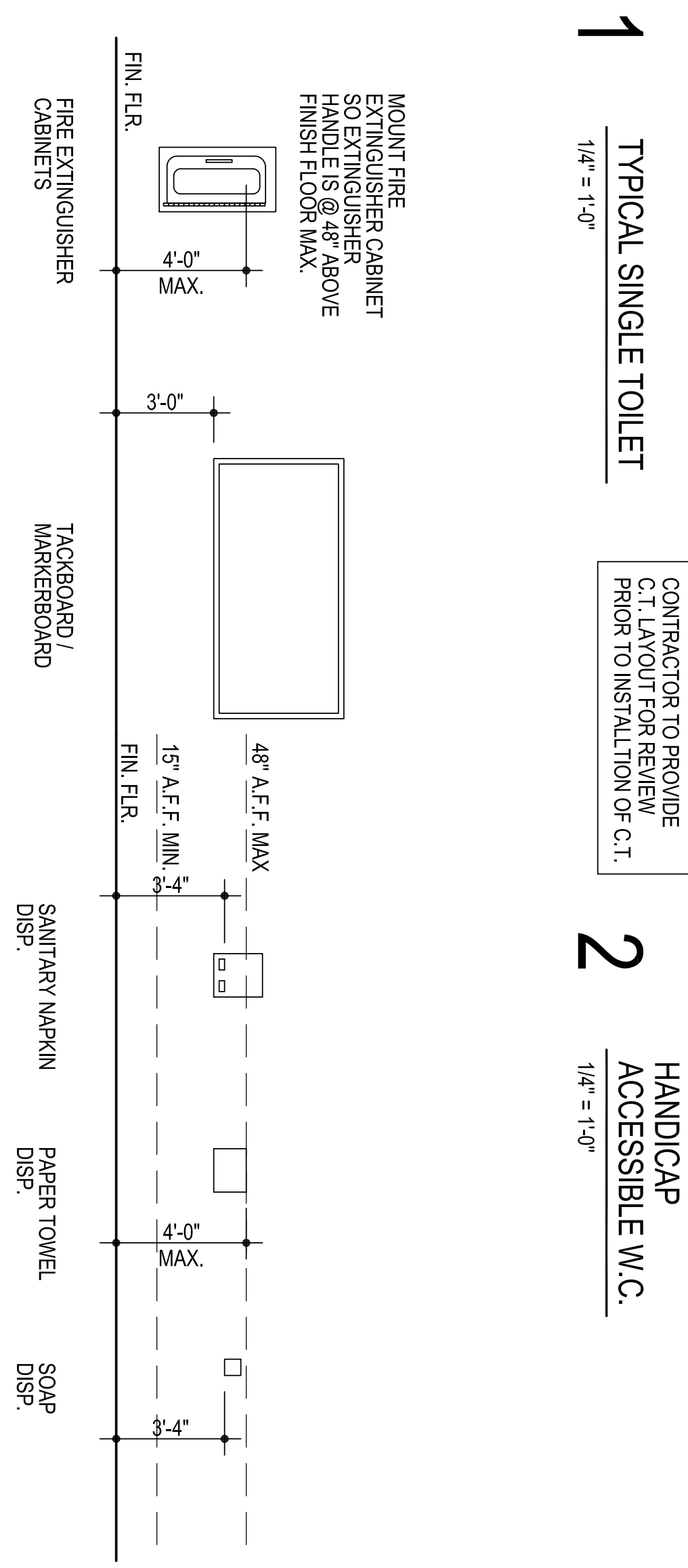
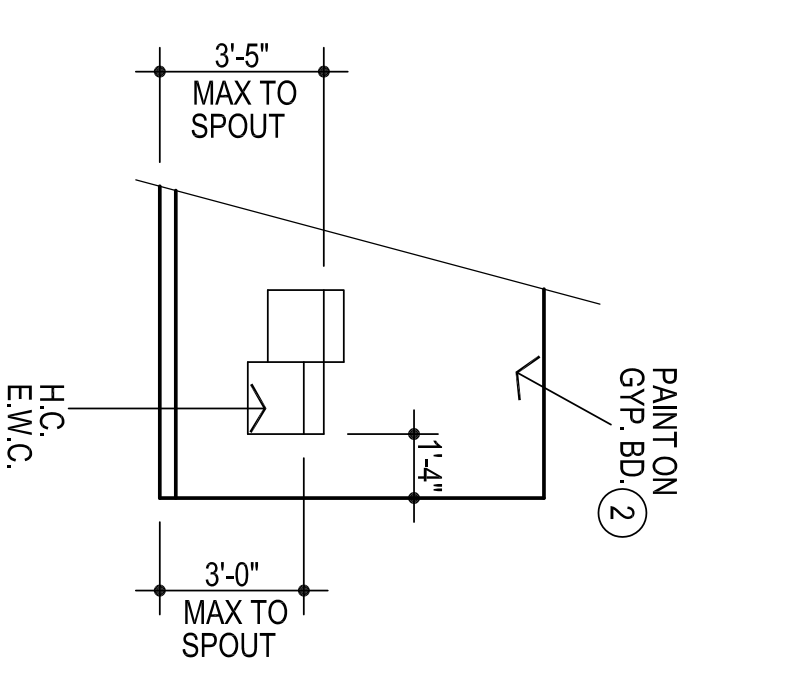
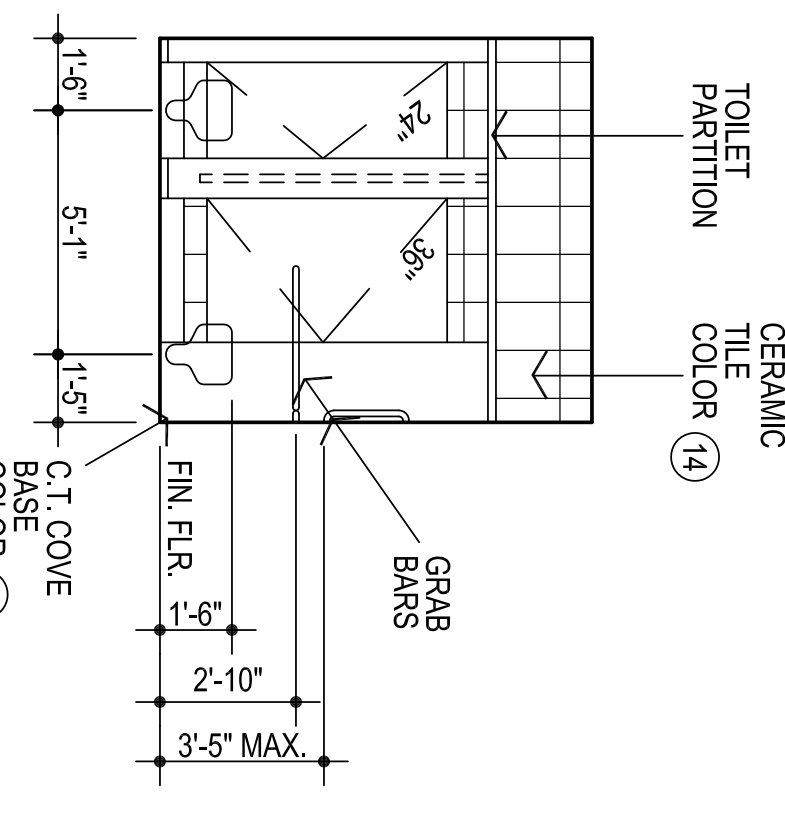
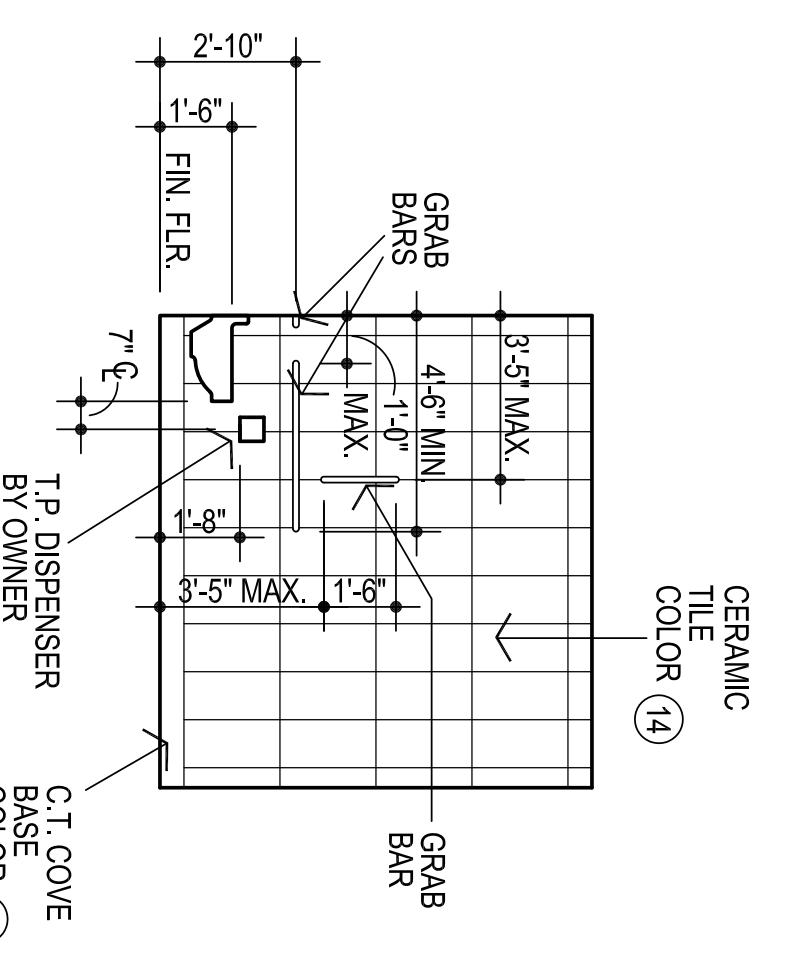
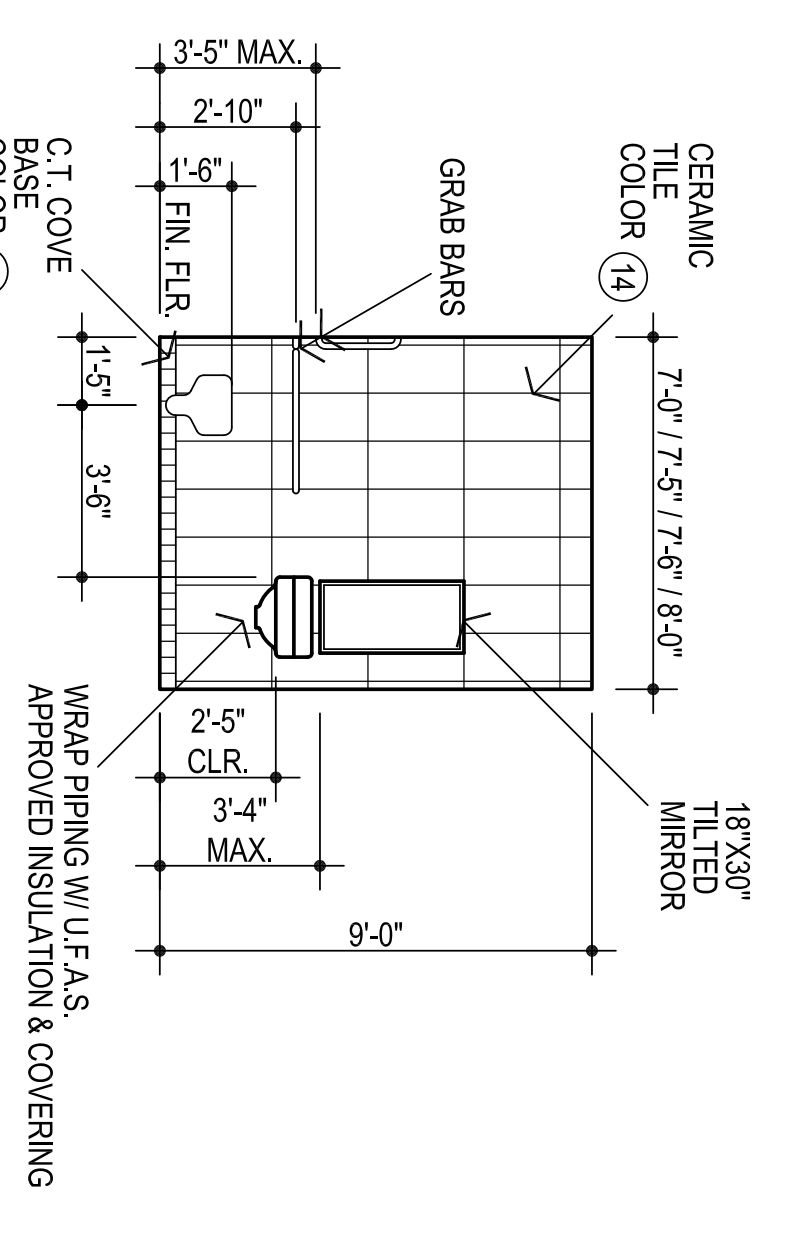


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NOTE: CONTRACTOR TO VERIFY THAT THE MOUNTING HEIGHTS & MINIMUM CLEARANCES OF ALL WALL MOUNTED FIXTURES (IE PLUMBING FIXTURES, GRAB BARS, MIRRORS, ETC.) MEET ALL APPLICABLE CODES & STANDARDS PRIOR TO INSTALLATION.



CEDAR CREEK

KFC ENGINEERING
STRUCTURAL

SALAS ORBEN
MECHANICAL/ELECTRICAL

10/22/24
MICHAEL L. MOORE
REGISTERED PROFESSIONAL ARCHITECT
STATE OF OKLAHOMA
NO. 2639

DC
drawn by
MA
checked by
OCTOBER 2024
date
revisions
ADDENDUM #1

MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No:
A601

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PAINT:

- 1 GYP BOARD CEILINGS / EXPOSED STRUCTURE: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 2 WALLS - FIELD: SHERWIN-WILLIAMS - SW708 - ALABASTER
- 3 WALLS - @ SIDE & ABOVE DOORS WHERE INDICATED:
 - 3a) DOORS 22, 24, 30, 31 & 57 - SW6868 REAL RED
 - 3b) DOORS 26, 33, 34, 46 & 49 - SW6886 KNOCKOUT ORANGE
 - 3c) DOORS 44, 50, 57, 72 & 75 - SW6903 CHEERFULL
 - 3d) DOORS 62, 64, 68, 69 & 765 - SW6998 DYNAMIC BLUE
 - 3e) DOORS 62, 64, 68, 69 & 765 - SW6998 DYNAMIC BLUE
- 4 H.M. DOORS & FRAMES: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 5 MISCELLANEOUS METALS: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 6 WOOD DOORS & MILLWORK: ARCHITECTURAL WOOD DOORS - CLEAR CL07
- 7 EXPOSED STRUCTURE & UNDERSIDE OF DECK: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 8 ACCEENT @ CORRIDORS: SW7073 DORIAN GRAY
- 9 EXTERIOR COLUMN COLORS:
 - 9a) SW7006 EXTRA WHITE
 - 9b) SW6992 INKWEIL
 - 9c) SW6868 REAL RED
 - 9d) SW6924 DIRECT GREEN
 - 9e) SW6888 KNOCKOUT ORANGE
 - 9f) SW6958 DYNAMIC BLUE
 - 9g) SW6903 CHEERFULL
 - 9h) SW6982 AFRICAN VIOLET

PREFINISHED COLORS:

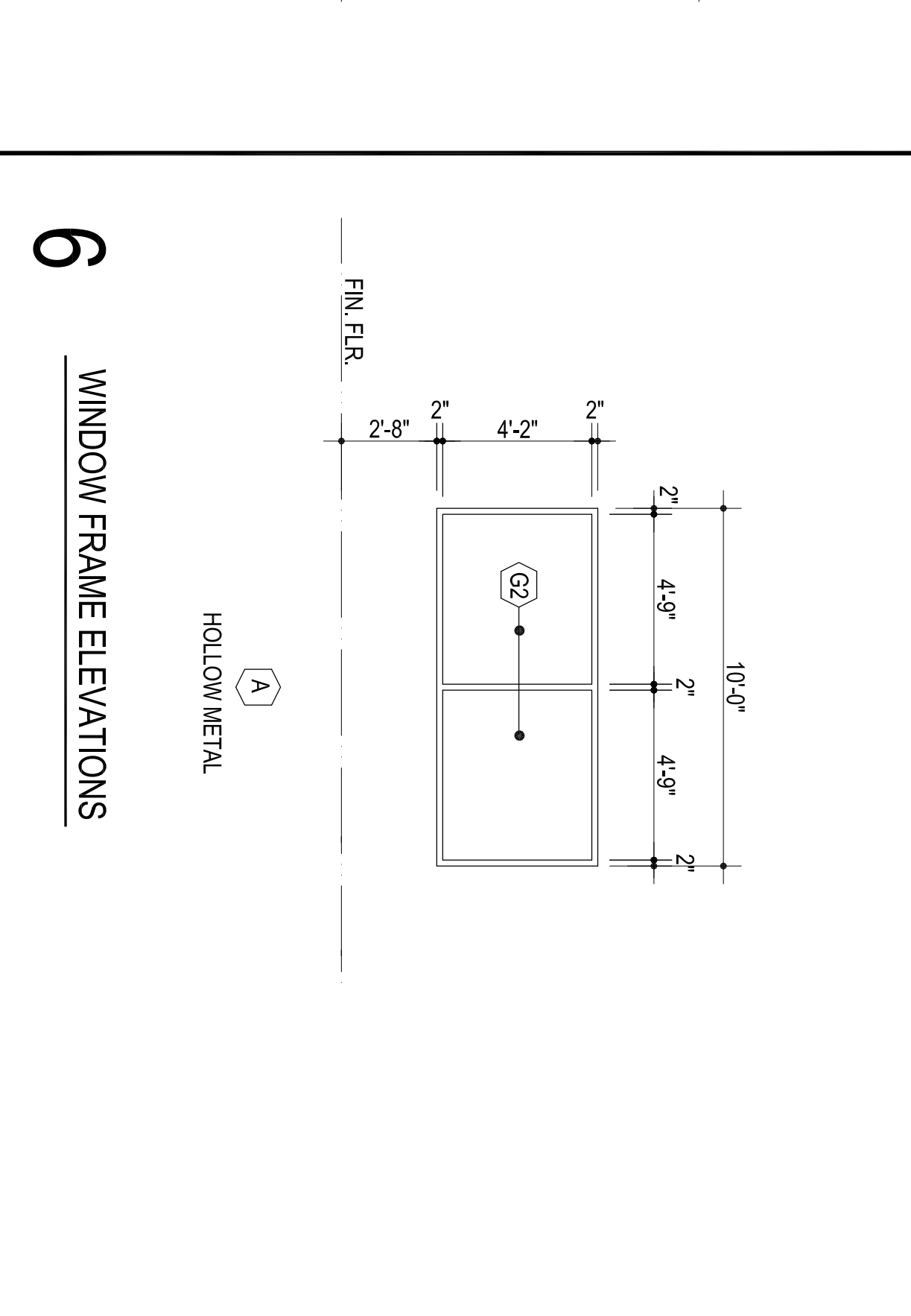
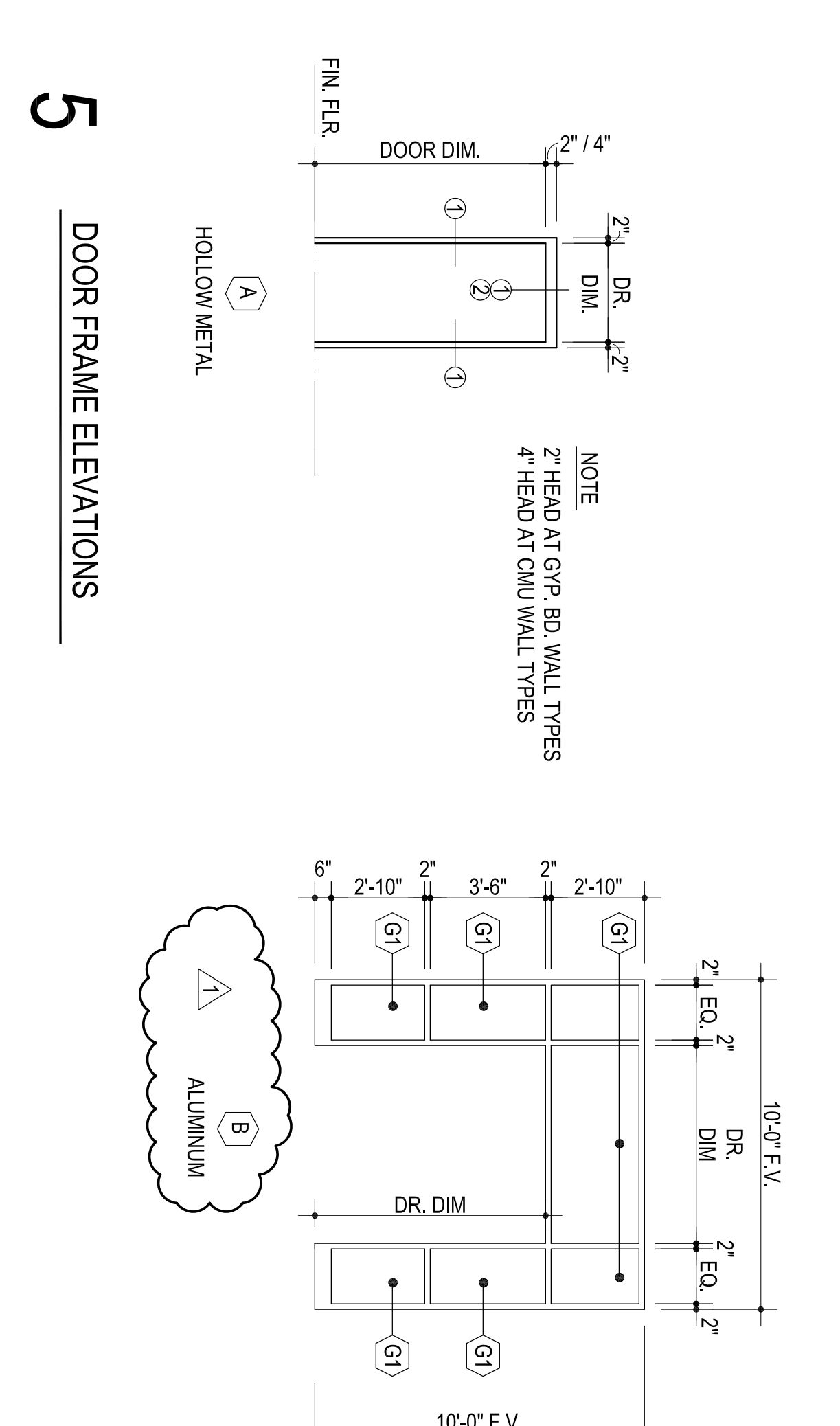
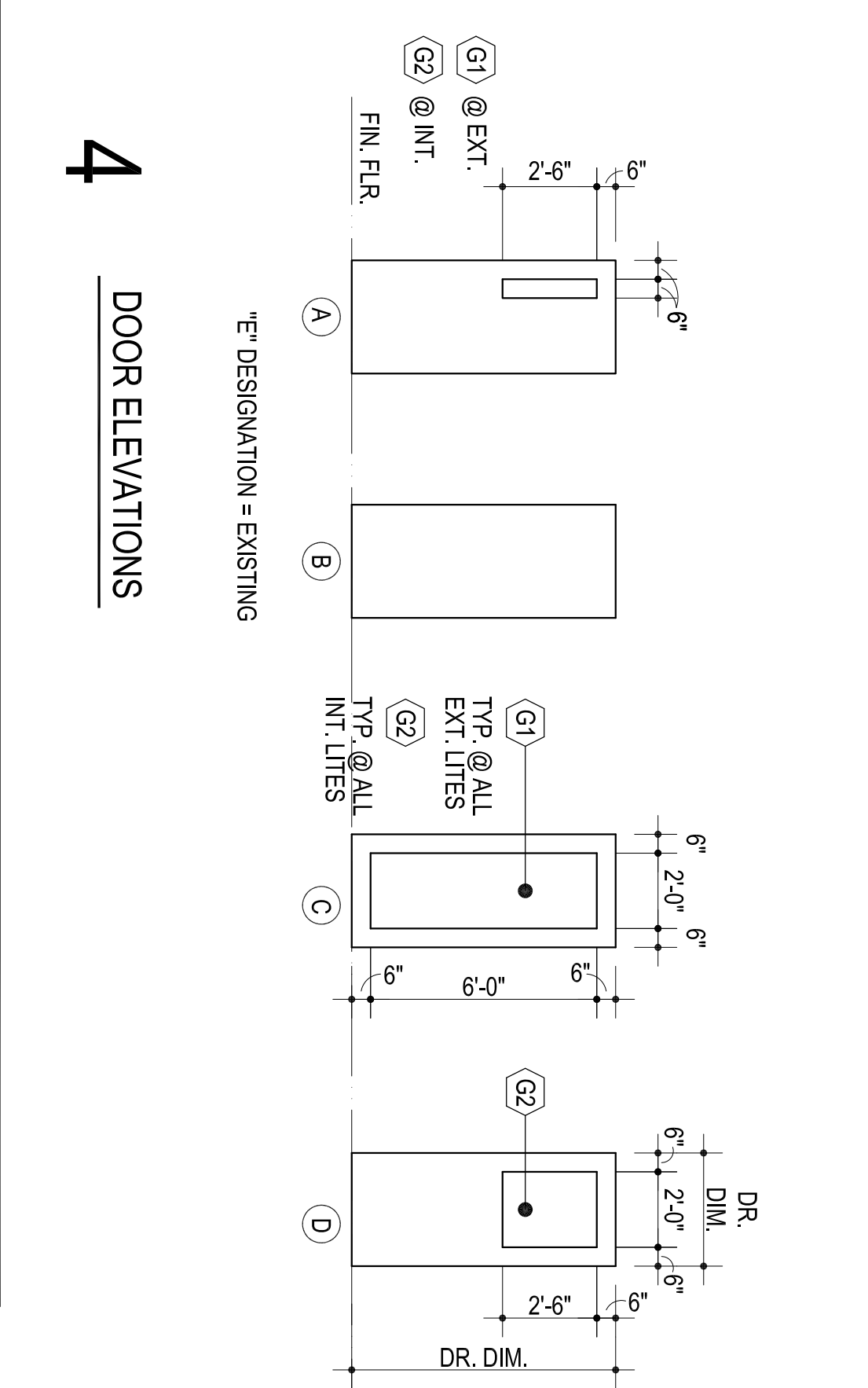
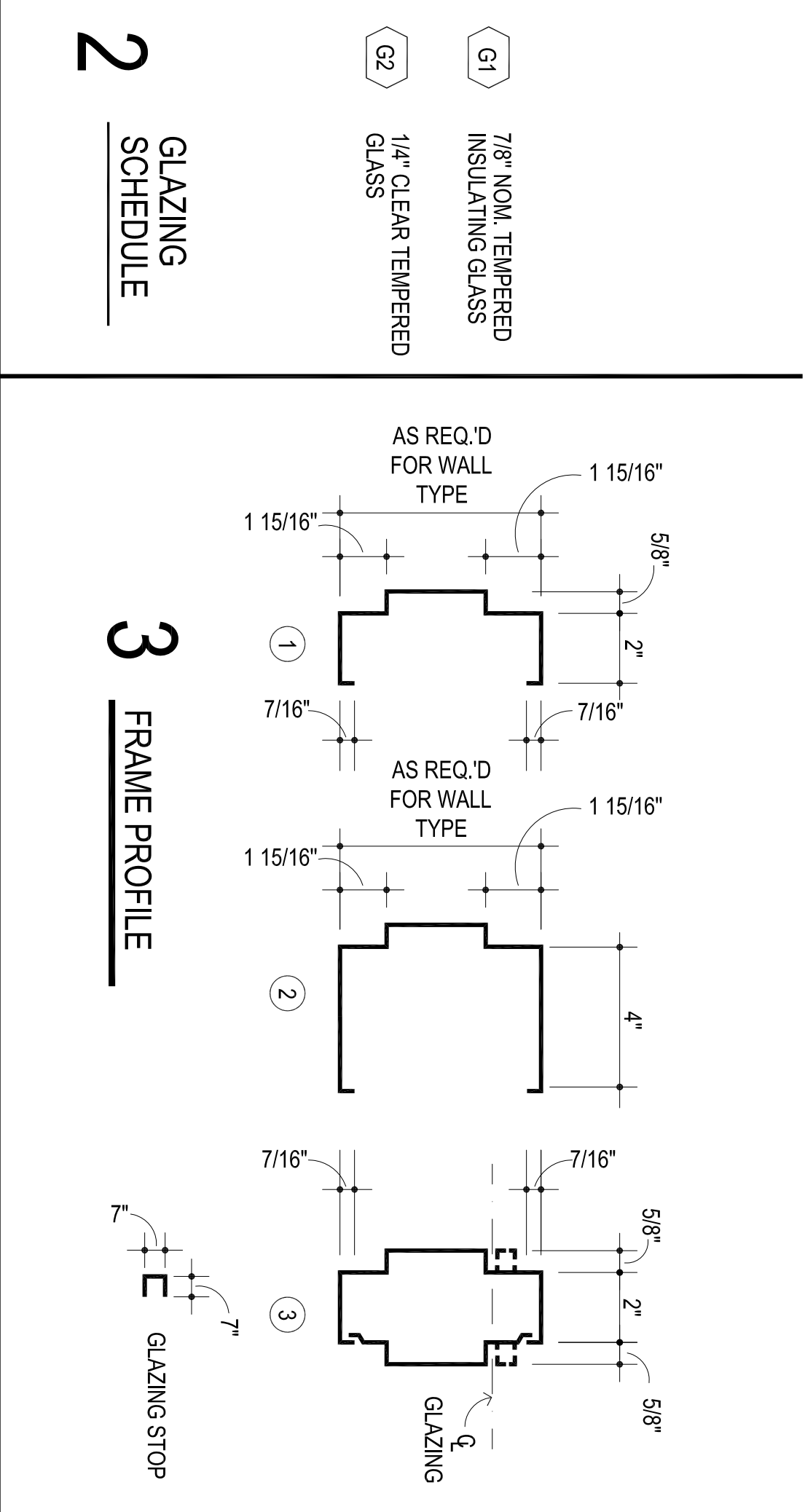
- 10 CARPET TILES: COLOR 'A': INTERFACE - COLOR 'B': INTERFACE -
- 11 RUBBER WALL BASE: ROPPE - 100 BLACK
- 12 LUXURY VINYL TILE COLOR: INTERFACE - A00702 PEWTER
- 13 LUXURY VINYL TILE ACCEENT COLOR:
 - 13a) INTERFACE - A00714 YELLOW
 - 13b) INTERFACE - A00721 ELECTRIC BLUE
 - 13c) INTERFACE - A00717 RED
 - 13d) INTERFACE - A00706 ORANGE
 - 13e) INTERFACE - A00701 SILVERLIGHT

COLOR SCHEDULE

**COORDINATE ALL COLORS & THEIR
LOCATIONS, QUANTITIES, ETC. W/ THE
ARCHITECT PRIOR TO ACQUIRING MATERIALS**

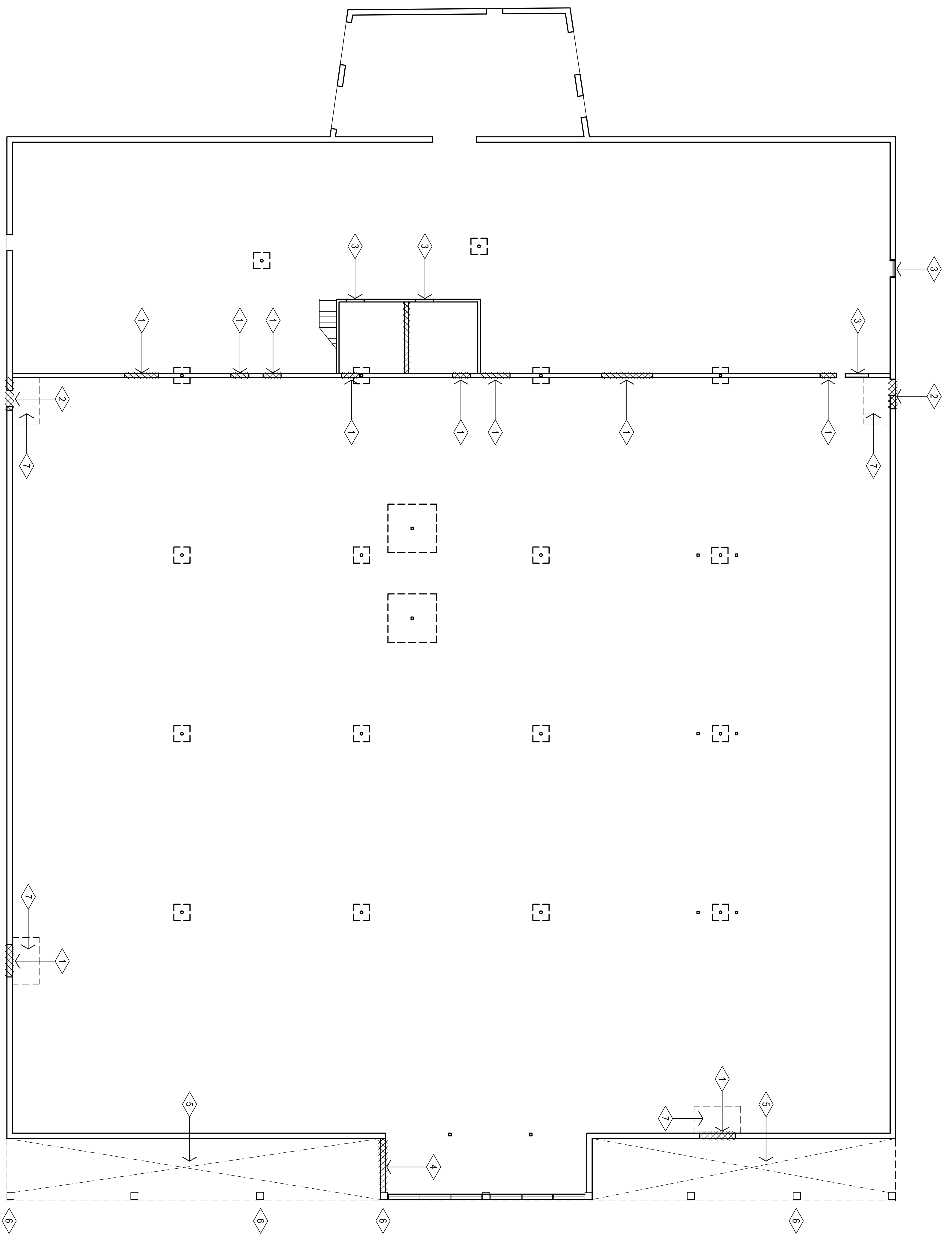
DESCRIPTION	RM. NO.	FLOOR	BASE	CEILING	CLG. HT.	REMARKS	RM. NO.	WALLS	PAINT / COLOR SCHEDULE						
									CLG.	WALLS				REMARKS	
									N	E	S	W			
CLASSROOM	001	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)	9'-0"		001	CERAMIC TILE GYP. BOARD EXISTING	(1)23	(2)23a	(2)2	(2)2	(1)23a	(1)19	(2)27
TOILET	001a	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			001a		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	001b	CERAMIC TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			001b		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	001c	CERAMIC TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			001c		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	001d	CERAMIC TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			001d		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	001e	CERAMIC TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			001e		(1)15	(1)15	(1)15	(1)15	(1)14		
CLASSROOM	002	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			002		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	003	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			003		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	004	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			004		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	005	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			005		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	101	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			101		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
TOILET	101a	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			101a		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	101b	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			101b		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	101c	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			101c		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	101d	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			101d		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	101e	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			101e		(1)15	(1)15	(1)15	(1)15	(1)14		
CLASSROOM	102	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			102		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	103	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			103		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	104	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			104		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	105	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			105		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	201	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			201		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
TOILET	201a	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			201a		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	201b	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			201b		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	201c	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			201c		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	201d	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			201d		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	201e	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			201e		(1)15	(1)15	(1)15	(1)15	(1)14		
CLASSROOM	202	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			202		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	203	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			203		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	204	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			204		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	205	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			205		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	301	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			301		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
TOILET	301a	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			301a		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	301b	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			301b		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	301c	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			301c		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	301d	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			301d		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	301e	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			301e		(1)15	(1)15	(1)15	(1)15	(1)14		
CLASSROOM	302	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			302		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	303	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			303		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	304	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			304		(1)23	(2)2	(2)2	(2)2.3a	(1)12	(1)19	(1)26
CLASSROOM	305	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			305		(1)23	(2)3a	(2)2	(2)2	(1)12	(1)19	(1)26
WAITING AREA	401	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			401		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)27
RECEPTIONIST	402	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			402		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
COPY	403	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			403		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
OFFICE	404	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			404		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
OFFICE	405	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			405		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
PRINCIPAL	406	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			406		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
CORRIDOR	407	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			407		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
CORRIDOR	408	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			408		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
CONFERENCE	409	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			409		(1)24	(2)2	(2)2	(2)2	(1)19	(1)19	(1)27
BREAKROOM	410	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			410		(1)23	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
VESTIBULE	411	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			411		(1)23	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
CORRIDOR	412	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			412		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
TOILET	413	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			413		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	414	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			414		(1)15	(1)15	(1)15	(1)15	(1)14		
STORAGE	415	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			415		(1)15	(1)15	(1)15	(1)15	(1)14		
CORRIDOR	416	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			416		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
INDOOR PLAY AREA	417	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			417		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
TOILET	417a	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			417a		(1)15	(1)15	(1)15	(1)15	(1)14		
TOILET	417b	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			417b		(1)15	(1)15	(1)15	(1)15	(1)14		
STORAGE	417c	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			417c		(1)15	(1)15	(1)15	(1)15	(1)14		
VESTIBULE	418	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			418		(1)23	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
CORRIDOR	419	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			419		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
CORRIDOR	420	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			420		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
VESTIBULE	421	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			421		(1)24	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
OFFICE	422	LUXURY VINYL TILE	CERAMIC TILE	2 X 2 ACoust. LAY-IN (TEG)			422		(1)23	(2)2	(2)2	(2)2	(1)12	(1)19	(1)26
TOILET	423	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			423		(1)15	(1)15	(1)15	(1)15	(1)14		
LOCKER ROOM	424	CARPET TILE	RUBBER	2 X 2 ACoust. LAY-IN (SQ)			424		(1)15	(1)15	(1)15	(1)15	(1)14		
RECEIVING	425	CARPET TILE	RUBBER	2											


DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
1	401 EXT. C	A	HM.	3'-0"	7'-0"	1 3/4"	A	16A501	16A501	29A501	29A501	20 MIN. DR & FRAME	5
2	411 EXT. A	C	<	<	<	<	<	4A501	16A501	11A501	11A501		7
3	412 411	<	<	<	<	<	<	22A501	16A501	11A501	11A501		10
4	435 EXT.							22A501	16A501	29A501	29A501		5
5	428 435							4A501	16A501	11A501	11A501		10
6	421 EXT.							22A501	15A501	29A501	29A501		5
7	420 421							4A501	16A501	11A501	11A501		10
8	418 EXT.							22A501	15A501	29A501	29A501		13
9	419 418							4A501	16A501	11A501	11A501		15
10	412 401							4A501	16A501	11A501	11A501		16
11	402 401							3A501	10A501	10A501	10A501		16
12	412 402							4A501	11A501	11A501	11A501		5
13	407 404							4A501	11A501	11A501	11A501		11
14	407 405							4A501	11A501	11A501	11A501		11
15	407 406							4A501	11A501	11A501	11A501		11
16	409 407							4A501	11A501	11A501	11A501		12
17	412 408							4A501	11A501	11A501	11A501		8
18	412 410							4A501	11A501	11A501	11A501		14
19	412 410							4A501	11A501	11A501	11A501		14
20	436 436a							3A501	10A501	10A501	10A501		2
21	435 436							4A501	11A501	11A501	11A501		14
22	435 001							4A501	11A501	11A501	11A501		9
23	001 001a							3A501	10A501	10A501	10A501		12
24	435 002							4A501	11A501	11A501	11A501		9
25	002 001b							3A501	10A501	10A501	10A501		12
26	435 101							4A501	11A501	11A501	11A501		9
27	101 101a							3A501	10A501	10A501	10A501		12
28	102 101b							3A501	10A501	10A501	10A501		12
29	003 101c							3A501	10A501	10A501	10A501		12
30	435 003							4A501	11A501	11A501	11A501		9
31	435 004							4A501	11A501	11A501	11A501		9
32	004 001d							3A501	10A501	10A501	10A501		12
33	435 102							4A501	11A501	11A501	11A501		9
34	435 103							4A501	11A501	11A501	11A501		9
35	005 001e							3A501	10A501	10A501	10A501		12
36	103 101c							3A501	10A501	10A501	10A501		12
37	435 005							4A501	11A501	11A501	11A501		9
38	428 434							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	3
39	428 433							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
40	428 432							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
41	428 431							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
42	429 428							4A501	11A501	11A501	11A501		9
43	428 436							19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
44	436 203							4A501	11A501	11A501	11A501		9
45	203 201c							3A501	10A501	10A501	10A501		12
46	436 104							4A501	11A501	11A501	11A501		9
47	104 201d							3A501	10A501	10A501	10A501		12
48	105 201e							3A501	10A501	10A501	10A501		12
49	436 105							4A501	11A501	11A501	11A501		9
50	436 202							4A501	11A501	11A501	11A501		9
51	202 201b							3A501	10A501	10A501	10A501		12
52	436 416							19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
53	417 417a							4A501	11A501	11A501	11A501		12
54	417 417b							4A501	11A501	11A501	11A501		12
55	417 417c							4A501	11A501	11A501	11A501		12
56	416 417							4A501	11A501	11A501	11A501		9
57	416 201							4A501	11A501	11A501	11A501		9
58	201 201a							3A501	10A501	10A501	10A501		12
59	412 413							4A501	11A501	11A501	11A501		2
60	412 414							4A501	11A501	11A501	11A501		2
61	415 412							4A501	11A501	11A501	11A501		4
62	412 305							4A501	11A501	11A501	11A501		9
63	305 301e							3A501	10A501	10A501	10A501		12
64	419 304							4A501	11A501	11A501	11A501		9
65	304 301d							3A501	10A501	10A501	10A501		12
66	303 301c							3A501	10A501	10A501	10A501		12
67	419 417							4A501	11A501	11A501	11A501		9
68	419 303							4A501	11A501	11A501	11A501		9
69	419 302							4A501	11A501	11A501	11A501		9
70	302 301b							3A501	10A501	10A501	10A501		12
71	301 301a							3A501	10A501	10A501	10A501		12
72	419 205							4A501	11A501	11A501	11A501		9
73	205 201e							3A501	10A501	10A501	10A501		12
74	204 201d							3A501	10A501	10A501	10A501		12
75	419 204							4A501	11A501	11A501	11A501		9
76	419 301							4A501	11A501	11A501	11A501		9
77	419 425							4A501	11A501	11A501	11A501		9
78	NUMBER NOT USED							NUMBER NOT USED					
79	425 424							4A501	16A501	11A501	11A501		2
80	425 423							4A501	16A501	11A501	11A501		2
81	425 422							4A501	16A501	11A501	11A501		11
82	427 426							4A501	16A501	11A501	11A501		6
83	425 EXT.							1A501	15A501	8A501	8A501	8" GIP BD. WALL ADJUST FRAME AS REQUIRED	5
84	436 436							4A501	16A501	11A501	11A501		12
85	105g 201							4A501	16A501	11A501	11A501		6



1 DOOR SCHEDULE

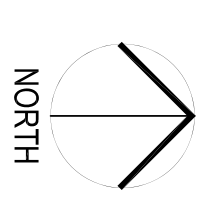
DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
86	105f 105	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6
87	439 EXT.	C	ALUM	PR. 3'-0"	7'-0"	1 3/4"		17A501	15A501				1



- DEMOLITION NOTES:
- 1.  INDICATES EXISTING WALLS TO BE DEMOLISH TO LIMITS INDICATED. RE: A1018 FOR LOCATIONS
 - 2. REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND EXISTING WALL SYSTEM. PREPARE OPENING TO RECEIVE NEW WALL IN-FILL AND NEW H.M. DOOR FRAME
 - 3. REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND PREPARE OPENING TO RECEIVE NEW WALL IN-FILL
 - 4. REMOVE EXISTING TEMPORARY WALL SYSTEM AND PREPARE OPENING TO RECEIVE NEW STOREFRONT
 - 5. REMOVE EXISTING SOFFIT SYSTEM AND ASSOCIATED FRAMING AS REQUIRED FOR NEW FRAMING AND PREFINISHED METAL SOFFIT PANEL
 - 6. REMOVE EXISTING "NO PARKING" SIGN & REINSTALL AFTER EXTERIOR WORK IS COMPLETE
 - 7. REMOVE EXISTING SLAB AT NEW DOOR LOCATIONS RE: A1008 & A1009. PREPARE AREA TO RECEIVE NEW CONCRETE SLAB AND STOOP. RE: 3A303

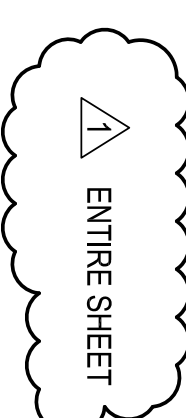
DEMOLITION FLOOR PLAN

3/32" = 1'-0"



GENERAL NOTES:

1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT PROVIDED TO THESE DOCUMENTS SHOULD BE BROUGHT TO THE ARCHITECT'S ATTENTION BY THE ARCHITECT AND INCLUDED IN THE BASE BID.
2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS INSTRUCTIONS.
3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED. PROTECT EXISTING CMU WALL TO REMAIN AS REQUIRED. PROTECT EXISTING EXTERIOR WALL TO REMAIN.

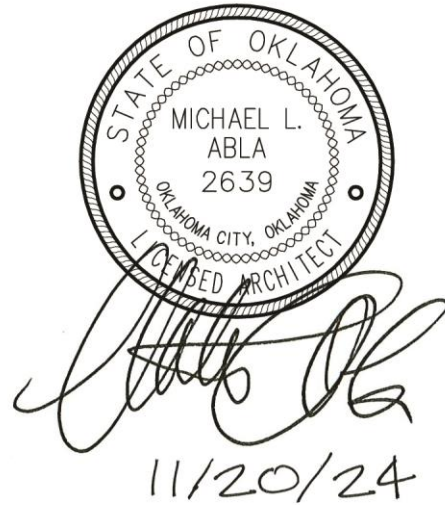


**MOORE PUBLIC SCHOOLS -
CHILD CARE CENTER**

Moore Public Schools - Moore, Oklahoma
AGP - Moore, Oklahoma

ADDENDUM NO. 1

November 20, 2024



This addendum applicable to work designated herein, shall be understood to be an Addendum, and as such shall be included in the Contract Agreement.

Receipt of this Addendum shall be acknowledged by the Construction Management Firm notifying this office in writing, and by any applicable subcontractor to the CM.

This addendum consists of three (3) pages with attachments of twenty-eight (28) 8.5"x11" pages and thirty-nine 24"x36" sheets.

A. Drawings:

Replace Cover Sheet "C". Refer to attachment.

General

1. Sheet G101, Tornado sign: added Construction Manager's name to tornado information sign.

Civil

1. Sheet C200, Demolition Site Plan and Notes: added sheet in its entirety. Refer to attachment.

Architectural Demolition

1. Sheet AD100, Demolition Floor Plan and Notes: added sheet in its entirety. Refer to attachment.

Structural

No changes.

Architectural

1. Sheet A100, Detail 1, Overall Floor Plan: revised entry vestibule at Door #87 and Room #439 / added various door and room numbers where noted. Refer to attachment.
2. Sheet A100a, Dimension Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
3. Sheet A100b, Reference Plan: added references. Refer to attachment.
4. Sheet A101, Wall Type Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
5. Sheet A102, Life Safety Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
6. Sheet A104, Detail 4, Typical New Exterior Door & Vestibule: added reference to section cut. Refer to attachment.
7. Sheet A105, Detail 1, Enlarged Floor Plan Rooms 425, 426, & 427: revised entry into Room #427 Dining. Refer to attachment.
8. Sheet A106, Detail 1, Reflected Ceiling Plan: various notes were revised/added. Refer to attachment.
9. Sheet A107, Detail 1 and Notes: information for gas line locations, etc. were added. Refer to attachment.
10. Sheet A107a, Details: added sheet in its entirety. Refer to attachment.
11. Sheet A108, Detail 1, LVT Dimension / Design Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
12. Sheet A109, Equipment Floor Plan and Schedule: added sheet in its entirety.
13. Sheet A201, Details 1 thru 4, Exterior Elevations: added references and revised notes. Refer to attachment.
14. Sheet A301, Details 1 and 2, Building Sections: wall section notations were added. Refer to attachment.
15. Sheet A302, Wall Sections: added sheet in its entirety.
16. Sheet A303, Wall Sections: added sheet in its entirety.

17. Sheet A304, Details 7 thru 11 and Detail 15, Interior Elevations: revised backsplash notes. Refer to attachments.
18. Sheet A501, Details 22 and 29, Door Details: added details as noted. Refer to attachment.
19. Sheet A601, Detail 2, Color Schedule: added note concerning the coordination of colors and layouts, etc. Refer to attachment.
20. Sheet A602, Detail 1, Door Schedule and Detail 5, Door Frame Elevations: revised door schedule and revised frame elevation "B". Refer to attachment.
21. Sheet A701, Details 1 and 2, Cabinet Sections: revised backsplash requirements at noted cabinets. Refer to attachment.

Mechanical, Electrical, and Plumbing

No changes.

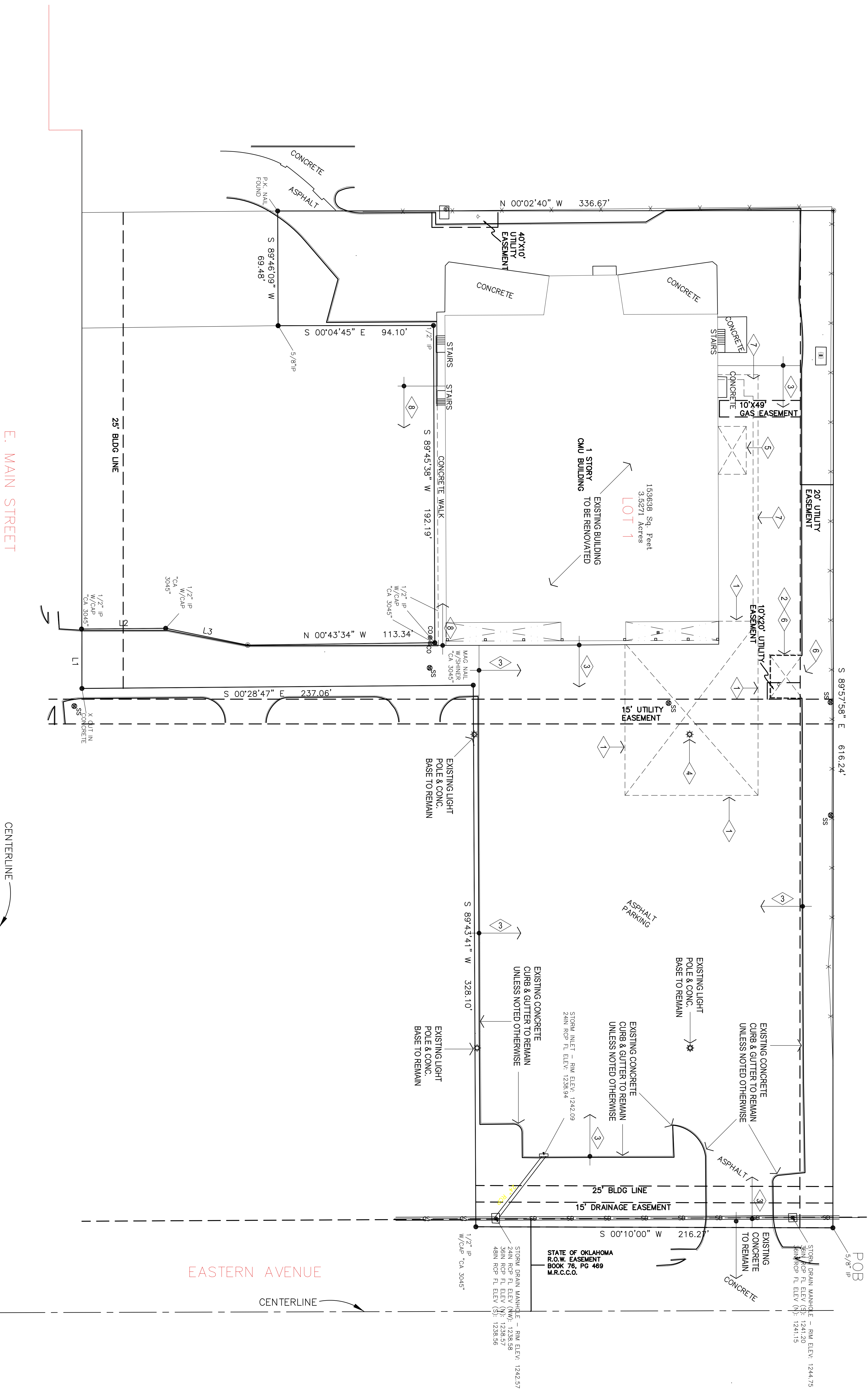
Food Service Documents

Refer to attachments.

B. Specifications:

1. Section 06410-2.09 Custom Casework, Hardware: at each base cabinet doors within children's reach in classrooms #001 thru 005, 101 thru 105, 201 thru 205, and 301 thru 305 provide magnetic lock equal to Rev-A-Lock, RAL-101-1 as manufactured by Rev-A-Shelf LLC.
2. Section 08700 Finish Hardware: add section in its entirety.
3. Section 114000 Kitchen Equipment: add section in its entirety.

END OF ADDENDUM NO. 1



DEMOLITION SITE PLAN



1

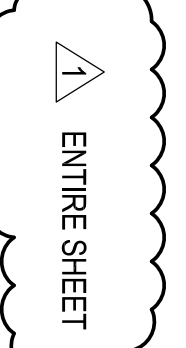
1" = 30'-0"

GENERAL NOTES:

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3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED.

DEMOLITION NOTES:

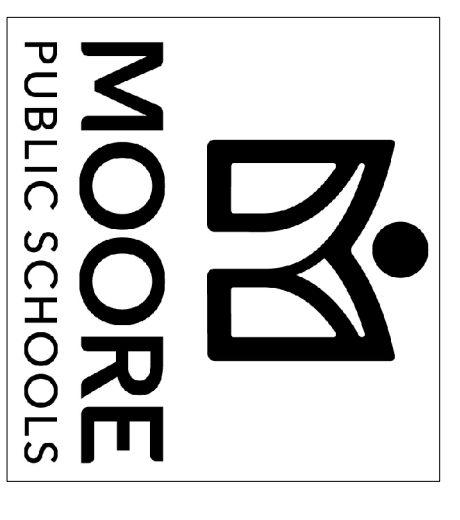
1. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW POURED-IN-PLACE RUBBER PLAYGROUND SURFACE.
2. DEMOLISH EXISTING CONCRETE CURB & GUTTER AROUND EXISTING FIRE HYDRANT TO BE RELOCATED. RE: CIVIL.
3. DEMOLISH / REMOVE TOP 2" OF ASPHALT WEARING COURSE W/IN LIMITS INDICATED & REPAIR / PREPARE EXISTING ASPHALT BASE COURSE TO REMAIN TO RECEIVE NEW 2" WEARING COURSE.
4. DEMOLISH / REMOVE EXISTING LIGHT POLE & CONCRETE BASE. LOCATE EXISTING ELECTRICAL CONDUIT & PROVIDE ALL MATERIALS REQUIRED FOR REMAINING LIGHT POLES TO WORKING ORDER.
5. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW GENERATOR BUILDING.
6. REMOVE EXISTING SUBGRADE AND PREPARE AREA TO RECEIVE NEW ASPHALT PAVING. MATCH EXISTING THICKNESS. PROVIDE NEW CURB & GUTTER AS REQUIRED. MATCH EXISTING.
7. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED FOR NEW GREASE INTERCEPTOR AND ASSOCIATED PIPING. RE: PLUMBING.
8. DEMOLISH / REMOVE EXISTING SIDEWALK TO LIMITS INDICATED. PREPARE SUBSTRATE FOR NEW RAMPS & SIDEWALK.



ENTIRE SHEET

CEDAR CREEK
OHL
KFC ENGINEERING
STRUCTURAL
SALUS O'BRIEN
MECHANICAL/ELECTRICAL

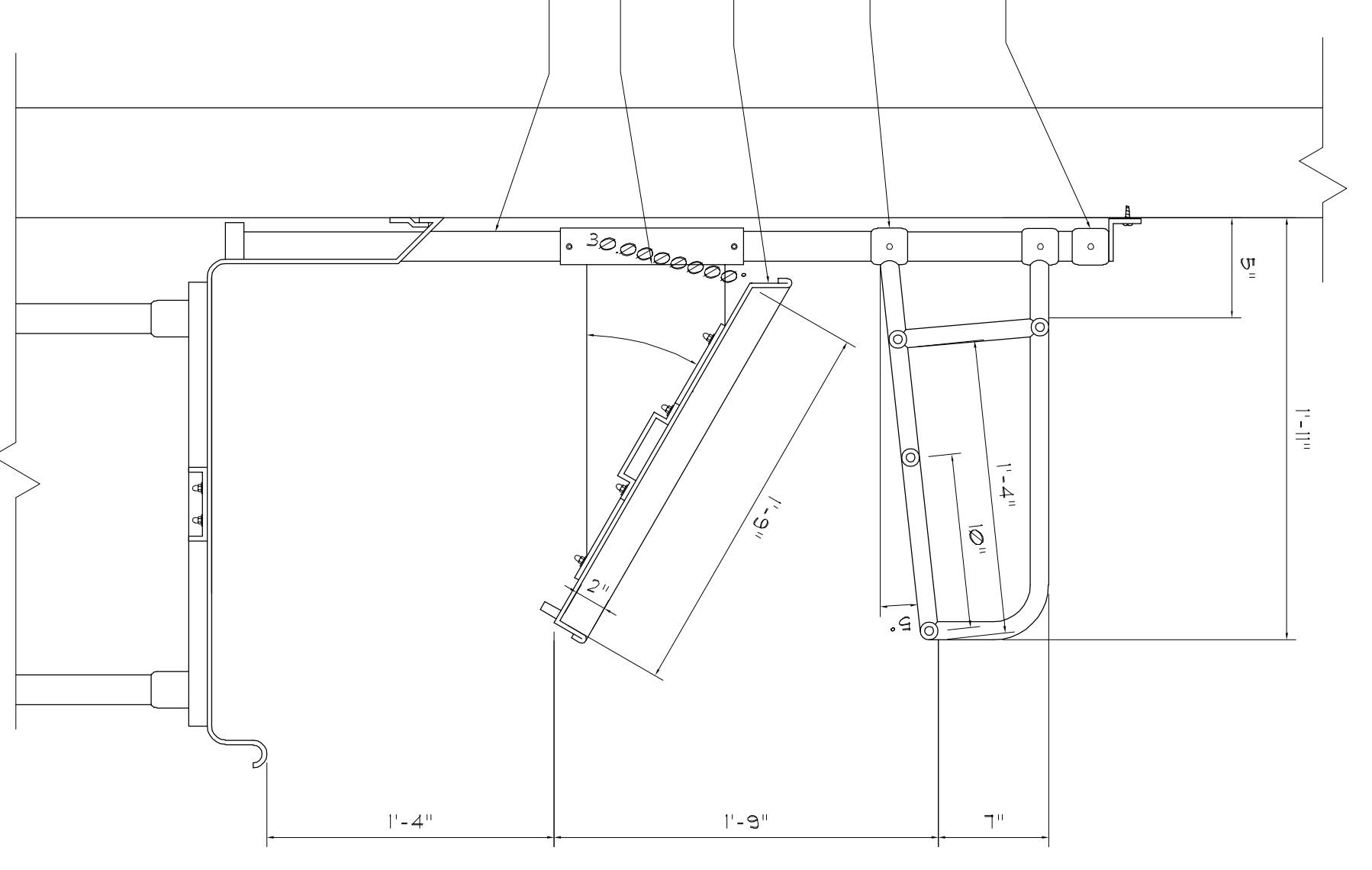
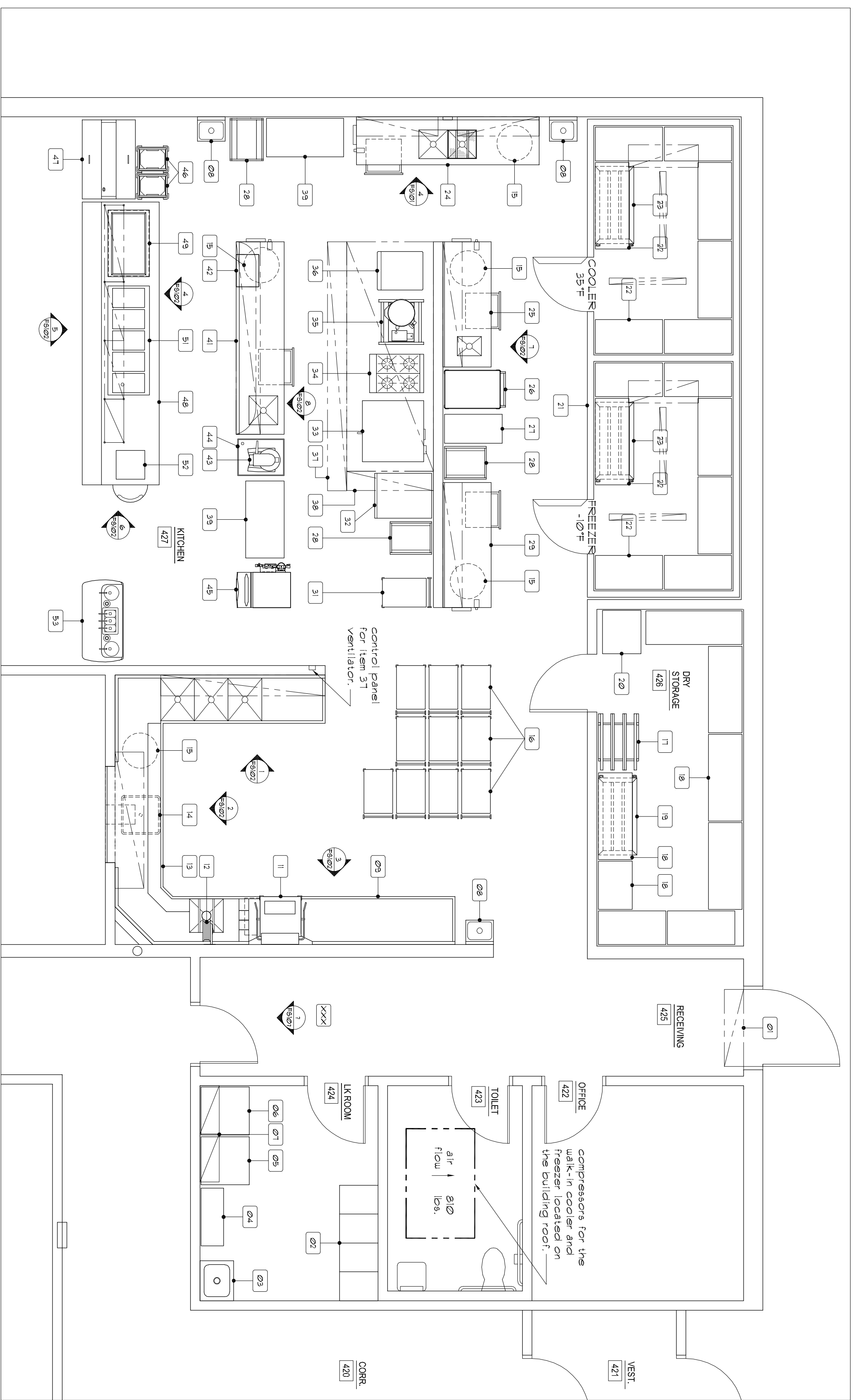
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RS
checked by
10/29/2024
date
revisions
Addendum #1 11/20/2024



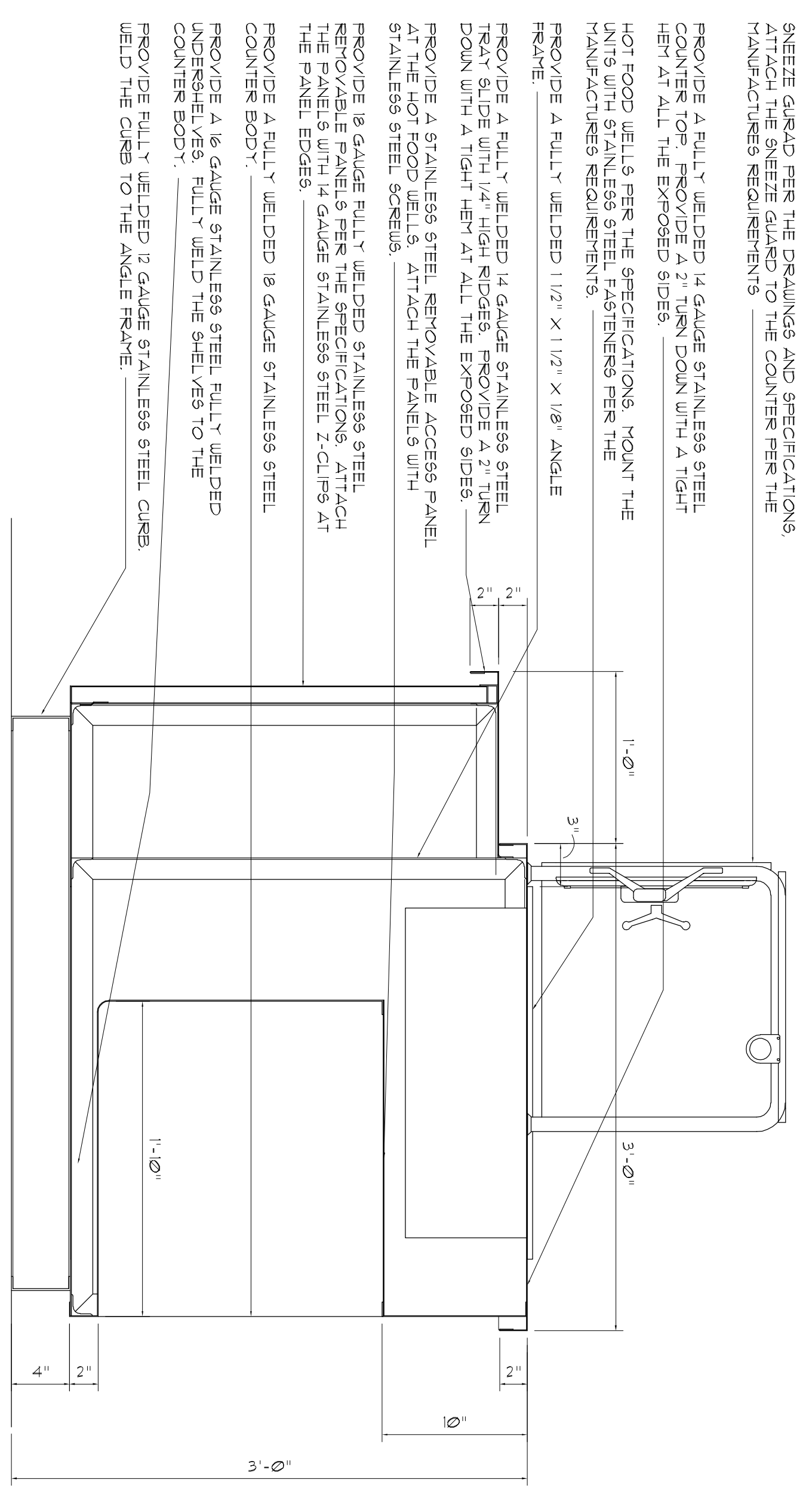
CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No:
FS101

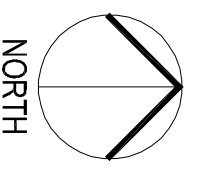
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CONSENT OF ACP.



2 SECTION - SOILED DISHTABLE RACK & RAIL SHELVES
NO SCALE



3 SECTION - SERVING COUNTER
NO SCALE



1

FOODSERVICE EQUIPMENT ARRANGEMENT PLAN
1/4" = 1'-0"

NO.	DESCRIPTION - PHASE I
01	AIR CURTAIN
02	LOCKERS
03	HOCKERS
04	CHEMICAL STORAGE SHELVING
05	WASHER BY THE QUINER
06	DRYER BY THE QUINER
07	WALL MOUNTED LINEN SHELVES
08	CAN DISH
09	CAN DISH TABLE
10	NUMBER NOT USED
11	VENTILATED DISHWASHER WITH BOOSTER HEATER
12	SOILED DISHTABLE
13	WALL MOUNTED HOSE REEL
14	TOILET SINK
15	TOILET SINK
16	MEAL TRANSPORT CART'S
17	CAN RACK
18	STORAGE SHELVING
19	MOBILE DINNAGE RACK
20	MOBILE BECAD RACK BY THE VENDOR
21	WALK IN STORAGE SHELVING
22	WALK IN STORAGE SHELVING
23	MOBILE DINNAGE RACK
24	FREEZE TABLE
25	FREEZE TABLE
26	ALLEGEY LOCK TABLE
27	ALLEGEY LOCK TABLE
28	MOBILE COOLING RACK
29	MEAL ASSEMBLY TABLE
30	NUMBER NOT USED
31	MOBILE UTILITY CART
32	MOBILE FOOD/HOT CABINET
33	MOBILE COOLING RACK
34	MOBILE RANGE
35	12 GALLON TILTING KETTLE
36	CONVECTION STEAMER
37	VENTILATOR
38	ME BUREAU
39	ME BUREAU
40	NUMBER NOT USED
41	NUMBER NOT USED
42	COOKS TABLE
43	MICROWAVE
44	20 QUART MIXER
45	MOBILE SERVER STAND
46	MOBILE TRAY DISPENSER
47	MOBILE MILK COOLER
48	SERVING COUNTER
49	DROPPIN COLD FOOD WELLS
50	DROPPIN COLD FOOD WELLS
51	POS BY THE QUINER
52	POS BY THE QUINER
53	MOBILE CONDIMENT COUNTER

FOODSERVICE EQUIPMENT SCHEDULE

SQUEEZE GUARD PER THE DRAWINGS AND SPECIFICATIONS,
ATTACH THE SQUEEZE GUARD TO THE COUNTER PER THE
MANUFACTURERS REQUIREMENTS.

PROVIDE A FULLY WELDED 14 GAUGE STAINLESS STEEL
COUNTER TOP. PROVIDE A 2" TURN DOWN WITH A TIGHT
HEM AT ALL THE EXPOSED SIDES.

HOT FOOD WELLS PER THE SPECIFICATIONS. MOUNT THE
UNITS WITH STAINLESS STEEL FASTENERS PER THE
MANUFACTURERS REQUIREMENTS.

PROVIDE A FULLY WELDED 1 1/2" X 1 1/2" X 1/8" ANGLE
FRAMING.

PROVIDE A FULLY WELDED 14 GAUGE STAINLESS STEEL
TRAY SLIDE WITH 1/4" HIGH EDGES. PROVIDE A 2" TURN
DOWN WITH A TIGHT HEM AT ALL THE EXPOSED SIDES.

PROVIDE A STAINLESS STEEL REMOVABLE ACCESS PANEL
AT THE HOT FOOD WELL'S. ATTACH THE PANELS WITH
STAINLESS STEEL SCREWS.

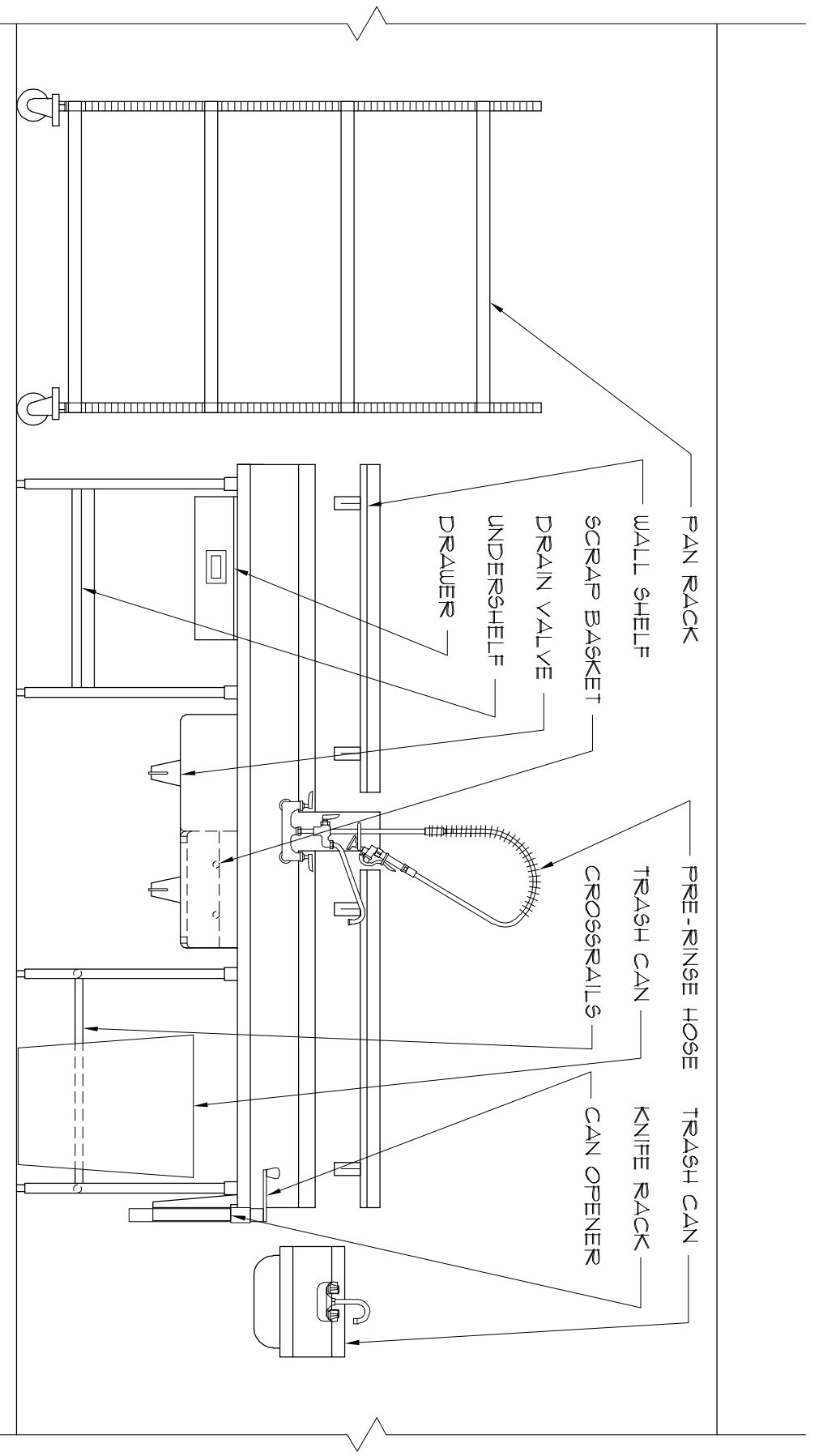
PROVIDE 18 GAUGE FULLY WELDED STAINLESS STEEL
REMOVABLE PANELS PER THE SPECIFICATIONS. ATTACH
THE PANEL EDGES.

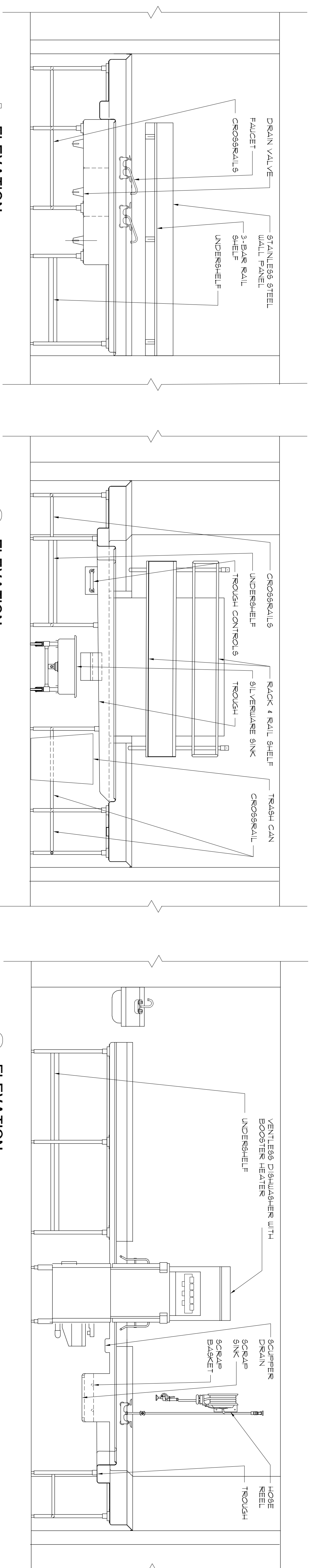
PROVIDE A FULLY WELDED 18 GAUGE STAINLESS STEEL
COUNTER BODY.

PROVIDE A 18 GAUGE STAINLESS STEEL FULLY WELDED
UNDER-SHELVES. FULLY WELD THE SHELVES TO THE
COUNTER BODY.

PROVIDE FULLY WELDED 12 GAUGE STAINLESS STEEL CURB
WELD THE CURB TO THE ANGLE FRAMING.

4 ELEVATION
NO SCALE

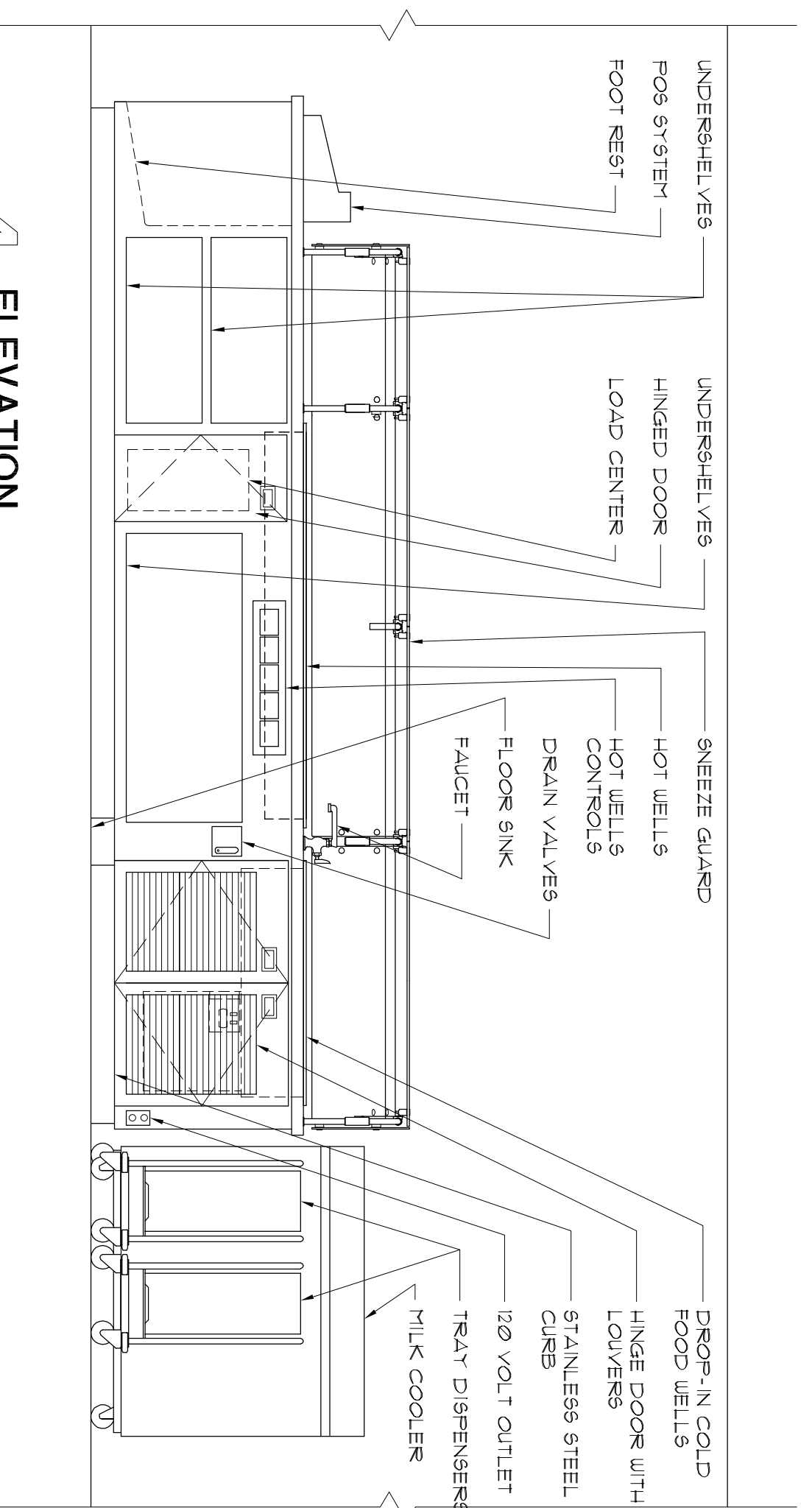




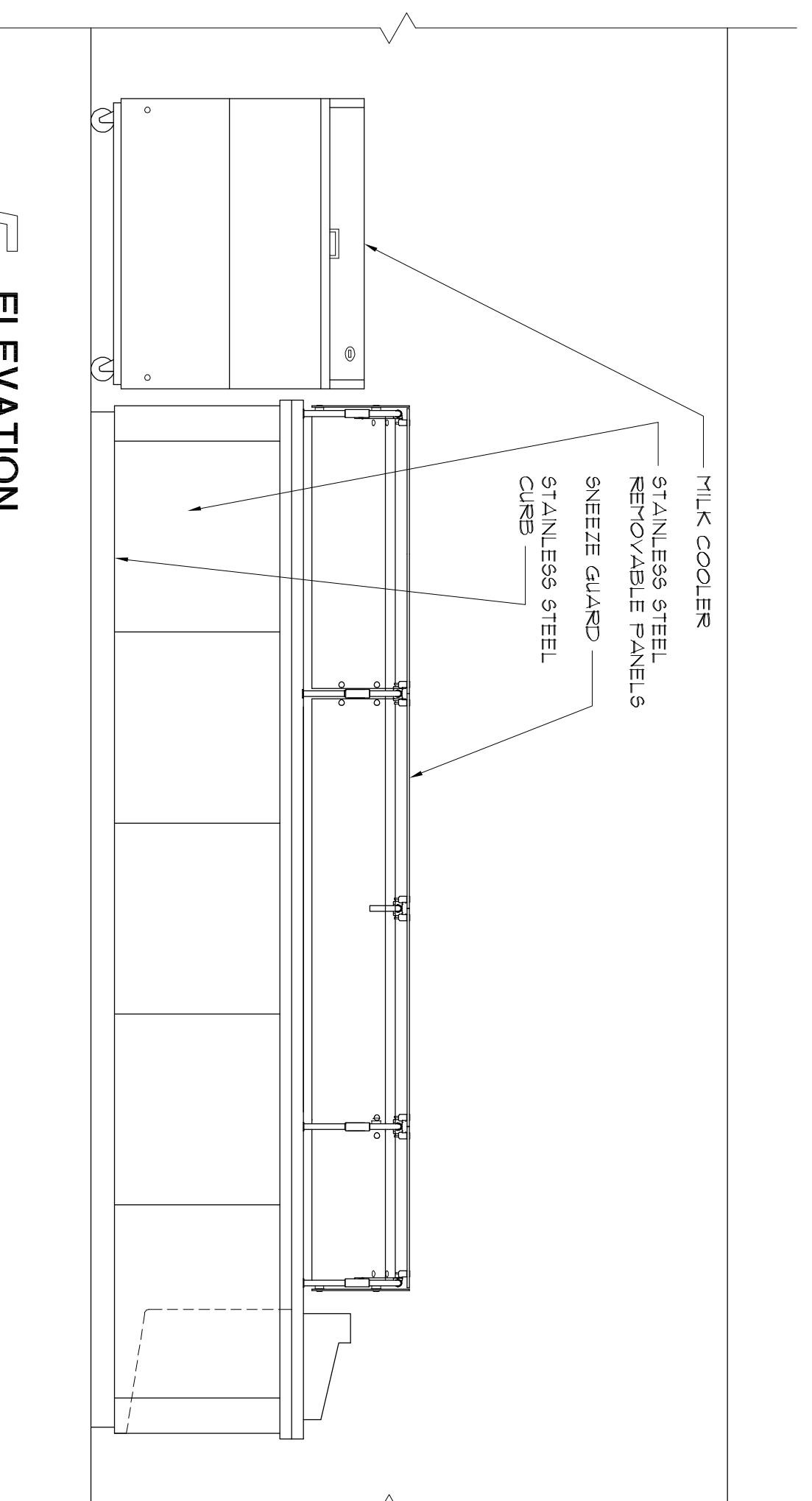
1 ELEVATION
NO SCALE

2 ELEVATION
1/2" = 1'-0"

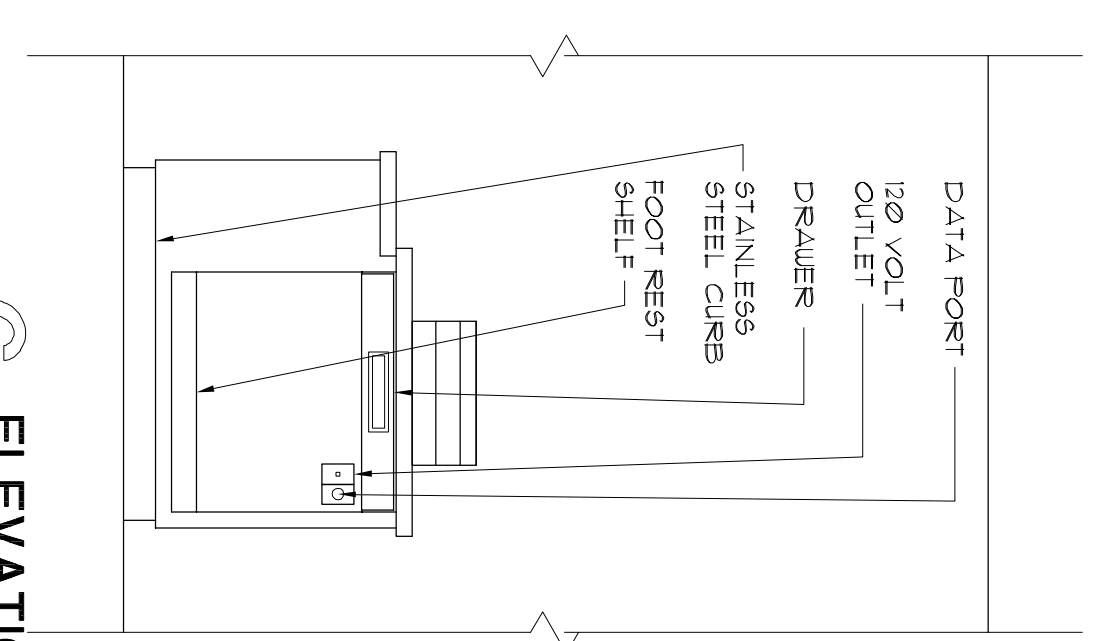
3 ELEVATION
1/2" = 1'-0"



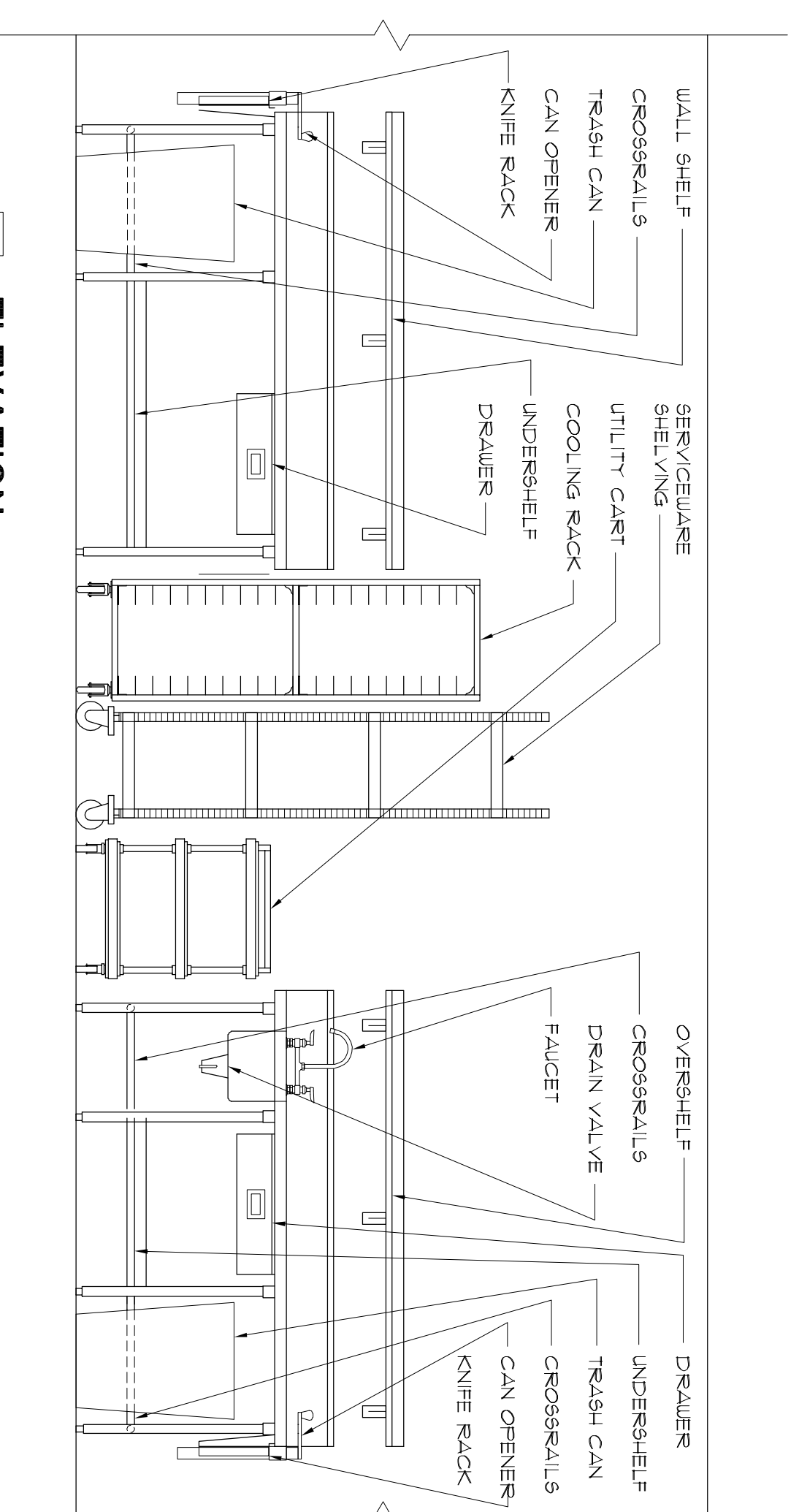
4 ELEVATION
1/2" = 1'-0"



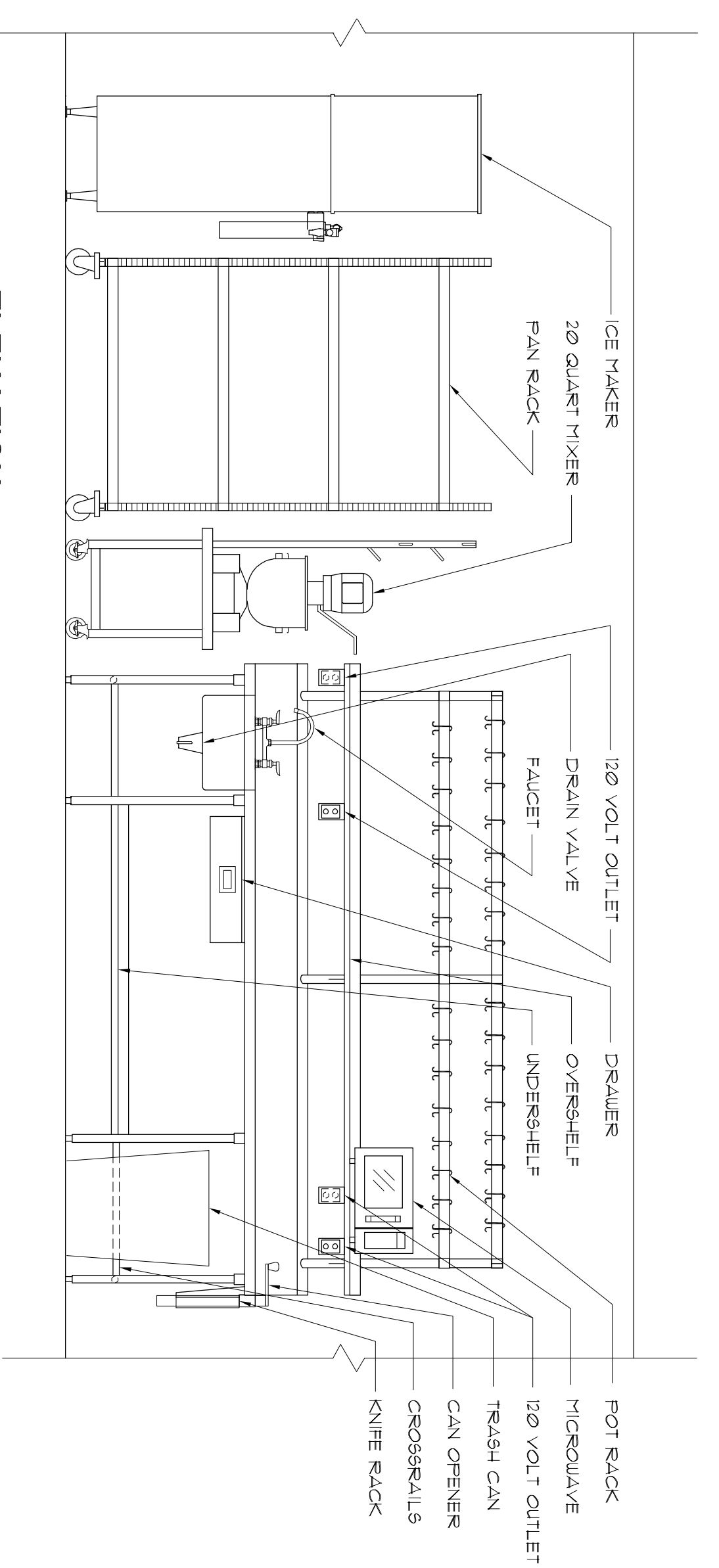
5 ELEVATION
1/2" = 1'-0"



6 ELEVATION
1/2" = 1'-0"



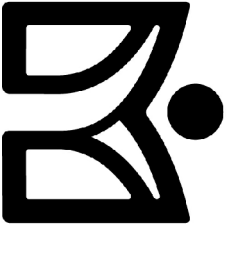
7 ELEVATION
1/2" = 1'-0"



8 ELEVATION
NO SCALE

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 MECHANICAL/ELECTRICAL

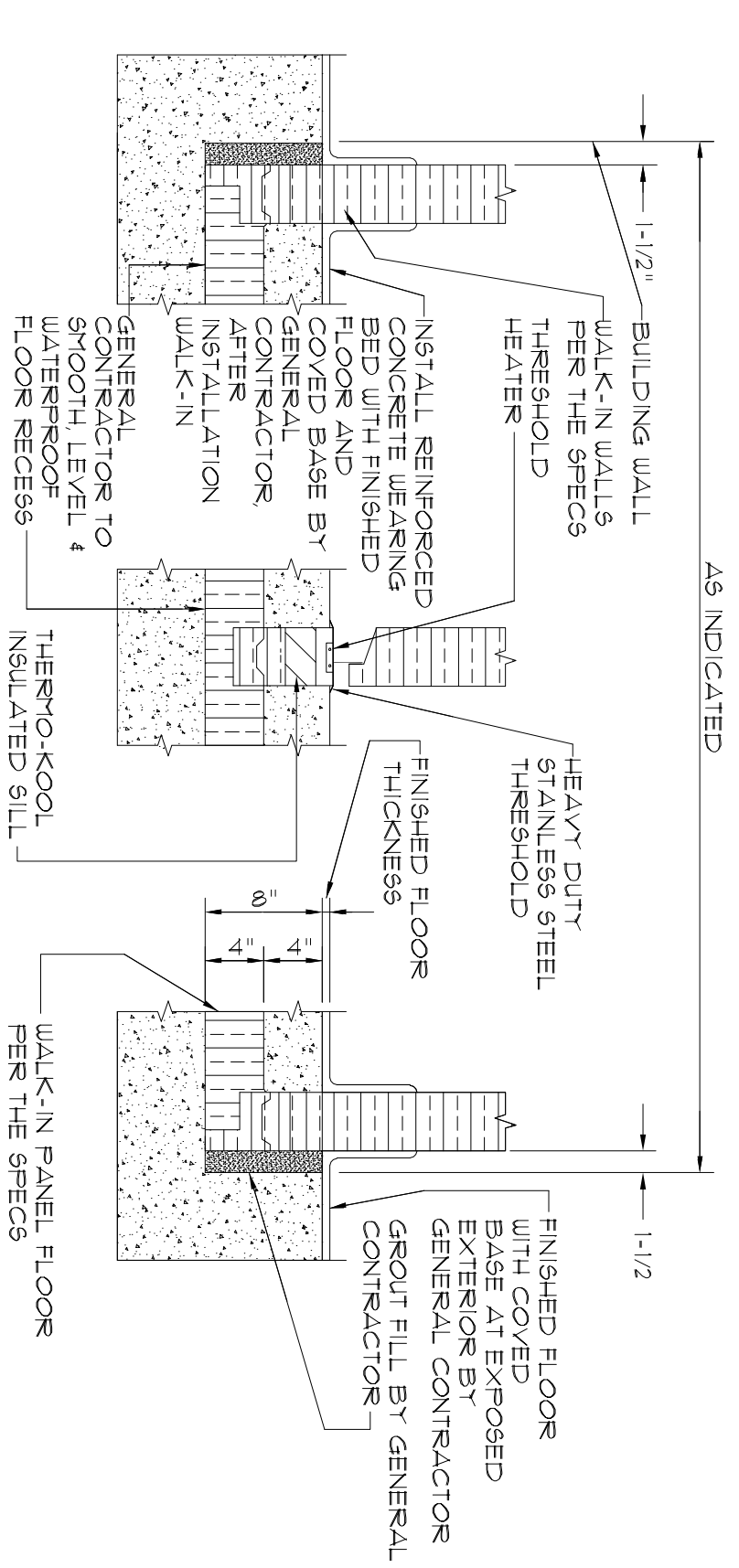
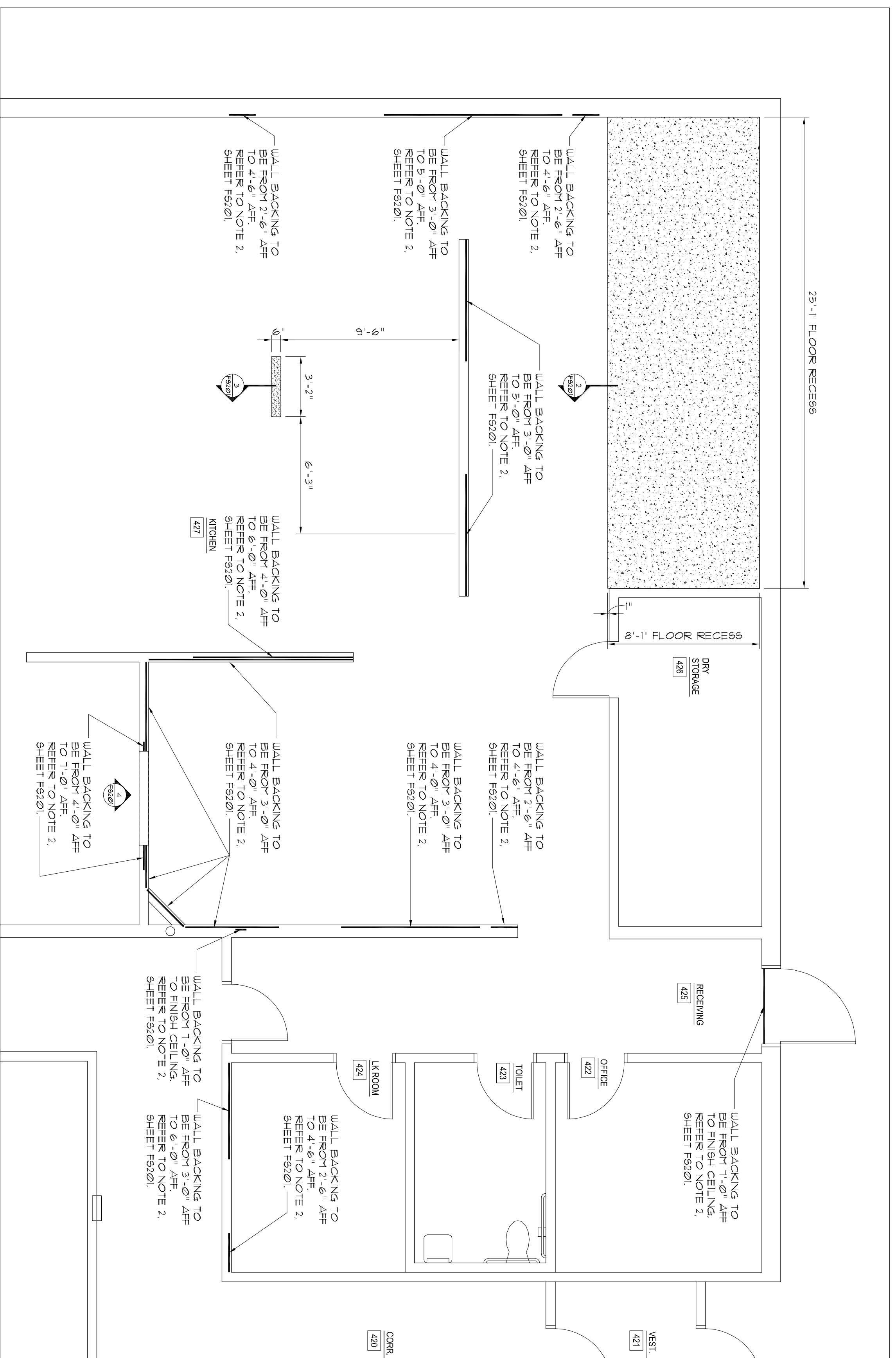

MOORE
 PUBLIC SCHOOLS

CHILD CARE FACILITY
 201 N. EASTERN AVE.

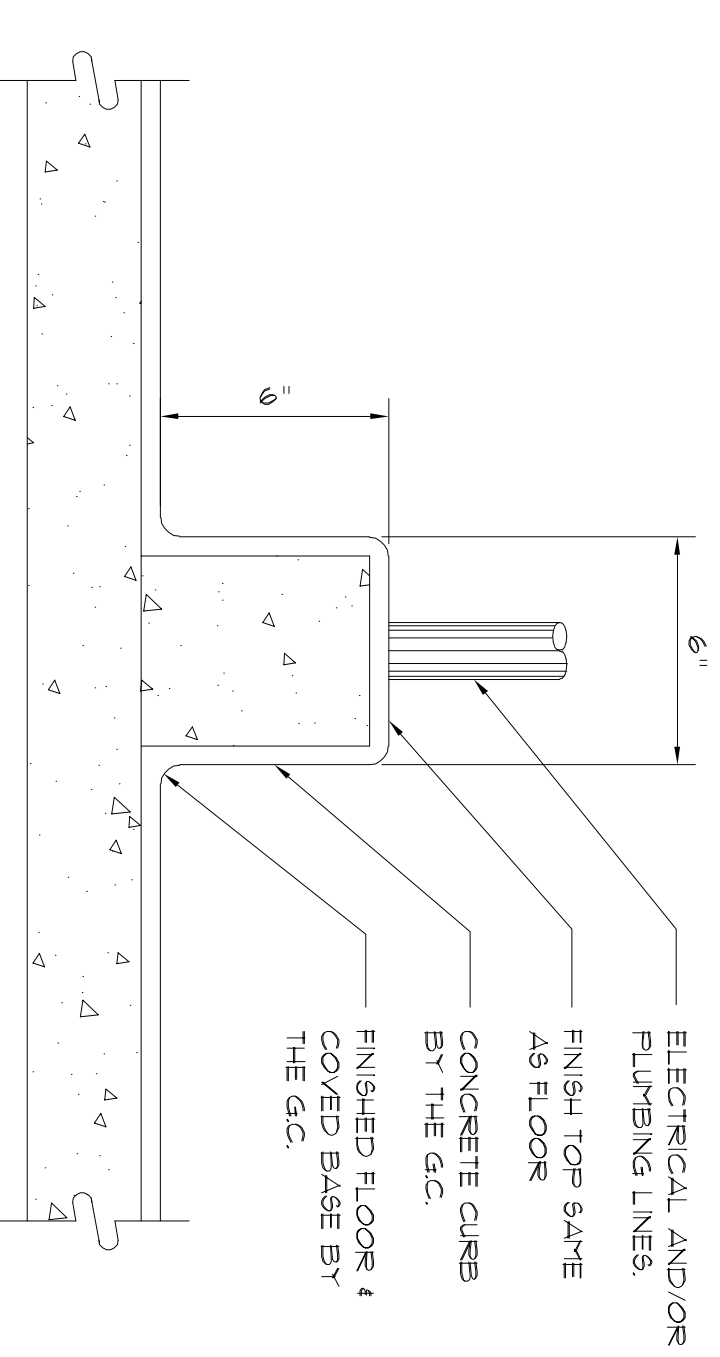
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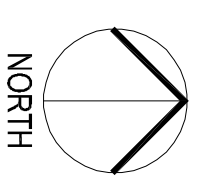
RS	drawn by
RS	checked by
10/29/2024	date
	revisions
Addendum #1	11/20/2024



2 DETAIL - WALK-IN RECESS @ COOLERS & FREEZERS
NO SCALE



3 SECTION - UTILITY CURB
NO SCALE

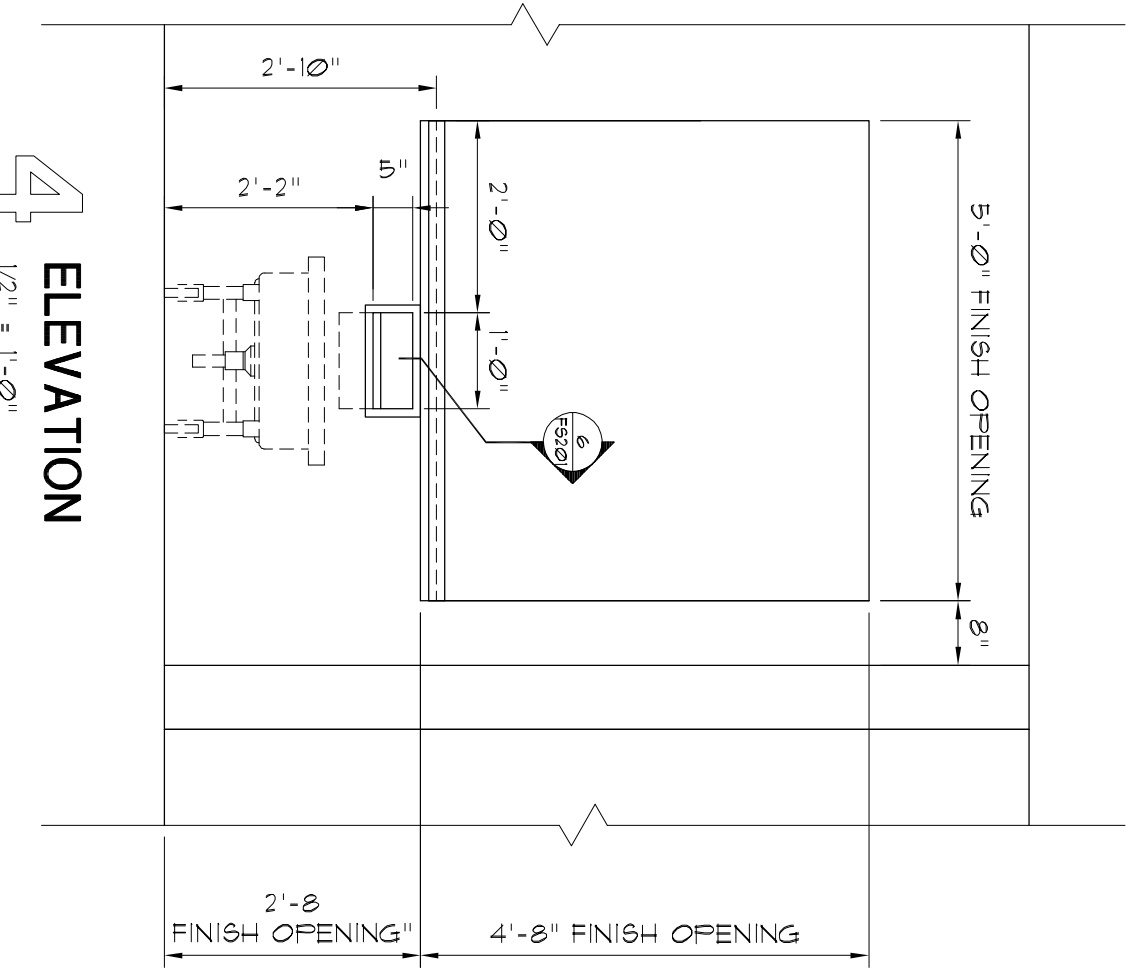


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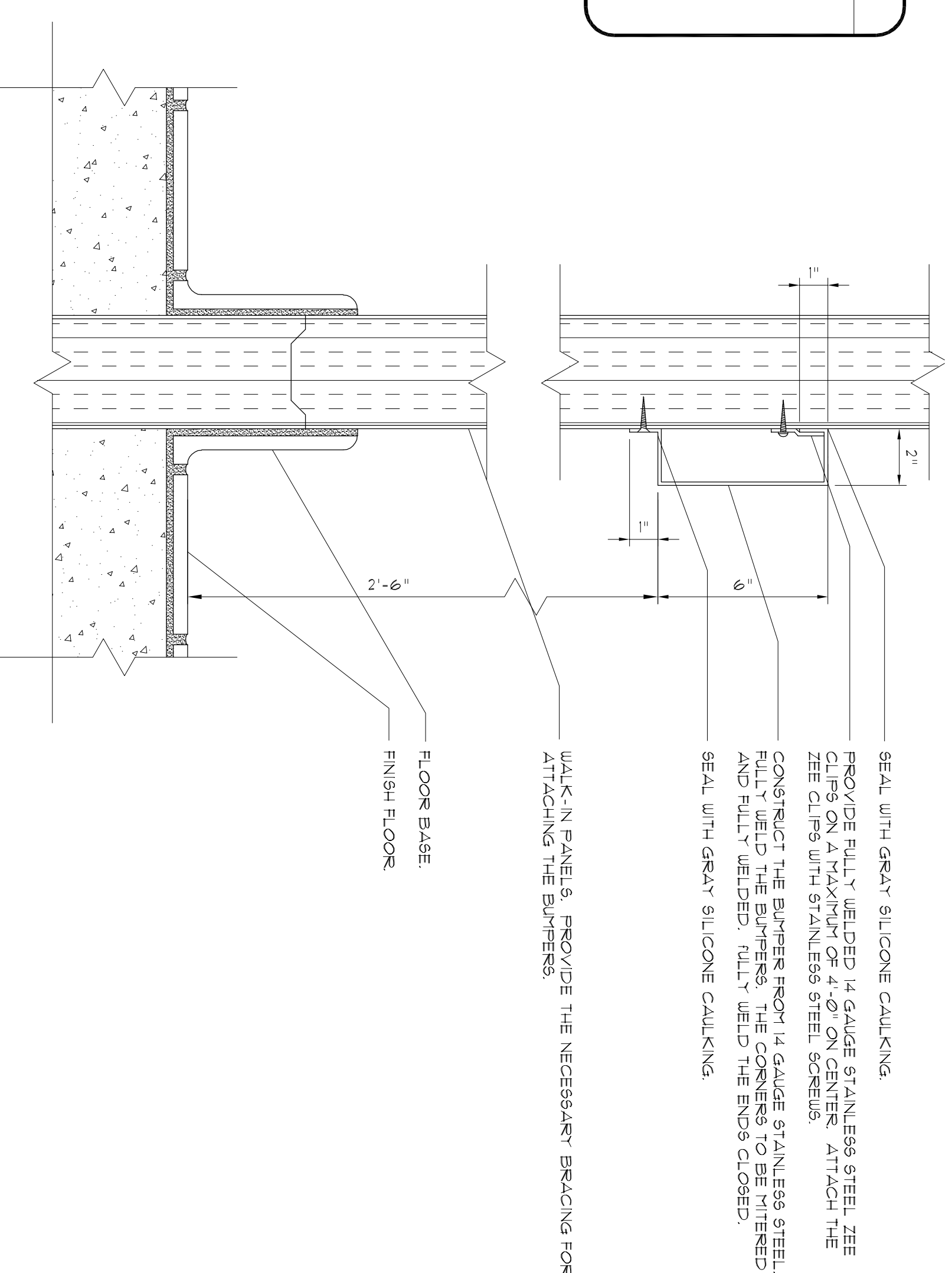
FOODSERVICE EQUIPMENT SPECIAL CONDITIONS PLAN
1/4" = 1'-0"

GENERAL NOTES

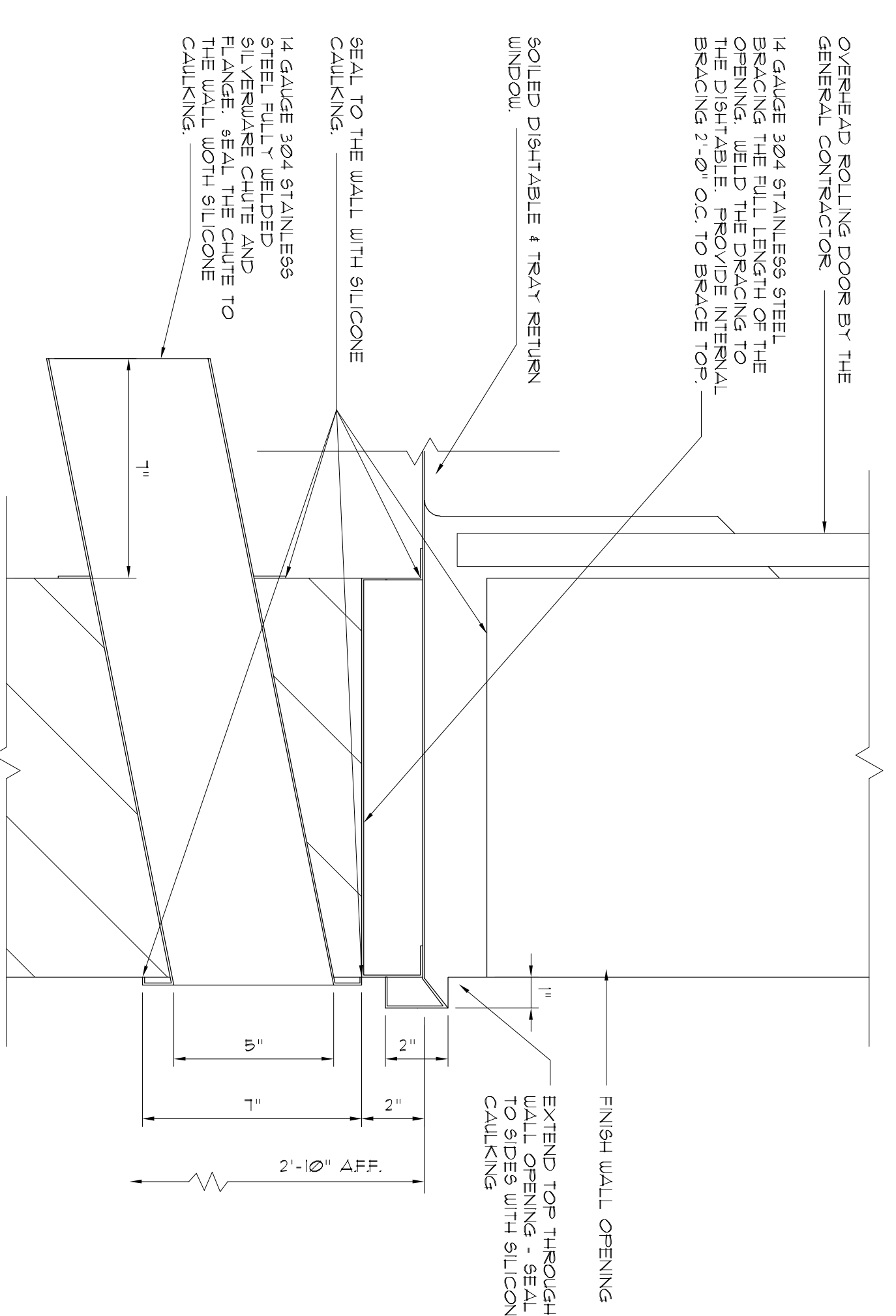
1. THE FOODSERVICE CONTRACTOR MUST COORDINATE AND VERIFY ALL DIMENSIONS WITH THE FOODSERVICE EQUIPMENT SHOP DRAWINGS AND THE PURPOSER ONLY.
2. THE GENERAL CONTRACTOR TO PROVIDE AND INSTALL 3/4" THICK WOOD BACKING IN THE WALL FOR THE MOUNTING OF THE EQUIPMENT FURNISHED BY THE FOODSERVICE CONTRACTOR. THE FOODSERVICE CONTRACTOR TO FURNISH EXACT DIMENSIONED LOCATIONS.
3. THE WALK-IN DOORS MUST BE LEFT OPEN UNTIL THE INTERIOR CONCRETE WALK-IN FLOOR CURES. FAILURE TO DO SO MAY DAMAGE THE INTERIOR OF THE WALK-IN REQUIRING THE UNIT TO BE REPLACED.



4 ELEVATION
1/2" = 1'-0"



5 DETAIL - BUMPER RAILS AT THE WALK-INS
NO SCALE



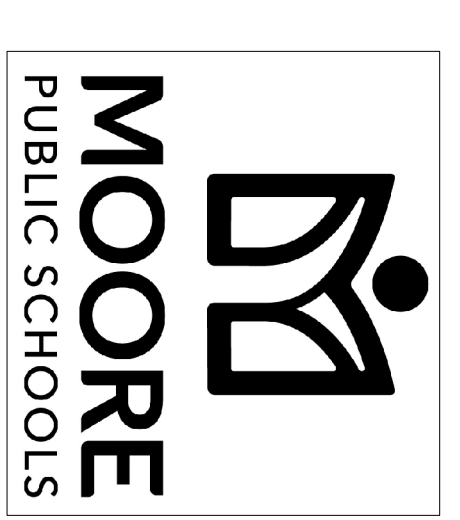
6 SECTION - TRAY RETURN COUNTER
NO SCALE

ACGP
the Abila Griffin
Partnership L.L.C.
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405.735.3477
ACGP@theACGP.net
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RS
drawn by
RS
checked by
10/29/2024
dlb

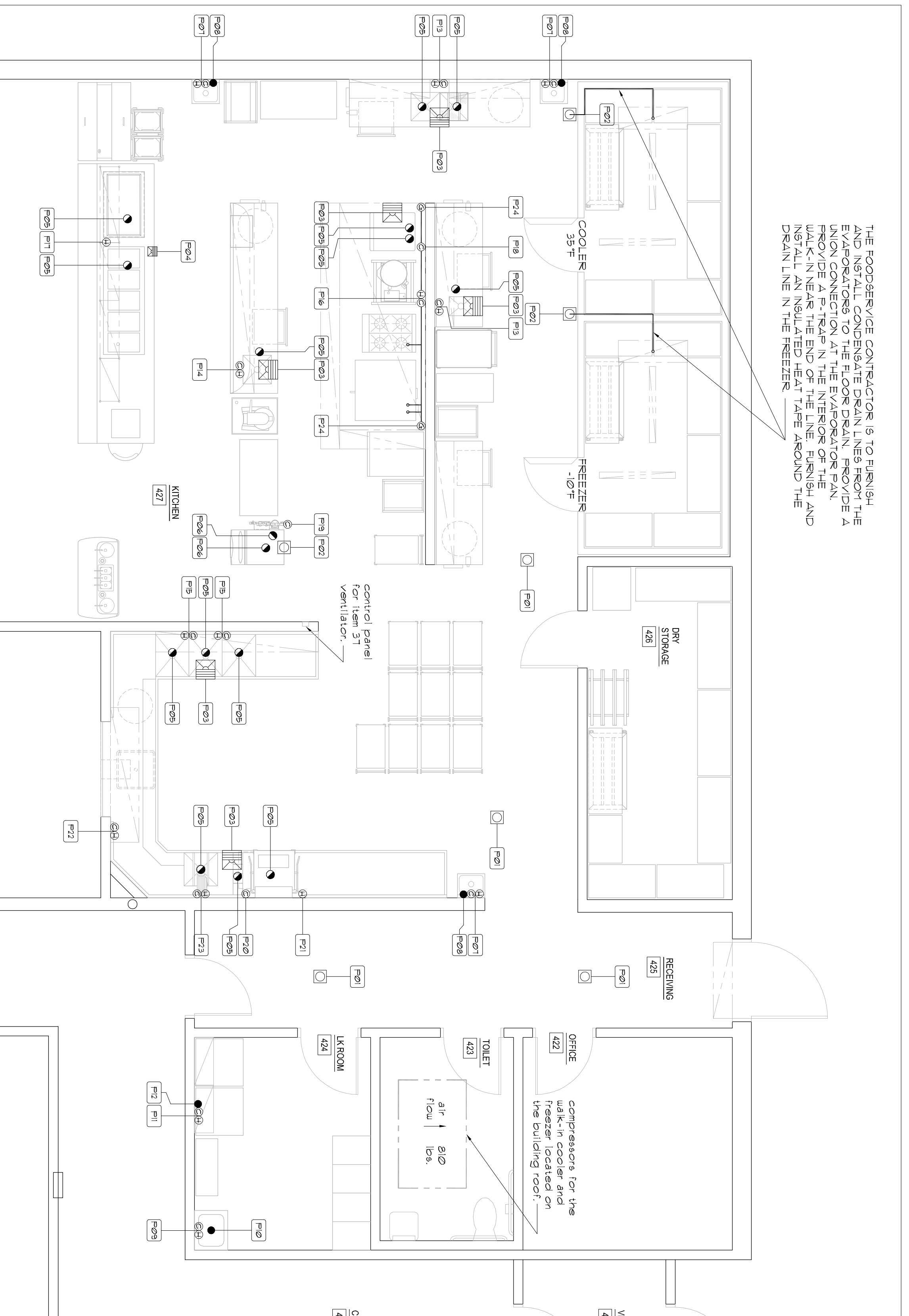
revisions
Addendum #1 11/20/2024



CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No:
FSS201

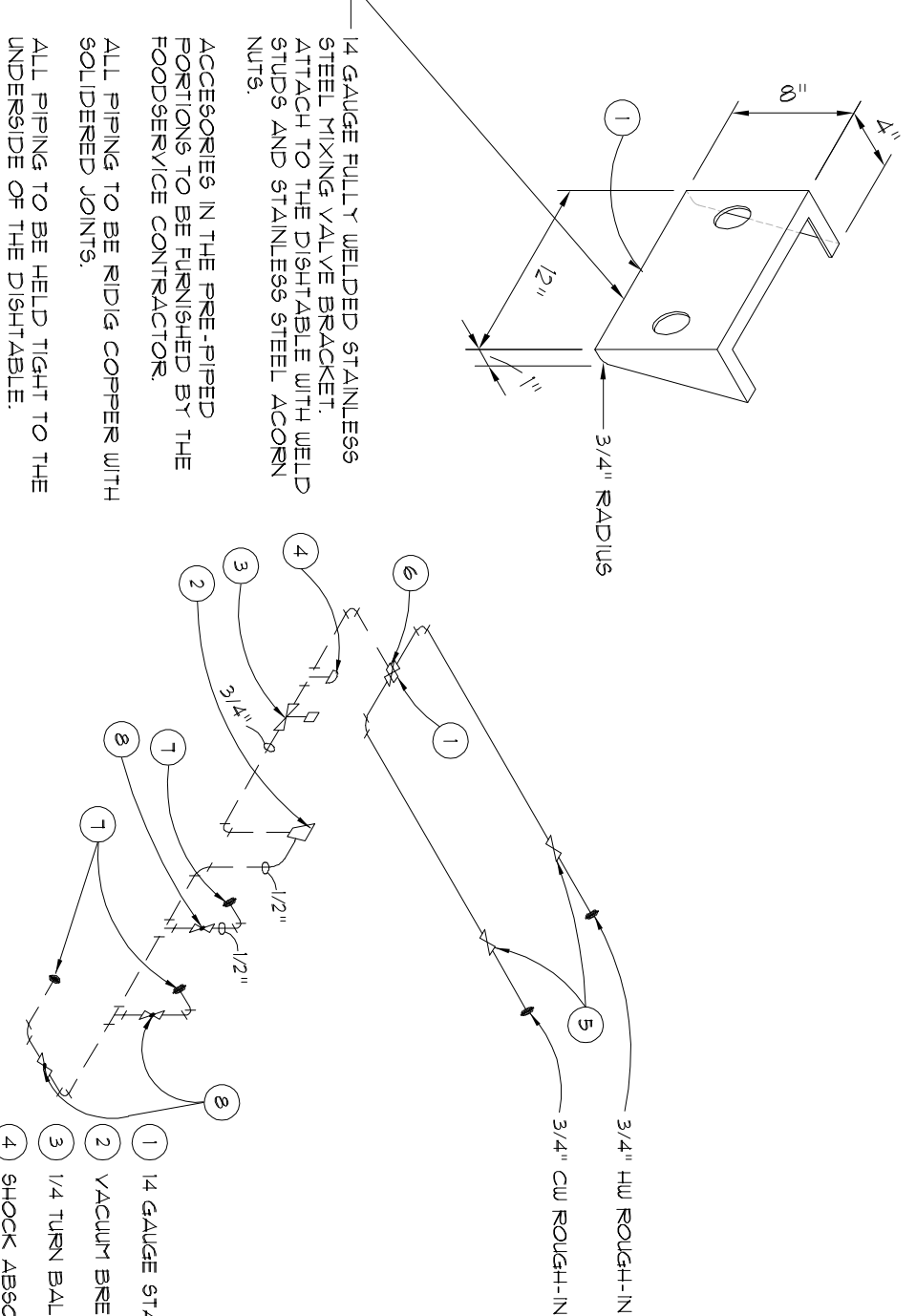
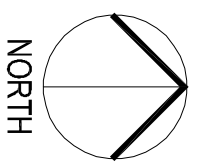
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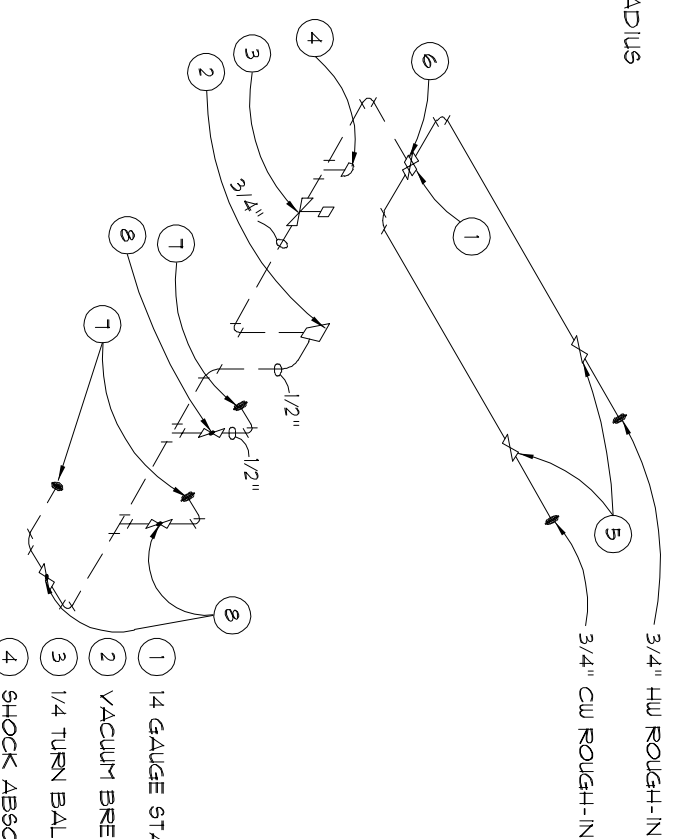
THE FOODSERVICE CONTRACTOR IS TO FURNISH AND INSTALL CONDENSATE DRAIN LINES FROM THE EXTRACTORS TO THE FLOOR DRAIN. PROVIDE A MINIMUM OF 1/2" CLEARANCE FROM THE DRAIN. PROVIDE A P-TAPE IN THE INTERIOR OF THE WALK-IN NEAR THE END OF THE LINE. FURNISH AND INSTALL AN INSULATED HEAT TAPE AROUND THE DRAIN LINE IN THE FREEZER.

1 FOODSERVICE EQUIPMENT PLUMBING CONNECTIONS PLAN

1/4" = 1'-0"



14 GAUGE FULLY WELDED STAINLESS STEEL WALK-IN VALVE BRACKET ATTACH TO THE DISHABLE WITH WELD STUDS AND STAINLESS STEEL ACORN NUTS



- 1 14 GAUGE STAINLESS WALKING VALVE BRACKET
- 2 VACUUM BREAKER PER THE SPECIFICATIONS
- 3 1/4 TURN BALL VALVE TO TURN WATER ON / OFF
- 4 SHOCK ABSORBERS
- 5 GATE VALVE (STOP) BY THE PLUMBING CONTRACTOR
- 6 1 & 8 MODEL B-1035 WALKING VALVE
- 7 WATER INLETS PER THE SPECIFICATIONS
- 8 1/4 TURN BALL VALVE

2 TROUGH PIPING DETAIL

NO SCALE

PLUMBING CONNECTIONS SCHEDULE

NO.	ITEM NO.	SIZE	DESCRIPTION	LOCATION	APP.	SERVICE TO	REMARKS
F01	21, 45	---	FD	FLOOR	0'	---	AREA DRAIN
F02	4, 48	---	FD	FLOOR	0'	---	THE PLUMBING CONTRACTOR IS TO EXTEND THE EQUIPMENT DRAIN TO THE FD.
F03	11, 13, 24, 25, 4, 26	1 1/2" S.O.	FL. SINK	FLOOR	0'	---	THE PLUMBING CONTRACTOR IS TO EXTEND THE EQUIPMENT DRAIN TO THE FL. SINK. FURNISH WITH A 1/2" GRATE.
F04	48	6" S.O.	FL. SINK	FLOOR	0'	---	THE PLUMBING CONTRACTOR IS TO EXTEND THE EQUIPMENT DRAIN TO THE FL. SINK. FURNISH WITH A 1/2" GRATE.
F05	11, 13, 21, 24, 25, 36, 4, 48	---	W	EQUIP.	---	---	THE PLUMBING CONTRACTOR IS TO FURNISH AND INSTALL THE LINE. DO NOT HANG/OLD MULTIPLE SINKS TOGETHER.
F06	45	---	W	EQUIP.	---	---	THE PLUMBING CONTRACTOR IS TO FURNISH AND INSTALL THE LINE. DO NOT HANG/OLD THIS LINE WITH ANY OTHER LINE.
F07	08	1/2"	H & CW	WALL	24"	FAUCET	BTIC
F08	08	1/2"	H & CW	FLOOR	9"	SINK	BTIC
F09	03	1/2"	H & CW	WALL	36"	FAUCET	BTIC
F10	03	1/2"	H & CW	FLOOR	36"	WATER SINK	BTIC
F11	05	2"	DR	WALL	42"	WASHER	BTIC
F12	05	2"	DR	WALL	18"	FAUCET	BTIC
F13	24 & 25	1/2"	H & CW	FLOOR	9"	FAUCET	BTIC
F14	41	1/2"	H & CW	WALL	18"	FAUCET & SPRAY HEAD	BTIC
F15	25	3/4"	H & CW	WALL	12"	FILL FAUCET	BTIC
F16	25	1/2"	H & CW	WALL	12"	ICE MAKER	BTIC
F17	36	1/2"	CW	WALL	48"	CEILING	BTIC
F18	45	1/2"	CW	WALL	12"	WALL	BTIC
F19	45	1/2"	CW	WALL	12"	WALL	BTIC
F20	11	3/4"	CW	WALL	12"	WALL	BTIC
F21	11	1/2"	H & CW	WALL	18"	WALL	BTIC
F22	12	1/2"	H & CW	WALL	18"	WALL	BTIC
F23	33 & 34	---	GAS	---	---	---	BTIC

PLUMBING SYMBOLS

HW	HOT WATER
CW	COLD WATER
G	GAS SUPPLY
DR	DRAIN
IWD	INDIRECT WASTE (EXTEND TO FD)
FD	FLOOR DRAIN
F8	FLOOR SINK - 1/2 GRATE
AF8	ABOVE FINISHED FLOOR BTIC BRANCH TO CONNECTION
FD4	DRAIN FROM ABOVE

NOTES

THE PLUMBING CONTRACTOR TO ROUGH-IN FROM THE FOODSERVICE CONTRACTORS ROUGH-IN DRAWINGS ONLY. THE PLUMBING CONTRACTOR WILL TAKE FULL RESPONSIBILITY FOR THE ROUGH-IN LOCATIONS IF THE FOODSERVICE AND/OR PLUMBING DRAWINGS ARE USED FOR THIS WORK.

PLUMBING/MECHANICAL NOTES

- DIMENSIONS INDICATED ARE TO BE VERIFIED BY THE FOODSERVICE CONTRACTOR AND ADJUSTED AS REQUIRED BY THE FOODSERVICE EQUIPMENT OR FIELD CONDITIONS.
 - VENTILATE REFRIGERATION "MACHINE" ROOMS TO PROVIDE 95°F MAXIMUM AMBIENT TEMPERATURE.
 - EXHAUST DUCTS AND FANS CONNECTED TO EXHAUST HOODS SHALL NOT SERVE ANY OTHER AREA OR APPLIANCE.
 - DUCTS OF MULTIPLE EXHAUST HOODS WITH COMMON CONTROL PANEL MUST BE INTEGRATED FOR USE WITH A SINGLE EXHAUST FAN.
- THE FOLLOWING WORK IS BY THE PLUMBING CONTRACTOR. REFER TO THE PLUMBING DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL INFORMATION:
- FIELD INSTALLATION OF ACCESSORIES & FITTINGS PROVIDED LOOSE WITH THE FOODSERVICE EQUIPMENT.
 - SERVICE SINKS, LAVATORIES AND DRINKING FOUNTAINS.
 - GREASE PROOF EXHAUST DUCTS FROM VENT CONNECTIONS OF THE EXHAUST HOODS.
 - FLUSHING-OUT OF ALL PIPING AND DRAINAGE SYSTEMS PRIOR TO CONNECTION TO FOODSERVICE EQUIPMENT.



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Sheet No.

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RS
drawn by
RS
checked by
10/29/2024
date

revisions
Addendum #1: 11/20/2024

ELECTRICAL CONNECTIONS SCHEDULE

NO.	ITEM NO.	CONN.	SERVICE TO	RATING	VOLTS	PH.	LOCATION	DEF.	REMARKS
E01	34		CONVENIENCE	16.0 A	120	1	WALL	12"	RATING ASSESSED A 1200 A OUTLET.
E02	24, 25	DR	CONVENIENCE	16.0 A	120	1	WALL	50"	RATING ASSESSED A 1200 A OUTLET.
E03	41, 42	C9R	CONVENIENCE	16.0 A	120	1	FLOOR	9"	SEE DETAIL 2, SHEET F9401.
E04	4, 45	C6	VENTILATION EXH. SYSTEM	50.0 A	120	1	WALL	48"	BTC
E05	31	9R	REF. HOT CABINET	132.0 KU	120	1	WALL	50"	BTC
E06	35	9R	CONVECTION STEAMER	8.0 KU	208	1	WALL	12"	CONDUCTOR & FLUG BY THE ELECTRICAL CONTRACTOR
E07	36	9R	12 GALLON FRY KETTLE	120.0 KU	208	3	WALL	12"	BTC - SEE DETAIL 2, SHEET F9401
E08	33	9R	CONVECTION OVEN	1/2 HP	120	1	FLOOR	9"	CONDUCTOR & FLUG BY THE ELECTRICAL CONTRACTOR
E09	45	DCR	ICE MAKER	1/2 HP	120	1	CEILING	78"	BTC - SEE DETAIL 2, SHEET F9401
E10	48	C5	MICROVAIVE SERVING COUNTER	15.0 KU	208	3	FLOOR	9"	CONTRACTOR TO VERIFY THE CONDUIT SIZE AND ENDING
E11	45	DCR	ICE MAKER	1/2 HP	120	1	CEILING	78"	CONTRACTOR TO VERIFY THE CONDUIT SIZE AND ENDING
E12	42	9R	MICROVAIVE SERVING COUNTER	22.0 A	208	3	FLOOR	9"	CONTRACTOR TO VERIFY THE CONDUIT SIZE AND ENDING
E13	48	C5	MICROVAIVE SERVING COUNTER	22.0 A	208	3	FLOOR	9"	CONTRACTOR TO VERIFY THE CONDUIT SIZE AND ENDING
E14	52	C9R	POS SYSTEM	12.0 A	120	1	FLOOR	9"	VERIFY THE CONDUIT SIZE AND ENDING
E15	52	C9R	POS SYSTEM	FLOOR	9"	VERIFY THE CONDUIT SIZE AND ENDING
E16	01	9R	AIR DOOR	1 HP	120	1	WALL	90"	CONDUCTOR & FLUG BY THE ELECTRICAL CONTRACTOR
E17	05	9R	WASHER	120.0 A	120	1	WALL	50"	BTC
E18	06	9R	DRYER	300.0 A	208	1	WALL	50"	BTC
E19	11	9R	DRAIN WATER TEMPERING KIT	5.0 A	120	1	WALL	12"	BTC
E20	11	9R	DISHWASHER	1 HP	208	3	WALL	78"	BTC
E21	08	9R	WALK-IN LIGHTS & HEATER	6.0 KU & 6.0 A	120	1	WALL	108"	BTC - PENETRATE THE WALK-IN THROUGH THE TOP IN A NEAT MANNER. SEAL THE HOLE AND THE CONDUIT IN AN AIR TIGHT MANNER.
E22	08	9R	WALK-IN EVAPORATOR	1.0 A	208	1	WALL	108"	BTC - PENETRATE THE WALK-IN THROUGH THE TOP IN A NEAT MANNER. SEAL THE HOLE AND THE CONDUIT IN AN AIR TIGHT MANNER.
E23	08	9R	WALK-IN EVAPORATOR	9.8 A	208	1	WALL	108"	BTC - PENETRATE THE WALK-IN THROUGH THE TOP IN A NEAT MANNER. SEAL THE HOLE AND THE CONDUIT IN AN AIR TIGHT MANNER.
E24	07	C9R	WALK-IN HEAT TAPE	16.0 A	120	1	WALL	108"	BTC - PENETRATE THE WALK-IN THROUGH THE TOP IN A NEAT MANNER. SEAL THE HOLE AND THE CONDUIT IN AN AIR TIGHT MANNER.
E25	08	C6	REFRIGERATION SYSTEM	210.0 A	208	3	SCOPE	9"	AND INSTALL A RECEPTACLE IN THE WALK-IN FOR THE HEAT TAPE.

ELECTRICAL SYMBOLS

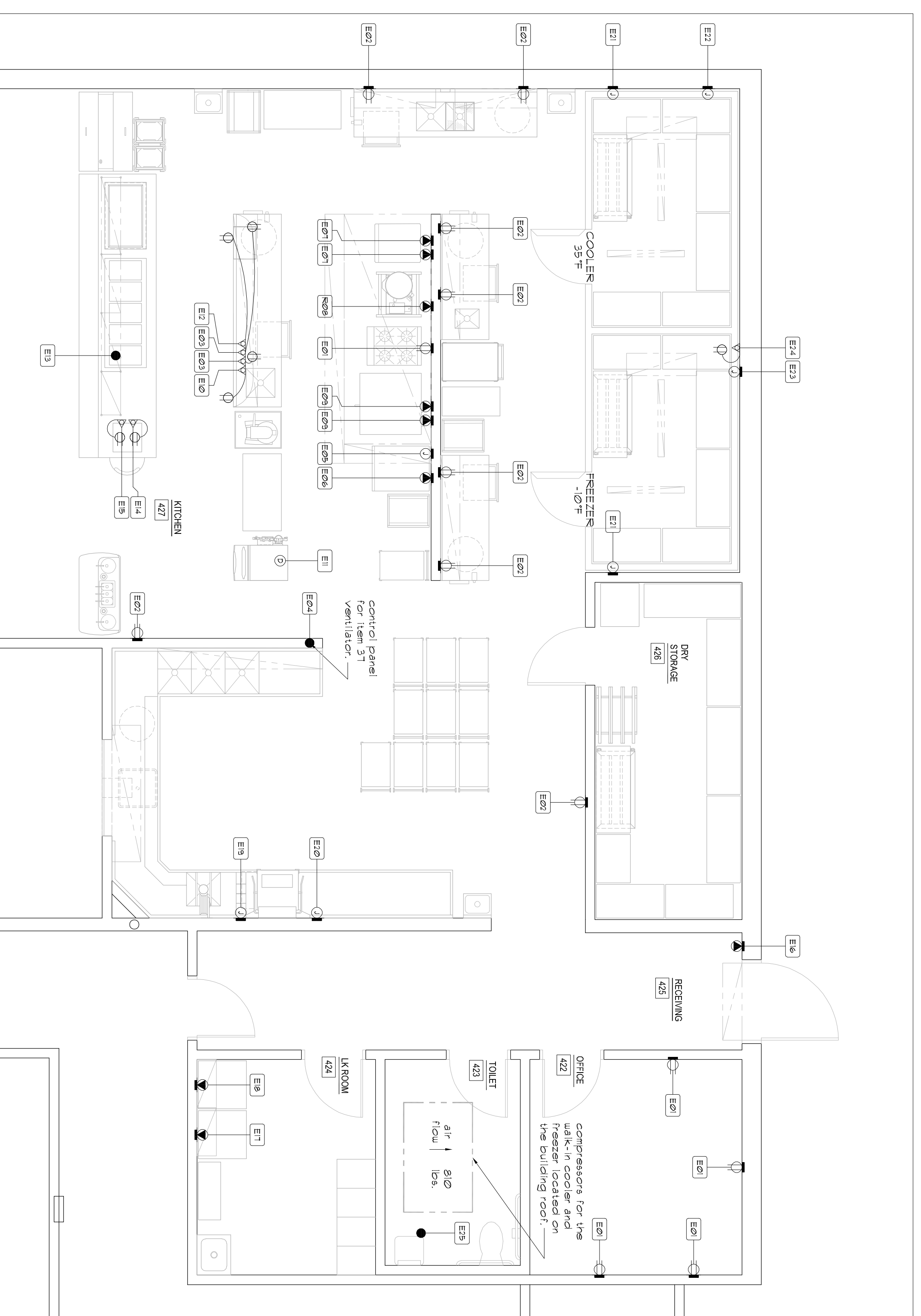
	DRY DUPLEX RECEPTACLE
	1 PH SINGLE FURROSE RECEPTACLE
	JUNCTION BOX IN WALL
	CONDUIT STUB UP/OUT
	DROP CORD RECEPTACLE
	C9R CONDUIT STUB - BTC AT RECEPTACLE FURNISHED WITH EQUIP.
	BTC BRANCH TO CONNECTION
	DFA DROP FROM ABOVE

ELECTRICAL NOTES

- DO NOT ROUGH-IN FROM THIS DRAWING. REFER TO CONTRACTOR'S DIMENSIONED DRAWINGS.
- VERIFY ALL ELECTRICAL CHARACTERISTICS WITH ARCHITECT'S ENGINEERING DRAWINGS.
- DIMENSIONS INDICATED ARE TO BE VERIFIED BY THE FOODSERVICE CONTRACTOR AND ADJUSTED AS REQUIRED BY THE FOODSERVICE EQUIPMENT AND/OR FIELD CONDITIONS.
- REFER TO ARCHITECT'S DRAWINGS FOR CLOCKS, 67"AF TIME CLOCKS AND COMMUNICATION SYSTEMS IN FOODSERVICE AREAS.
- THE FOLLOWING WORK IS BY THE ELECTRICAL CONTRACTOR. REFER TO THE ELECTRICAL DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- FIELD INSTALLATION OF ACCESSORIES & FITTINGS PROVIDED LOOSE WITH THE FOODSERVICE EQUIPMENT.
- ALL RECEPTACLES PER CODES.
- CONDUIT AND WIRING BETWEEN THE WALK-IN COOLER AND FREEZER AND DEFROST HEATING ELEMENTS.
- CONDUIT AND WIRING FROM EXHAUST HOOD FIRE EXTINGUISHING CYLINDER SHUT-OFF DEVICES AND ALARM.
- CONTRACTOR OR SHUT-TIME BREAKER FOR FUEL SHUT-OFF TO ALL ELECTRICAL HEATED COOKING EQUIPMENT INDICATED ON DRAWINGS. FUEL SHUT-OFF DEVICE SHALL BE ACTUATED BY FIRE EXTINGUISHING SYSTEM DETECTOR LOCATED IN EXHAUST HOOD.
- PENETRATIONS IN THE WALK-IN COOLERS AND FREEZERS MUST BE SEALED IN AN AIR TIGHT MANNER. INSTALL STAINLESS STEEL ESQUICHON FLANGE ON THE INTERIOR AND EXTERIOR OF THE UNITS. SEAL THE ESQUICHON FLANGE WITH SILICONE SEALANT.

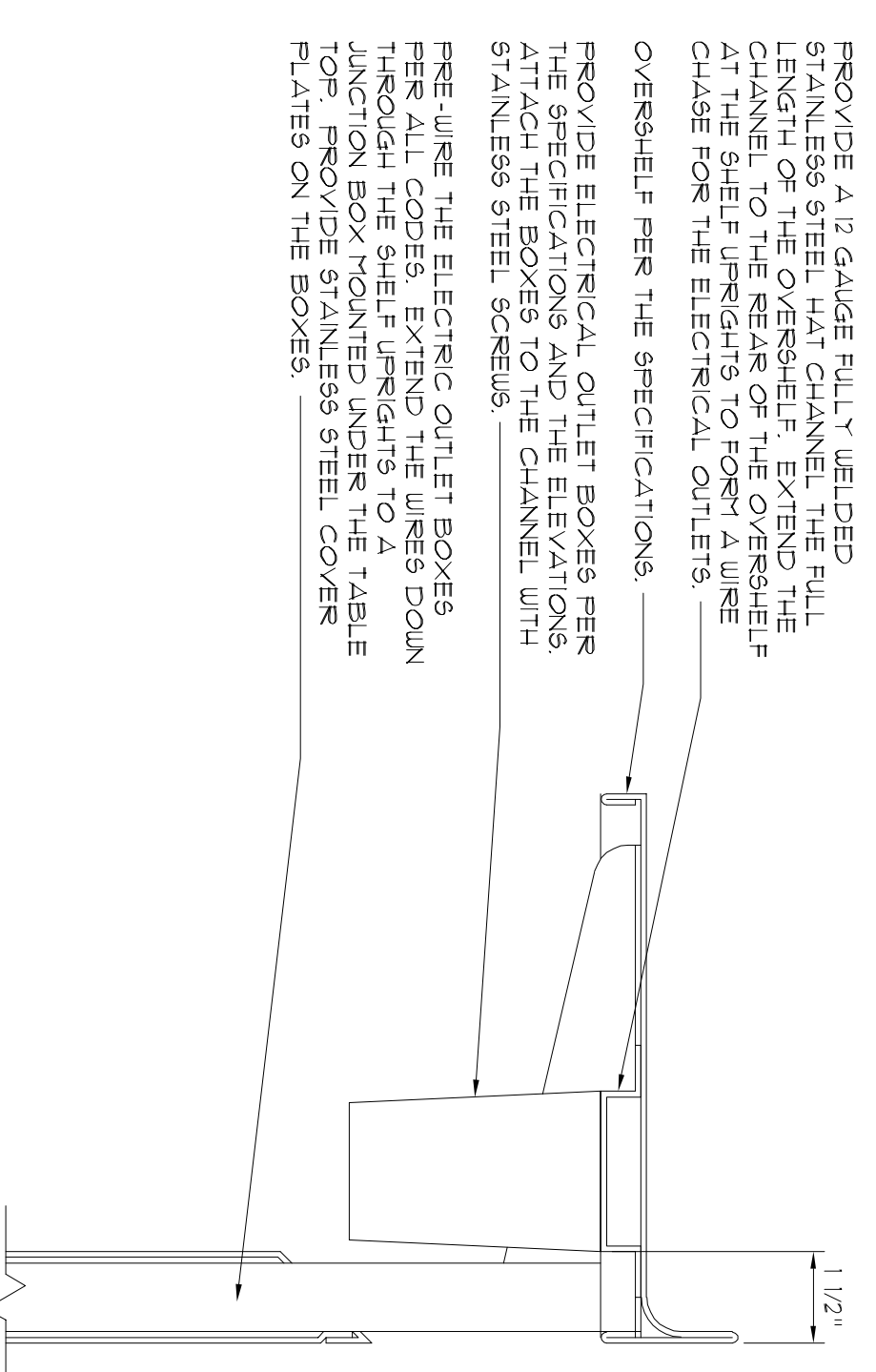
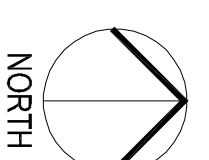
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FOODSERVICE EQUIPMENT ELECTRICAL CONNECTIONS PLAN

1/4" = 1'-0"

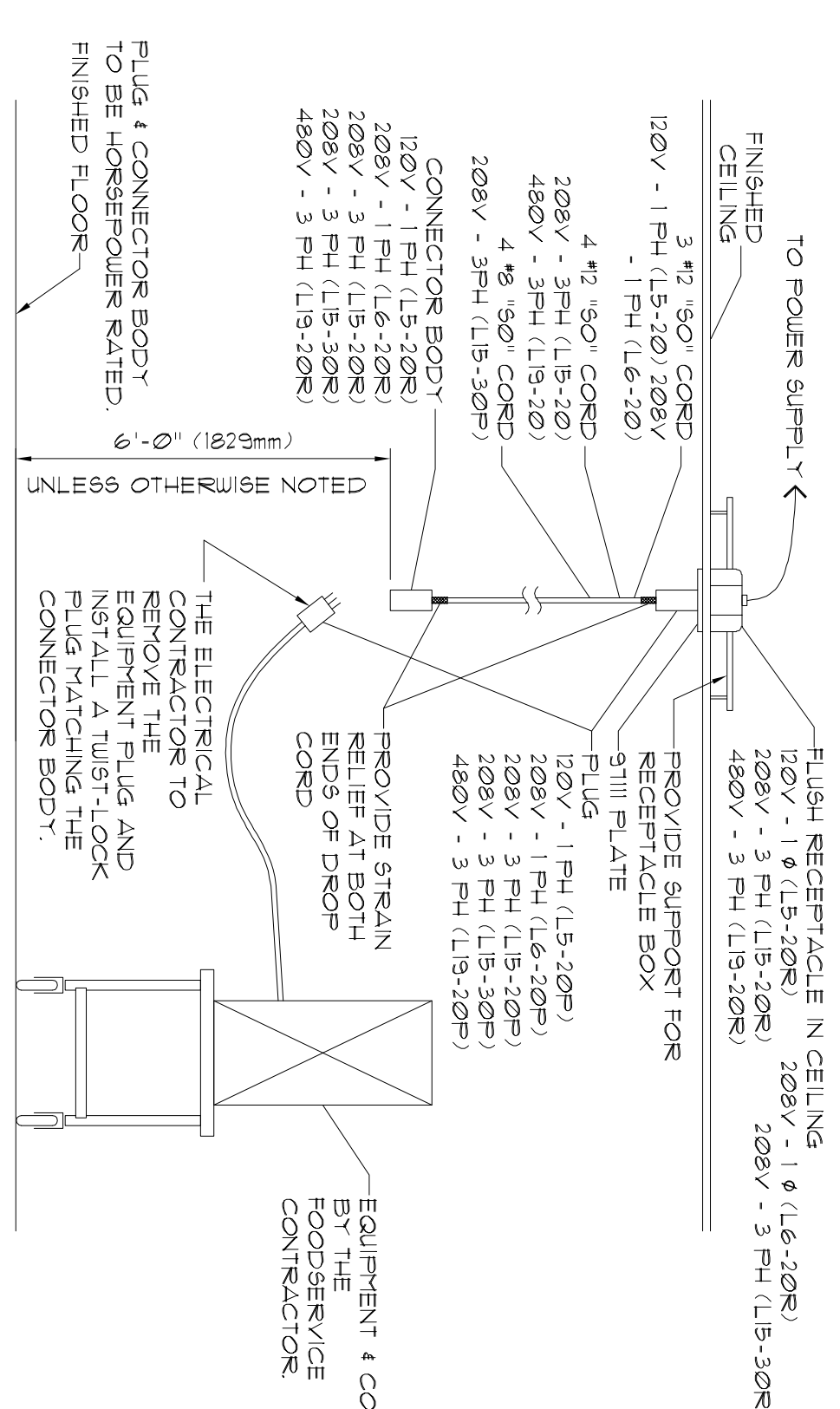


DETAIL - ELECTRICAL BOXES AT THE OVERSHELVES

NO SCALE

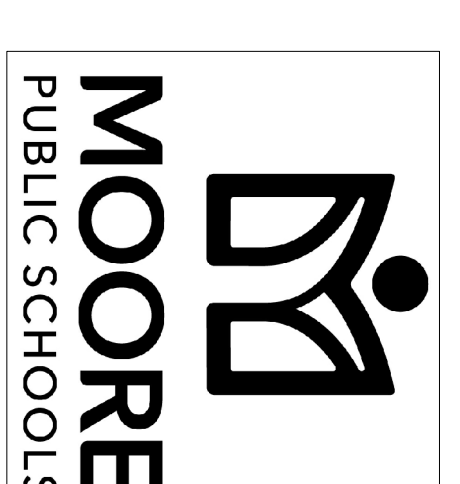
TYPICAL DETAIL DROP CORD RECEPTACLE

NO SCALE



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RS	revisions	Added Item #1	11/20/2024
RS	drawn by		
RS	checked by		
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PATENT NUMBERS
 EXHAUST HOODS ND-2/BD-2/SD-2 (CANADA) - CA PATENT 2520435 C

HOOD INFORMATION - JOB#7165196

HOOD TAG	MODEL	MANUFACTURER	LENGTH	DEPTH	MAY CODING	TYPE	APPLIANCE DUTY	DESIGN EXH CFM	TOTAL WIDTH	TOTAL LENGTH	EXHAUST PLENUM RISERS(S)	HOOD CONSTRUCTION	HOOD CONFIG						
1	6624 ND-2	CAPTIVARE	11' 11"	11"	600 DEG	1	HEAVY	210	2500	4"	16"	2500	1790	-1186"	SP	430 SS	END TO END	ALDNE	ALDNE

HOOD INFORMATION

HOOD TAG	TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	LIGHTS(S)		UTILITY CABINET(S)		ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE HANGING SYSTEM WEIGHT	HOOD HANGING WEIGHT		
								WIRE GUARD	AVERAGE FOOT COUNDS	LOCATION	SIZE					TYPE	SIZE
1	CAPTIVARE SOLID FILTER	8	16"	16"	95% SPEC	6	RECESSED ROUND	ND	S2	RIGHT	12"x66"x24"	TANK FS	40/40	SC-311100MA	1 FAN	YES	1149 LBS

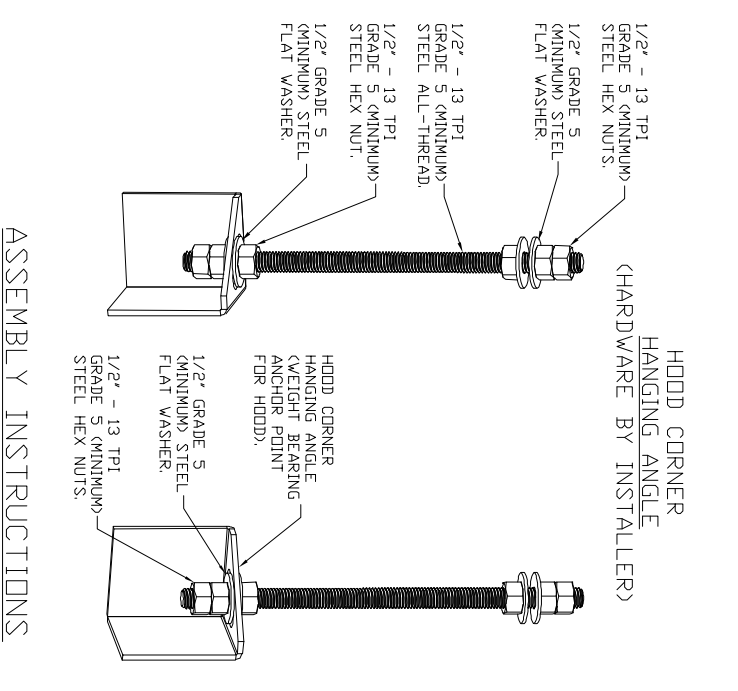
HOOD OPTIONS

HOOD TAG	FIELD WRAPPER	1800" HIGH FRONT, LEFT, RIGHT	22800" LONG	430 SS VERTICAL
1	BACKSLASH 18200"	1" WIDE	66" LONG	INSULATED
	INSULATION FOR TOP OF HOOD			
	INSULATION FOR BACK OF HOOD			
	LEFT VERTICAL END PANEL	27"	TOP WIDTH, 21"	BOTTOM WIDTH, 80" HIGH
	SS			INSULATED 430

CLEARANCE TO COMBUSTIBLES

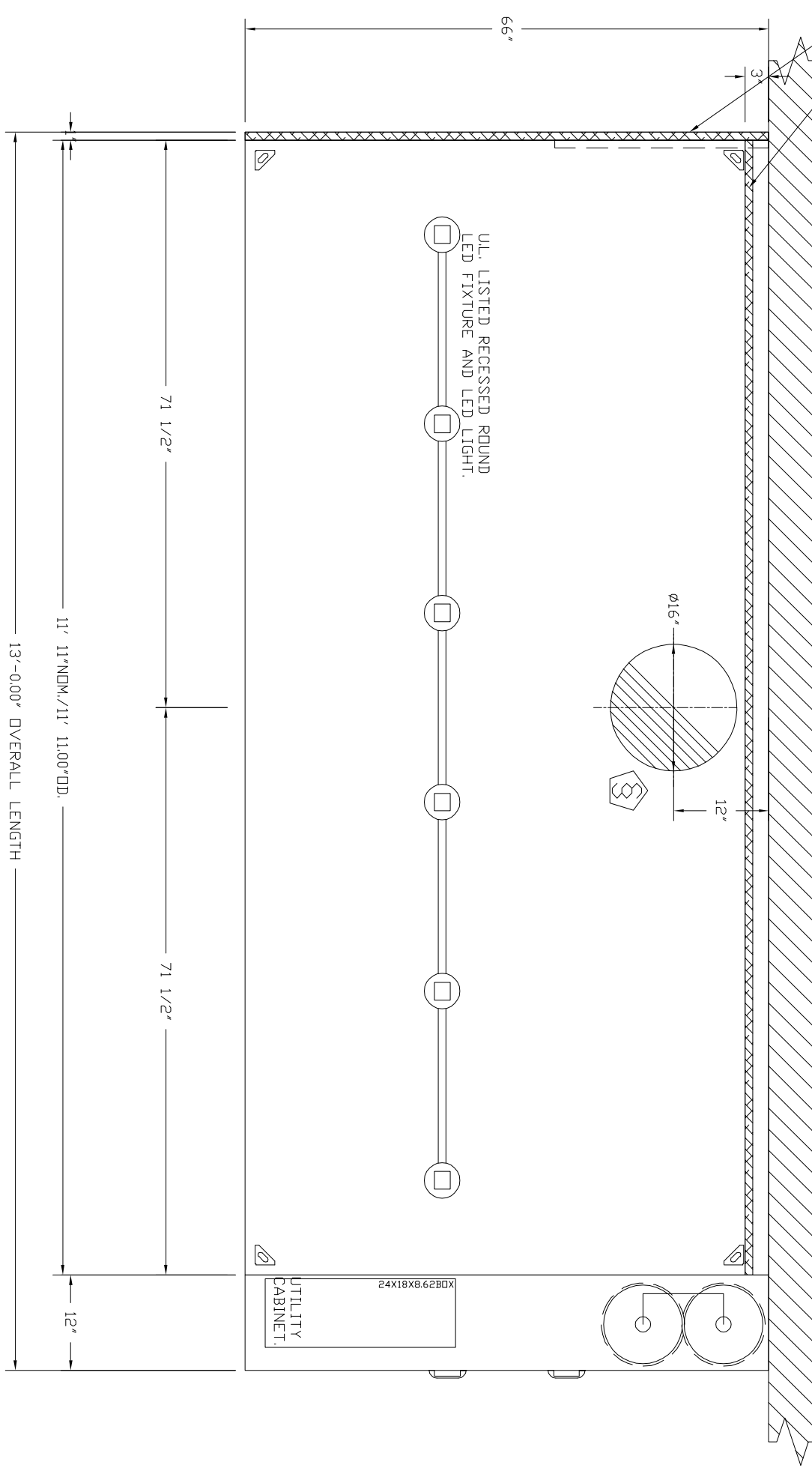
HOODS #	SURFACE	*CLEARANCE
1	TOP	0"
	FRONT	0"
	BACK	0"
	LEFT	0"
	RIGHT	0"

- *0" CLEARANCE TO COMBUSTIBLES CONFORMS TO UL710 STANDARD.
 - HOOD MOUNTED UTILITY CABINETS REQUIRE 36" SERVICE CLEARANCE.



HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TP1 GRADE 5 GRIPNUTS ALL-THEAD. SANDWICH HANGING ANGLE AND CEILING ANCHOR PLAINS WITH 1/2" GRADE 5 GRIPNUTS. GRADE 5 GRIPNUTS MUST BE SHOWN. MUST USE DOUBLE HEX NUT CONFIGURATION. HANGING ANGLE AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BETWEEN BOTTOM HEX NUTS. TROUBLE ALL HEX NUTS TO 57 FT LBS.

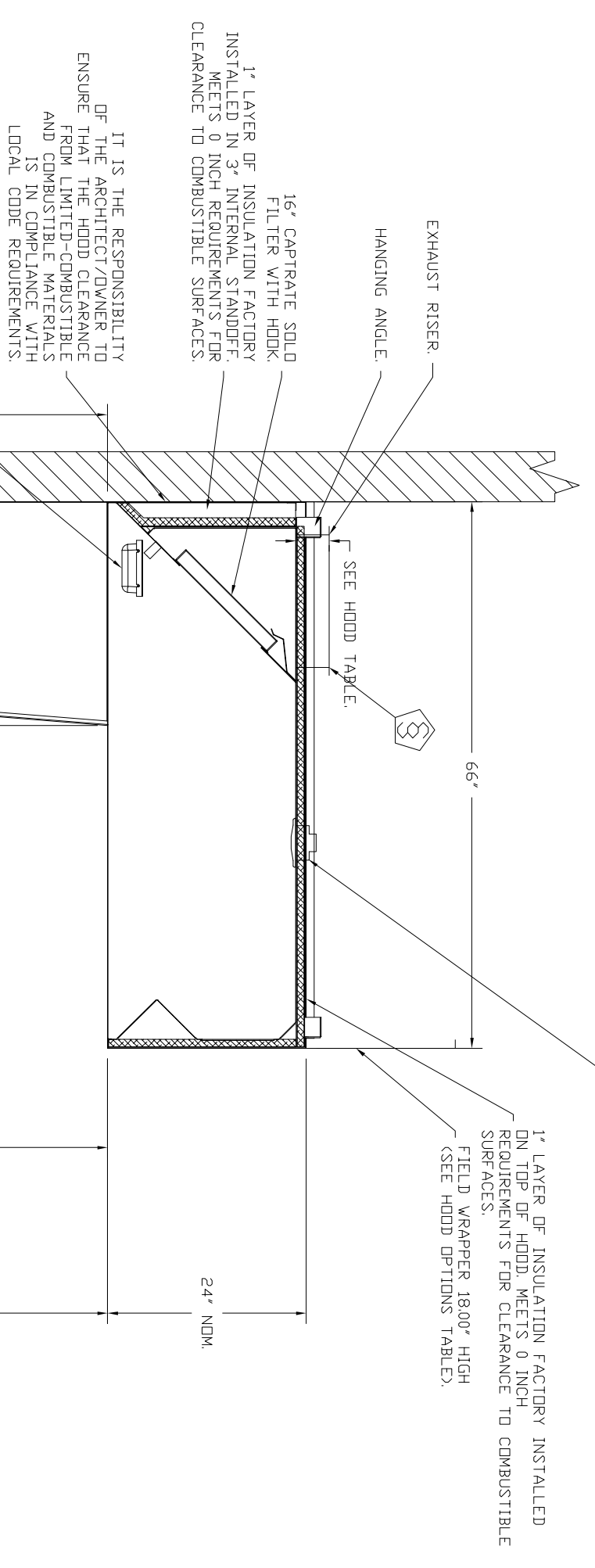
1" LAYER OF INSULATION FACTORY INSTALLED MEETS 8 INCH REQUIREMENTS FOR CLEARANCE TO COMBUSTIBLES FOR HOODS WITH INSULATION FACTORY INSTALLED IN HOOD STANDOFF PANELS TO COMBUSTIBLE SURFACES.



PLAN VIEW - HOOD #1
 11' 11.00" LONG 6624ND-2

VERIFY CEILING HEIGHT

HEIGHT REQUIRED TO VERIFY THAT HOOD FITS SPACE AND TO SIZE THE ENCLOSURE PANELS



SECTION VIEW - HOOD - #1
 HOOD - #1

REVISIONS

NO.	DESCRIPTION	DATE
1		



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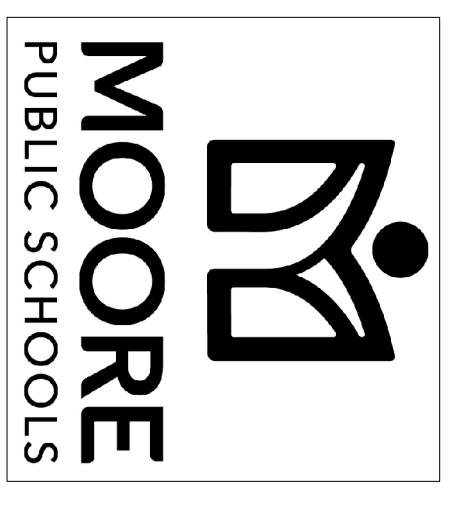
DATE: 11/13/2024
DWG.#: 7165196
DRAWN BY: R.JH-80
SCALE: 3/4" = 1'-0"
MASTER DRAWING
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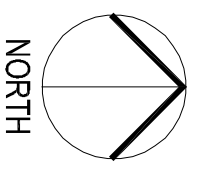
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RS	checked by
date	10/29/2024
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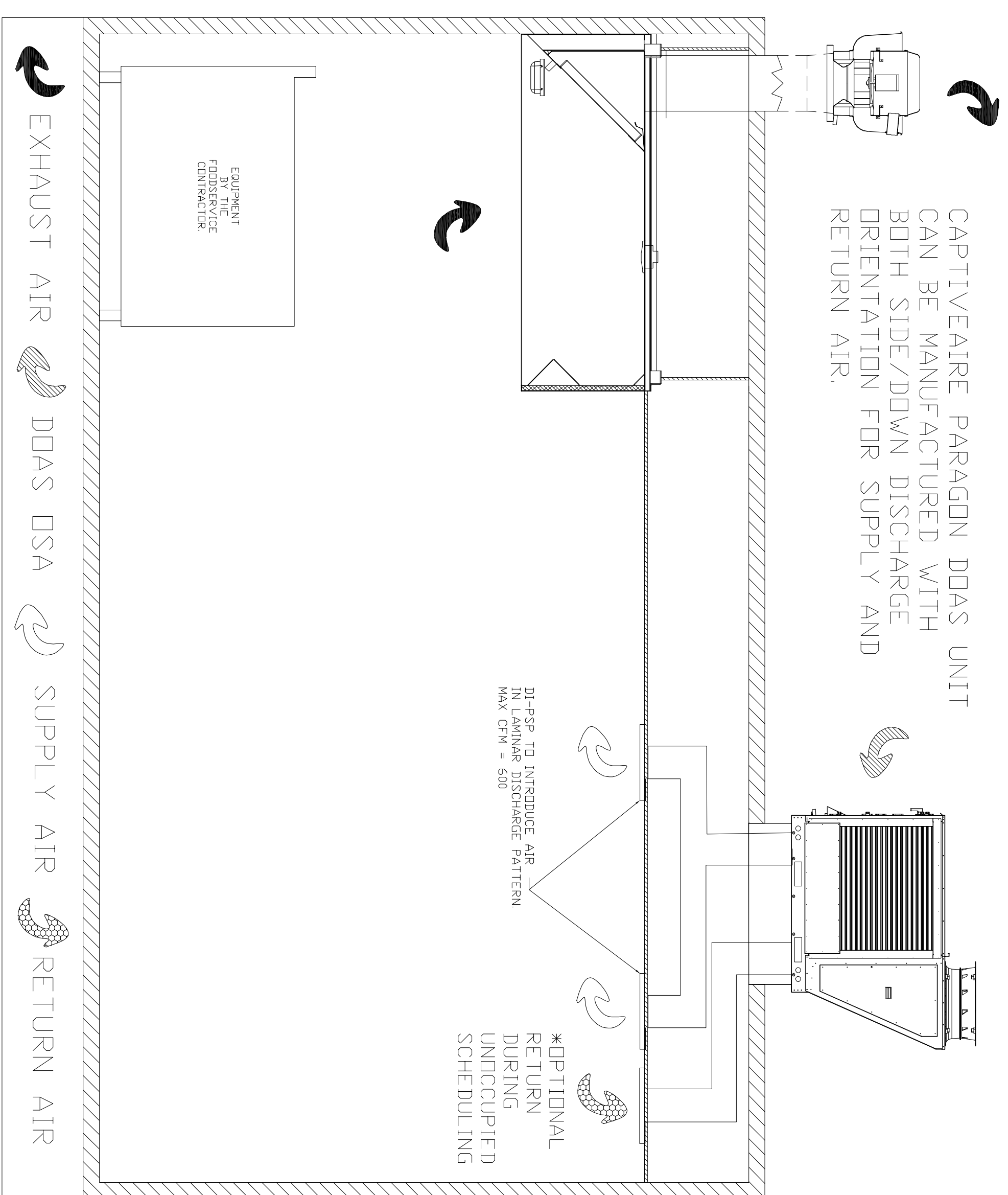
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FOODSERVICE EQUIPMENT VENTILATOR PLAN
 NO SCALE

CAPTIVEAIRE PARAGON DDAS UNIT
CAN BE MANUFACTURED WITH
BOTH SIDE/DOWN DISCHARGE
ORIENTATION FOR SUPPLY AND
RETURN AIR.



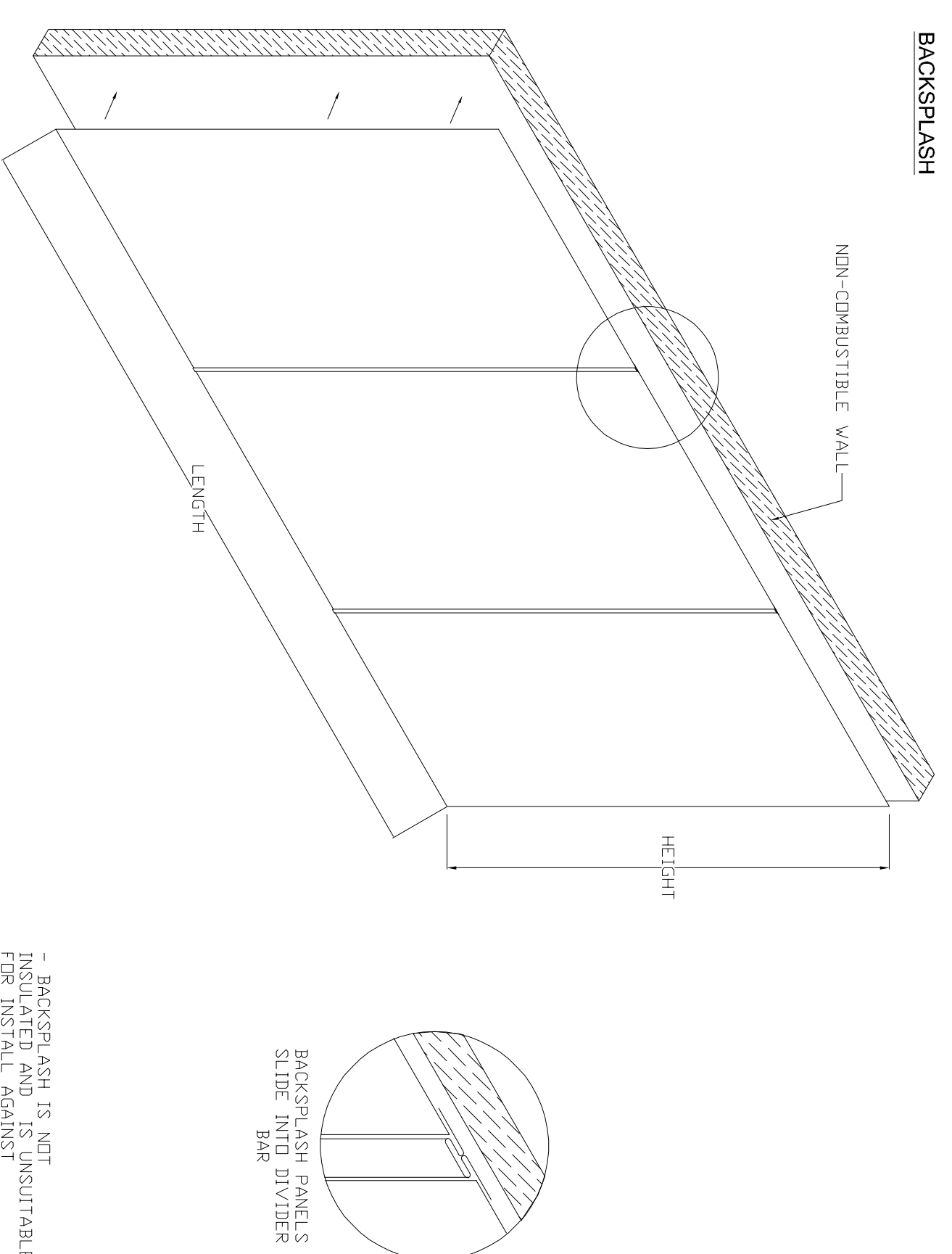
SEQUENCE OF OPERATIONS:
OCCUPIED SCHEDULING:

1. HOOD TURNS ON VIA BUTTON OR TEMPERATURE.
 2. DDAS, IF NOT ALREADY ON, WILL TURN ON AND MODULATE TO PROPER DSA CFM.
 3. DDAS TEMPERATURE AND HUMIDITY WILL MODULATE UNTIL WITHIN THRESHOLD.
 4. SYSTEM WILL STAY ON UNTIL TURNED OFF OR HEAT UNDER HOOD DISSIPATES.
- UNOCCUPIED SCHEDULING *IF OPTIONAL RETURN IS INCLUDED*:
1. EXHAUST FAN IS TURNED OFF VIA BUTTON OR TEMPERATURE.
 2. DSA DAMPER ON PARAGON DDAS WILL MODULATE PROPER POSITION (IF OPTIONAL RETURN INCLUDED).
 3. DDAS WILL ADJUST HEATING/COOLING REQUIRED TO PROPERLY TREAT DSA.
 4. DDAS RUNS IN RE-CIRCULATION MODE UNTIL HOOD IS ACTIVATED.

HVAC DISTRIBUTION NOTE

Diffuser throw/velocity guidance:

- ? Withing 0?-2? of hood - NO Diffusers
- ? Between 2?-5? from hood - 50 FPM at 80? AFF
- ? Between 5?-10? from hood - 75 FPM at 80? AFF
- ? Between 10?-15? from hood - up to 150 FPM at 80? AFF



REVISIONS	DATE

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Moore Public Schools Child Care
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Moore, OK, 73160

DATE: 11/13/2024
DWG.#: 7165196
DRAWN BY: RJH-80
SCALE: 3/4" = 1'-0"

MASTER DRAWING
SHEET NO. 2

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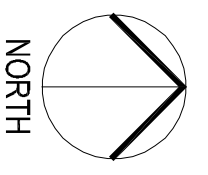
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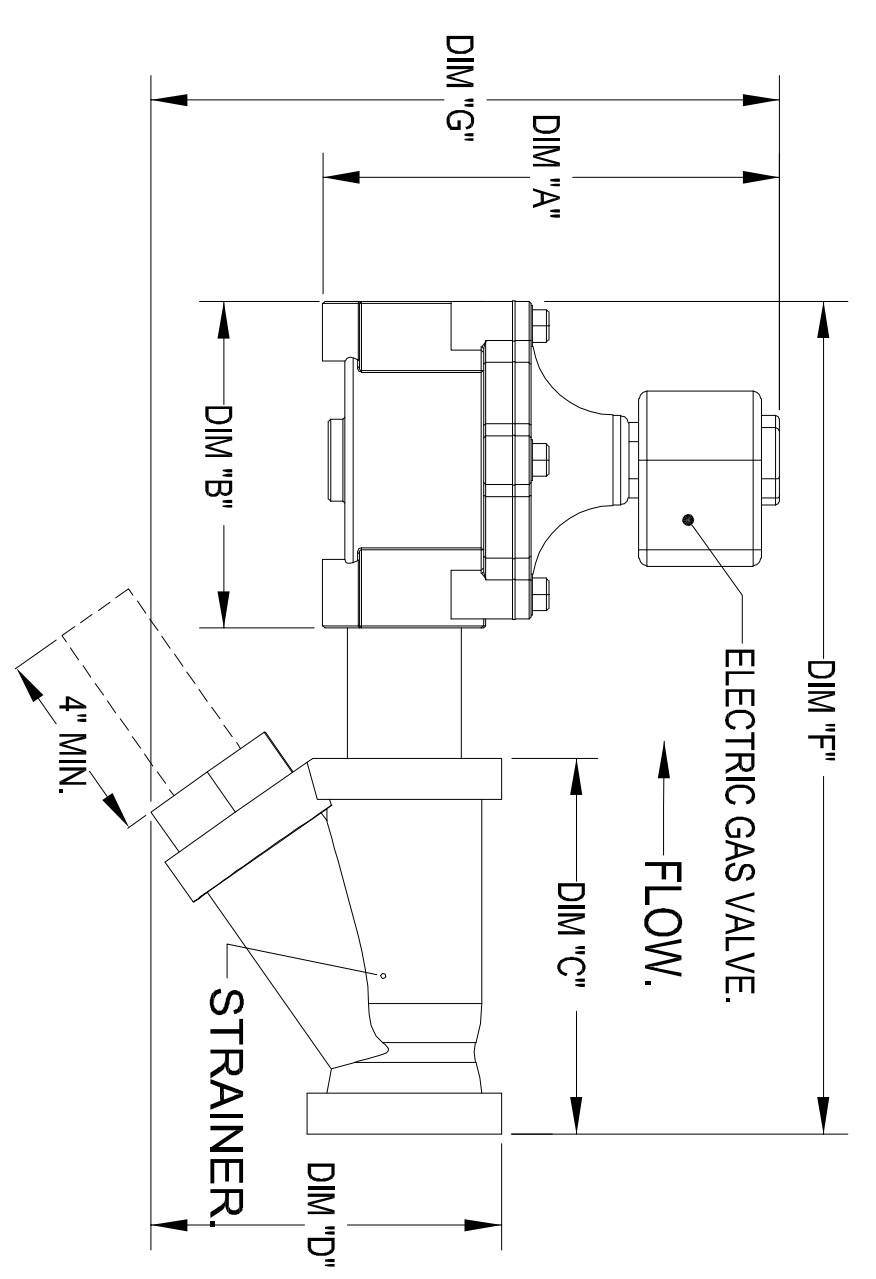
FOODSERVICE EQUIPMENT VENTILATOR PLAN
NO SCALE

FIRE SYSTEM INFORMATION - JOB#7165196				INSTALLATION	
FIRE SYSTEM TAG	TYPE	SIZE	MAX FP	DESIGN FP	SYSTEM LOCATION
1	TANK F.S.	4.0/4.0	40	37	FIRE CABINET RIGHT
					RIGHT, HOOD 1

GAS VALVES(S)			
FIRE SYSTEM TAG	TYPE	SIZE	SUPPLIED BY
1	SC ELECTRICAL	2.000	CAPTIVEAIRE SYSTEMS

FIRE SYSTEM PARTS LIST KEY		KEY NUMBER - PART DESCRIPTION		QTY BY FACTORY	QTY BY DIST.
0-0-0	TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.			1	0
0-0-0	TANK FIRE SUPPRESSION MAINTENANCE GUIDE UTILITY CABINET LABEL SHEET.			1	0
0-0-0	12-F28291-22144-01-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. ND.			1	0
	CLOSE DN TEMP. RISE #1 360°F. (A0094310).				
0-0-0	32-0002 QUIK SEAL - 1/2" (QL).			1	0
0-0-0	4429K153 1/2" MALE NPT TO 1/2" FEMALE NPT ELBOW, BRASS.			2	0
0-0-0	4429K422 1/2" X 1/4" BRASS REDUCING BUSHING.			1	0
0-0-0	79580 1/2" X 1/2" BRQ-PRESS. ELBOW WITH 1/2"NPT FEMALE CONNECTION, VIEGA.			1	0
0-0-0	79580 1/2" X 1/2" BRQ-PRESS. TEE X 1/2"NPT FEMALE CONNECTION, VIEGA.			2	0
0-0-0	87-12042-001 SECONDARY ACTUATOR VALVE (SVA) - SINGLE ACTUATOR, REQUIRES PRIMARY RELEASE ACTUATOR, TANK FIRE SUPPRESSION.			1	0
0-0-0	87-12045-001 HOSE, SECONDARY ACTUATOR HOSE, 75" BRAIDED STAINLESS STEEL, TANK FIRE SUPPRESSION.			1	0
0-0-0	87-30001-001 TANK - PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION ASSEMBLY, ONE NEEDED PER FIRE SYSTEM, SUPERVISED, TANK FIRE SUPPRESSION.			2	0
0-0-0	87-30030-001 PRIMARY ACTUATOR KIT (PAK) - ACTUATOR AND RELEASE SOLENOID ASSEMBLY, ONE NEEDED PER FIRE SYSTEM, SUPERVISED, TANK FIRE SUPPRESSION.			1	0
0-0-0	87-30032-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.			8	0
0-0-0	9055455PC PRD PRESS 1/2" PRESS X PRESS 90 ELBOW LD.			7	0
0-0-0	9097200PC PRD PRESS PEG#1 1/2" PRESS TEE LD.			7	0
0-0-0	986944115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.			4	0
0-0-0	A0034322 JUNCTION BOX FOR MANUAL PULL STATION, 15" DEEP BACK BOX, RED COULDR. NPT HALT, UNION, USED ON TANK SERVICE PDMT.			1	0
0-0-0	A31484 1/4" NPT SCRAPPER VALVE AND CAP, JB INDUSTRIES, 1/4" FLARE X 1/4" NPT HALT, UNION, USED ON TANK SERVICE PDMT.			1	0
0-0-0	B145 3/8" BLACK IRON 90 ELL.			3	0
0-0-0	B145 3/8" BLACK IRON 90 ELL.			3	0
0-0-0	DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.			2	0
0-0-0	TANK STRAP TANK STRAP - USED FOR TANK FIRE SUPPRESSION.			6	0
0-0-0	TFS-UTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.			2	0
0-0-0	WK-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.			2	0
16-16	79210 1/2" X 3/8" NPT MALE ADAPTER, VIEGA.			8	0
16-16	DL-F NOZZLE - TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLDV DFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE).			8	0
26-26	OSA-3/8 QUIK SEAL - 3/8" (QL).			8	0
34-34	A0034321 ZAVDC SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL STATION) WITH PROTECTIVE COVER, ONE (1) NORMALLY OPEN CONTACT, RED COULDR.			1	0

GAS VALVE SIZING				GAS VALVE DIMENSIONS				INSTALLATION		PART NUMBERS								
TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE (0 IN.W.C.)	MAX. INLET PRESSURE (5.98 IN.W.C.)	FLOW AT 1 IN.W.C. DROP NATURAL GAS (2.980/500 BTUHR)	FLOW AT 1 IN.W.C. DROP PROPANE (1.068/048 BTUHR)	DM "A"	DM "B"	DM "C"	DM "D"	DM "E"	DM "F"	DM "G"	DM "H"	MOUNTING ORIENTATION	GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
ELECTRICAL	2"	120 VAC	0 (IN.W.C.)	5.98 (IN.W.C.)	2.980/500 BTUHR	1.068/048 BTUHR	7.58"	6.48"	7.14"	7.13-16"	15.548"	13-15-16"		HORIZONTAL	8214280	4417K68	(S)EGVA2	



ELECTRIC GAS VALVES ONLY:
 3/4" 2" GAS VALVES MUST BE MOUNTED WITH THE SOLENOID IN ANY POSITION ABOVE HORIZONTAL, 2 1/2"±.
 2" GAS VALVES MUST BE MOUNTED WITH THE SOLENOID VERTICAL AND RIGHT.
 2" GAS VALVES MUST BE MOUNTED WITH THE SOLENOID VERTICAL AND DOWN.

ALL GAS VALVE/STRAINERS:
 PROPER CLEARANCE MUST BE PROVIDED IN ORDER TO SERVICE THE STRAINERS. A MINIMUM OF 4" CLEARANCE DISTANCE MUST BE PROVIDED AT THE BASE OF THE STRAINER. CUSTOMER MUST VERIFY BTU CONSUMPTION AS SPECIFIED ON STRAINER. SPECIFIC GRAVITY OF NATURAL GAS = 0.54.
 SPECIFIC GRAVITY OF LP = 1.52.

CALCULATIONS:
 TO CALCULATE GAS FLOW FOR OTHER THAN 1 IN.W.C. PRESSURE DROP NEW BTUHR = (BTUHR AT 1 IN.W.C. PRESSURE DROP) X NEW PRESSURE DROP.
 TO CALCULATE GAS FLOW FOR OTHER THAN 0.54 SPECIFIC GRAVITY NEW BTUHR = (BTUHR AT 0.54) X (NEW SPECIFIC GRAVITY).
 TO CALCULATE GAS FLOW FOR OTHER THAN 1 IN.W.C. PRESSURE DROP AND OTHER THAN 0.54 SPECIFIC GRAVITY NEW BTUHR = (BTUHR AT 1 IN.W.C. PRESSURE DROP) X NEW PRESSURE DROP X NEW SPECIFIC GRAVITY.

Moore Public Schools Child Care
 201 North Eastern Avenue,
 Moore, OK, 73160

DATE: 11/13/2024
 DWG.#: 7165196
 DRAWN BY: RJH-80
 SCALE: 3/4" = 1'-0"
 MASTER DRAWING

SHEET NO. 3

Tulsa Office
 12101 East 51st Street, Suite 101A, Tulsa, OK, 74146 PHONE: (918) 258 - 0291 FAX: 9182275947 EMAIL: reg90@captiveaire.com

REVISIONS	DATE

the Abila Griffin Partnership L.L.C.
 313 S. E. 5th Street
 MOORE, OK, 73160
 405.735.3477
 ACP@theACGP.net
 www.theACGP.net

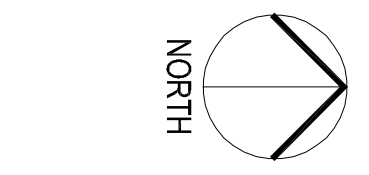
OWNER: CEDAR CREEK
 O&M: KFC ENGINEERING
 STRUCTURAL: SALAS O'BRIEN
 MECHANICAL/ELECTRICAL:

RS
 drawn by: RS
 checked by: 10290204
 date: 11/20/2024
 revisions:
 Addendum #1 11/20/2024

MOORE PUBLIC SCHOOLS

CHILD CARE FACILITY
 201 N. EASTERN AVE.

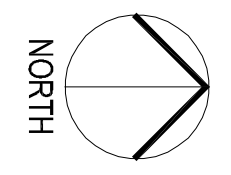
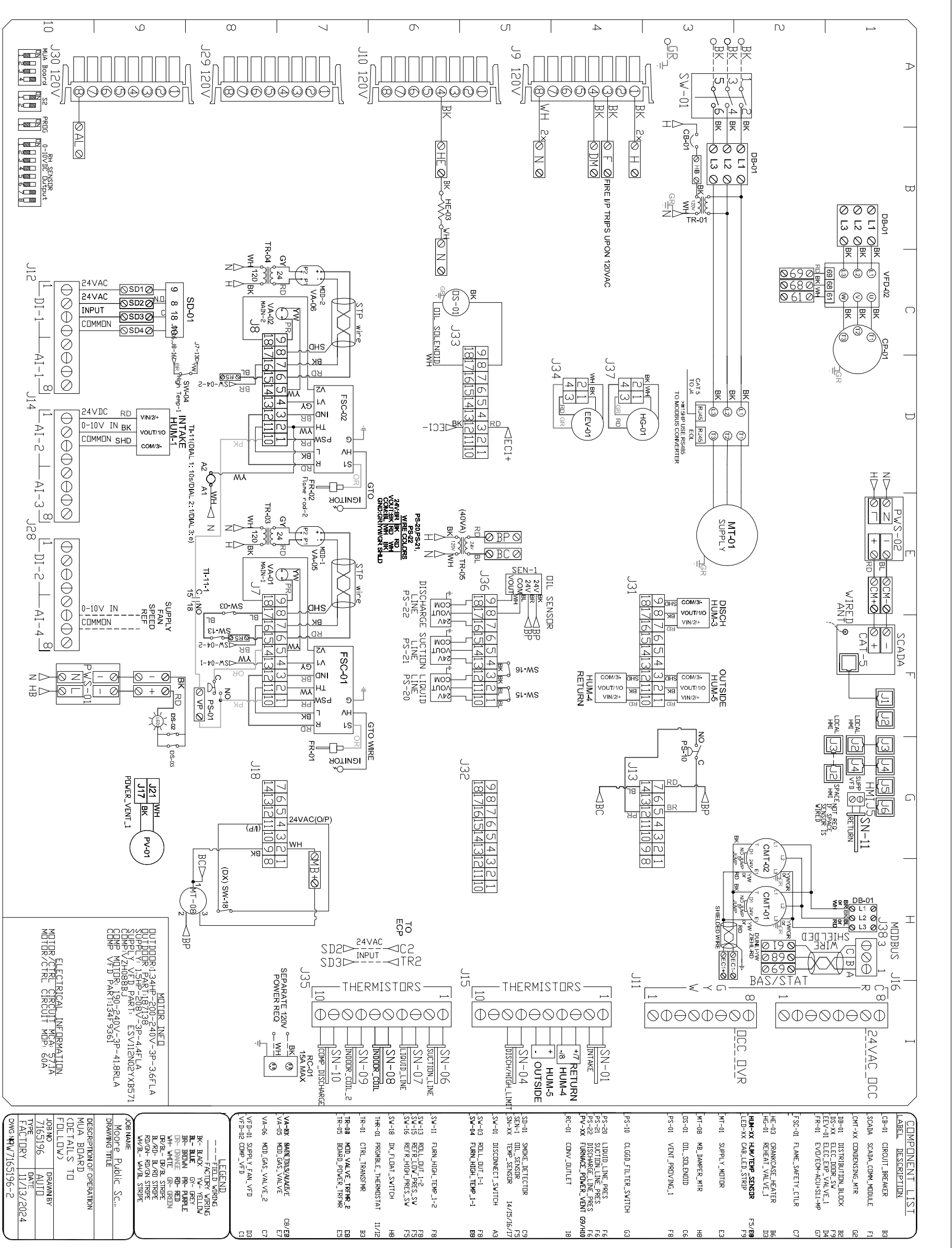
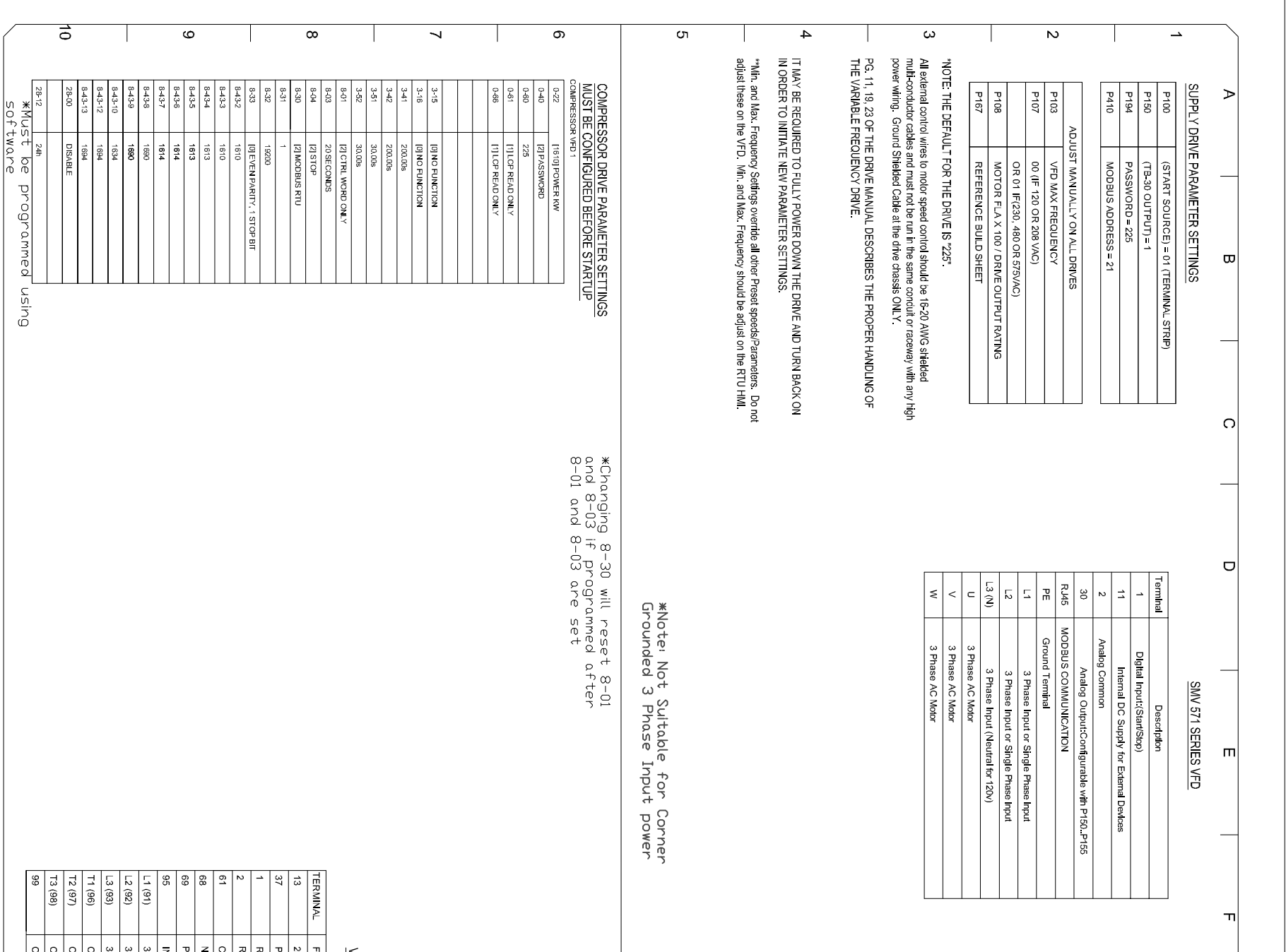
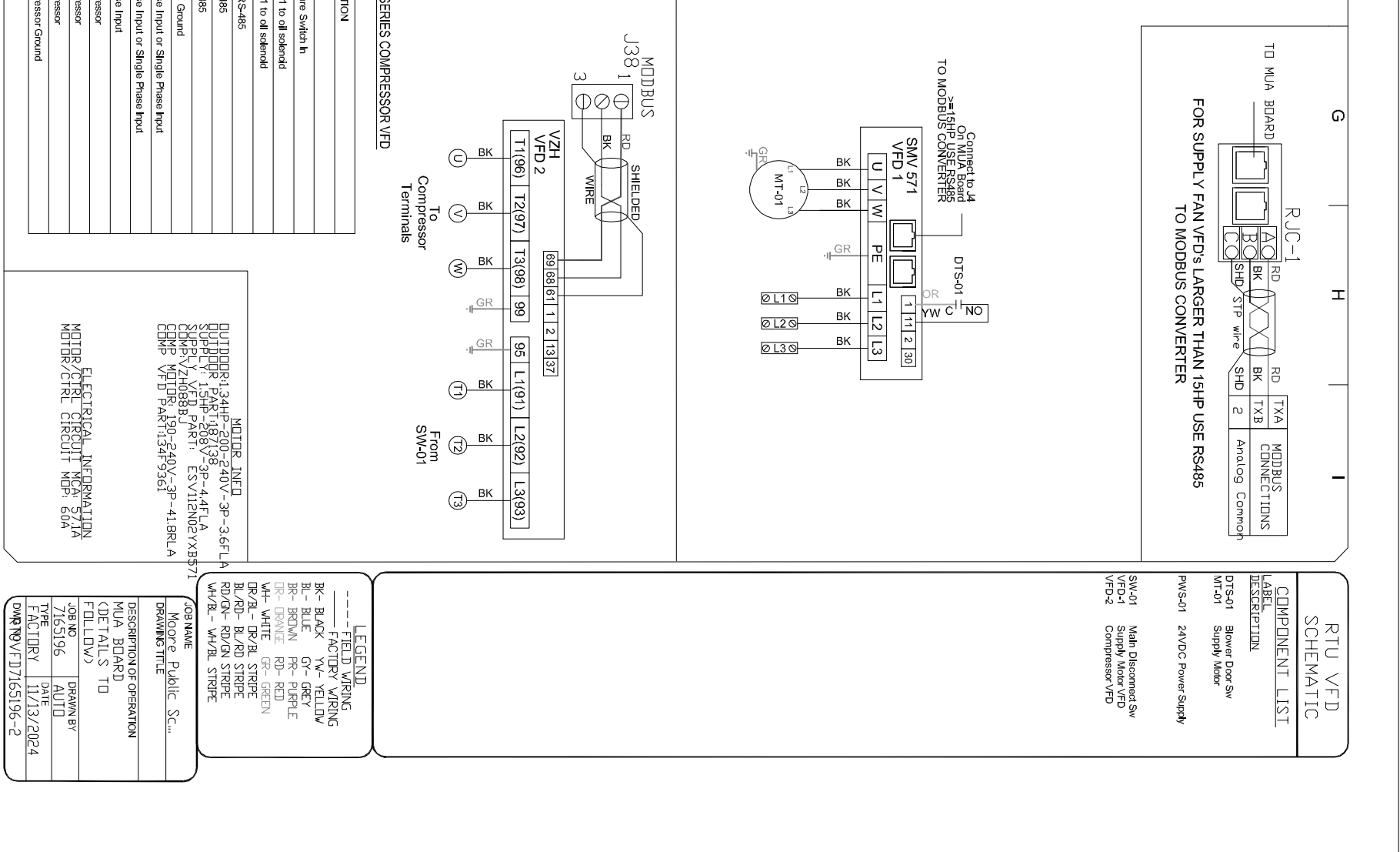
FS503



FOODSERVICE EQUIPMENT VENTILATOR PLAN
 NO SCALE

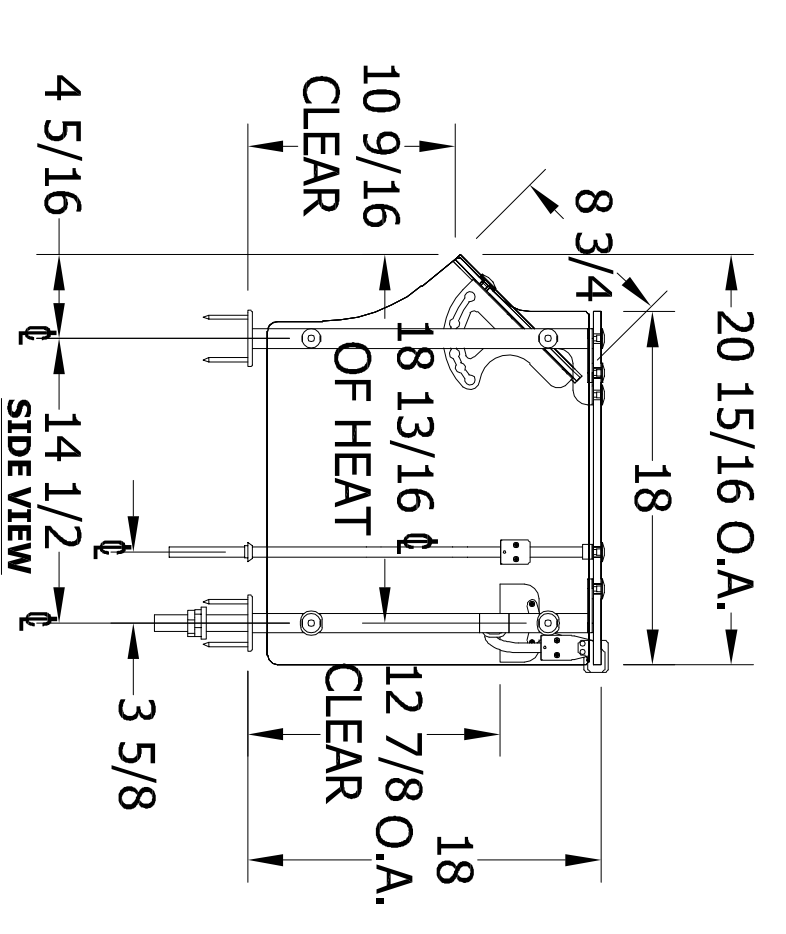
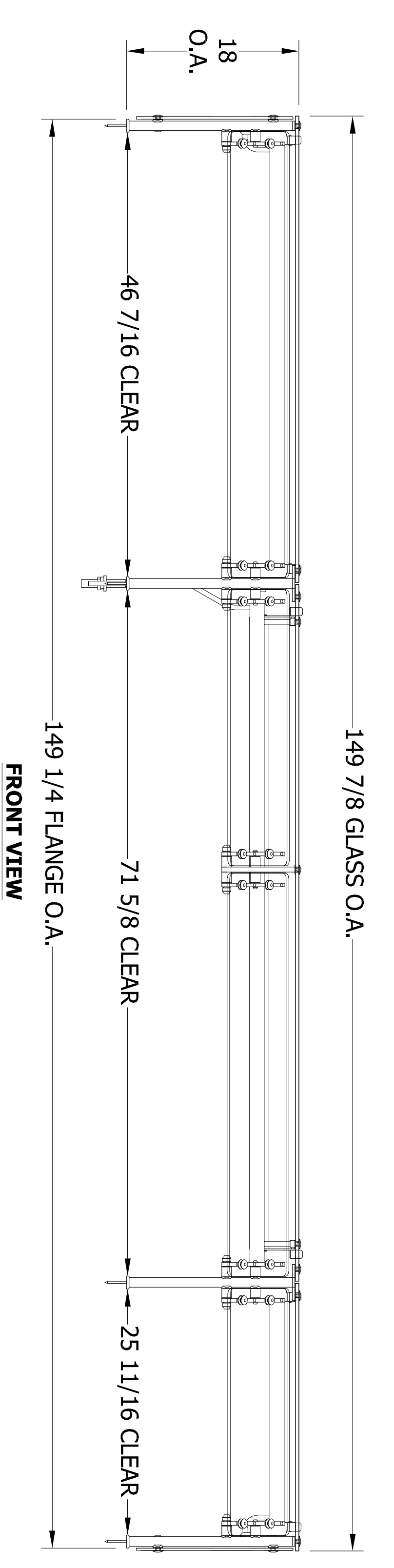
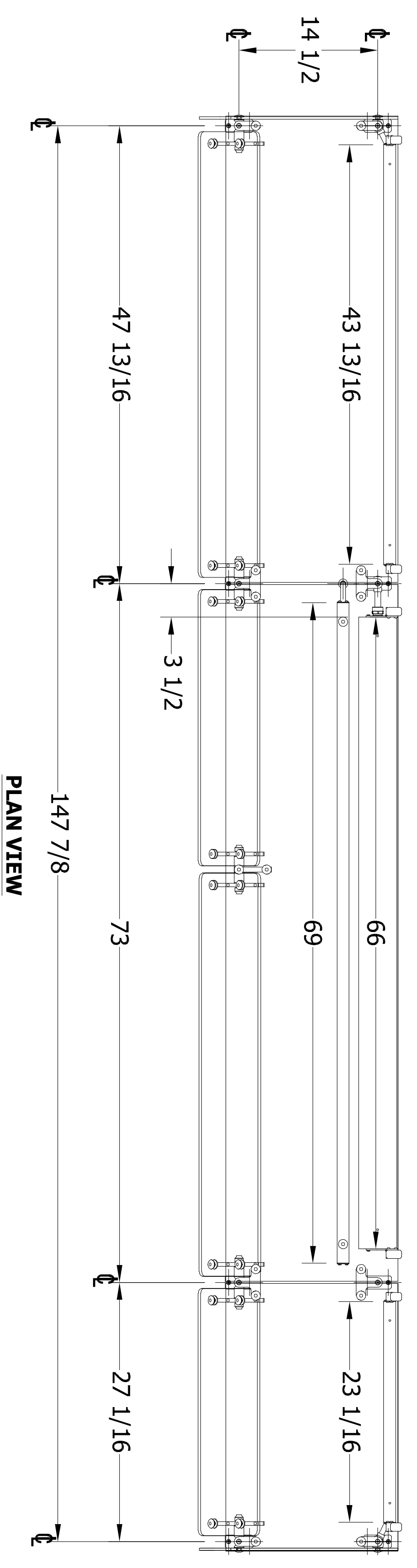
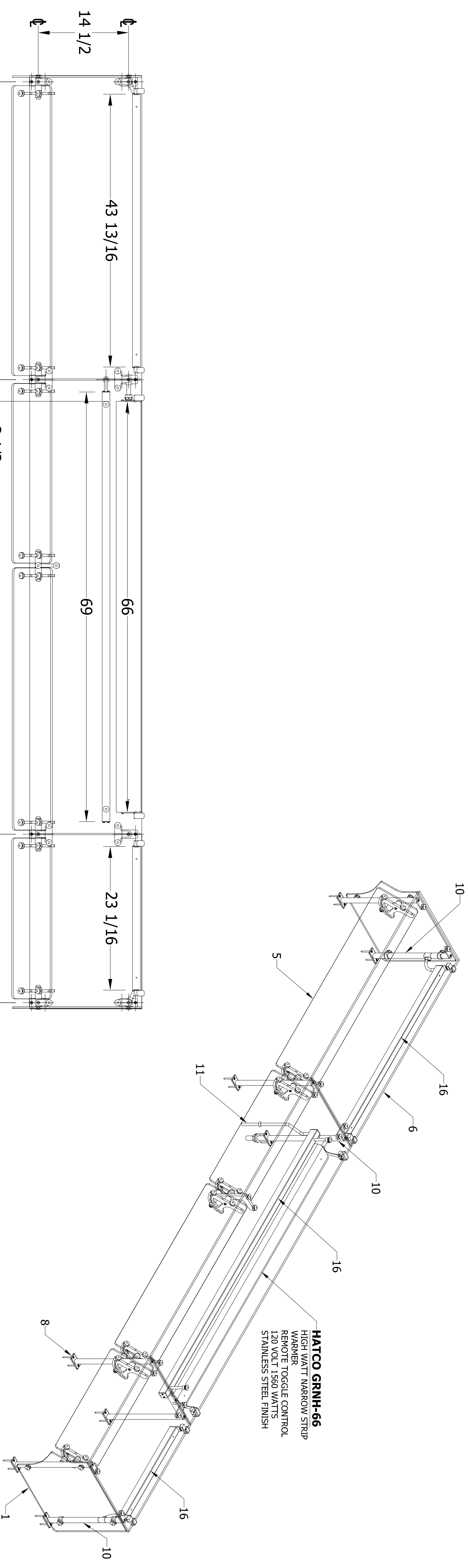
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NO.	DESCRIPTION	DATE
1	REVISIONS	
2		
3		
4		
5		



1

FOODSERVICE EQUIPMENT VENTILATOR PLAN
NO SCALE

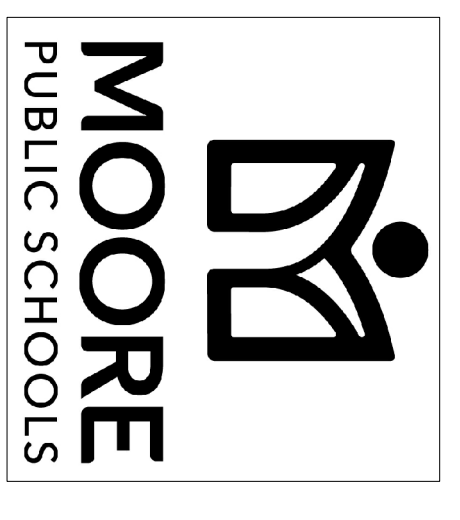


V-G
by Versa-Gard®
3663 Southland Drive
Flowerly Branch, Ga 30542
PH: 678-730-4155
FX: 678-730-2919

MODEL/ITEM:
1-#48A-VG3-SK-HTLED
FINISH:
SATIN CLEAR ANODIZED ALUMINUM

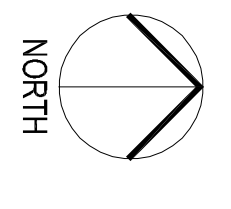
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PROJECT: MOORE PUBLIC SCHOOLS CHIL CARE	CLIENT: STURM CONSULTING	QTY.: 1	DRAWN BY: KW	DATE: 11/07/24	APPROVED BY:
	CUSTOMER PO: LOI		REVISED BY:	REV. DATE:	SHEET NO.: 1 OF 2



CHILD CARE FACILITY
201 N. EASTERN AVE.

FS801



1

FOODSERVICE EQUIPMENT SNEEZE GUARD PLAN
NO SCALE

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RS	drawn by
RS	checked by
10/29/2024	date
revisions	
Addendum #1	11/20/2024

SECTION 11 40 00
KITCHEN EQUIPMENT

PART 1 – GENERAL

1.01 SCOPE

- A. Include the work specified, shown or reasonably inferred as part of the foodservice equipment. Portions of the work may be subcontracted to those qualified to do the work as required by jurisdictional trade agreements and restrictions.
- B. Kitchen equipment furnished and installed by the Foodservice Contractor In the base bid.
- C. Provide itemized pricing providing both each pricing and total pricing for every item specified with a bid grand total.

1.02 RELATED SECTIONS

- A. Division 15 – Mechanical rough-ins, inter-connections of the equipment as required and final connections.
- B. Division 16 – Electrical rough-ins, inter-connections of the equipment as required and final connections.

1.03 QUALITY ASSURANCE

- A. All equipment and associated work must comply with all applicable laws, statutes, building codes and regulations of public authorities and comply with the following:
 - a. NSF (National Sanitation Foundation). All the equipment must bear the NSF label.
 - b. NEC (National electric Code).
 - c. UL (Underwriter’s Laboratories, Inc.).
 - d. AGA (American Gas Association Laboratories).
 - e. NFPA (National Fire Protection Association).
- B. The following are approved fabricators for providing the fabricated food service equipment:

Jero Manufacturing, Inc.
5117 South 100th East Avenue
Tulsa, Oklahoma 74115

Stainless Innovations
1110 Carnall
Fort Smith, Arkansas 72901

1.04 SUBSTITUTIONS

- A. Equipment items and the components specified are intended to be the basis of the bid. All other manufactures, including manufactures which may be listed as “alternates” or “approved equals” must conform with the specifications, size, accessories, etc. of the original manufacture specified.
- B. Proposed substitutions will be substituted no later then fourteen (14) days prior to the bid date. Submit the proposed substitutions with the manufactures specification or catalog sheets, shop drawings, etc. indicating all modifications required to conform to the specified items.

- C. Approved substitutions will be addressed in an addendum(s). Approved substitutions will be noted on the bid form as a substitution. All costs and fees for any design and engineering services required to make adjustments to the space, systems, utilities, etc. will be the responsibility of the successful bidder. All costs incurred for modifications of the utilities or construction or professional services will be the responsibility of the successful bidder.
- D. The Owner reserves the right to accept or reject any or all of the substitutions proposed before the execution of the contract.

1.05 DOCUMENT INTERPERTATION

- A. An addendum(s) will be issued addressing questions and comments from contractors, suppliers or vendors pertaining to the intent or clarity of the construction documents.
- B. All questions and comments will be submitted in writing by the contractors, suppliers and vendors for review.

1.06 SUBMITTALS

- A. Submit brochure books, rough-in drawings, fabrication shop drawings and manufactures shop drawings. Refer to the general specifications for the required quantities.
 - a. Brochures:
 - 01 Provide with a front and rear cover. Label the front cover with the project name.
 - 02 Provide a cover sheet for each item number. The cover sheet will indicate the item number, the item name, the quantity, the manufacture, all optional equipment and accessories, specified modifications, the utility requirements and any special instructions.
 - 03 The manufactures catalog specification sheets.
 - b. Submittal drawings:
 - 01 Indicate all equipment shown on the contract documents drawn at a 1/4" scale.
 - 02 The contract documents are not to be traced or reproduced.
 - 03 Provide an equipment schedule indicating all the equipment shown on the contract documents.
 - 04 Drawings to be submitted on the same size drawing sheet as the Contract Documents in a PDF format. Provide the necessary required hard copies of the reviewed/stamped document to the General Contractor. Submit the drawings separately from the Brochure Book.
 - c. Rough-in drawings:
 - 01 Indicate all equipment shown on the contract documents drawn at a 1/4" scale.
 - 02 indicate all general use and convenience utilities indicated on the contract documents.
 - 03 Include utilities shown on the contract documents but connected to equipment not furnished in this section.
 - 04 Fully dimension all the utilities for the plumbing, electrical and mechanical from the finished room surface to the point of the stub-up through the floor and the stub-out through the wall or ceiling.
 - 05 Drawings to be submitted on the same size drawing sheet as the Contract Documents in a PDF format. Provide the necessary required hard copies of

the reviewed/stamped document to the General Contractor. Submit the drawings separately from the Brochure Book.

- d. Manufacture's and fabricators shop drawings:
 - 01 Indicate all equipment shown on the contract documents drawn at a 3/4" scale for the plan views and elevations. All sections and details to be drawn at a minimum of 1 1/2" scale.
 - 02 Include the equipment name, the item number and the quantity on the drawings.
 - 03 Include all required and necessary sections, details and elevations to reflect the drawings and the specifications.
 - 04 Indicate all adjacent equipment, walls and columns.
 - 05 Include all necessary plumbing and electrical schematic drawings.
 - 06 Include any ventilation or access panels as required by the manufactures of the built-in equipment.
 - 07 Drawings to be submitted on the same size drawing sheet as the Contract Documents in a PDF format. Provide the necessary required hard copies of the reviewed/stamped document to the General Contractor. Submit the drawings separately from the Brochure Book.

1.07 COORDINATION OF THE PROJECT AND DATA

- A. Review the contract documents, rough-in drawings, shop drawings and brochure books for accuracy and completeness.
 - a. Notify the Architect of any conflicts and required adjustments in writing.
 - b. Coordinate the work with this section with the other sub-contractors on the job.
 - c. Submit paint, stain, plastic laminate, vinyl coated surfaces, molded plastic, natural stone, man-made stone and solid surface material to the Owner for approval.
 - d. Obtain serviceware samples for sizing and weight information from the Owner for coordination of all self-leveling equipment.
 - e. Coordinate all mobile equipment will go through doors, wall openings and roll-in/roll-thru equipment. Notify the Architect of all conflicts or deviations from the approved submittals in writing.

1.08 FIELD VERIFICATION OF THE PROJECT AND DATA

- A. Review the contract documents, rough-in drawings, shop drawings and brochure books for accuracy and completeness.
 - a. Field verify all the under-slab rough-in locations and quantities before the concrete slab is poured. Notify the Architect in writing of all conflicts or omissions of the rough-ins.
 - b. Field verify all the in-slab recess locations, sizes, depths and quantities before the concrete slab is poured. Notify the Architect in writing of all conflicts or omissions of the in-slab recess.
 - c. Field verify all the in-wall rough-in locations and quantities before the drywall is installed. Notify the Architect in writing of all conflicts or omissions of the rough-ins.
 - d. Obtain actual field dimensions or guaranteed measurements from the general contractor to insure the proper fit of the equipment at the job site. The dimensions shown in the contract documents are approximate. The dimensions are for the bidding process only.
 - e. Field check all dimensions, measurements job site conditions before the fabrication and/or delivery of equipment to the job site. Notify the Architect of all conflicts or deviations from the approved submittals in writing.

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- f. Coordinate any exterior wall openings required for the delivery of all oversized equipment with the general contractor. The equipment must be manufactured to fit through standard door openings if this cannot be done.

1.09 WARRANTY

- A. Provide manufacture's warranty on each piece of specified equipment.
- B. The warranty period will be for one year after acceptance from the Owner for parts and labor.
- C. The warranty period will be for five years after acceptance from the Owner for compressor bodies for refrigeration equipment.
- D. The warranty period will be for ten years after acceptance from the Owner for the walk-in panels.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Stainless steel.
 - a. All stainless steel to 18-8, type 304, polished to a 180 grit number 4 finish unless noted otherwise in the item specifications or in the drawings.
 - b. All seams and joints are to be heli-arc welded completely and free of flaws and pits. Grind the welds smooth and polish to a number 4 finish.
 - c. The grain of the stainless steel is to run the length of the equipment including the backsplash. Provide a polished miter look where the tops form a corner.
- B. Galvanized iron.
 - a. All seams and joints are to be heli-arc welded completely and free of flaws and pits. Grind the welds.
 - b. Thoroughly clean the welded and polished areas and prime and paint with Rustoleum in a color to match the metal.
- C. Sound deadening.
 - a. Apply 1/2" wide Schnee Butyl sealant rope continuously between all bracing/frame members and the underside of the table/counter tops, overshelves, wall shelves and undershelves.
 - b. Weld stud bolts to the underside of the tops, overshelves, wall shelves and undershelves. Tighten the stud bolts for maximum compression of the sound deadening. Trim any excess that extends from out of the bracing.
- D. Shop and field joints.
 - a. Field joints are to be used only when the equipment size must be limited for access into the building.
 - b. Indicate the field joint locations on the shop drawings.

PART 3 – EXECUTION

3.01 INSPECTION

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- A. Verify and test that all equipment is plumbed, wired correctly, true and in good working order. Do not use until turned over to the Owner.
- B. Protect all appliances from construction dirt until the project is turned over to the Owner.

3.02 DELIVERY

- A. Coordinate with the construction progress and the Owner's operation schedule. Unless otherwise instructed by the general contractor or the Owner, the following procedures apply.
 - a. Items that integrate into the building, such as, walk-in coolers and freezers, ventilators, hoods, equipment supports, ceiling mounted utensil racks, etc. will be sent to the job site after the building is water tight and directed by the general contractor. Protect the equipment as required after installation is complete.
 - b. All the additional fixed equipment and mobile equipment requiring plumbing and electrical final connections will be delivered to the job site after the completion of the finished floor, wall finish, ceiling grid and tile or drywall and paint and the lighting system.
 - c. The remaining mobile equipment will be delivered to the job site after the equipment can be inventoried and secured in a lockable area. If a secured area is not available, deliver the equipment when the job site when the installation is completed and the equipment clean-up process have been completed.
 - d. Small counter item, pans, flatware containers, etc. will be delivered only when the Owner is ready to receive and inventory the items.

3.03 INSTALLATION

- A. Provide a competent supervisor at the job site during the entire installation process.
- B. Install the equipment per the manufacture's recommendations. Install the equipment square and level. All equipment shall be ready for the final connections.
- C. Protect the equipment after the installation process is complete.
 - a. Protect the custom fabricated equipment with fiberboard or plywood taped to the tops and exposed body surfaces.
 - b. Protect the buy-out equipment with fiberboard or plywood taped to the tops and exposed body surfaces.
 - c. The general contractor must insure the equipment is not used by other sub-contractors as work tables, scaffolding, tool and material storage, etc.
- D. Provide and install 18 gauge stainless steel trim at all gaps between the equipment and the walls and/or other high equipment when the gap is larger than 7/16 of an inch wide. Turn the trim down 90 degrees at the equipment splashes, top and/or turn downs. Attach the trim with hidden fasteners and seal with silicone caulking.

3.04 CLEAN AND ADJUST

- A. Leave the work area clean and free of debris.
- B. Remove or replace panels, parts or frames that are bowed, warped, dented or scratched as a result of manufacturing defects, shipping and delivery to the job site.
- C. The Foodservice Contractor is to deliver the foodservice equipment to the job sits, uncrate the equipment, remove all packing materials from the equipment, set the equipment into place per the floor plan and the job site conditions, level the equipment and make ready for

final connection by the Mechanical, Plumbing and/or Electrical Contractor. All crating materials are to be removed from the job site by the Foodservice Contractor.

- D. The Foodservice Contractor will final clean (not sanitizing) the foodservice equipment and seal the fixed foodservice equipment to the adjacent walls and/or fixed equipment with silicone caulking after all the utilities have been connected. The caulking will be neat, smooth and level with the foodservice equipment. Concaved caulking will be rejected. Remove any smeared caulking from the foodservice equipment and adjacent surfaces.

3.05 SERVICE MANUAL

- A. Provide manufacture's warranties and operating manuals on all appliances over to the Owner.
- B. Each appliance shall have operating instructions and maintenance information.
- C. The Foodservice Contractor will furnish to the Owner three (3) copies of an owner's and operations manual. The manual will be in three ring binders. The manuals will include a cover sheet for each equipment item, warranty information sheets, manufactures specification sheets and the service agent's name, address and telephone number.
- D. All warranties are not to begin until after the Owner accepts successful completion of the Start-up Demonstration and the kitchen.

3.06 EQUIPMENT DEMO AND START UP

- A. The Foodservice Contractor must test, adjust and regulate all the equipment per the manufacturer's instructions.
- B. The Foodservice Contractor will schedule, at the Owner's convenience, a date and time to demonstrate the foodservice equipment to the Owner. The Foodservice Contractor will start up and check out the foodservice equipment before the equipment is demonstrated to the Owner.

PART 4 – EQUIPMENT

ITEM NO. 01 - AIR CURTAIN (1 REQUIRED)

Mars Air Systems model NH248-1UA-TS with all the standard features. Mount with stainless screws per the manufactures requirements.

Accessories

- 1 ea. 120 volts, single phase with a cord and plug.
- 1 ea. Model 99-014 level 1 control package.
- 1 lot Model J2272 filter kit.

ITEM NO. 02 - LOCKERS BY THE GENERAL CONTRACTOR

ITEM NO. 03 - MOP SINK (1 REQUIRED)

Eagle Group model F1916-12 floor mounted stainless steel mop sink with all the standard features.

Accessories

- 1 ea. T & S model B-0665-BSTR faucet.
- 1 ea. Model 312689 mop hanger.

1 ea. Model 321561 hose & hanger.

ITEM NO. 04 - CHEMICAL STORAGE SHELVING (1 LOT REQUIRED)

Quantum model WIRE storage shelves. Locate the bottom shelf at 10" above the finish floor. Verify the location of the remaining four (4) shelves with the Owner prior to assembly.

Accessories

5 ea. Model 1236C shelves.
4 ea. Model P86C posts.

ITEM NO. 05 - WASHER BY THE OWNER

ITEM NO. 06 - DRYER BY THE OWNER

ITEM NO. 07 - LINEN WALL SHELVING (4 REQUIRED)

Quantum model WC34-CB1460P with all the standard features. Mount the bottom shelves at 48" above the finished floor and the upper shelves at 54" with stainless steel screws.

ITEM NO. 08 - HAND SINK (3 REQUIRED)

Eagle Group model HSA-10 with all the standard features.

Accessories

3 ea. Model 300886 drain assembly.
3 ea. Model LRS left and right hand splash on the sinks.
3 ea. Component Hardware Group, Inc. model KL45-4002-RE1 faucets.
3 ea. Component Hardware Group, Inc. model KN91-0100 quik-wash faucet control. Install on the faucets.

ITEM NO. 09 - CLEAN DISHTABLE (1 REQUIRED)

Custom fabricated clean dishtable to be constructed per drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under top with fully welded closed ends where they are exposed. Sound deadened between top and underbracing.

Features:

- 01 Provide with a 10" high x 2" thick backsplash at walls. Attach back splash to wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 3" high rolled rim at exposed sides. Locate top of rolled rim 3'-1" above finish floor.
- 03 Provide type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel bullet feet. Fully weld the leg sockets the underbracing.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at rear and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.

ITEM NO. 10 - NUMBER NOT USED

ITEM NO. 11 - DISHWASHER WITH BOOSTER HEATER (1 REQUIRED)

CMA Dishmachines model 180-VL with standard features.

Accessories:

- 1 ea. 208 volts, three phase.
- 1 ea. Built-in booster heater.
- 1 ea. Electric heat.
- 1 ea. Provide with a 3/4" brass pressure regulator.
- 1 ea. Model 117009 shock arrestor.
- 1 ea. Model 116751 drain water tempering kit.

ITEM NO. 12 - SOILED DISHTABLE & POT SINK (1 REQUIRED)

Custom fabricated soiled dishtable & pot sink to be constructed per drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing. Extend the top through the pass-through window. Provide a 1" high marine edge at the opening.

Features:

- 01 Provide with a 10" high x 2" thick backsplash at walls. Attach back splash to wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 3" high rolled rim at exposed sides. Locate top of rolled rim 3'-1" above finish floor.
- 03 Provide a 1'-9" x 1'-9" x 12" deep 14 gauge type 304 stainless steel scrap sink welded integrally into top and 12 gauge type 304 stainless steel fully welded rack guide.
- 04 Provide an 8" wide x depth per drawings scrap trough at scrap sink. Slope the trough to collector per drawings. Provided a hinged silver saver in trough located near scrap sink. Pre-pipe trough per drawings.
- 05 Provide a 6" wide x 2" deep 14 gauge type 304 stainless steel scupper drain welded integrally into top. Provide a removable fully welded stainless steel basket with a perforated bottom. Full weld two (2) 1/4" stainless steel grab rods across the width in two places.
- 06 Provide three (3) 26 1/2" front-to-back x 21" x wide x 11" deep sink compartments constructed with 14 gauge type 304 stainless steel fully welded integrally into the top.
- 07 Provide type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel bullet feet. Fully weld the leg sockets the underbracing.
- 08 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at rear and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 09 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 07 Provide trash can space under top per drawings.
- 08 Provide a 7'-1" long cantilevered 16 gauge type 304 stainless steel slanted rack shelf with a 7'-1" long x 1" diameter rail fully welded stainless steel cantilevered rack storage shelf. Provide adjustable socket mounts on uprights for shelves. Attach uprights to wall at upright top. Mount slant rack shelf 1'-4" above rolled rim and mount rack storage shelf 1'-9" above slanted rack shelf.

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- 09 Provide 1'-1" wide x length indicated on the drawing x 1" diameter fully welded stainless steel three-bar wall shelf at the sinks. Mount the rail shelf 1'-9" above the work surface.
- 10 Support the shelf with 12 gauge type 304 stainless steel angled brackets fully welded to the uprights
- 11 Provide a 14 gauge type 304 stainless steel wall panel behind the shelf per the drawings. Attach the panel to the wall with industrial adhesive.

Accessories:

- 1 ea. Component Hardware model E38-1012 basket drain in scrap sink.
- 1 ea. Component Hardware model E18-1822 basket drain in scupper drain.
- 3 ea. Fisher model 2906 water inlets.
- 1 ea. Fisher model 2905 water inlet.
- 2 ea. T & S model B-0290 faucets.
- 3 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 3 ea. Component Hardware model J19-4962 brackets.

ITEM NO. 13 - HOSE REEL (1 REQUIRED)

T & S Brass model B-1433-01M-QDS hose reel with standard features. Mount to wall with stainless steel fasteners near ceiling per manufacturer's requirements. Center spray valve over scrap sink.

Accessories:

- 2 ea. Model B-CVH1-2 check valves. Provide to plumbing contractor for installation into water lines.
- 2 ea. Model B-0109-01 wall brackets. Mount to wall with stainless steel screws.

ITEM NO. 14 - MOBILE SILVERWARE SOAK SINK (2 REQUIRED)

Piper Products/Servolift Eastern model 337-3474 with all the standard features.

ITEM NO. 15 - TRASH CAN (5 REQUIRED)

CFS Brands model 34103223 trash can in a gray color. NSF listed.

Accessories

- 5 ea. Model 34103323 GY lid for in a gray color. NSF listed.
- 5 ea. Model 3691003 dolly in a black color.

ITEM NO. 16 - MEAL TRANSPORT CARTS (4 REQUIRED)

Renfro Industries Inc. model SUCER1827-3 with all the standard features.

ITEM NO. 17 - CAN RACK (1 REQUIRED)

New Age model 1250CK with all the standard features.

ITEM NO. 18 - STORAGE SHELVING (1 LOT REQUIRED)

Quantum model WIRE storage shelves. Locate the bottom shelf at 10" above the finish floor and the remaining four (4) shelves at 17" O.C. at the balance of the shelving.

Accessories

- 5 ea. Model 2130P shelves.
- 6 ea. Model 2142P shelves.
- 18 ea. Model 2154P shelves.
- 5 ea. Model 2160P shelves.
- 32 ea. Model P86P posts.
- 4 ea. Model FP foot plates. Mount the foot plates to the floor with stainless steel fasteners. Locate the foot plates on the units at the ingredient bins.

ITEM NO. 19 - MOBILE DUNNAGE RACKS (1 REQUIRED)

New Age mobile dunnage racks with all the standard features.

Accessories

- 1 ea. Model 1206 with all the standard features.
- 1 set. Provide with all swivel polyurethane tired casters with brakes.
- 1 ea. Model 1174 handles. Shorten the handle to 42" above the finished floor installed height.

ITEM NO. 20 - MOBILE BREAD RACK BY THE VENDOR

ITEM NO. 21 - WALK-IN COOLER & FREEZER (1 REQUIRED)

The walk-in cooler & freezer to be manufactured by Thermo-Kool. The walk-in cooler & freezer to be 24'-10" x 7'-11" x 9'-3" high per the drawings and proposal number Q44596-55. Provide a 4" thick insulated panel floor. Provide stucco aluminum on the exterior and interior of the unit and white stucco aluminum on the ceiling.

Features

- 01 Provide two (2) hinges on the doors.
- 02 Two (2) vapor proof lights.
- 03 Foot treadle at the doors.
- 04 One (1) 14" x 24" heated peep window in each door.
- 05 Two (2) pressure relief vents.
- 06 EC motors on the evaporator coils.
- 07 Provide wall trim and a closure panel constructed of stucco aluminum.
- 08 Provide all necessary refrigeration lines (hard copper), refrigerant and labor from the evaporator to the refrigeration rack system located on the ground.
- 09 All refrigerant line runs to be on the exterior of the walk-in with short runs only from the evaporators to above the ceiling. Seal the holes for the lines with a spray foam insulation to make an air-tight seal. Provide stainless steel or chrome covers at all exposed penetrations.
- 10 14 Gauge fully welded stainless steel bumper rails pre drawings and details on the exposed exterior walls and doors.
- 11 Provide 14 Gauge fully welded stainless steel trim pre drawings and details around the opening in the building and the walk-in box.

Accessories

- 1 ea. ColdZone model MPL-2 refrigerated rack system per proposal number 24-1140. Locate the rack on the building roof. Verify the location at the job site.
- 1 ea. 208 volts, three phase.

- 2 ea. Berner model ASD36078 swing door. Install per the Manufactures requirements with stainless steel screws.
- 4 ea. Kason model 1810LCT40048" LED light fixtures with bulbs as located per the drawings. Conduit shall not be run on the interior of the units except what is required to connect to the lights. Seal the holes for the conduit and inside the conduit with a spray foam insulation to make an air-tight seal.

ITEM NO. 22 - WALK-IN SHELVING (1 LOT REQUIRED)

Quantum model WIRE storage shelves. Locate the bottom shelf at 10" above the finish floor and the remaining four (4) shelves at 17" O.C. at the balance of the shelving.

Accessories

- 36 ea. Model 2142P shelves.
- 20 ea. Model 2148P shelves.
- 5 ea. Model 2154P shelves.
- 16 ea. Model P74P posts.
- 40 ea. Model P86P posts.
- 8 ea. Model FP foot plates. Mount the foot plates to the floor with stainless steel fasteners. Locate the foot plates on the units at the ingredient bins.

ITEM NO. 23 - MOBILE DUNNAGE RACKS (2 REQUIRED)

New Age mobile dunnage racks with all the standard features.

Accessories

- 2 ea. Model 1206 with all the standard features.
- 2 sets. Provide with all swivel polyurethane tired casters with brakes.
- 2 ea. Model 1174 handles. Shorten the handle to 42" above the finished floor installed height.

ITEM NO. 24 - PREP TABLE (1 REQUIRED)

Custom fabricated prep table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features

- 01 Provide with a 10" high x 2" thick backsplash at the rear and high equipment. Attach the back splash to the wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a marine edge with a 2" turn down with a tight hem at the exposed sides.
- 03 Extend splash at pre-rinse faucet per drawings. Extend counter bracing up to top of extension. Fully weld bracing to counter bracing. Provide with a removable finished back where exposed.
- 04 Provide two (2) 18" x 18" x 10" deep 14 gauge type 304 stainless steel sinks fully welded into the top.
- 05 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel feet. Fully weld the leg sockets the underbracing.
- 06 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at rear. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304

- stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 07 Provide type 304 stainless steel crossrails in the locations shown by the drawings. Fully weld the crossrails to the legs.
- 08 Provide two (2) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshef. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws. Extend the back turn up of the shelves over the top of the overshelves of item 28 1/2" 90 degrees.

Accessories

- 1 ea. T & S model B-0133 pre-rinse faucet.
- 1 ea. T & S model B-0230-K installation kit.
- 1 ea. T & S model B-0156 add-on faucet.
- 1 ea. T & S model B-0109-01 wall bracket. Mount the bracket to the top extension with stainless steel screws.
- 2 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.

ITEM NO. 25 - ALLERGY WORK TABLE (1 REQUIRED)

Custom fabricated allergy table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features

- 01 Provide with a 8" high x 1" thick backsplash at the rear and high equipment. Attach the back splash to the wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 2" turn down with a tight hem at the exposed sides.
- 03 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel flanged feet. Fully weld the leg sockets the underbracing. Anchor the feet to the floor with stainless steel fasteners.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at walls and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.

- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 06 Provide one (1) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshelf. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws.

Accessories

- 1 ea. T & S model B-0320 faucets.
- 1 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.

ITEM NO. 26 - ALLERGY MOBILE CART (1 REQUIRED)

Metro model MY2030-34AP with all the standard features.

ITEM NO. 27 - MOBILE CLASSROOM SERVICEWARE SHELVING (1 REQUIRED)

Quantum Model mobile pan rack. Provide each unit four (4) shelves with 74" high posts. Mount the bottom shelf at 10" above the finish floor. Mount the remaining shelves at 17" on center.

Accessories

- 4 ea. Model 1836P shelves.
- 4 ea. Model P74P posts.
- 4 ea. Model WR-00HS casters with brakes.

ITEM NO. 28 - MOBILE COOLING RACKS (3 REQUIRED)

New Age model 1306 with all the standard features.

Accessories

- 3 sets Provide with polyurethane tired casters with brakes.
- 3 sets Model PB - Perimeter bumpers.

ITEM NO. 29 - MEAL ASSEMBLY TABLE (1 REQUIRED)

Custom fabricated meal assembly table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

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Features

- 01 Provide with an 8" high x 1" thick backsplash at the rear and high equipment. Attach the back splash to the wall with stainless steel screws at a 4'-0" o.c. maximum spacing with 14 gauge stainless steel Z-clips.
- 02 Provide with a 2" turn down with a tight hem at the exposed sides.
- 03 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel flanged feet. Fully weld the leg sockets the underbracing. Anchor the feet to the floor with stainless steel fasteners.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at walls and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 06 Provide one (1) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshelf. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws.

Accessories

- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.

ITEM NO. 30 - NUMBER NOT USED

ITEM NO. 31 - MOBILE UTILITY CART (1 REQUIRED)

Renfro Industries Inc. model SUCER1827-3 with all the standard features.

ITEM NO. 32 - MOBILE PROOF/HOT CABINET (1 REQUIRED)

CresCor model 121-PH-UA-11D with all the standard features.

Accessories

- 1 ea. 120 volts, single phase.
- 1 ea. Model 1405-135 perimeter bumper
- 1 set Provide with 5" polyurethane casters with brakes on all the casters.

ITEM NO. 33 - CONVECTION OVEN (1 REQUIRED)

Blodgett Oven model DFG-100 DOUBLE with all the standard features. Provide with separate gas connections.

Accessories

- 1 ea. Natural gas.
- 1 ea. 120 volts, single phase.
- 2 ea. Model SSI-M controls.
- 1 set Polyurethane casters with brakes.
- 1 ea. Dormont model 1675KIT2S48 gas connector hose kit. Provide to the plumbing contractor for installation.
- 1 ea. Dormont model 1675KIT2S48PS gas connector hose kit. Provide to the plumbing contractor for installation.

ITEM NO. 34 - MOBILE RANGE (1 REQUIRED)

Imperial model IHPA-4-24 with all the standard features.

Accessories

- 1 ea. Natural gas
- 1 ea. 3/4" gas regulator.
- 1 ea. Model STAND-24mobile equipment stand.
- 1 ea. Polyurethane tired casters with brakes.
- 1 ea. Dormont model 1675KIT2S48PS gas connector hose kit. Provide to the plumbing contractor for installation.

ITEM NO. 35 - 12 GALLON TILTING KETTLE (1 REQUIRED)

Groen model TDB-48C with standard features.

Accessories:

- 1 ea. Two year parts and labor warranty.
- 1 ea. 208 volts, three phase.
- 1 ea. Model 155237 316 stainless steel liner.
- 1 ea. Model Z005186 lip strainer.
- 1 ea. Model 128002 lift off cover.
- 1 ea. Provide with etch marks in gallon increments in kettle.
- 1 ea. Model FL FOOTKIT flanged feet. Attach to the floor with stainless steel anchors.
- 1 ea. T & S model B-0176 faucet.
- 1 ea. T & S model B-0970-01 back flow preventer.

ITEM NO. 36 - CONVECTION STEAMER (1 REQUIRED)

AccuTemp model E32081E060 DBL with standard features.

Accessories:

- 1 ea. 208 volts, single phase.
- 1 ea. Model SNH-20-07 support stand.
- 1 ea. Drain water tempering kit..

ITEM NO. 37 - VENTILATOR (1 SECTIONSREQUIRED)

Compensating wall canopy ventilator per Captive-Aire proposal number 7165196. Construct from type 430 stainless steel where exposed.

Features

- 01 Provide stainless steel baffle filters with handles.
- 02 Six (6) LED light fixtures with bulbs.
- 03 Half pint grease cups.

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- 04 Provide a gas pipe chase in the corner per the drawings.
- 05 Seal the ventilator to the wall with silicone caulking.
- 06 Provide written test and balance forms to the Architect and Sturm Consulting, Inc.
- 07 Model SC-311110MA electrical controls. Locate in the fire suppression system cabinet.
- 08 Provide a touch screen control panel located per the drawings.

Accessories

- 1 ea. Provide a stainless steel enclosure extending from the top of the ventilator to the finish ceiling.
- 1 ea. Provide a stainless steel wall splash extending at the rear from 1" above the bottom of the ventilator to the finish floor or the wall base.
- 1 ea. Hang the ventilator from the roof structure above with 1/2" diameter all-thread rods per the manufactures requirements.
- 1 ea. Provide the labor to hang the ventilator per local codes and the manufactures requirements. Install the ceiling closure panels. Seal the ventilator and ceiling closures to the wall with clear silicone caulking in a neat manner. Seal the intersections of stainless steel with gray silicone caulking in a neat manner.
- 1 ea. The electrical connections will be by the electrical contractor.
- 1 ea. The ducts, curbs and fans will be by the mechanical contractor.

ITEM NO. 38 - FIRE SUPPRESSION SYSTEM (1 REQUIRED)

Ansul Fire Protection Model tank-SP-1 fire suppression system from Captive-Aire with all the standard features per Captive-Aire proposal number 7165196.

Features

- 1 ea. Mount the fire suppression in a cabinet against the ceiling at the location per the drawings.
- 1 ea. Install the fire suppression system per the current codes.
- 1 ea. Provide chrome-plated drops at the required locations.
- 1 ea. Locate the remote pull per all current codes.

Accessories

- 1 ea. Mechanical gas valve. Verify the size valve required and provide the valve to the plumbing contractor for installation.

ITEM NO. 39 - MOBILE PAN RACK (2 REQUIRED)

Quantum Model mobile pan rack. Provide each unit four (4) shelves with 74" high posts. Mount the bottom shelf at 10" above the finish floor. Mount the remaining shelves at 17" on center.

Accessories

- 8 ea. Model 2448P shelves.
- 8 ea. Model P74P posts.
- 8 ea. Model WR-00HS casters with brakes.

ITEM NO. 40 - NUMBER NOT USED

ITEM NO. 41 - COOK'S TABLE (1 REQUIRED)

Custom fabricated cook's table to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top. Provide 12 gauge fully welded type 304 stainless steel

channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features

- 01 Provide with a 8" high x 2" thick backsplash at the rear.
- 02 Provide a 16 gauge type 304 stainless steel finished back on the exposed backsplash. Attach the finished back to the backsplash in a concealed manner with stainless steel fasteners.
- 03 Provide with a 2" turn down with a tight hem at the exposed sides.
- 03 Provide 1 5/8" diameter type 304 stainless steel legs with stainless steel leg sockets and adjustable stainless steel flanged feet. Fully weld the leg sockets the underbracing. Anchor the feet to the floor with stainless steel fasteners.
- 04 Provide a 16 gauge type 304 stainless steel undershelves per the drawings. Turn the undershelves up 2" at walls and high equipment. Fully weld the undershelves to the legs. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing.
- 05 Provide type 304 stainless steel crossrails per the drawings. Fully weld the crossrails to the legs.
- 06 Provide one (1) 1'-0" wide x length indicated on the drawing fully welded 16 gauge stainless steel wall mounted overshef. Provide 12 gauge fully welded type 304 stainless steel wall brackets. Mount the wall shelf 1'-6" above the work surface of the work table with stainless steel screws.

Accessories

- 1 ea. T & S model B-0320 faucets.
- 1 ea. Component Hardware model DBN-8000 twist waste valve. Shorten the handle to be flush with the front of the sink bowl. Provide 14 gauge type 304 stainless steel brackets to support the handles. Attach to the sink bottom with stainless steel anchors.
- 1 ea. Advance Tabco model SWT-120 wall mounted pot rack. Modify the length per the drawings. Attach to the wall with stainless steel screws.
- 1 ea. Edlund model G-2S can opener. Provide loose to the Owner. The Owner will mount the can opener to the table in the location shown on the drawings with stainless steel screws per the manufactures requirements. Widen the underbracing at the can opener to allow clearance for the mounting screws.
- 1 ea. Edlund model KR-699 knife rack. Provide a 14 gauge type 304 stainless steel bracket for the knife holder. Locate the knife holder per the drawings. Attach the rack to the bracket with Component Hardware model Q37-0250 stainless steel keyhole studs welded to the bracket at the top.
- 1 ea. Component Hardware model S90-0020 drawer assembly. Locate the drawer per the drawings.
- 4 ea. Component Hardware Model R58-1010 electrical outlet box at the microwave oven. Attach the boxes to the overshef with stainless steel fasteners per the manufacturer's requirements. Provide with stainless steel cover plates. Provide and install conduit in an unexposed manner from the box through the shelf upright to a 4x4 junction box mounted below the table top.

ITEM NO. 42 - MICROWAVE OVEN (1 REQUIRED)

ACP model RMS10TSA with all the standard features.

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Accessories
1 ea. 120 volts, single phase.

ITEM NO. 43 - 20 QUART MIXER (1 REQUIRED)

Globe model SP20 with all the standard features.

Accessories
1 ea. 120 volts, single phase.

ITEM NO. 44 - MOBILE MIXER STAND (1 REQUIRED)

Jero Manufacturing model JSS-2831 with all the standard features.

ITEM NO. 45 - ICE MAKER (1 REQUIRED)

Scotsman model MC0522SA-1-32 with all the standard features.

Accessories
1 ea. 120 volts, single phase.
1 ea. Model B322S bin.
1 ea. Model KLP8S stainless steel legs.
1 ea. Everpure model EV932422 water filter assembly. Mount on the side of the ice maker and bin with stainless steel screws.
1 pk. Everpure model EV9534-26 EC210 replace cartridge.

ITEM NO. 46 - MOBILE TRAY DISPENSERS (2 REQUIRED)

Piper Products/Servolift Eastern model PT/1014MO with all the standard features. Verify the Owner's tray size before the unit is ordered.

Accessories
2 sets Model WB brakes.
2 ea. Model PB perimeters bumpers.
2 sets Polyurethane casters.

ITEM NO. 47 - MOBILE MILK COOLERS (1 REQUIRED)

True Mfg. model TMC-49-S-SS-HC with all the standard features.

Accessories
1 ea. 120 volts, single phase.
1 ea. Model 882506 corner bumpers.
1 ea. Provide with 5" polyurethane casters with brakes on all the casters.

ITEM NO. 48 - SERVING COUNTER (1 REQUIRED)

Custom fabricated serving counter to be constructed per the drawings with a fully welded 14 gauge type 304 stainless steel top with a 2" drop down at the cashier stand. Provide 12 gauge fully welded type 304 stainless steel channel underbracing under the top with fully welded closed ends where they are exposed. Sound deadened between the top and the underbracing.

Features
01 Provide with a 2" turn down with a tight hem at the sides.

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- 02 Provide a 16 gauge type 304 stainless steel fully welded counter body with a 16 gauge type 304 stainless steel fully welded undershelves per the drawing elevations. Provide 12 gauge type 304 stainless steel channel underbracing under the undershelves. Sound deadened between the undershelves and the underbracing. Notch the undershelf around the floor sink.
- 03 Provide a 16 gauge type 304 stainless steel double pan hinged doors per the elevations. Fully weld the corners on the panels.
- 04 Provide a 16 gauge type 304 stainless steel double pan hinged doors with fully welded louvers per the elevations. Fully weld the corners on the panels.
- 05 Provide a Component Hardware Group, Inc. model P46-1012 pull at the doors. Attach with stainless steel screws.
- 06 Provide a Component Hardware Group, Inc. model M32-2401 magnetic catches at the doors. Install the catch per the manufactures requirements.
- 07 Provide steel j-boxes on the counter body per the drawings and elevations for switches and controls. Provide with stainless steel cover plates. Weld the j-boxes to the counter.
- 08 Provide removable 18 gauge stainless steel panels on the counter fronts and side per the elevations. Provide a 6" x 6" one piece panel at the corners. Attach the panels to the counter with 14 gauge stainless steel Z-clips at the bottom of the panels.
- 09 Provide a quarter-turn ball valve drain valve in an 18 gauge fully welded stainless steel recess per the drawings. Pre-pipe the hot well drain to the valve and the drain line to the floor drain per current codes.
- 10 Provide polyurethane tired casters with brakes.

Accessories

- 1 ea. T & S model B-0208 faucet. Provide a hot water indicator on the handle.
- 1 Lot Versa-Gard sneeze guards per quote # Q016904 the drawings in a brushed stainless steel finish. Provide an undercounter mount. Install into the counter top per the manufactures requirements.

ITEM NO. 49 - DROP-IN COLD FOOD WELLS (1 REQUIRED)

Low Temp Industries model DI-TA-20-03 with all the standard features.

Accessories

- 1 ea. 120 volts, single phase.

ITEM NO. 50 - NUMBER NOT USED

ITEM NO. 51 - DROP-IN HOT FOOD WELLS (1 REQUIRED)

Low Temp Industries model DI-TW-DW-20-05 with all the standard features.

Accessories

- 1 ea. 208 volts, single phase.

ITEM NO. 52 - POS BY THE OWNER

ITEM NO. 53 - MOBILE CONDIMENT COUNTER (1 REQUIRED)

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Lakeside Manufacturing model 70410 with all the standard features. Verify the Owner's top/cutout requirements before the unit is ordered. Verify the Owner's laminate choices requirements before the unit is ordered.

END OF SECTION

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Part 1 - General

1.01 Work Included:

- A. All materials, labor services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Finish Carpentry - Section 06200
- B. Custom Casework - Section 06410
- C. Metal Doors and Frames - Section 08100
- D. Wood Doors - Section 08200

1.03 Quality Assurance:

- A. This material shall be procured from a source of supply approved by the Architect as having a member of their firm registered by the American Society of Contracting Architectural Hardware Consultants, and with a proven record of several years of satisfactory experience in contract builder's hardware, both in furnishing material and properly servicing jobs. The supplier also must be an established contract builder's hardware firm who meets all the above requirements, and who maintains and operates an office, display room and stock.

1.04 Submittals:

- A. Prepare a complete schedule including all items processed for each opening and other miscellaneous items and submit four copies to the Architect for approval within 30 days submitted within that time, the supplier shall furnish the hardware specified by catalog number.
- B. Indicate on schedule name of manufacturer after each item.
- C. Upon receiving the approved schedule, the hardware supplier shall immediately forward a copy to the metal frame suppliers, when applicable; and as soon as they receive approved shop drawings, they will immediately forward a complete set to the hardware supplier who can then check the applications and make any necessary minor revisions. If revisions are necessary, notify Architect immediately.
- D. Mark each item of hardware for opening on which it is to be used and deliver a complete schedule to the contractor when hardware is delivered.

1.05 Schedule:

- A. This specification describes the quality, character and function that is required of items of hardware; however, it is not intended to mention each particular item.
- B. It is the responsibility of the supplier to thoroughly detail the entire project to assure that the items specified will properly function in the indicated locations and **meet the requirements of the Owner.**
- C. Quantities shall be determined by the bidder. Part 2, following, indicates the type and function of material applicable to the typical opening. Should an unlisted opening require different type of function of hardware than that specified, for similar opening, notify the Architect, and provide hardware for unlisted openings within the bid.

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Part 2 - Products

2.01 Finish Hardware:

A. Standards of Quality:

1. Codes, specifications and published recommendations, latest editions of the following are hereby made part of this section of the specifications in so far as they apply to the material or work called for.
 - a. National Builders Hardware Association (NBHA)
 - b. American Society for Testing Materials (ASTM)
 - c. Underwriters Laboratories (UL)
 - d. National Fire Protection Association (NFPA)
 - e. Code of Ethics of ASAH & NBHA
 - f. Federal Emergency Management Agency (FEMA)
2. Federal Specification, (ANSI Specifications):
 - a. Hinges: FF-H-116C (ANSI A156.1)
 - b. Locks and Door Trim: FF-H-106A (ANSI A 156.2)
 - c. Auxiliary Locks: FF-H-106A (ANSI A 156.5)
 - d. Exit Devices: FF-H-106A, FF-H-111B, FF-L486 (ANSI A156.3).
 - e. Door Closers: FF-H-121C (ANSI A 156.4)
 - f. Shelf and Miscellaneous Hardware: FF-H-00116 (ANSI A156.6).
 - g. All Door hardware: Comply with ADAAG where applicable.

B. General:

1. All hardware relating to hollow metal doors and frames shall be to standard templates of each respective hardware manufacturer for items furnished.
 - a. The related suppliers such as hollow metal doors and frames and such others as may be required will furnish the hardware supplier one copy of each of their approved shop drawings for proper coordination of their work and the finish hardware.

C. Manufacturers and Requirements:

1. Hardware manufacturers and brand names are for a guide as to type and standard required and all such hardware furnished must meet these standards as far as quality, weight, finish and design.

D. Keying:

1. All locks and cylinders to be masterkeyed as directed by the Architect/Owner.
2. Keys: Furnish the following keys:
 - a. 2 change keys each lock or cylinder
 - b. 6 masterkeys
 - c. **all EXTERIOR locks and cylinders shall be Primus Schlage Key System and keyed to Owner's Primus Master Key system. All remaining interior locks and cylinders shall be Classic Schlage and keyed to the Owner's Primus Master Key System.**

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

2.02 Hardware Sets:

Hardware Group No. 001: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA PIVOT SET	7215 SET	626	IVE
2	EA PIVOT	7215 INT	626	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA DOOR SWEEP	C627A LENGTH AS REQUIRED	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQUIRED	AL	NGP
1	MEETING STYLE SEAL BY DOOR MANUFACTURER			
1	PERIMETER SEAL BY DOOR MANUFACTURER			
	REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.			

Hardware Group No. 002: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PRIVACY SET	L9444 03N	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 003: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
6	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	SET AUTO FLUSH BOLT	FB31P OR FB41P AS REQUIRED	630	IVE
1	EA DUST PROOF STRIKE	DP2	626	IVE
1	EA STOREROOM LOCK	L9080T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA COORDINATOR	COR X FL X MTG BRKTS X HW PREPS X LENGTH AS REQ	628	IVE
1	SET ASTRAGAL	9605A HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AL	NGP
2	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
2	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	SET SEALS	5050BR H & J (USE SILENCERS @ NON-RATED DOORS)	CLR	NGP

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Hardware Group No. 004: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA STOREROOM LOCK	L9080T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
1	SET SEALS	5050BR H & J (USE SILENCERS @	NON-RATED DOORS)	
			CLR	NGP

Hardware Group No. 005: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
1	EA CONTINUOUS HINGE	224HD HEIGHT AS REQUIRED	628	IVE
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED		
			626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
1	EA MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA PRIMUS CORE ONLY	20-740	626	SCH
1	EA OFFSET DOOR PULL	8190-0-0	630	IVE
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	EA DOOR SWEEP	C627A LENGTH AS REQUIRED	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQUIRED	AL	NGP

Hardware Group No. 006: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA STORE LOCK	L9466T 03N	626	SCH
2	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 007: Provide each PR doors with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQUIRED	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED		
			626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED		
			626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Hardware Group No. 008: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA LOCK	ND66T TRL	626	SCH
1	EA OVERHEAD STOP	904S	630	GJ
1	EA SURFACE CLOSER	4040SE MTG BRKTS, SPCRS & PLATES AS REQ (MAX DEGREE HOLD OPEN)	689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA CLASSIC CORES	23-030	626	SCH
1	SET SEALS	5050B H & J	BLK	NGP

Provide ALL connections required to the fire alarm and electrical systems necessary for a fully functioning device meeting all applicable codes. REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

Hardware Group No. 009: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA CLASSROOM LOCK	L9070T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA SURFACE CLOSER	4041H OR P4041H MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	SET SEALS	5050B H & J	BLK	NGP

Hardware Group No. 010: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA PUSH PLATE	8200 4" X 16"	630	IVE
1	EA PULL PLATE	8303EZ-0 4" X 16"	630	IVE
1	EA SURFACE CLOSER	4041H OR P4041H MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 011: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Hardware Group No. 012: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PASSAGE SET	L9010T 03N	626	SCH
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE

Hardware Group No. 013: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQ	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQ	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA SURFACE CLOSER	4040XP SHCUSH MTG BKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	700SA H & J (INSTALL PRIOR TO OTHER HARDWARE)	AL	NGP
2	EA DOOR SWEEP	C627A LENGTH AS REQ	AL	NGP
1	EA OVERHEAD RAIN DRIP	16A DW + 4"	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQ	AL	NGP

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION, ETC.

Hardware Group No. 014: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN

Hardware Group No. 015: Provide each PR doors with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQUIRED	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PUSH PLATE	8200 4" X 16"	630	IVE
1	EA PULL PLATE	8303EZ-0 4" X 16"	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	5050B H & J	BLK	NGP

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Hardware Group No. 016: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	23-030	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

The following list of products and manufactures are acceptable for this project.

<u>Product</u>	<u>Manufacture and Approved Equals</u>
1. Hinges	A. Ives B. Hager C. Bommer
2. Continuous Hinges	A. Pemko B. Roton C. Select
3. Key System	A. Schlage (No substitutions)
4. Lock/Latch	A. Schlage (No substitutions)
5. Closers	A. LCN (No substitutions)
6. Exit Devices	A. Von Duprin (No substitutions)
7. Push/Pull/Plates	A. Ives B. Rockwood C. Trimco
8. Misc. Stop, Bolts, etc.	A. Ives B. Glynn-Johnson C. Rockwood
9. Door Seal/Thresholds	A. National Guard B. Pemko C. Reese

Each Product, by category, shall be the product of one manufacture. Complete lockset, including keyed lock cylinder, shall be the product of one manufacturer unless noted otherwise.

Part 3 - Execution

3.01 Installation:

- A. Install all finish hardware in strict accordance with the

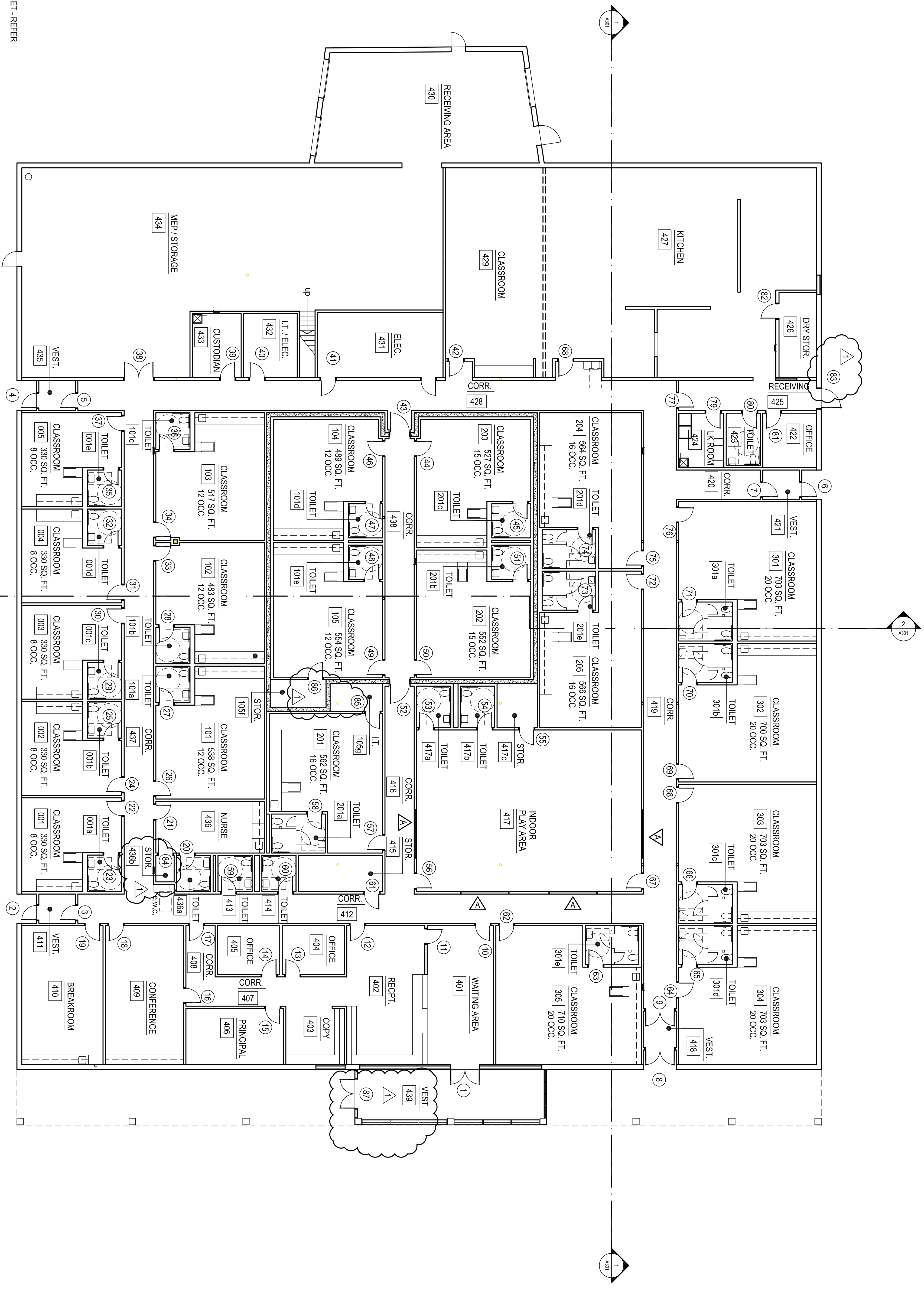
DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

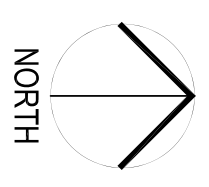
manufacturer's recommendations and printed instructions. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item. Do not install surface mounted items until finishes have been completed on the substrate.

- B. All hardware relating to hollow metal and aluminum doors and frames shall be to standard templates of each respective hardware manufacturer for items furnished.
 - C. Mounting Heights: Mount Hardware units at heights recommended by the National Builders Hardware Association, except as specifically indicated or required to comply with governing regulations, or as may be otherwise directed by the Architect.
- 3.02 Prior to the Final Inspection:
- A. The supplier shall check all closers for proper operation after they have been installed and adjusted by the Contractor. He shall verify the keying to ensure proper location of locksets and shall assist the Contractor in correcting faulty operation of any locks.
 - B. Within 30 days after the acceptance of the entire project, the Contractor shall be responsible for this supplier meeting with the maintenance custodian at the job site for the purpose of instructing him thoroughly in the proper repair and adjustment of all finish hardware items, and items, and shall present to the custodian a full complement of tools to be used.

End of Section

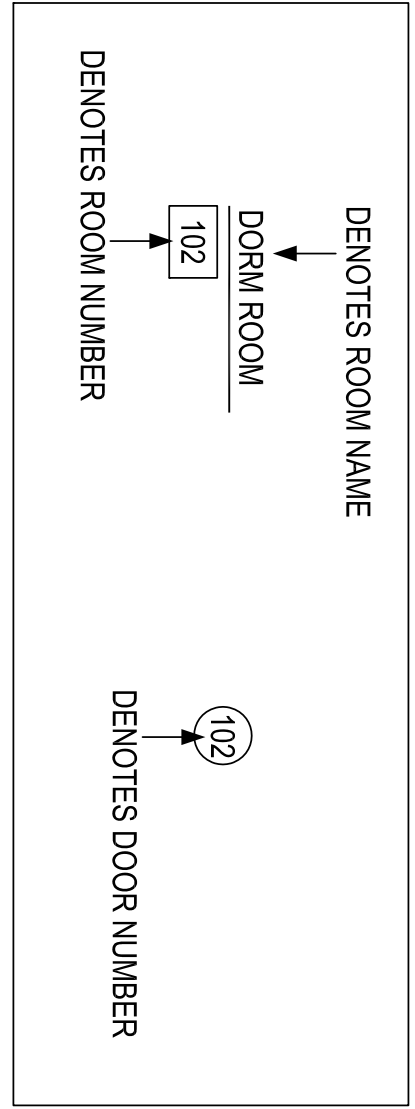


- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. REFER SHEETS A100a FOR DIMENSION PLAN
 5. NUMBER OF CLASSROOM STUDENT OCCUPANTS ARE BASED ON DEPARTMENT OF HUMAN SERVICES' 2022 LIMITS



1

OVERALL FLOOR PLAN
3/82" = 1'-0"





CG
drawn by
MA
checked by
OCTOBER 2024
date
revisions
ADDENDUM #1



MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
201 N. EASTERN AVE.

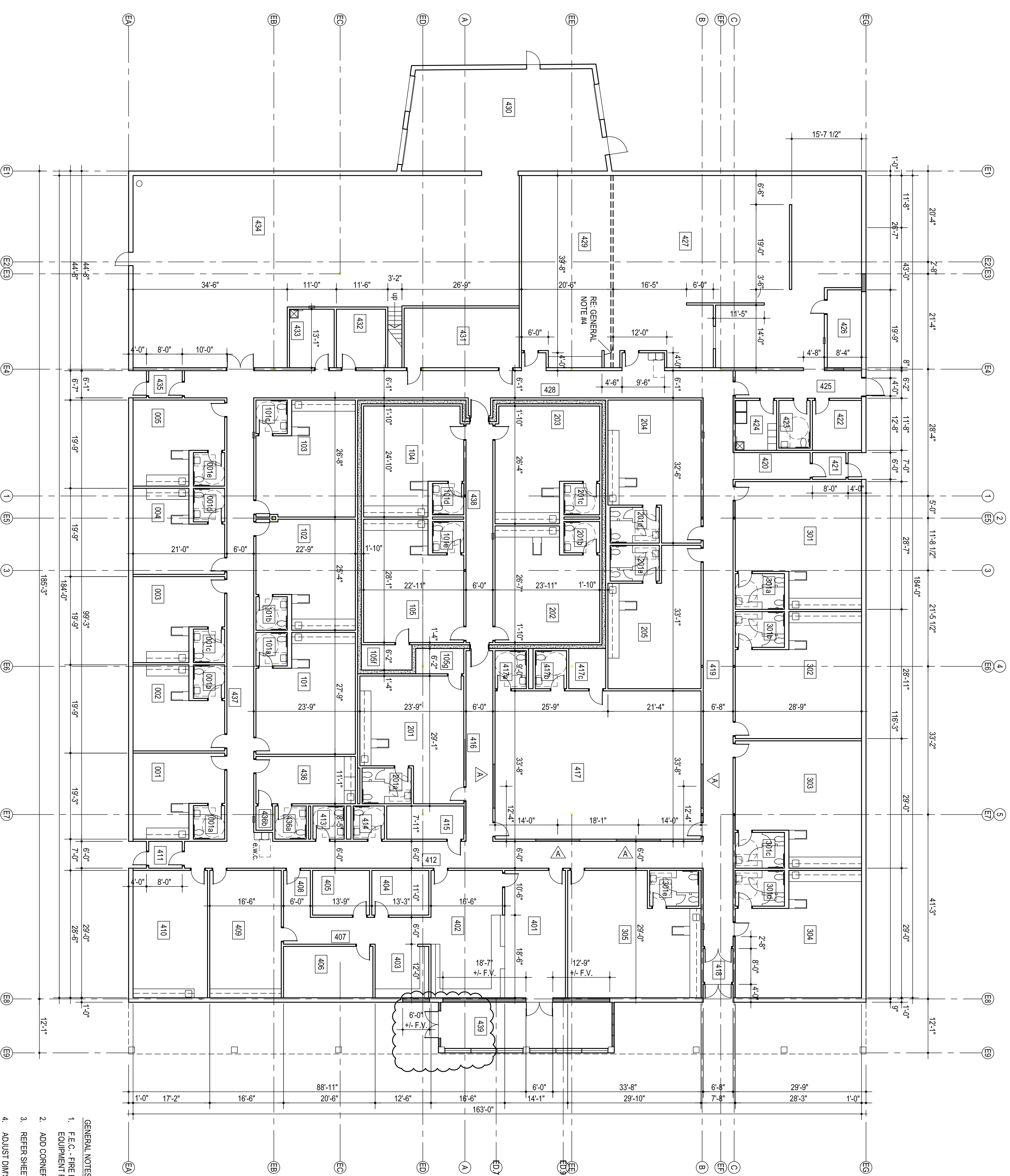
Sheet No.:

A100a

OWNERSHIP USE OF DOCUMENTS:

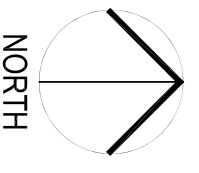
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WITHOUT THE EXPRESS WRITTEN
CONSENT OF AGP.

- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. ADJUST DIMS AS REQUIRED FOR MOVEABLE PARTITION SUPPLIED



DIMENSION PLAN

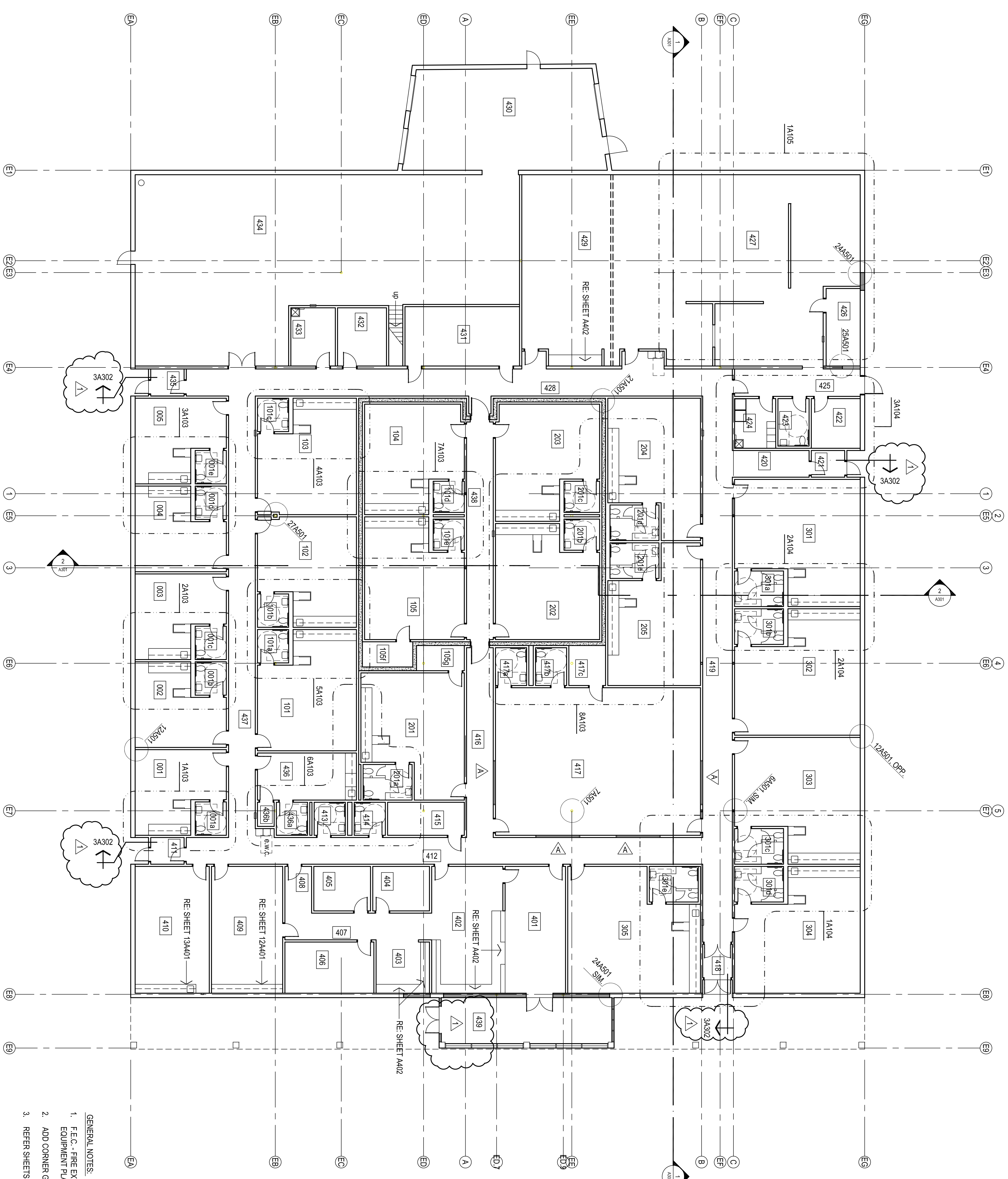
3/32" = 1'-0"



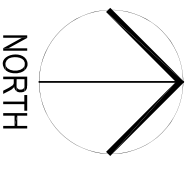
NORTH



- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS



REFERENCE PLAN
3/32" = 1'-0"



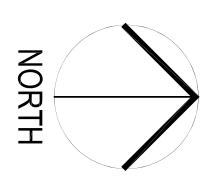
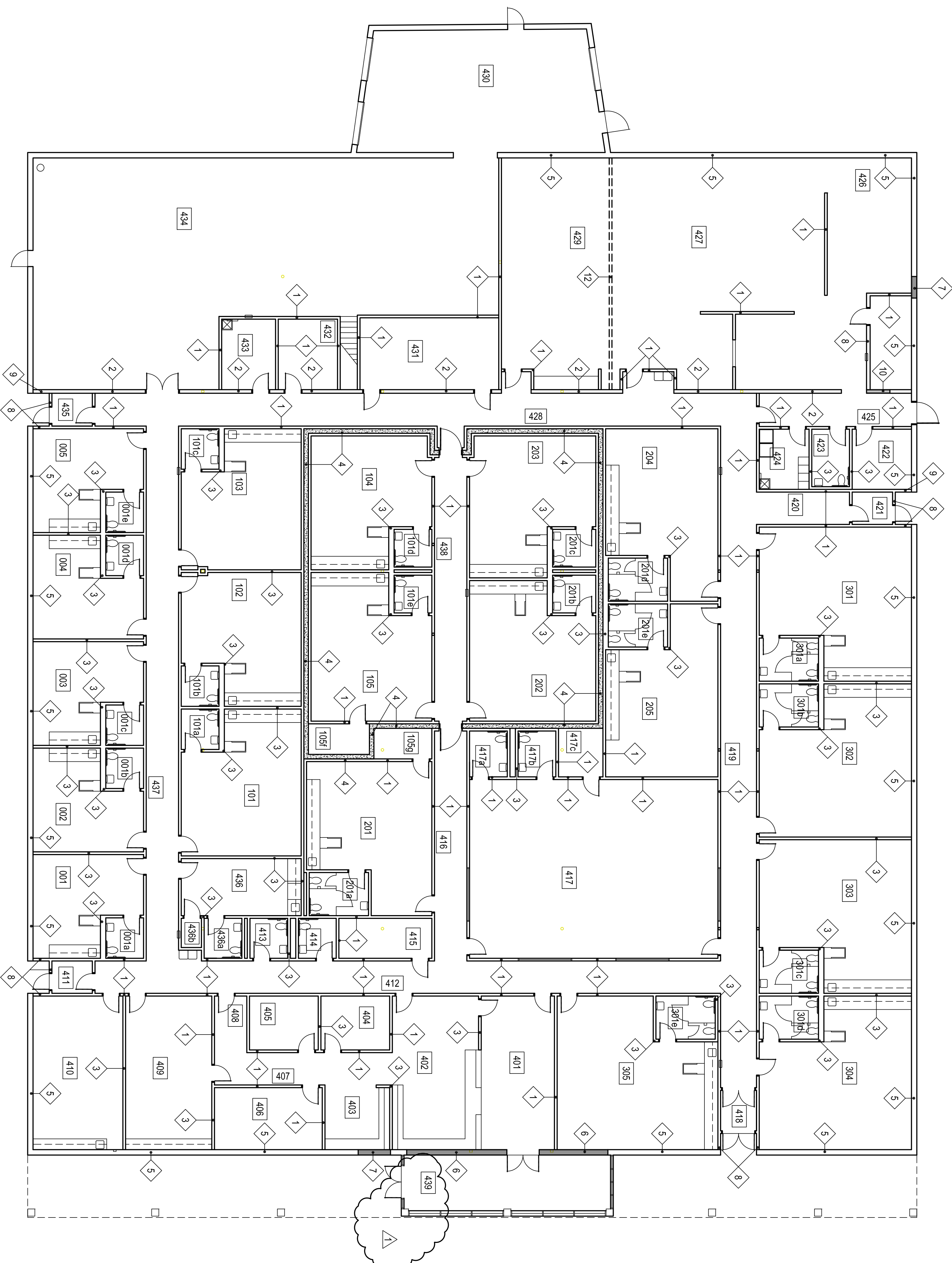


WALL / PARTITION LEGEND

- 1 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 2 EXISTING LOAD BRNG. 6" CMU WALL
1 LAYER FIRE RATED GYP. BD. EA.SIDE ON 7/8" FURRING STRIPS
HEIGHT: 6" ABOVE CEILING
PROVIDE FIRE STOPPING AS REQUIRED AT TOP OF EXISTING CMU WALL
- 3 STUD WALL / CHASE WALL (12" CLEAR)
1 LAYERS GYPSUM BOARD EACH SIDE, 3.58" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
- 4 SHELTER WALL
1 LAYER GYP. BD. EA. SIDE ON 3/8" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
10" CONC. WALL TO SLAB ABOVE - 12'-6", RE. STRUCT.
- 5 EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. ON 2" FURRING STRIPS W/ 2" BATT INSULATION
HEIGHT: SLAB TO 6" ABOVE CEILING
- 6 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO MATCH
EXISTING CMU WIDTH
HEIGHT: SLAB TO DECK ABOVE
- 7 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. AND EXTERIOR SHEATHING ON METAL STUDS TO
MATCH EXISTING CMU WIDTH. MATCH EXISTING E.F.I.S. THICKNESS
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 8 STUD WALL / METAL WALL PANEL
1 LAYERS GYPSUM BOARD, 6" METAL STUDS, EXTERIOR SHEATHING W/
METAL WALL PANELS
HEIGHT: 6" STUDS AND GYP. BD. SLAB TO DECK ABOVE. SHEATHING
AND METAL WALL PANEL TO SOFFIT ABOVE
- 9 EXISTING CMU WALL / METAL WALL PANEL
7/8" FURRING STRIPS, EXTERIOR SHEATHING W/ METAL WALL PANELS
HEIGHT: SHEATHING AND METAL WALL PANEL TO SOFFIT ABOVE
- 10 NEW STUD IN-FILL AT EXISTING 8" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO
MATCH EXISTING CMU WIDTH.
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 11 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 12 MOVABLE PARTITION
REFER SPECIFICATIONS

REFER ROOM FINISH SCHEDULE, COLOR SCHEDULE,
INTERIOR ELEVATIONS & SPECIFICATIONS FOR ADDITIONAL
WALL FINISH INFORMATION

CONSTRUCTION MANAGER & SUBCONTRACTORS SHALL
COORDINATE FINAL CONSTRUCTION OF ALL WALLS
PRIOR TO BEGINNING WORK



WALL TYPE PLAN
3/32" = 1'-0"

CONSTRUCTION DATA (TABLE 603):

CONSTRUCTION TYPE -	E & I-4
TYPE II - B	
BASIC ALLOWABLE AREA -	E - 58,000 S.F. / I-4 - 52,000 S.F. PER FLOOR
ALLOWABLE STORIES -	3 / 3
ACTUAL STORIES -	1 / 1
ACTUAL HEIGHT -	23'-4"

BUILDING SIZES:
BUILDING : 1 STORY @ 32,200 S.F.

STRUCTURAL FIRE PROTECTION (TABLE 601):	0 HOUR
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
COLUMNS	0 HOUR
BEAMS	0 HOUR
PERMANENT PARTITIONS	NONCOMBUSTIBLE
FLOOR ASSEMBLIES	0 HOUR
ROOF ASSEMBLIES	0 HOUR
EXTERIOR OPENINGS	N/A

PASSIVE FIRE SAFETY SYSTEM:
PORTABLE FIRE EXTINGUISHERS (REF: SHEETS A104)
TRAVEL DISTANCE = 250'-0" MAX.
ACTUAL MAX. TRAVEL DISTANCE = 170'-0"
DEADEND - 50'-0" MAX.
ACTUAL DEADEND - NONE

ACTIVE FIRE SAFETY SYSTEMS (EXISTING & NEW ADDITION):
FIRE SPRINKLER SYSTEM THROUGHOUT
FIRE ALARM SYSTEM
SMOKE DETECTION
AUTOMATIC AIR HANDLING EQUIP. SHUTDOWN
EXIT LIGHTS/EMERGENCY LIGHTS BATTERY

CODES/REGULATIONS USED: (CITY OF MOORE):
2018 IBC - INTERNATIONAL BUILDING CODE
AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE
2009 ENERGY CONSERVATION CODE
ASSOCIATED SUPPLEMENTS TO EACH CODE

OCCUPANT LOAD (TABLE 1004.1.1.1):

BUILDING RENOVATION: 278 CHILDREN
12 ADMIN / STAFF
40 TEACHERS
330 TOTAL OCCUPANTS

EGRESS WIDTH:

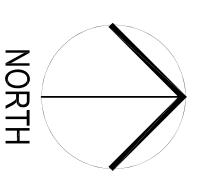
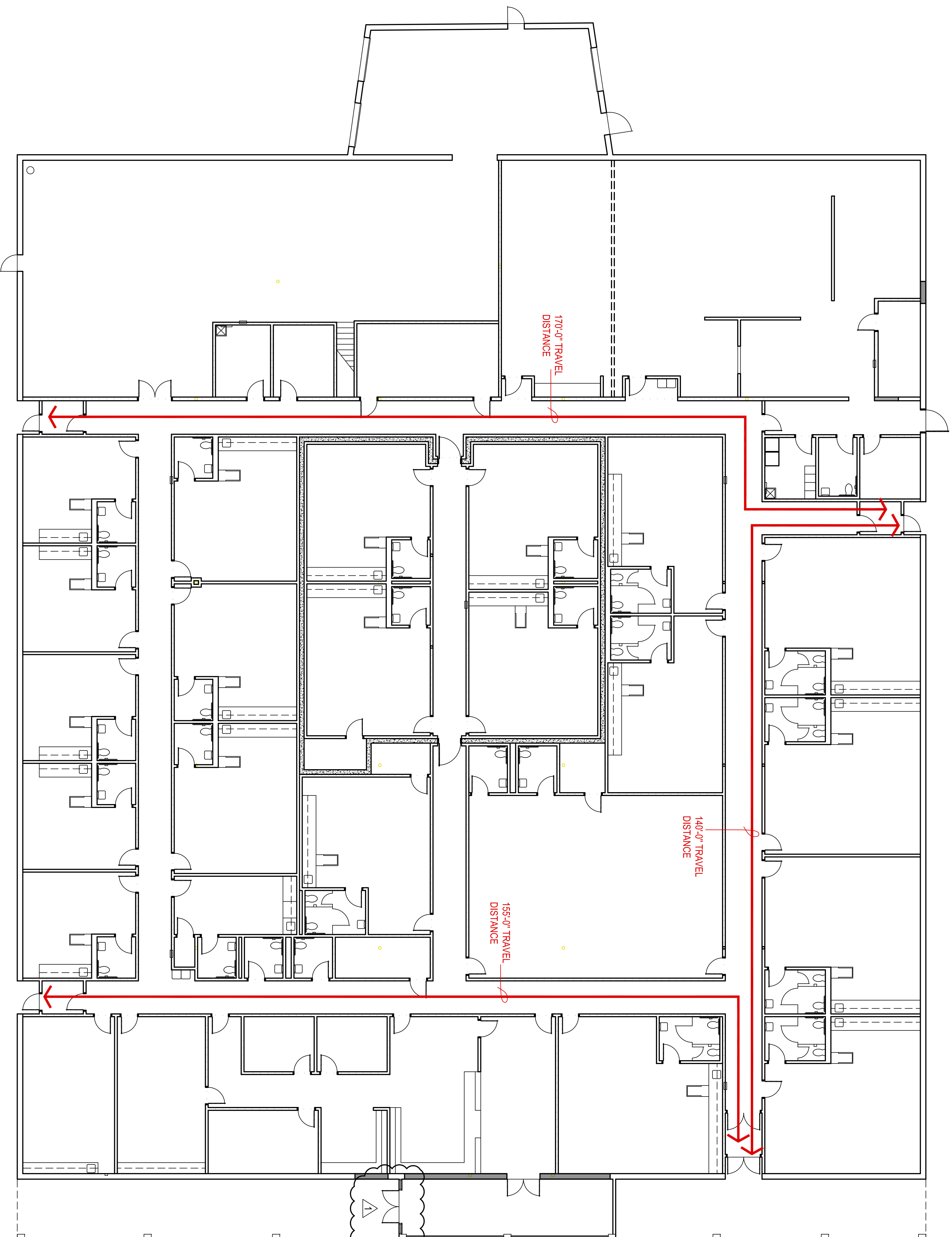
BUILDING RENOVATION: REQUIRED 66"
BUILDING RENOVATION: PROVIDED 432"

PLUMBING FIXTURES (TABLE 2902.1):

TOTAL OCCUPANT LOAD (INSTITUTIONAL) = 330

TOTAL REQUIRED:	TOTAL PROVIDED
WATER CLOSETS = 22	WATER CLOSETS = 34
LAVATORIES = 22	URINALS = 0
DRINKING FOUNTAINS = 4	LAVATORIES = 49
SERVICE SINKS = 1	DRINKING FOUNTAINS = 4
	SERVICE SINKS = 2

DEVOTES 1 HR. RATED PARTITIONS CLOSE-OUT TO
BOTTOM OF DECKING - CLOSE-OUT PARTITIONS TO
BE CMU WHERE INDICATED ON STRUCTURAL FOR
LOAD BEARING CONDITIONS. ALL OTHER INDICATED
LOCATIONS TO BE CONSTRUCTED OF 1 LAYER
OF 5/8" FIRE RATED GYP. BOARD EACH SIDE
ON 6" METAL STUDS @ 16" O.C. STAGGER ALL
JOINTS & PROVIDE FIRE TAPE SEAL ALL PENETRATIONS
W/ CONTINUOUS FIRE STOPPING INSULATION
& OR SEALANT.



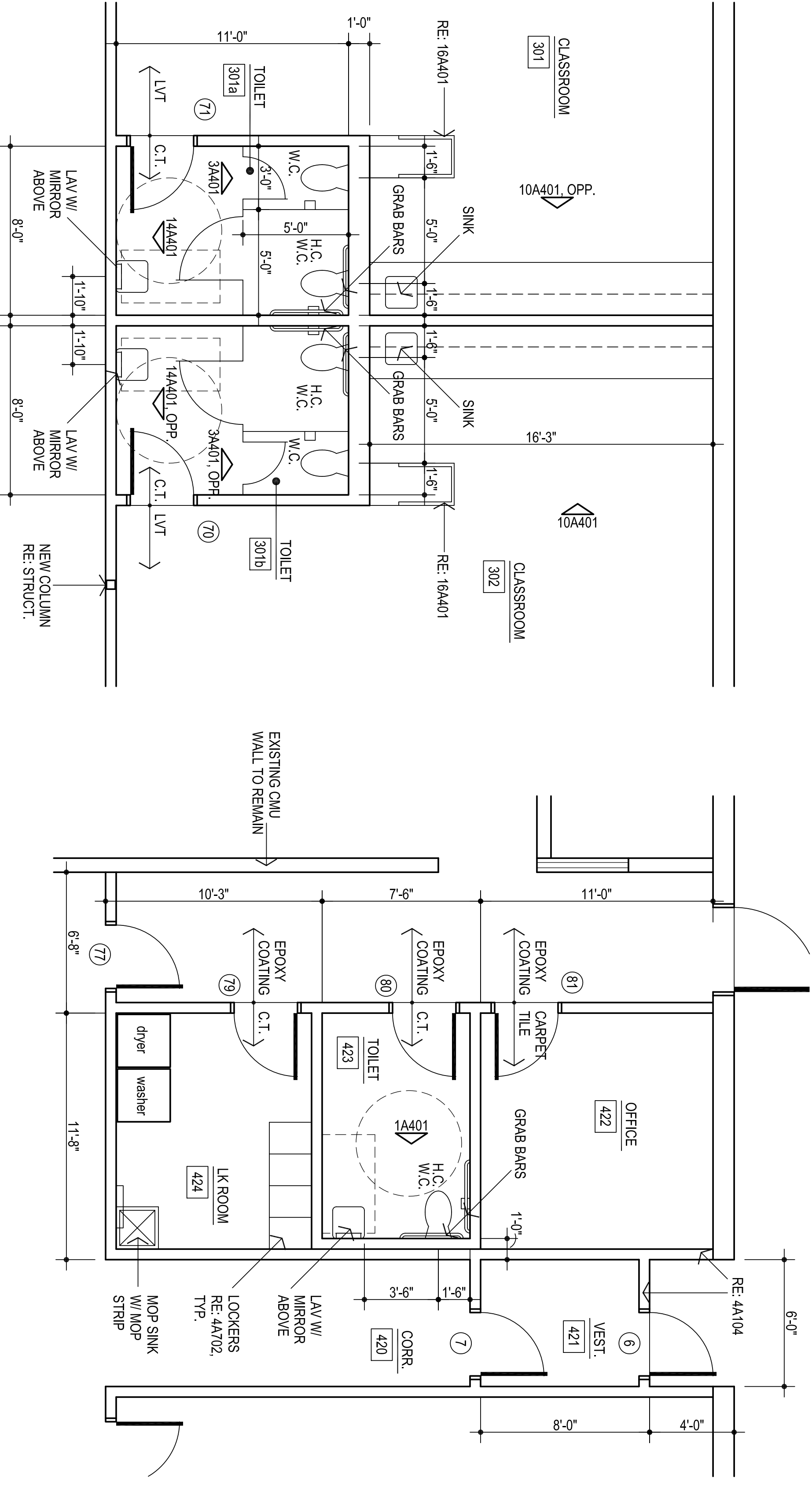
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LIFE SAFETY PLAN

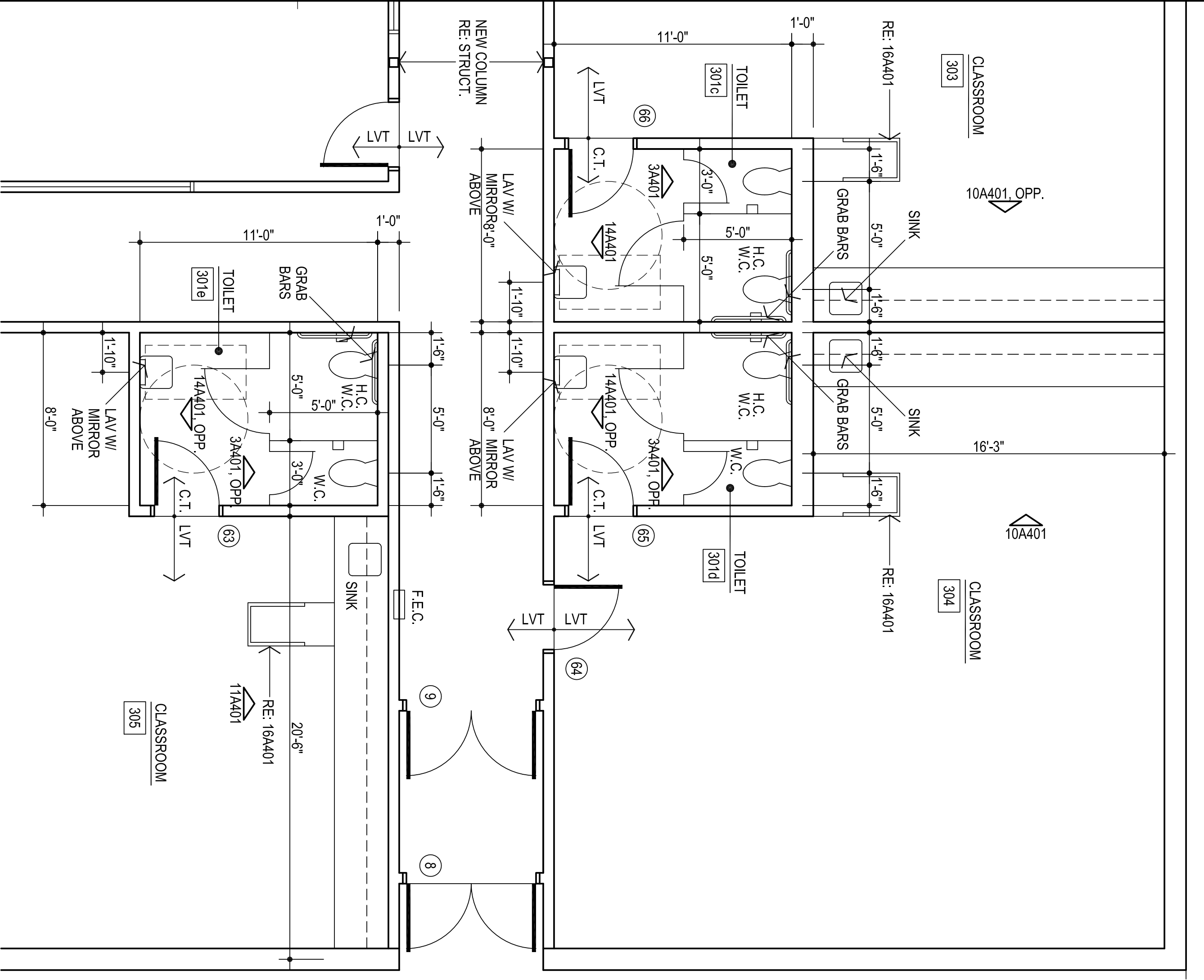
3/32" = 1'-0"



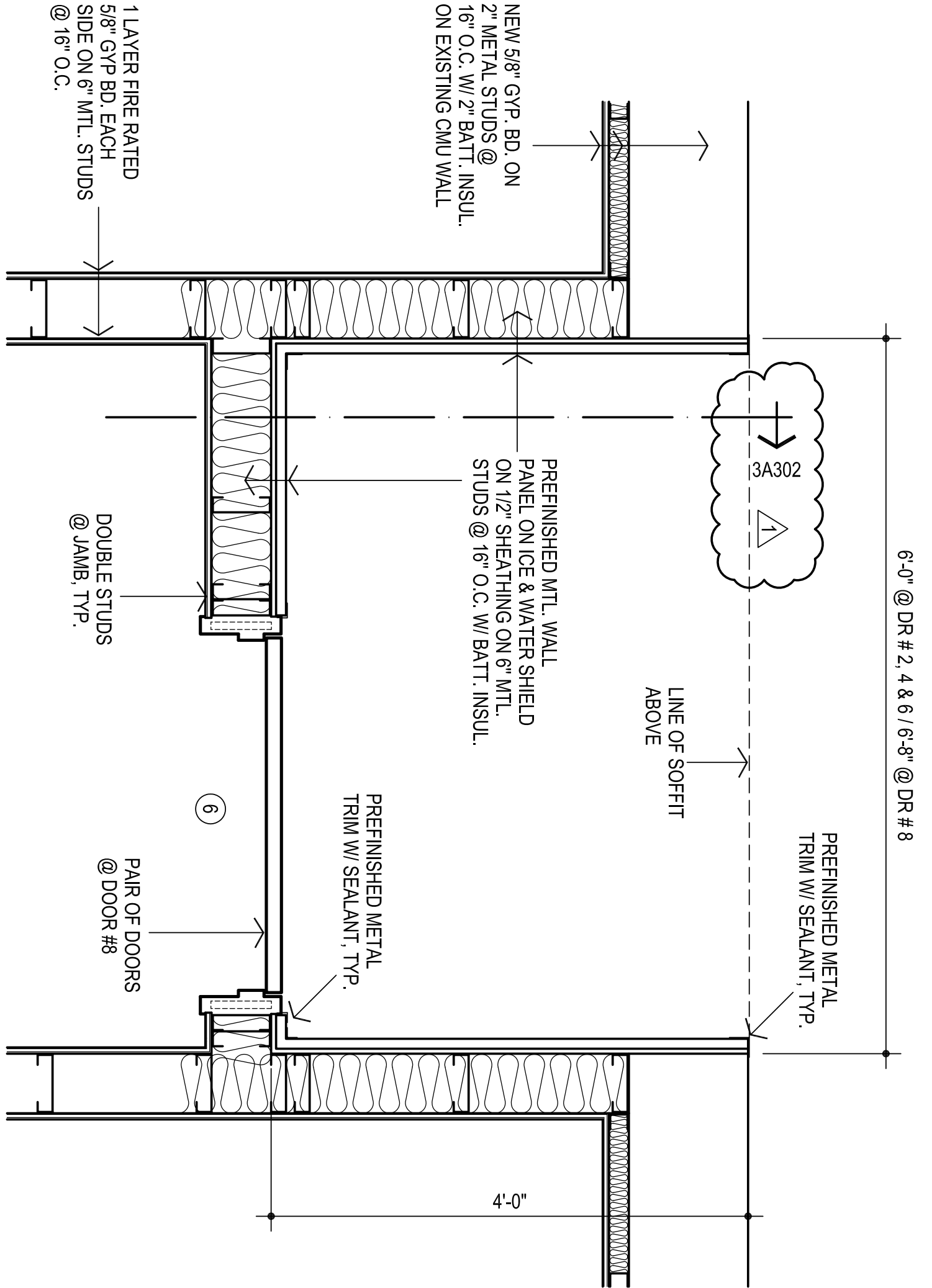
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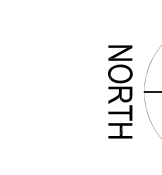
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ENLARGED FLOOR PLAN
ROOM # 301, 302, 301a, & 301b
1/4" = 1'-0"



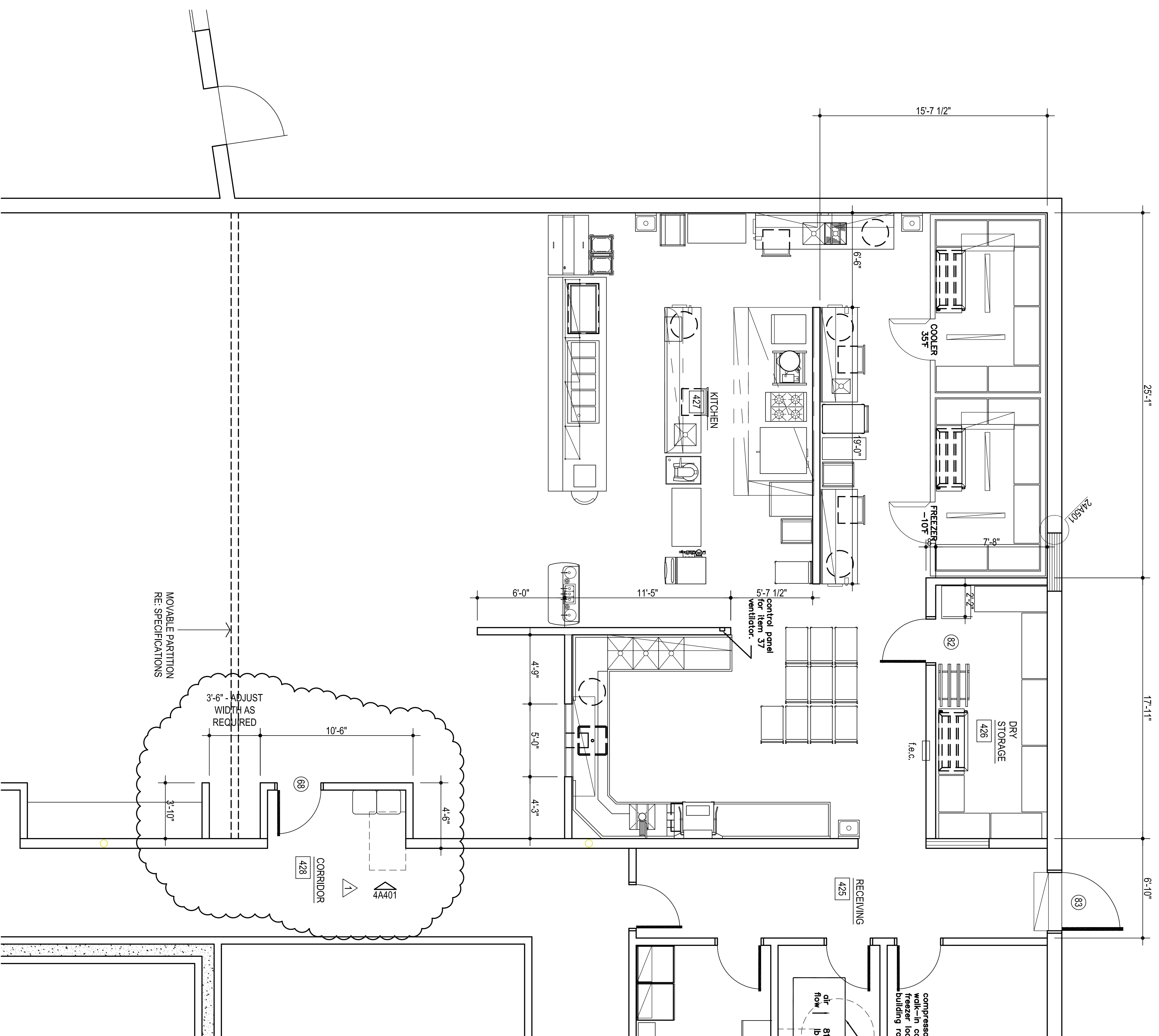
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ENLARGED FLOOR PLAN
ROOM # 420, 421, 422, 423 & 424
1/4" = 1'-0"



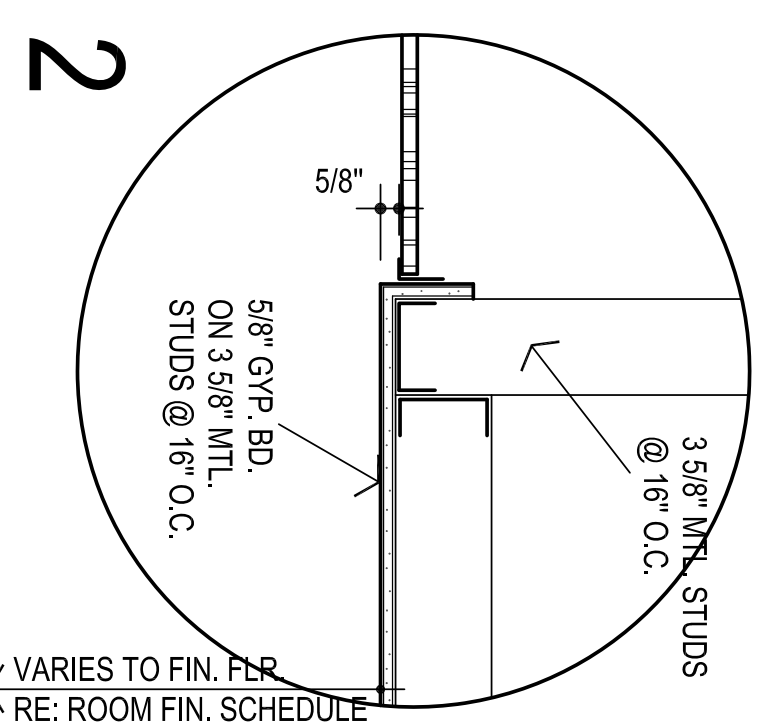
4



4
TYPICAL NEW EXT. DOOR & VESTIBULE
1" = 1'-0"



RE: KITCHEN EQUIPMENT SHEETS
FOR KITCHEN INFORMATION



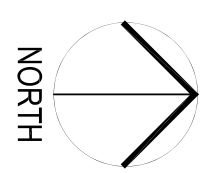
LEGEND:

- MECHANICAL OPENINGS
- ELECTRICAL FIXTURES
- ⊙ CEILING MOUNTED SMOKE DETECTOR, RE: ELEC
- INDICATES AREA / ROOM TO RECEIVE GYP. BD. CEILING
- INDICATES AREA / ROOM TO RECEIVE 2X2 LAY-IN CEILING
- INDICATES AREA / ROOM TO RECEIVE 2X2 LAY-IN CEILING

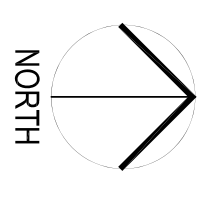
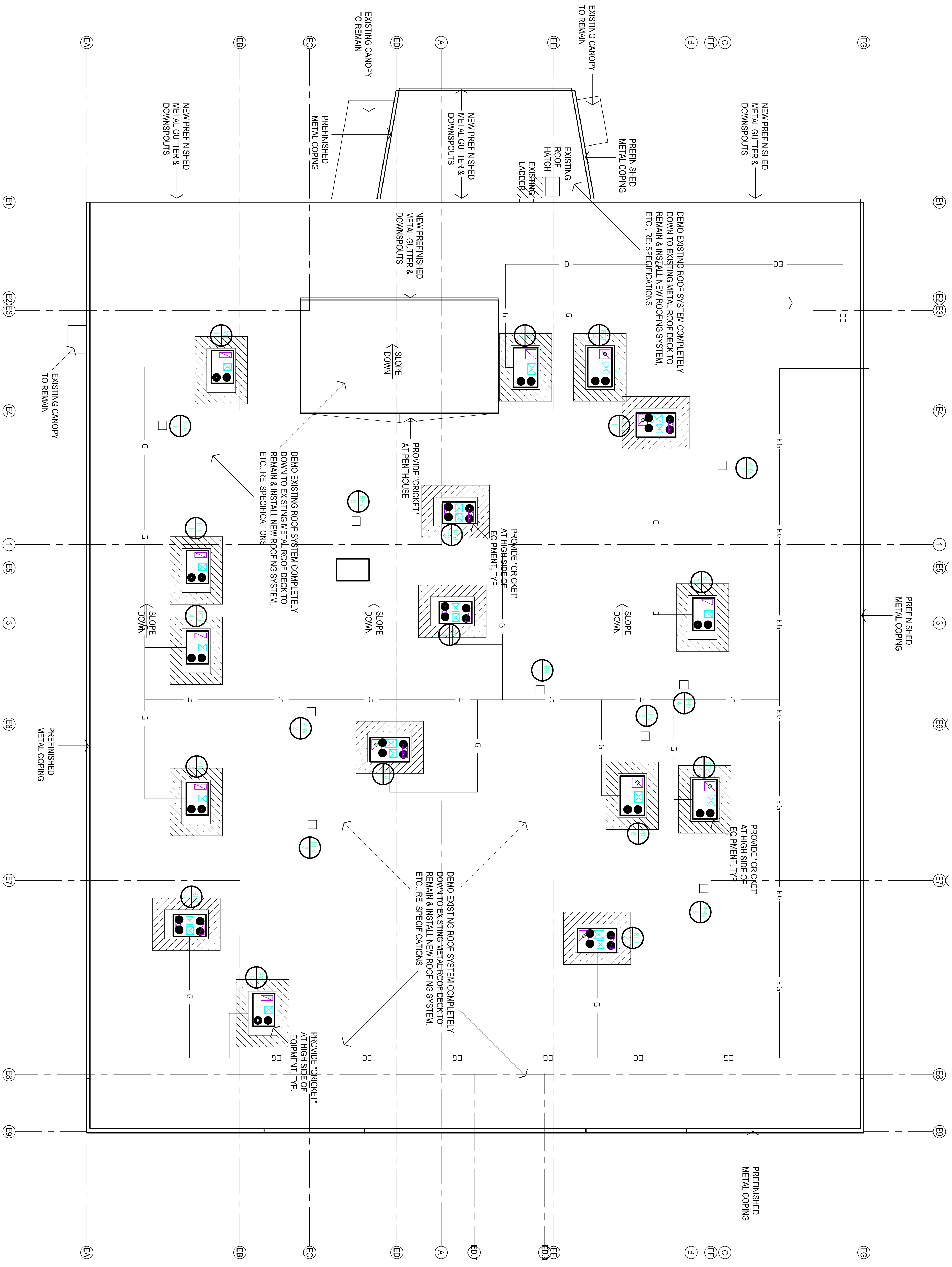
- NOTES:**
- REFER MECHANICAL & ELECTRICAL FOR ANY ADDITIONAL CEILING MOUNTED FIXTURES
 - REFER TO SHEET A100 FOR LOCATIONS OF FIRE-RATED WALLS



REFLECTED CEILING PLAN
3/32" = 1'-0"



- NOTES:**
- ALL CEILINGS TO BE LOCATED AT 9'-0" A.F. UNLESS NOTED OTHERWISE.
 - THESE DRAWINGS INDICATE THE LIMITS OF FINISHES FOR AREAS THAT HAVE MULTIPLE TYPES AND COLORS. REFER ROOM FINISH SCHEDULE FOR CEILING MATERIAL AND COLOR DESIGNATIONS NOT SHOWN ON THIS SHEET.
 - ALL FURDOWNS SHALL BE PAINTED UNLESS NOTED OTHERWISE.
 - ALL CEILING FURDOWNS SHALL BE BRACED WITH LIGHT GAUGE FRAMING TO PREVENT SWAYING.
 - ALL CEILINGS, FURDOWNS, PIPES, DUCTS, EQUIPMENT, ETC. SHALL BE SUSPENDED FROM STRUCTURAL STEEL ABOVE. DO NOT SUPPORT ITEMS FROM METAL DECK ONLY. REFER STRUCTURAL FOR REQUIREMENTS OF ATTACHMENT TO STEEL.
 - MECHANICAL AND ELECTRICAL DISCIPLINES ARE SHOWN FOR INFORMATION PURPOSES ONLY. REFER TO CONSULTANT SHEETS FOR EXACT FIXTURE LOCATIONS.
 - COORDINATE LOCATION OF ANY CONTROL JOINTS NOT SHOWN WITH THE ARCHITECT PRIOR TO INSTALLATION.
 - PROVIDE DRYWALL CONTROL JOINTS AT WALLS, CEILINGS AND SOFFITS, FURRINGS, ETC. WHERE SHOWN ON DRAWINGS, AND THE FOLLOWING LOCATIONS (SHOWN OR NOT):
 - AT OTHER LOCATIONS WHERE STRUCTURAL SUPPORT FOR FRAMING CHANGES LEVEL OR MATERIAL, OR WHERE DIFFERENTIAL MOVEMENT IS LIKELY TO OCCUR.
 - AT LOCATIONS WHERE CEILING FRAMING MEMBERS CHANGE DIRECTION.
 - AT 30" MAX SPACING IN ANY UNINTERRUPTED STRAIGHT PLANE OR CURVE FOR WALLS, CEILINGS AND SOFFITS (IN TWO DIRECTIONS).
 - AT DOORS, WINDOWS AND OPENINGS LESS THAN OR EQUAL TO 4'-0" WIDE FROM ONE EDGE OF FRAME, TO TOP OF WALL, AND TO FLOOR IF OPENING DOES NOT EXTEND TO FLOOR.
 - AT DOORS, WINDOWS AND OPENINGS GREATER THAN 4'-0" WIDE FROM BOTH EDGES OF FRAME, TO TOP OF WALL, AND TO FLOOR IF OPENING DOES NOT EXTEND TO FLOOR.
 - AT BUILDING CONTROL JOINTS, SEISMIC JOINTS AND EXPANSION JOINTS.
 - AT LOCATIONS OF EXTREME DIFFERENCE IN THE DIMENSIONS OF ADJACENT DRYWALL AREAS.
 - REFER TO SHEET A100 FOR LOCATIONS OF FIRE-RATED WALLS

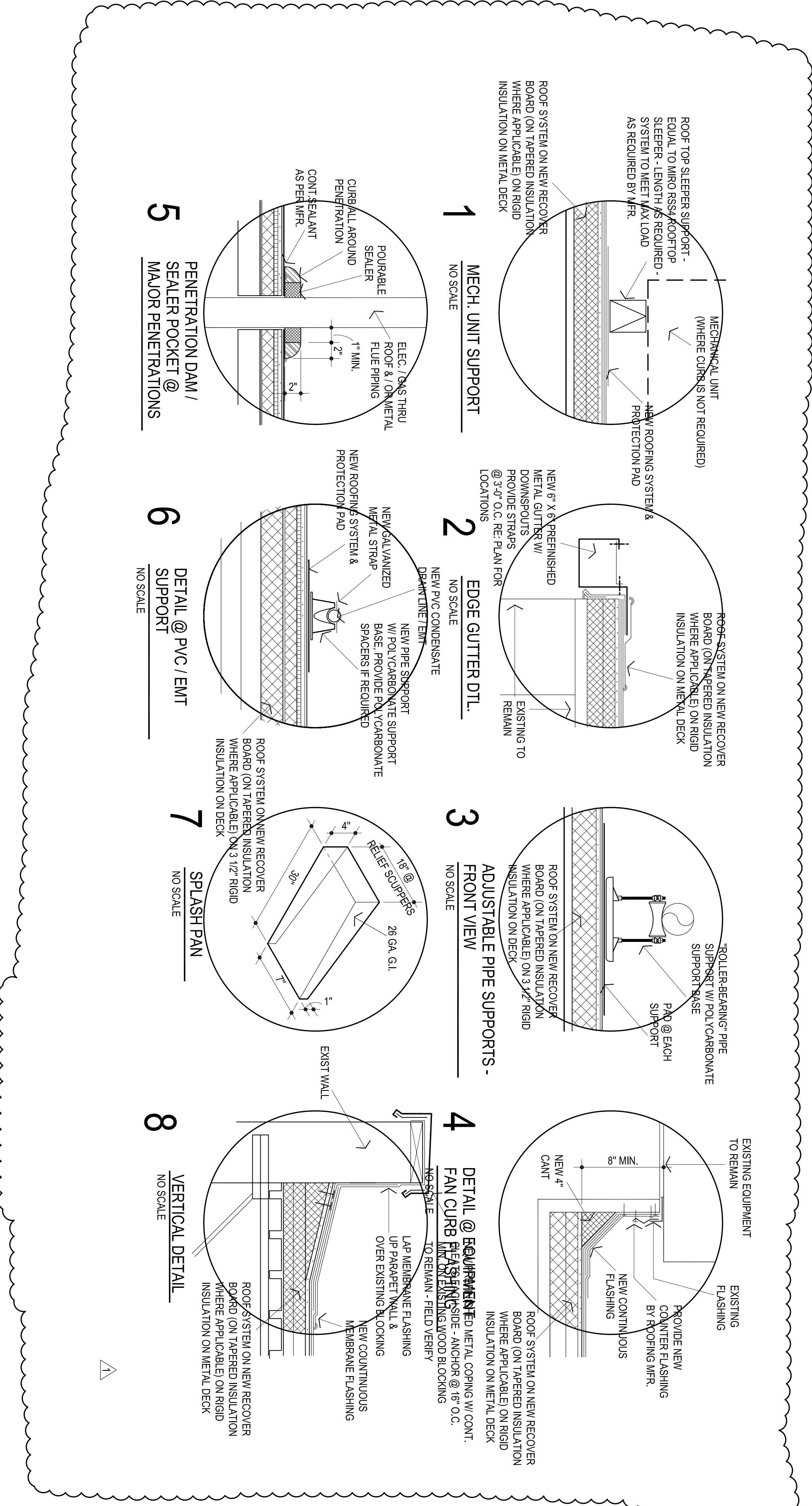


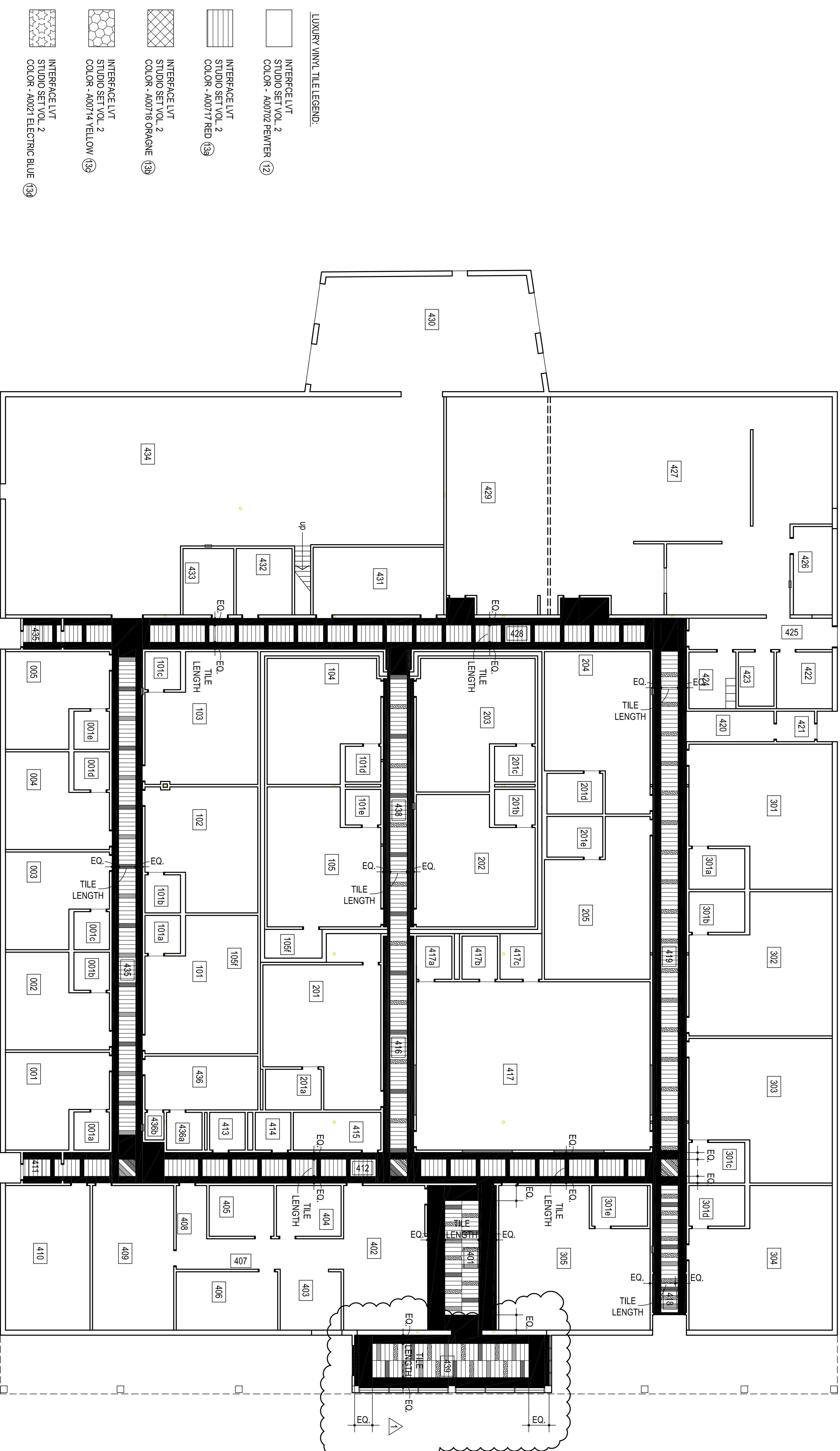
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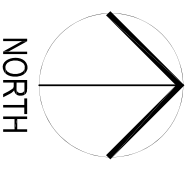
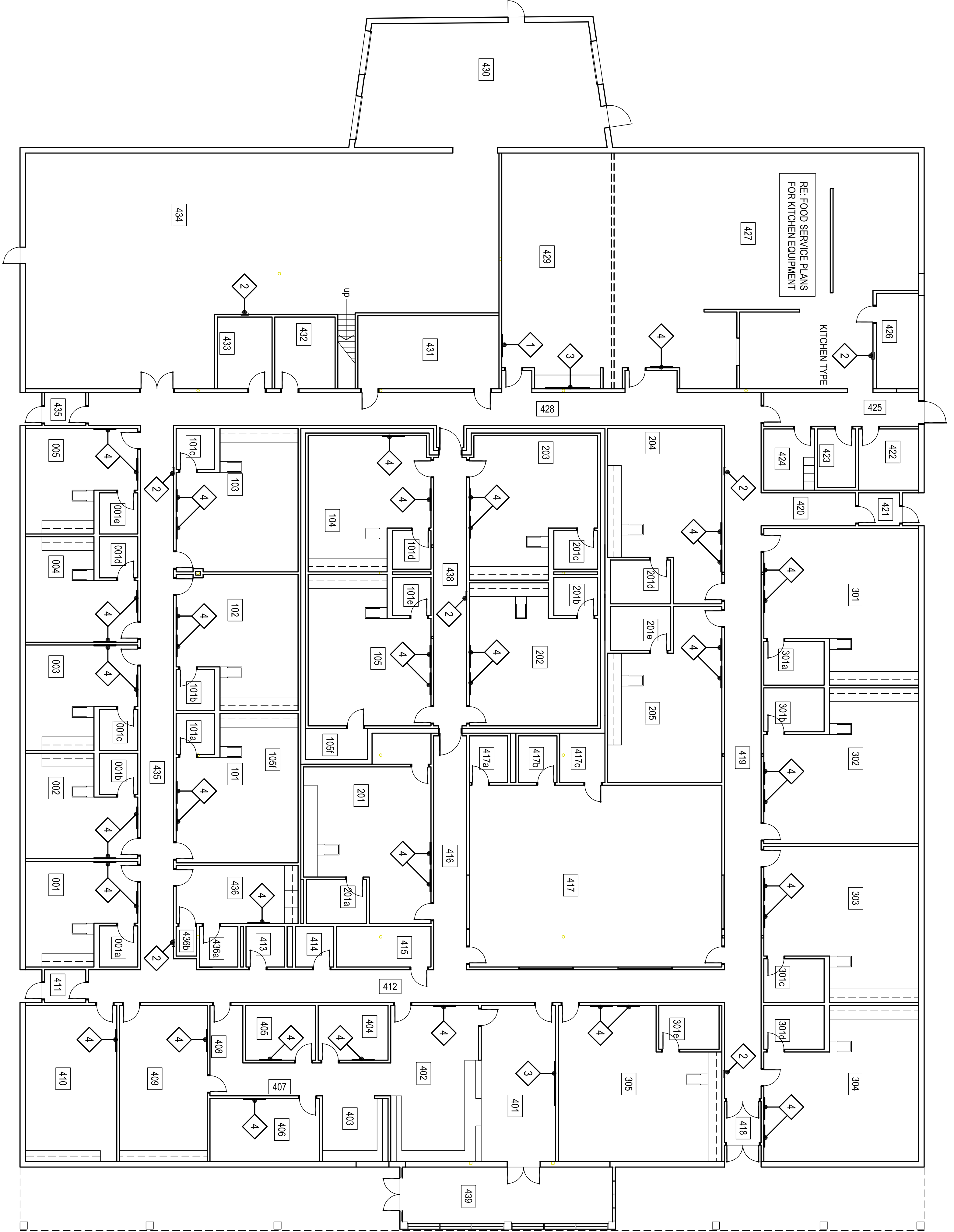
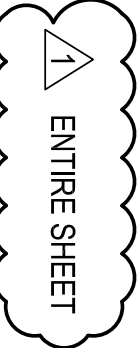
ROOF PLAN
3/32" = 1'-0"

NOTES:

1. RE: MECH & ELEC. FOR ADDITIONAL ROOF MOUNTED ITEMS. CONTRACTOR TO COORDINATE ALL ROOF MOUNTED ITEMS & PENETRATIONS W/ APPLICABLE TRADES
2. CONTRACTOR TO COORDINATE ROOF VENT PENETRATIONS W/ ARCHITECT.
3. INDICATES NEW WALKWAY PAD LOCATIONS - CUT PADS INTO 5'-0" MAX LENGTHS & PLACE 2" APART TO COVER AREAS INDICATED.
4. PROVIDE @ ALL ROOF PENETRATIONS - PENETRATION DAM / SEALER POCKETS AS PER SHEET A107A
5. MECHANICAL ROOF TOP EQUIPMENT IDENTIFICATION, COORDINATE W/ MECHANICAL DRAWINGS







1 EQUIPMENT FLOOR PLAN
3/32" = 1'-0"

ONE ITEM EACH ROOM
ROOM # 001a thru 001e
ROOM # 201a & 201c
ROOM # 413, 414, 417a, 417b, 423 & 438a

TWO ITEMS EACH ROOM
ROOM # 201a, 201d & 201e
ROOM # 301a THRU 301e

ITEM NO.	QTY	OF	CI	DESCRIPTION	MANUFACTURER	MODEL NO.	REMARKS
1	●			MARKERBOARD - 4'-0"	BEST-RITE CHALKBOARD CO.	RE: SPECS	W/ CHALK RAIL
2	●			FIRE EXTINGUISHER & CABINET	J.I. INDUSTRIES	RE: SPECS	
3	●			TACKBOARD - 8'-0"	BEST-RITE CHALKBOARD CO.	RE: SPECS	
4	●			TACKBOARD - 4'-0"			
5	●			WALL MOUNTED DISPLAY			RE: TECHNOLOGY PLANS
6	●			TOILET PAPER HOLDER			
7	●			PAPER TOWEL DISPENSER			
8	●			SOAP DISPENSER			

2 EQUIPMENT SCHEDULE

- LEGEND:**
- ◊ CONTRACTOR FURNISHED AND INSTALLED (CFI)
 - ◊ OWNER FURNISHED AND INSTALLED (OFI)
 - ◊ OWNER FURNISHED AND CONTRACTOR INSTALLED (OF/CI)

NOTE:
ALL CHALKBOARDS & TACKBOARDS MOUNTED @ EXTERIOR WALLS SHALL HAVE STAND-OFF MOUNTING BRACKETS TO PREVENT CONDENSATION BEHIND BOARDS.
PRIOR TO INSTALLATION OF MARKERBOARDS & TACKBOARDS VERIFY LOCATIONS WITH MPS PERSONAL & ARCHITECT.



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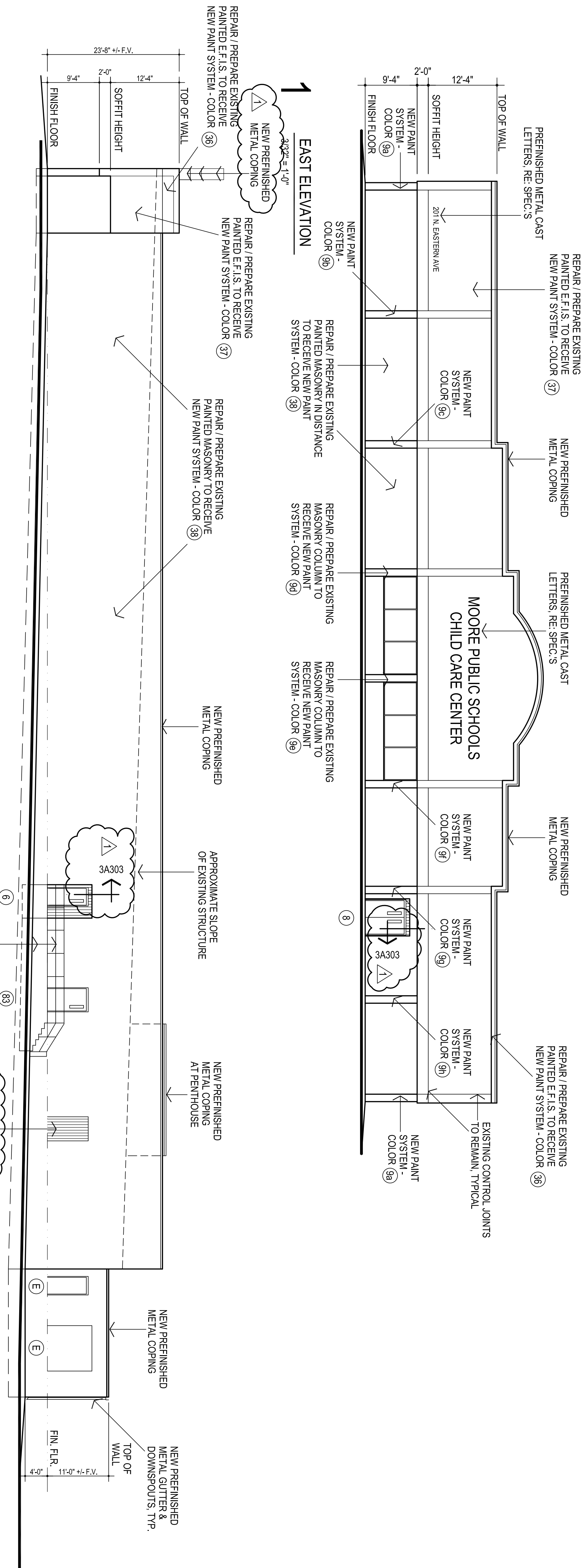
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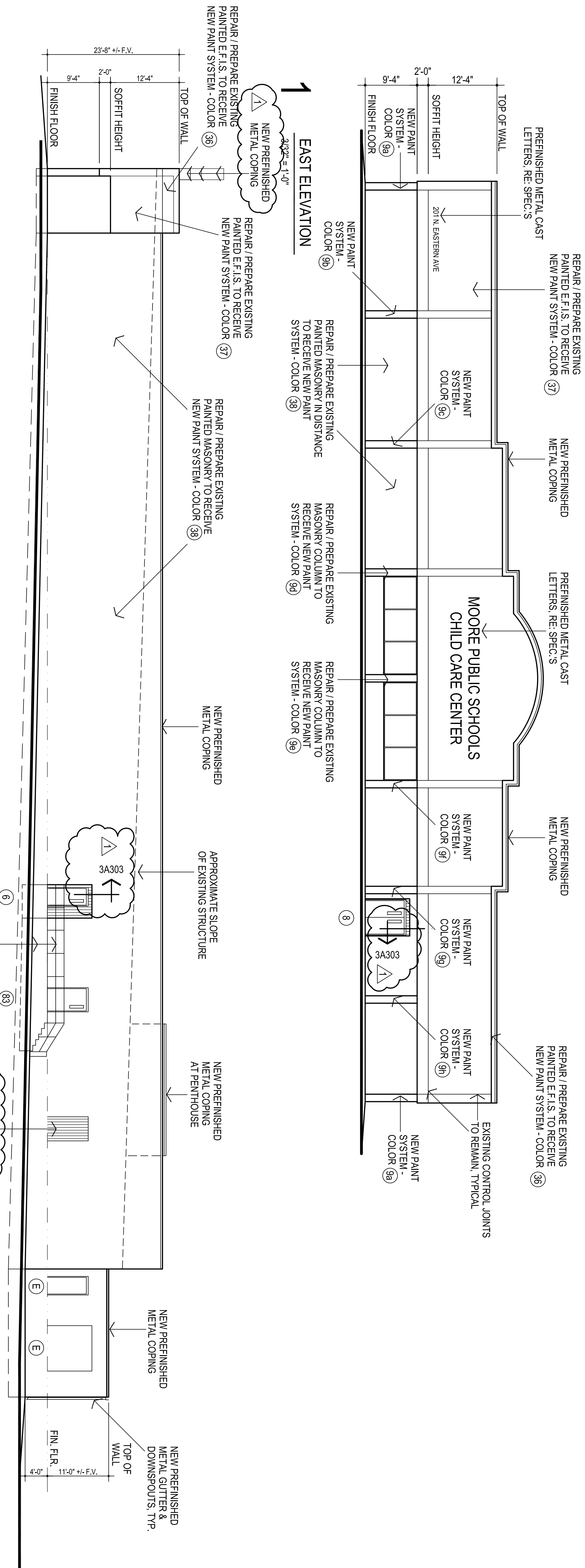
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A201

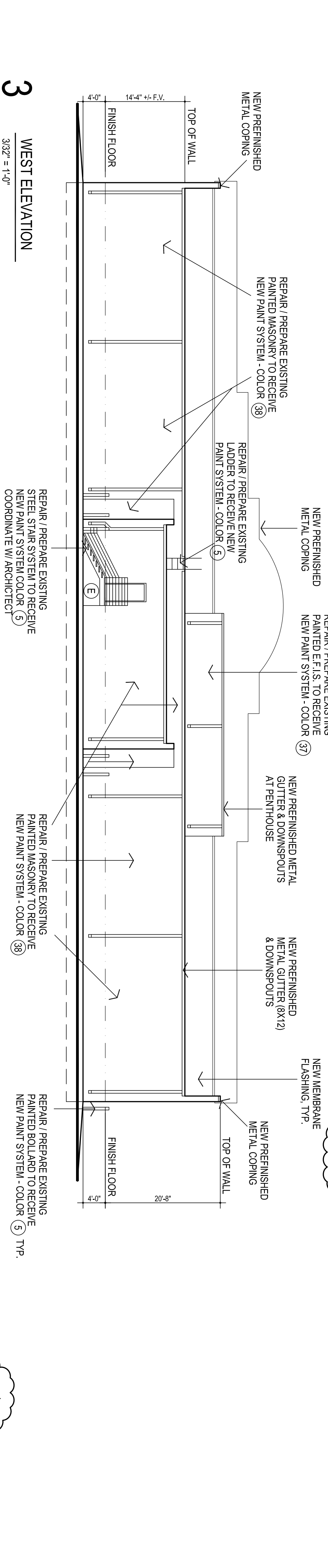
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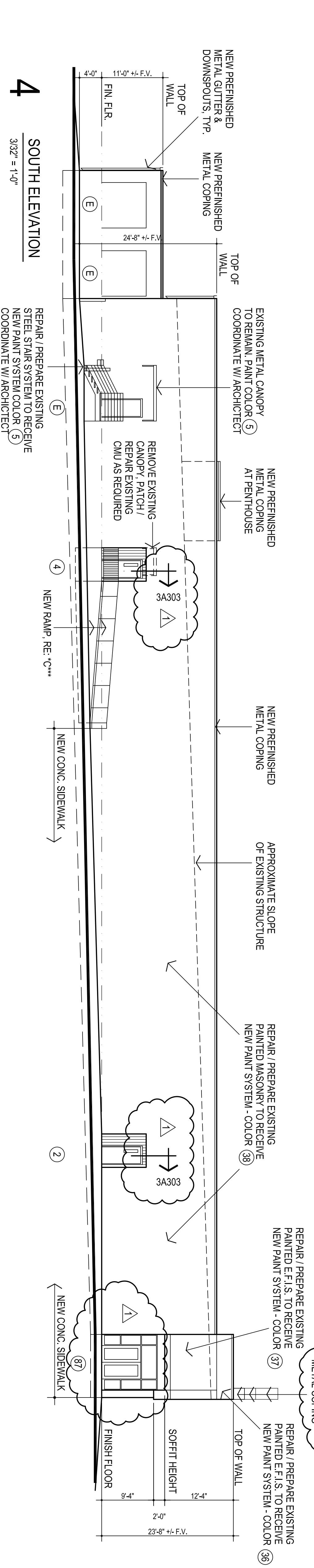
1 EAST ELEVATION
3/32" = 1'-0"



2 NORTH ELEVATION
3/32" = 1'-0"



3 WEST ELEVATION
3/32" = 1'-0"



4 SOUTH ELEVATION
3/32" = 1'-0"



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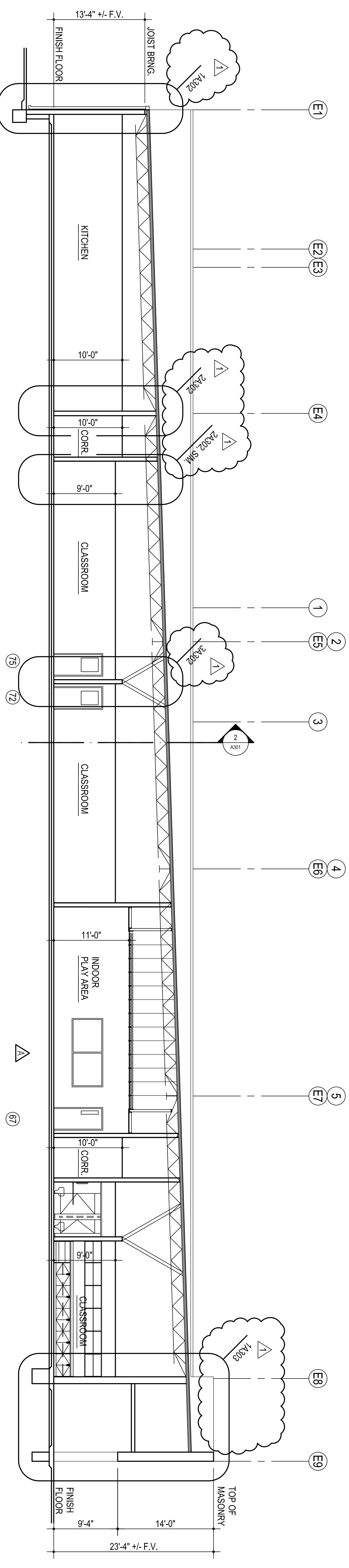


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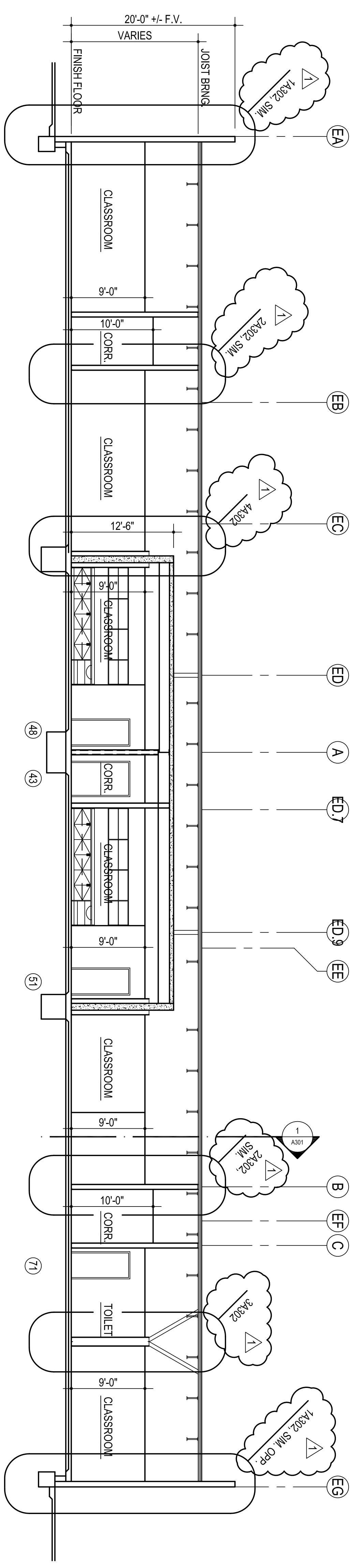
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1
BUILDING SECTION
1/8" = 1'-0"



2
BUILDING SECTION
1/8" = 1'-0"



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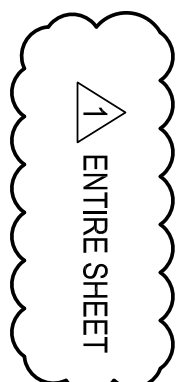


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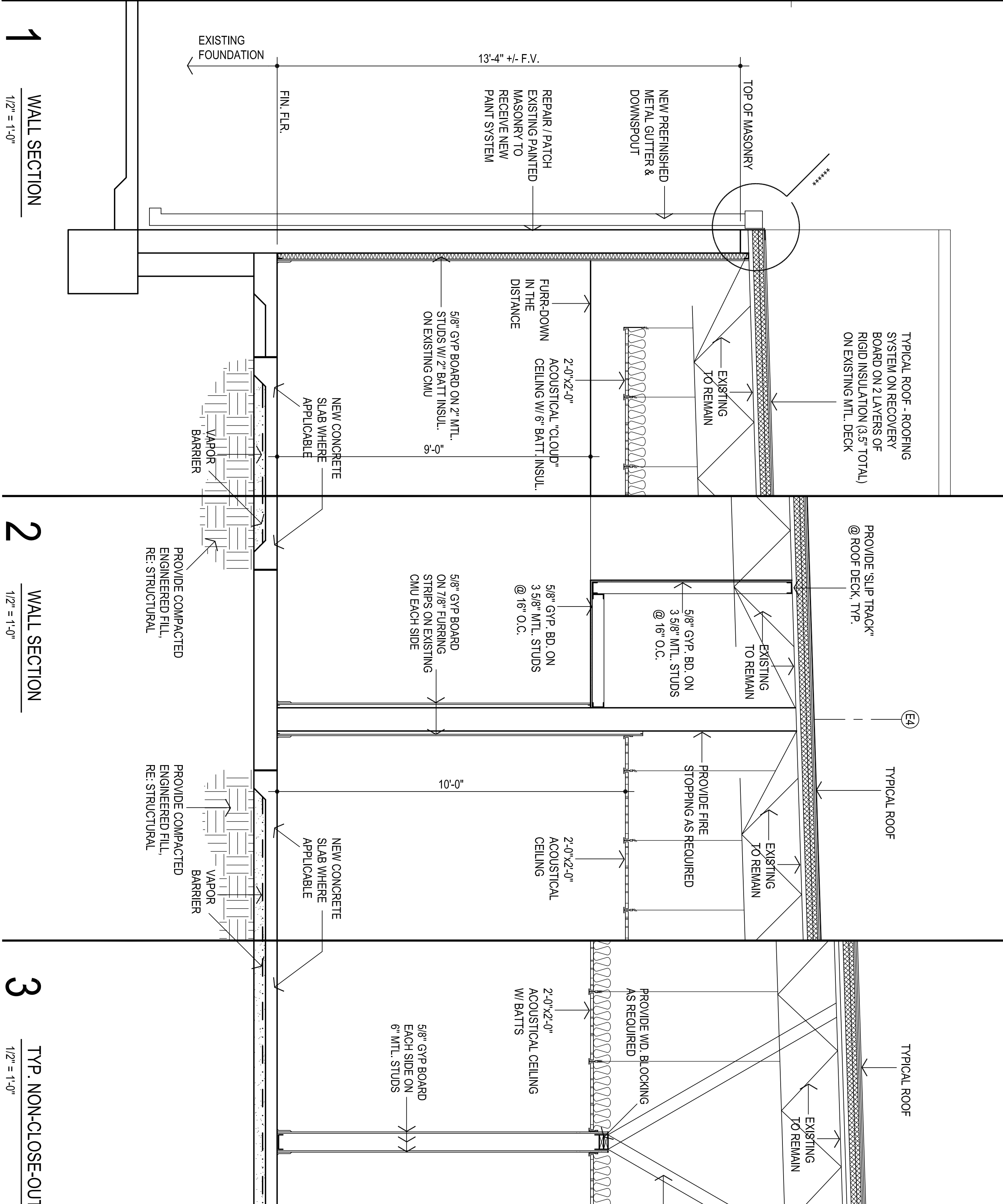
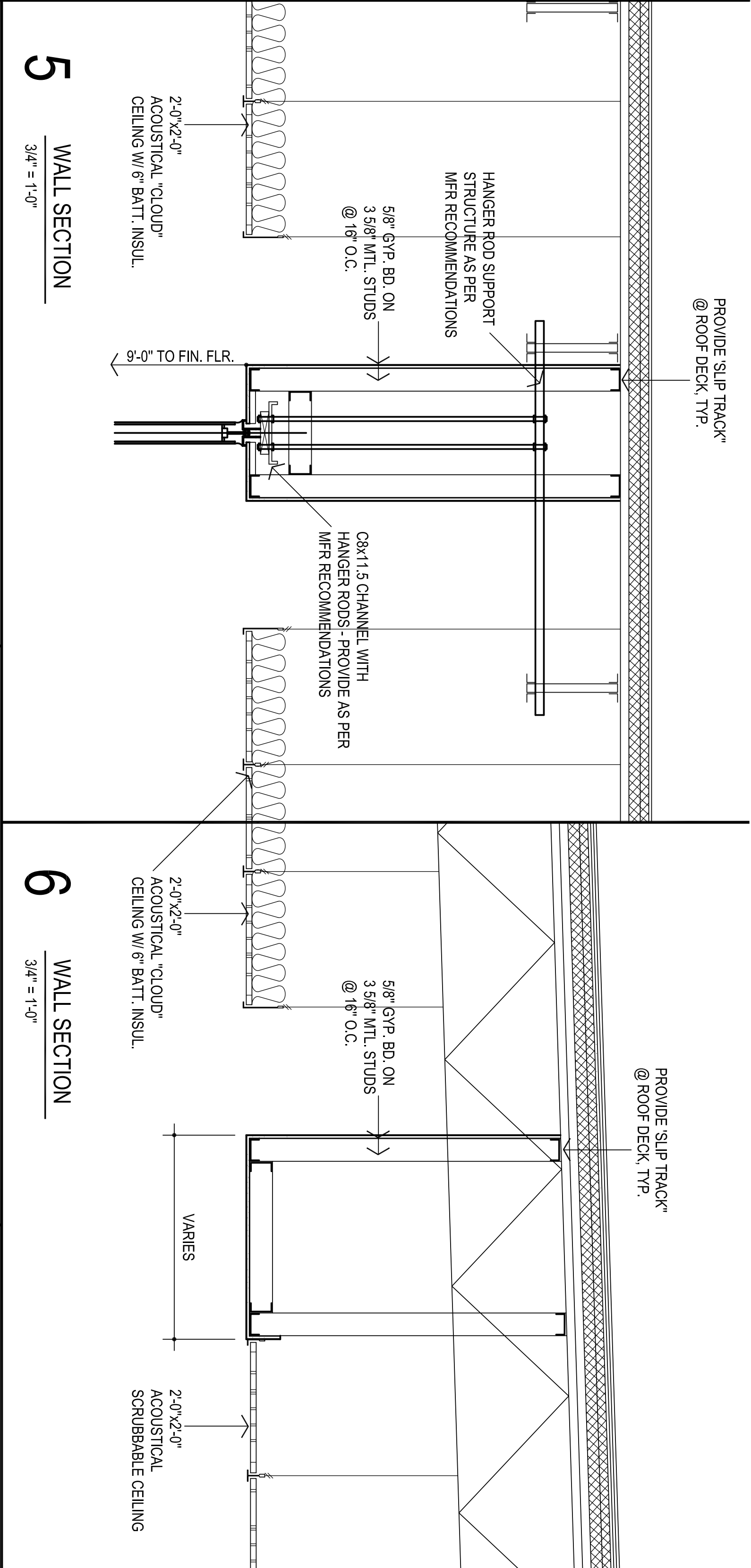
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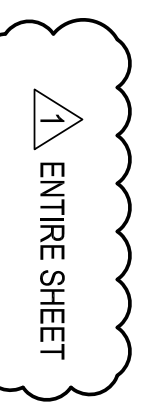
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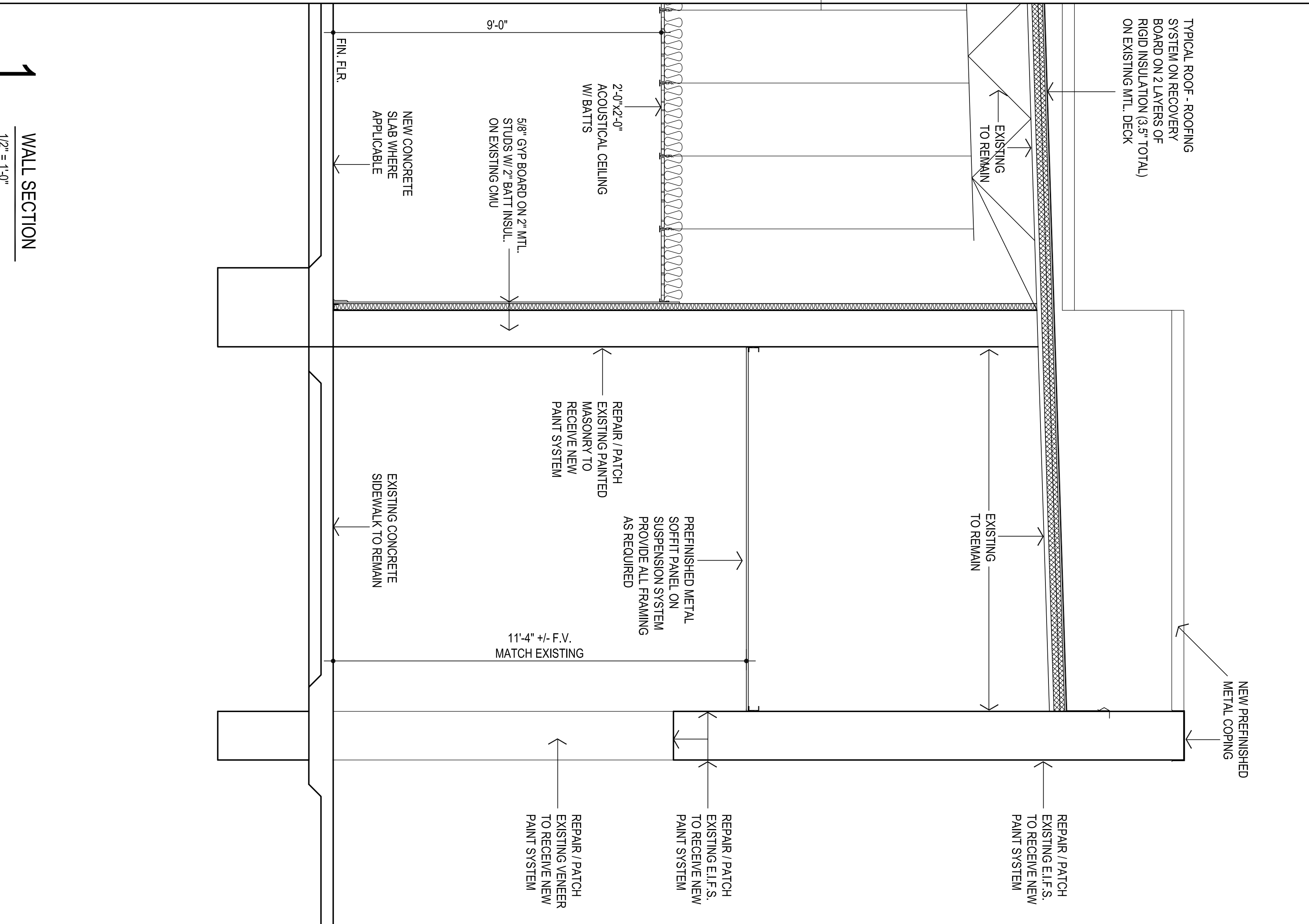
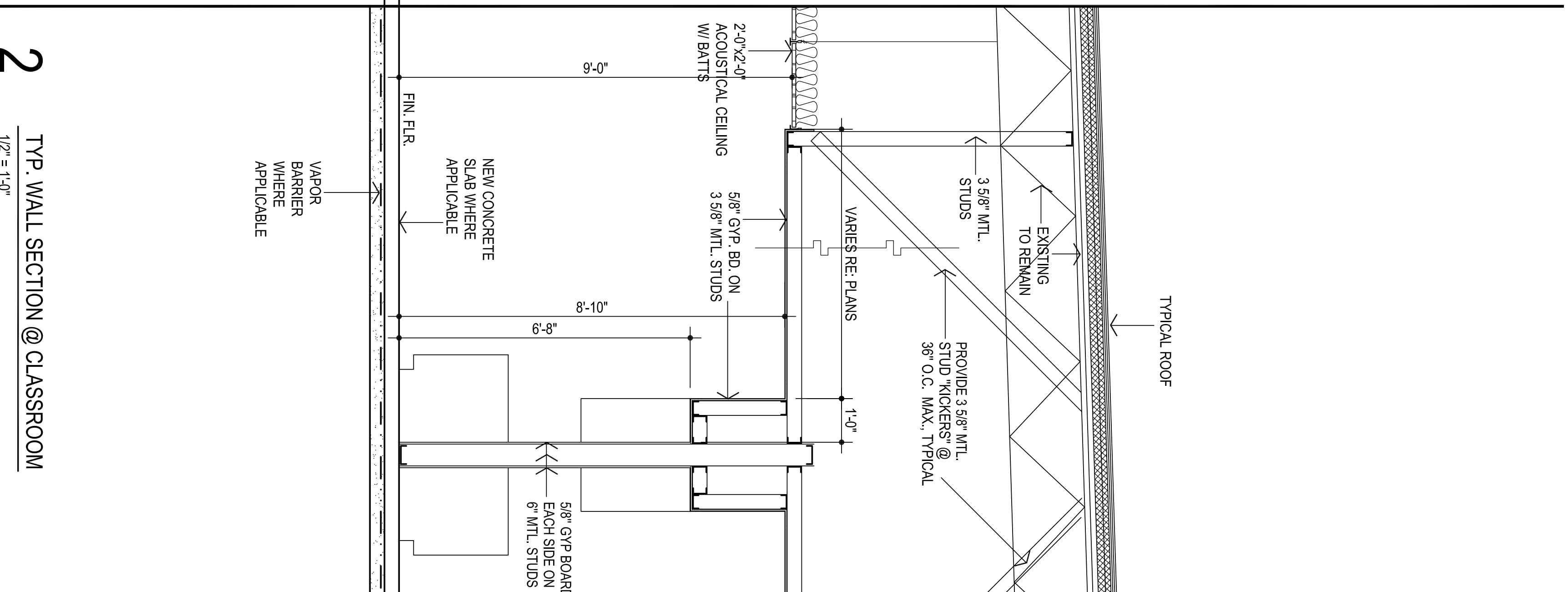
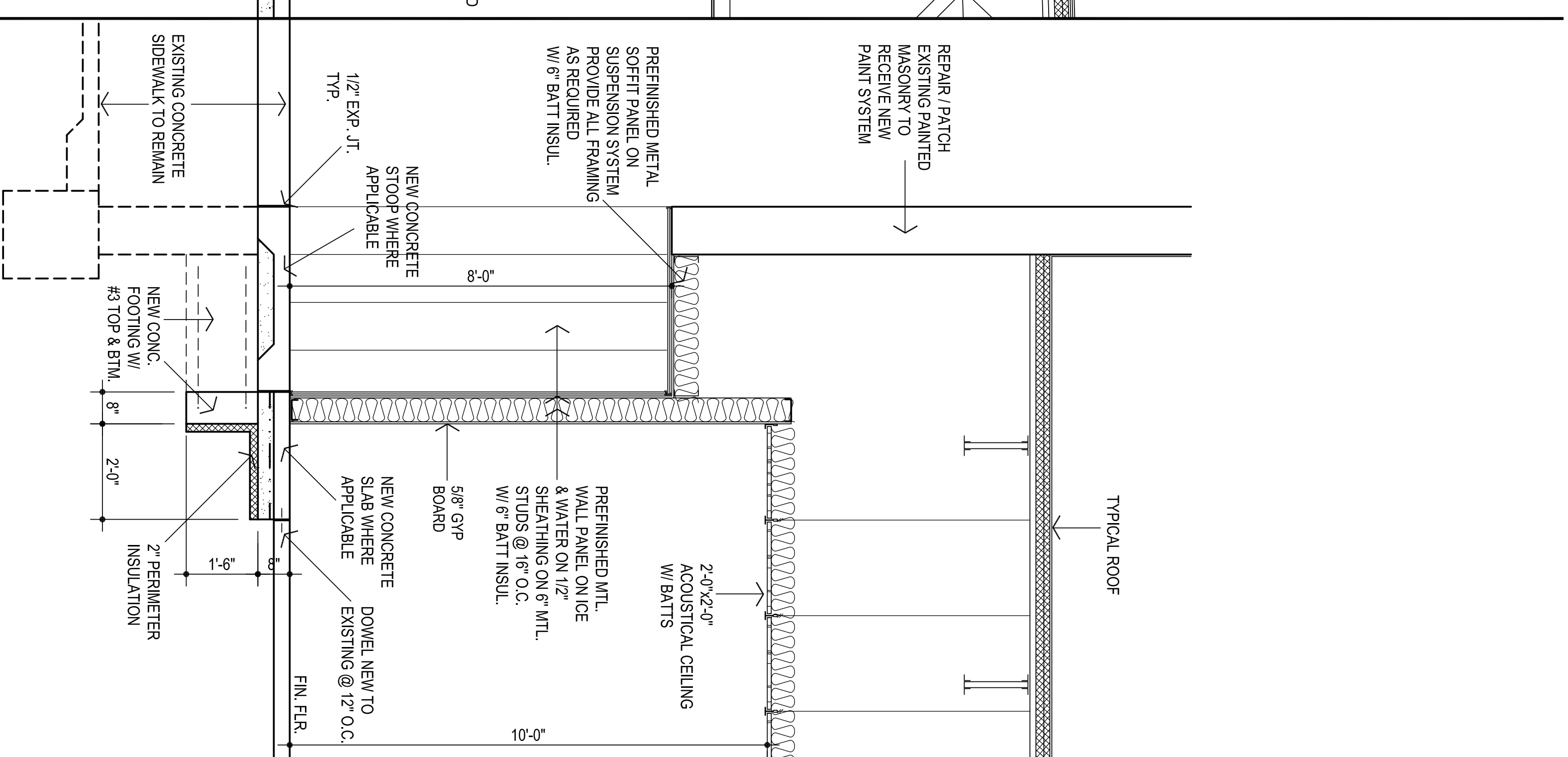
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1 WALL SECTION
1/2" = 1'-0"

2 TYP. WALL SECTION @ CLASSROOM
1/2" = 1'-0"

3 TYP. WALL SECTION @ NEW EXT. DOOR
1/2" = 1'-0"

CEDAR CREEK

KFC ENGINEERING
STRUCTURAL

SALAS ORBEN
MECHANICAL/ELECTRICAL

10/22/24


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PAINT:

- 1 GYP BOARD CEILINGS / EXPOSED STRUCTURE: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 2 WALLS - FIELD: SHERWIN-WILLIAMS - SW708 - ALABASTER
- 3 WALLS - @ SIDE & ABOVE DOORS WHERE INDICATED:
 - 3a) DOORS 22, 24, 30, 31 & 57 - SW6868 REAL RED
 - 3b) DOORS 26, 33, 34, 46 & 49 - SW6886 KNOCKOUT ORANGE
 - 3c) DOORS 44, 50, 57, 72 & 75 - SW6903 CHEERFULL
 - 3d) DOORS 62, 64, 68, 69 & 765 - SW6998 DYNAMIC BLUE
 - 3e) DOORS 62, 64, 68, 69 & 765 - SW6998 DYNAMIC BLUE
- 4 H.M. DOORS & FRAMES: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 5 MISCELLANEOUS METALS: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 6 WOOD DOORS & MILLWORK: ARCHITECTURAL WOOD DOORS - CLEAR CL07
- 7 EXPOSED STRUCTURE & UNDERSIDE OF DECK: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 8 ACCEENT @ CORRIDORS: SW7073 DORIAN GRAY
- 9 EXTERIOR COLUMN COLORS:
 - 9a) SW7006 EXTRA WHITE
 - 9b) SW6992 INKWEIL
 - 9c) SW6868 REAL RED
 - 9d) SW6924 DIRECT GREEN
 - 9e) SW6888 KNOCKOUT ORANGE
 - 9f) SW6958 DYNAMIC BLUE
 - 9g) SW6903 CHEERFULL
 - 9h) SW6982 AFRICAN VIOLET

PREFINISHED COLORS:

- 10 CARPET TILES: COLOR 'A': INTERFACE - COLOR 'B': INTERFACE -
- 11 RUBBER WALL BASE: ROPPE - 100 BLACK
- 12 LUXURY VINYL TILE COLOR: INTERFACE - A00702 PEWTER
- 13 LUXURY VINYL TILE ACCEENT COLOR:
 - 13a) INTERFACE - A00714 YELLOW
 - 13b) INTERFACE - A00721 ELECTRIC BLUE
 - 13c) INTERFACE - A00717 RED
 - 13d) INTERFACE - A00706 ORANGE
 - 13e) INTERFACE - A00701 SILVERLIGHT

2 COLOR SCHEDULE

COORDINATE ALL COLORS & THEIR LOCATIONS, QUANTITIES, ETC. W/ THE ARCHITECT PRIOR TO ACQUIRING MATERIALS

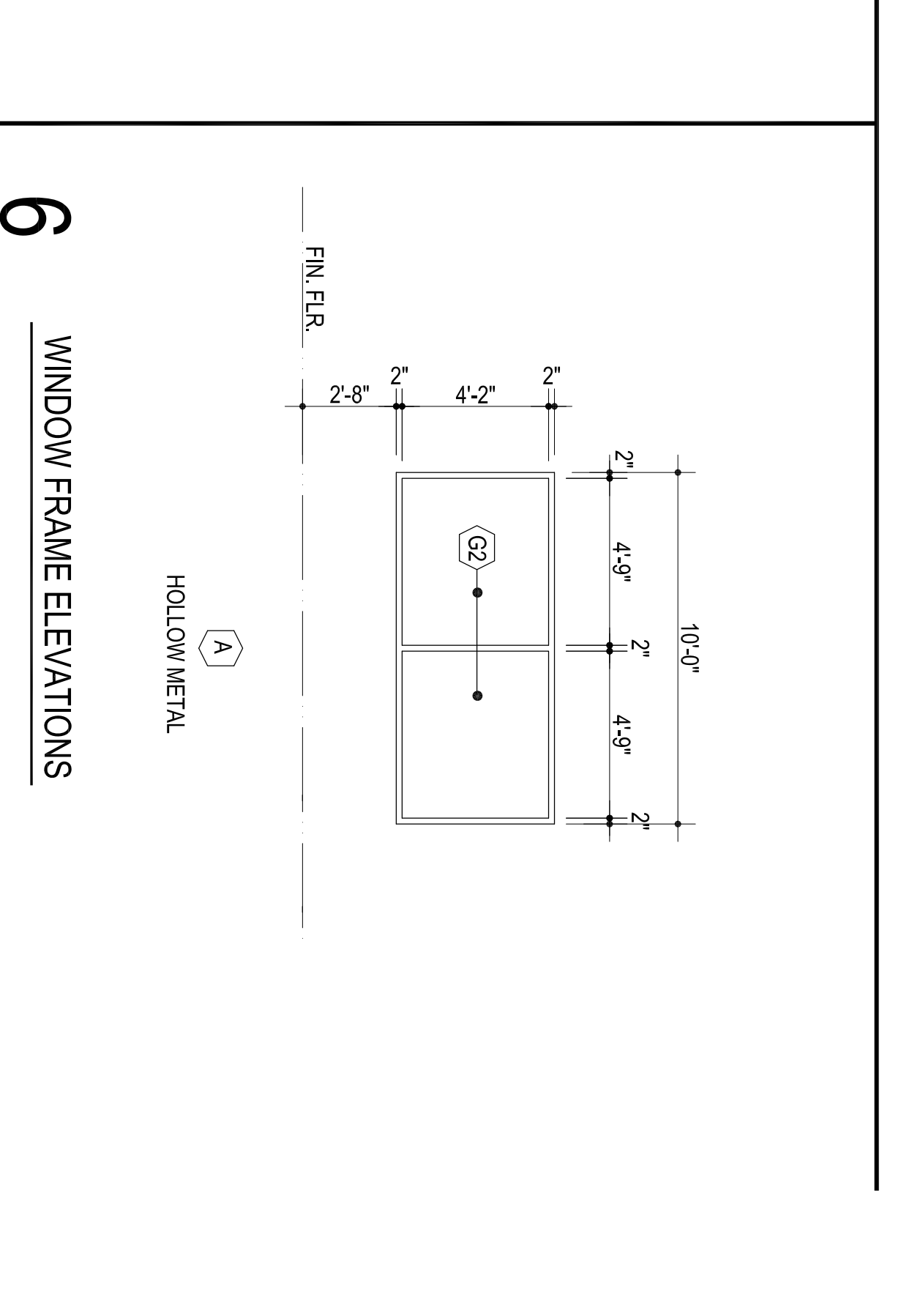
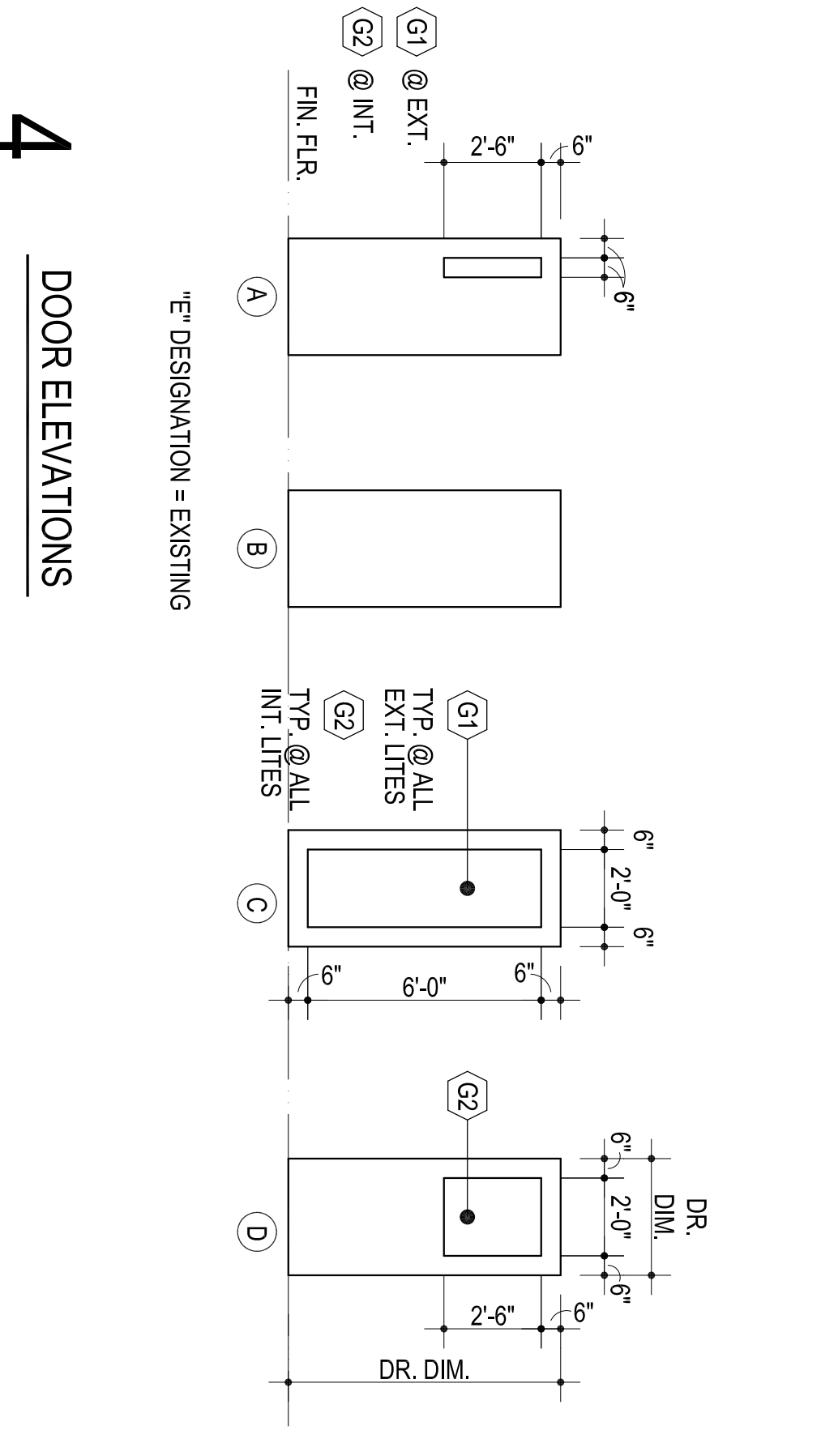
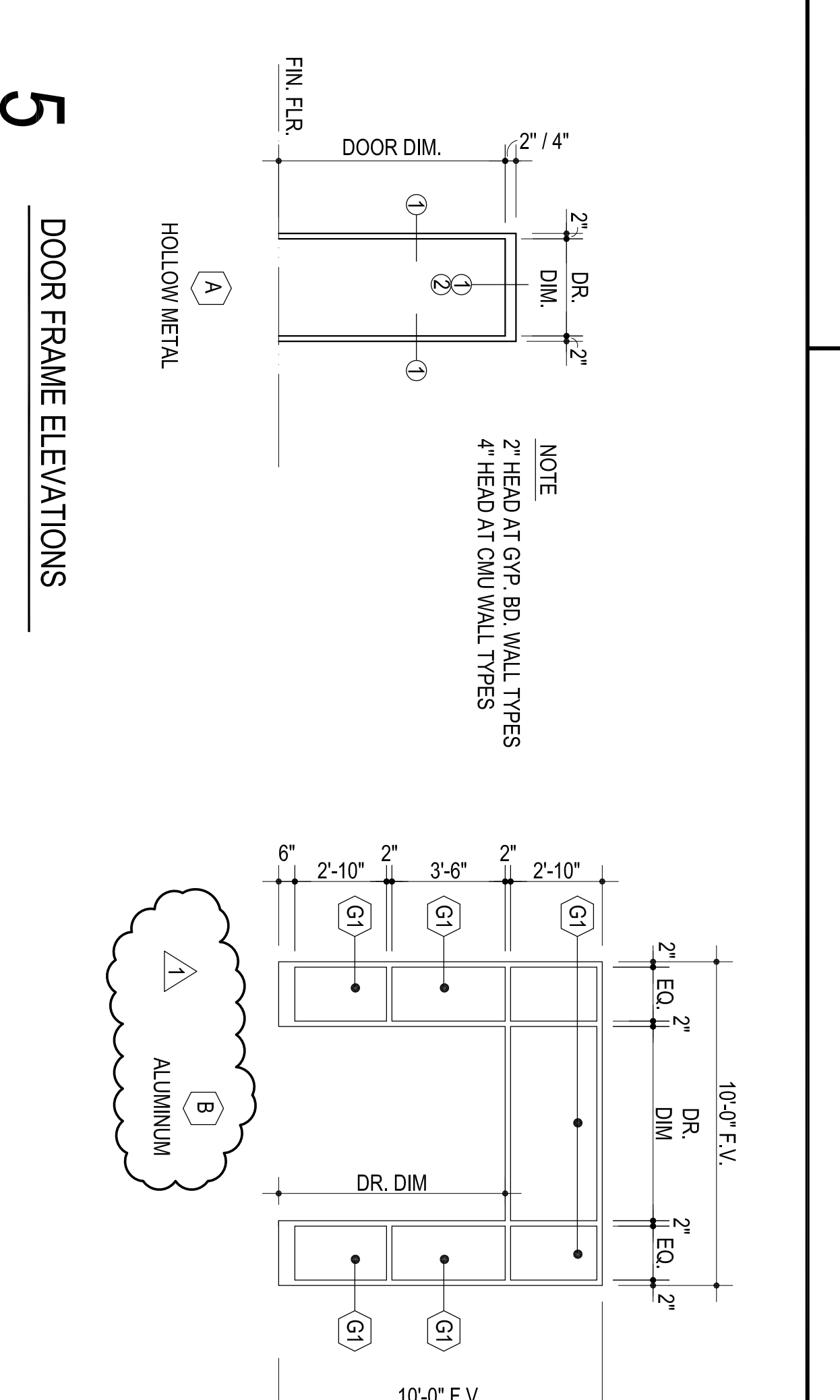
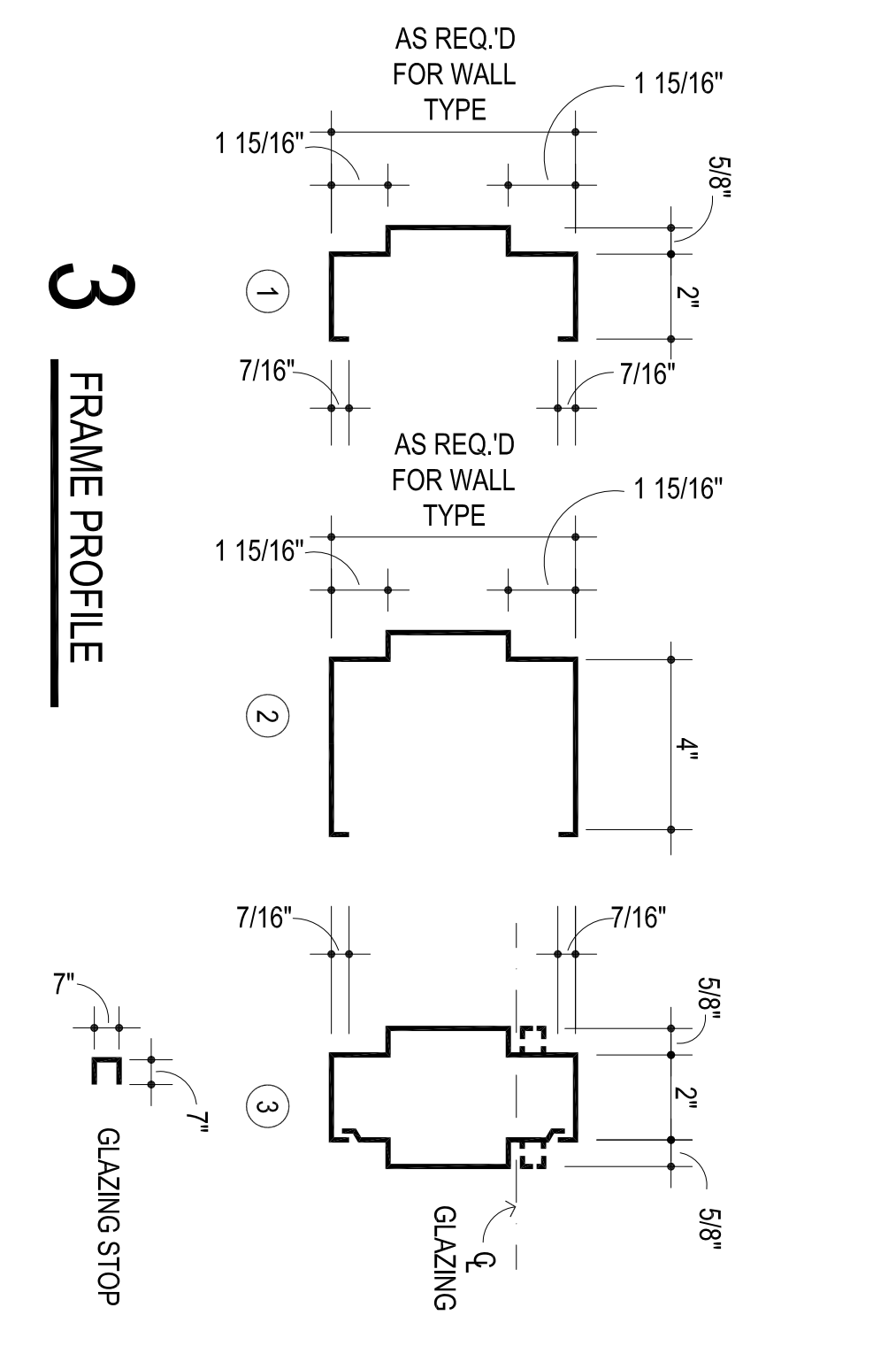
DESCRIPTION	RM. NO.	FLOOR	BASE	CEILING	CLG. HT.	REMARKS	RM. NO.	WALLS	PAINT / COLOR SCHEDULE						
									WALLS					REMARKS	
								N	E	S	W				
CLASSROOM	001	LUXURY VINYL TILE CARPET TILE CERAMIC TILE EPOXY FLOORING EXPOSED CONCRETE W/ HARDENER	CERAMIC TILE RUBBER NONE	2 X 2 ACOUST. LAY-IN (TEG) 2 X 2 ACOUST. LAY-IN (SQ) GYP. BOARD EXPOSED STRUCTURE	9'-0"			CERAMIC TILE GYP. BOARD EXISTING	0.6						
TOILET	001a						001	(1)23 (2)23 (2)23 (2)23	(1)15 (1)15 (1)15 (1)15	(1)14 (1)14 (1)14 (1)14	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	001b						001a	(1)15 (1)15 (1)15 (1)15	(1)15 (1)15 (1)15 (1)15	(1)14 (1)14 (1)14 (1)14	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	001c						001b	(1)15 (1)15 (1)15 (1)15	(1)15 (1)15 (1)15 (1)15	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	001d						001c	(1)15 (1)15 (1)15 (1)15	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	001e						001d	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
CLASSROOM	002						001e	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
CLASSROOM	003						002	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	004						003	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	005						004	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	101						005	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
TOILET	101a						101	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
TOILET	101b						101a	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	101c						101b	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	101d						101c	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	101e						101d	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
CLASSROOM	102						101e	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	103						102	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	104						103	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	105						104	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	201						105	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
TOILET	201a						201	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	201b						201a	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	201c						201b	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	201d						201c	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	201e						201d	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
CLASSROOM	202						201e	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	203						202	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	204						203	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	205						204	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	301						205	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
TOILET	301a						301	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	301b						301a	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	301c						301b	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	301d						301c	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
TOILET	301e						301d	(1)15 (1)15 (1)15 (1)15)	(1)15 (1)15 (1)15 (1)15)	(1)14 (1)14 (1)14 (1)14)	(1)12 (1)12 (1)12 (1)12)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)		
CLASSROOM	302						301e	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	303						302	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	304						303	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CLASSROOM	305						304	(1)23 (2)23 (2)23 (2)23)	(1)22 (2)22 (2)22 (2)22)	(1)23 (1)23 (1)23 (1)23)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
WAITING AREA RECEPTIONIST COPY	401						305	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
OFFICE	402						401	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
OFFICE	403						402	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
OFFICE	404						403	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
OFFICE	405						404	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
PRINCIPAL	406						405	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CORRIDOR	407						406	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CORRIDOR	408						407	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CONFERENCE	409						408	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
BREAKROOM	410						409	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
VESTIBULE	411						410	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
CORRIDOR	412						411	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1)19 (1)19 (1)19)	(2)27 (2)27 (2)27 (2)27)			
TOILET	413						412	(1)24 (2)24 (2)24 (2)24)	(1)22 (2)22 (2)22 (2)22)	(1)24 (1)24 (1)24 (1)24)	(1)19 (1				

DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
1	401 EXT. C	A	HM.	3'-0"	7'-0"	1 3/4"	A	16A501	16A501	29A501	29A501	20 MIN. DR & FRAME	5
2	411 EXT. A	C	<	<	<	<	<	4A501	16A501	11A501	11A501		7
3	412 411	<	<	<	<	<	<	22A501	16A501	11A501	11A501		10
4	435 EXT.							22A501	16A501	29A501	29A501		5
5	428 435							4A501	16A501	11A501	11A501		10
6	421 EXT.							22A501	15A501	29A501	29A501		5
7	420 421							4A501	16A501	11A501	11A501		10
8	418 EXT.							22A501	15A501	29A501	29A501		13
9	419 418							4A501	16A501	11A501	11A501		15
10	412 401							4A501	16A501	11A501	11A501		16
11	402 401							3A501	10A501	10A501	10A501		16
12	412 402							4A501	11A501	11A501	11A501		5
13	407 404							4A501	11A501	11A501	11A501		11
14	407 405							4A501	11A501	11A501	11A501		11
15	407 406							4A501	11A501	11A501	11A501		11
16	409 407							4A501	11A501	11A501	11A501		12
17	412 408							4A501	11A501	11A501	11A501		8
18	412 410							4A501	11A501	11A501	11A501		14
19	412 410							4A501	11A501	11A501	11A501		14
20	436 436a							3A501	10A501	10A501	10A501		2
21	435 436							4A501	11A501	11A501	11A501		14
22	435 001							4A501	11A501	11A501	11A501		9
23	001 001a							3A501	10A501	10A501	10A501		12
24	435 002							4A501	11A501	11A501	11A501		9
25	002 001b							3A501	10A501	10A501	10A501		12
26	435 101							4A501	11A501	11A501	11A501		9
27	101 101a							3A501	10A501	10A501	10A501		12
28	102 101b							3A501	10A501	10A501	10A501		12
29	003 101c							3A501	10A501	10A501	10A501		12
30	435 003							4A501	11A501	11A501	11A501		9
31	435 004							4A501	11A501	11A501	11A501		9
32	004 001d							3A501	10A501	10A501	10A501		12
33	435 102							4A501	11A501	11A501	11A501		9
34	435 103							4A501	11A501	11A501	11A501		9
35	005 001e							3A501	10A501	10A501	10A501		12
36	103 101c							3A501	10A501	10A501	10A501		12
37	435 005							4A501	11A501	11A501	11A501		9
38	428 434							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	3
39	428 433							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
40	428 432							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
41	428 431							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
42	429 428							4A501	11A501	11A501	11A501		9
43	428 436							19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
44	436 203							4A501	11A501	11A501	11A501		9
45	203 201c							3A501	10A501	10A501	10A501		12
46	436 104							4A501	11A501	11A501	11A501		9
47	104 201d							3A501	10A501	10A501	10A501		12
48	105 201e							3A501	10A501	10A501	10A501		12
49	436 105							4A501	11A501	11A501	11A501		9
50	436 202							4A501	11A501	11A501	11A501		9
51	202 201b							3A501	10A501	10A501	10A501		12
52	436 416							19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
53	417 417a							4A501	11A501	11A501	11A501		12
54	417 417b							4A501	11A501	11A501	11A501		12
55	417 417c							4A501	11A501	11A501	11A501		12
56	416 417							4A501	11A501	11A501	11A501		9
57	416 201							4A501	11A501	11A501	11A501		9
58	201 201a							3A501	10A501	10A501	10A501		12
59	412 413							4A501	11A501	11A501	11A501		2
60	412 414							4A501	11A501	11A501	11A501		2
61	415 412							4A501	11A501	11A501	11A501		4
62	412 305							4A501	11A501	11A501	11A501		9
63	305 301e							3A501	10A501	10A501	10A501		12
64	419 304							4A501	11A501	11A501	11A501		9
65	304 301d							3A501	10A501	10A501	10A501		12
66	303 301c							3A501	10A501	10A501	10A501		12
67	419 417							4A501	11A501	11A501	11A501		9
68	419 303							4A501	11A501	11A501	11A501		9
69	419 302							4A501	11A501	11A501	11A501		9
70	302 301b							3A501	10A501	10A501	10A501		12
71	301 301a							3A501	10A501	10A501	10A501		12
72	419 205							4A501	11A501	11A501	11A501		9
73	205 201e							3A501	10A501	10A501	10A501		12
74	204 201d							3A501	10A501	10A501	10A501		12
75	419 204							4A501	11A501	11A501	11A501		9
76	419 301							4A501	11A501	11A501	11A501		9
77	419 425							4A501	11A501	11A501	11A501		9
78	NUMBER NOT USED							NUMBER NOT USED					
79	425 424							4A501	16A501	11A501	11A501		2
80	425 423							4A501	16A501	11A501	11A501		2
81	425 422							4A501	16A501	11A501	11A501		11
82	427 426							4A501	16A501	11A501	11A501		6
83	425 EXT.							1A501	15A501	8A501	8A501	8" GRP. BD. WALL ADJUST FRAME AS REQUIRED	5
84	436 436							4A501	16A501	11A501	11A501		12
85	105g 201							4A501	16A501	11A501	11A501		6

DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE	FRAME ELEV.	HEAD	SILL	JAMB	JAMB	REMARKS	HWDR. SET NO.		
86	105f 105	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6
87	439 EXT.	C	ALUM	PR. 3'-0"	7'-0"	1 3/4"		17A501	15A501				1

1 DOOR SCHEDULE

DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE	FRAME ELEV.	HEAD	SILL	JAMB	JAMB	REMARKS	HWDR. SET NO.		
86	105f 105	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6
87	439 EXT.	C	ALUM	PR. 3'-0"	7'-0"	1 3/4"		17A501	15A501				1



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KFC ENGINEERING
STRUCTURAL
SALAS OBRIEN
MECHANICAL/ELECTRICAL

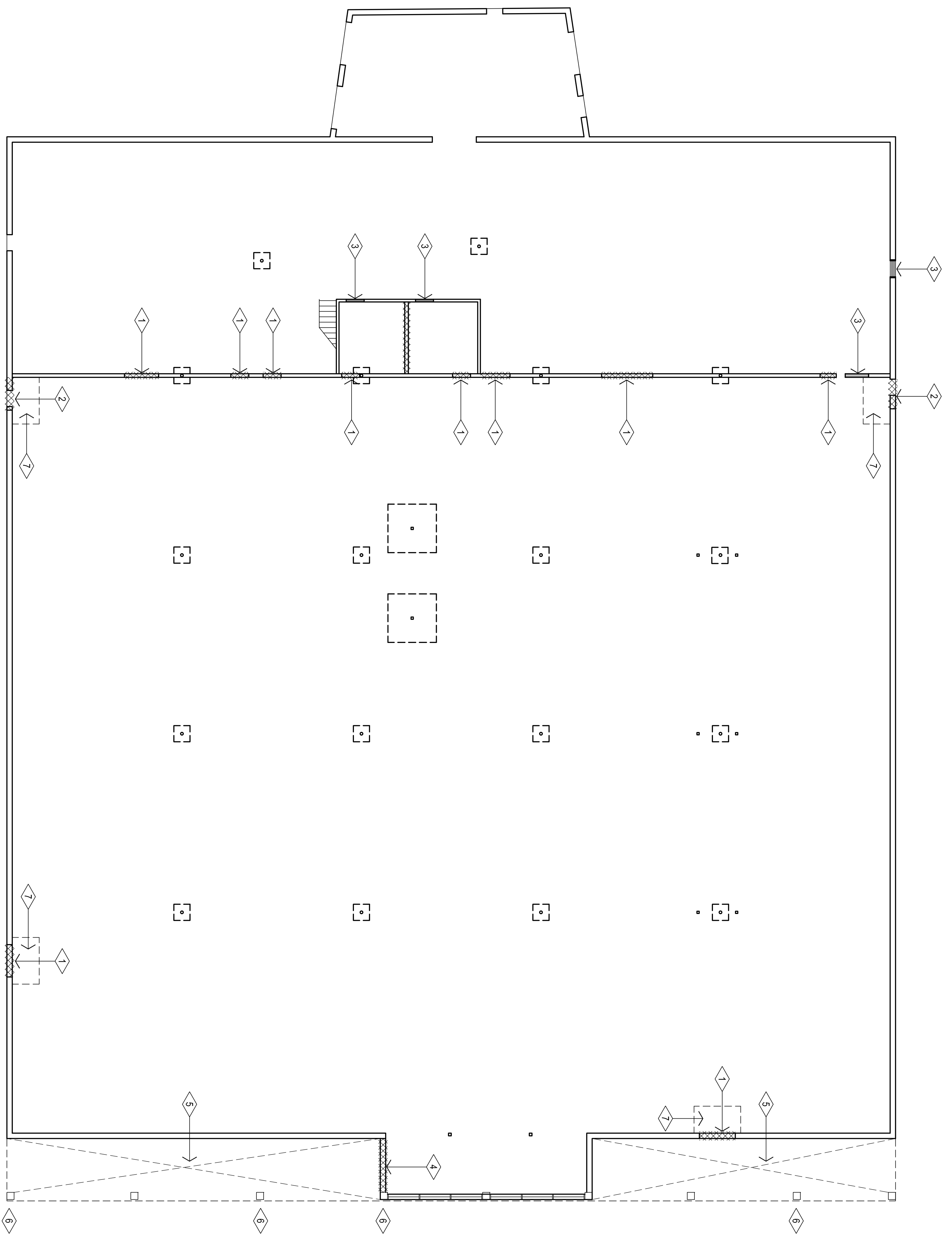
GC
drawn by
MA
checked by
SEPTEMBER 2024
date


MOORE
PUBLIC SCHOOLS

DEMOLITION PACKAGE
CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet No.:
A602

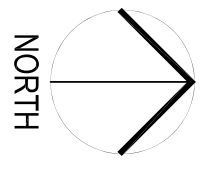
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CONSENT OF AGP.



- DEMOLITION NOTES:
- 1  INDICATES EXISTING WALLS TO BE DEMOLISH TO LIMITS INDICATED. RE: A101a FOR LOCATIONS
 - 2 REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND EXISTING WALL SYSTEM. PREPARE OPENING TO RECEIVE NEW WALL IN-FILL AND NEW H.M. DOOR FRAME
 - 3 REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND PREPARE OPENING TO RECEIVE NEW WALL IN-FILL
 - 4 REMOVE EXISTING TEMPORARY WALL SYSTEM AND PREPARE OPENING TO RECEIVE NEW STOREFRONT
 - 5 REMOVE EXISTING SOFFIT SYSTEM AND ASSOCIATED FRAMING AS REQUIRED FOR NEW FRAMING AND PREFINISHED METAL SOFFIT PANEL
 - 6 REMOVE EXISTING "NO PARKING" SIGN & REINSTALL AFTER EXTERIOR WORK IS COMPLETE
 - 7 REMOVE EXISTING SLAB AT NEW DOOR LOCATIONS RE: A100a & a100b. PREPARE AREA TO RECEIVE NEW CONCRETE SLAB AND STOOP. RE: 3A303

DEMOLITION FLOOR PLAN

3/32" = 1'-0"



GENERAL NOTES:

1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT PROVIDED TO THESE DOCUMENTS SHOULD BE BROUGHT TO THE ARCHITECT'S ATTENTION OF THE ARCHITECT AND INCLUDED IN THE BASE BID.
2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS INSTRUCTIONS.
3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED. PROTECT EXISTING CMU WALL TO REMAIN AS REQUIRED. PROTECT EXISTING EXTERIOR WALL TO REMAIN.

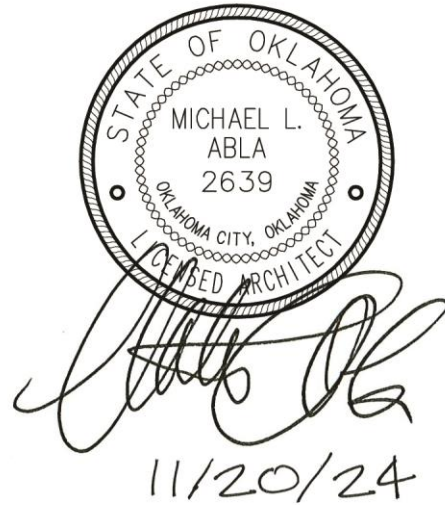
 ENTIRE SHEET

**MOORE PUBLIC SCHOOLS -
CHILD CARE CENTER**

Moore Public Schools - Moore, Oklahoma
AGP - Moore, Oklahoma

ADDENDUM NO. 1

November 20, 2024



This addendum applicable to work designated herein, shall be understood to be an Addendum, and as such shall be included in the Contract Agreement.

Receipt of this Addendum shall be acknowledged by the Construction Management Firm notifying this office in writing, and by any applicable subcontractor to the CM.

This addendum consists of three (3) pages with attachments of twenty-eight (28) 8.5"x11" pages and thirty-nine 24"x36" sheets.

A. Drawings:

Replace Cover Sheet "C". Refer to attachment.

General

1. Sheet G101, Tornado sign: added Construction Manager's name to tornado information sign.

Civil

1. Sheet C200, Demolition Site Plan and Notes: added sheet in its entirety. Refer to attachment.

Architectural Demolition

1. Sheet AD100, Demolition Floor Plan and Notes: added sheet in its entirety. Refer to attachment.

Structural

No changes.

Architectural

1. Sheet A100, Detail 1, Overall Floor Plan: revised entry vestibule at Door #87 and Room #439 / added various door and room numbers where noted. Refer to attachment.
2. Sheet A100a, Dimension Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
3. Sheet A100b, Reference Plan: added references. Refer to attachment.
4. Sheet A101, Wall Type Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
5. Sheet A102, Life Safety Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
6. Sheet A104, Detail 4, Typical New Exterior Door & Vestibule: added reference to section cut. Refer to attachment.
7. Sheet A105, Detail 1, Enlarged Floor Plan Rooms 425, 426, & 427: revised entry into Room #427 Dining. Refer to attachment.
8. Sheet A106, Detail 1, Reflected Ceiling Plan: various notes were revised/added. Refer to attachment.
9. Sheet A107, Detail 1 and Notes: information for gas line locations, etc. were added. Refer to attachment.
10. Sheet A107a, Details: added sheet in its entirety. Refer to attachment.
11. Sheet A108, Detail 1, LVT Dimension / Design Plan: revised entry vestibule at Door #87 and Room #439. Refer to attachment.
12. Sheet A109, Equipment Floor Plan and Schedule: added sheet in its entirety.
13. Sheet A201, Details 1 thru 4, Exterior Elevations: added references and revised notes. Refer to attachment.
14. Sheet A301, Details 1 and 2, Building Sections: wall section notations were added. Refer to attachment.
15. Sheet A302, Wall Sections: added sheet in its entirety.
16. Sheet A303, Wall Sections: added sheet in its entirety.

17. Sheet A304, Details 7 thru 11 and Detail 15, Interior Elevations: revised backsplash notes. Refer to attachments.
18. Sheet A501, Details 22 and 29, Door Details: added details as noted. Refer to attachment.
19. Sheet A601, Detail 2, Color Schedule: added note concerning the coordination of colors and layouts, etc. Refer to attachment.
20. Sheet A602, Detail 1, Door Schedule and Detail 5, Door Frame Elevations: revised door schedule and revised frame elevation "B". Refer to attachment.
21. Sheet A701, Details 1 and 2, Cabinet Sections: revised backsplash requirements at noted cabinets. Refer to attachment.

Mechanical, Electrical, and Plumbing

No changes.

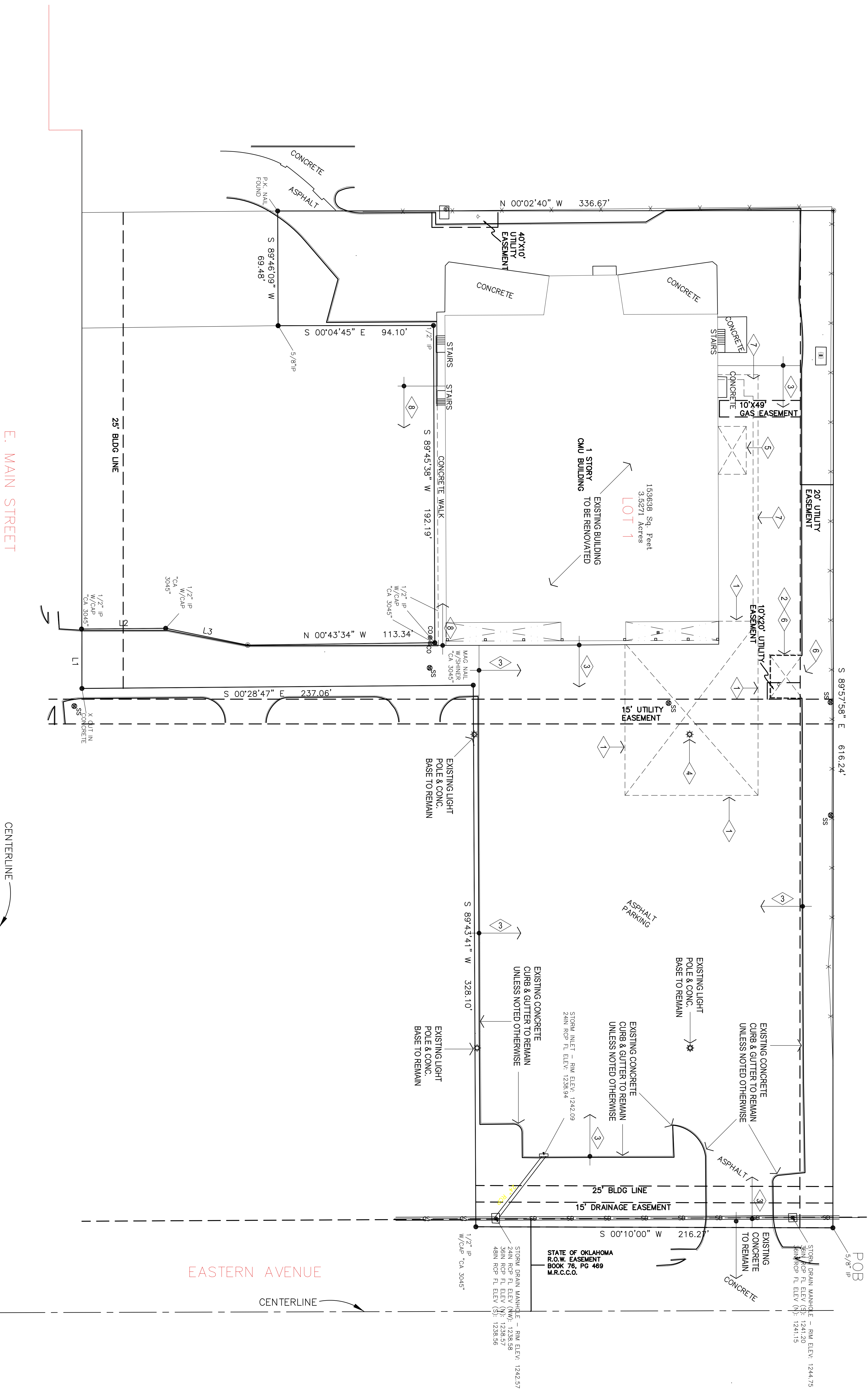
Food Service Documents

Refer to attachments.

B. Specifications:

1. Section 06410-2.09 Custom Casework, Hardware: at each base cabinet doors within children's reach in classrooms #001 thru 005, 101 thru 105, 201 thru 205, and 301 thru 305 provide magnetic lock equal to Rev-A-Lock, RAL-101-1 as manufactured by Rev-A-Shelf LLC.
2. Section 08700 Finish Hardware: add section in its entirety.
3. Section 114000 Kitchen Equipment: add section in its entirety.

END OF ADDENDUM NO. 1



DEMOLITION SITE PLAN



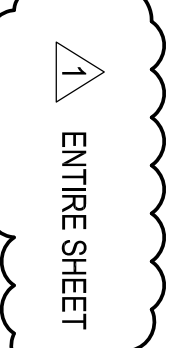
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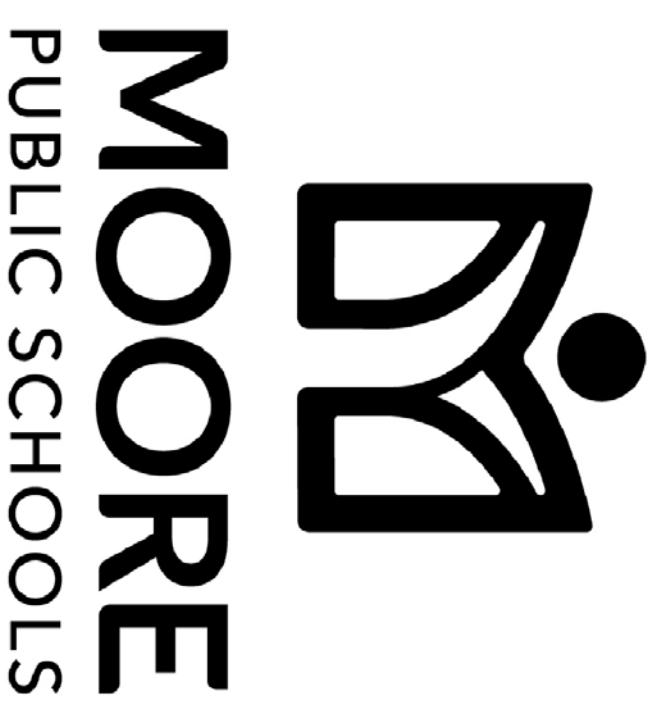
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4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED.

DEMOLITION NOTES:

1. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW POURED-IN-PLACE RUBBER PLAYGROUND SURFACE.
2. DEMOLISH EXISTING CONCRETE CURB & GUTTER AROUND EXISTING FIRE HYDRANT TO BE RELOCATED. RE: CIVIL.
3. DEMOLISH / REMOVE TOP 2" OF ASPHALT WEARING COURSE W/IN LIMITS INDICATED & REPAIR / PREPARE EXISTING ASPHALT BASE COURSE TO REMAIN TO RECEIVE NEW 2" WEARING COURSE.
4. DEMOLISH / REMOVE EXISTING LIGHT POLE & CONCRETE BASE. LOCATE EXISTING ELECTRICAL CONDUIT & PROVIDE ALL MATERIALS REQUIRED FOR REMAINING LIGHT POLES TO WORKING ORDER.
5. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW GENERATOR BUILDING.
6. REMOVE EXISTING SUBGRADE AND PREPARE AREA TO RECEIVE NEW ASPHALT PAVING. MATCH EXISTING THICKNESS. PROVIDE NEW CURB & GUTTER AS REQUIRED. MATCH EXISTING.
7. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED FOR NEW GREASE INTERCEPTOR AND ASSOCIATED PIPING. RE: PLUMBING.
8. DEMOLISH / REMOVE EXISTING SIDEWALK TO LIMITS INDICATED. PREPARE SUBSTRATE FOR NEW RAMPS & SIDEWALK.





MOORE PUBLIC SCHOOLS DISTRICT NO. 1-2
CLEVELAND COUNTY MOORE, OKLAHOMA

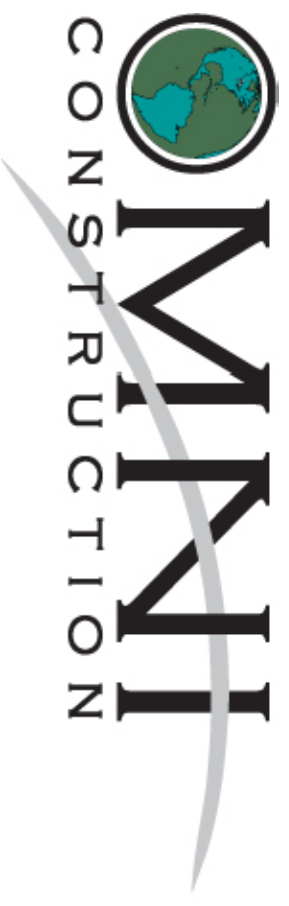
CHILD CARE CENTER

201 NORTH EASTERN AVE.
MOORE, OK. 73160

AGP | the Abila Griffin Partnership

313 SE. 5TH ST. MOORE, OK. 73160
405.735.3477 AGP@theAGP.net www.theAGP.net

CONSTRUCTION MANAGER



1909 S. EASTERN AVE.
MOORE, OK 73160

STRUCTURAL
KFC ENGINEERING

205 NW 63rd, SUITE 390
OKLAHOMA CITY, OK 73116

MECHANICAL/ELECTRICAL/PLUMBING
SALAS O'BRIEN

2900 S. TELEPHONE RD., SUITE 120
MOORE, OKLAHOMA 73160

CIVIL
CEDAR CREEK

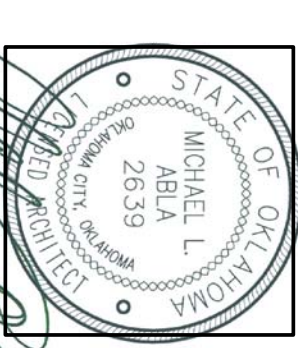
11912 N. PENNSYLVANIA AVE., SUITE D4
OKLAHOMA CITY, OK 73120

KITCHEN CONSULTANT
STURM CONSULTING, INC.

6838 S. HUDSON PL.
TULSA, OK. 74135

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S700	GENERAL FOUNDATION PLAN / FRAMING PLAN / SECTIONS	E100	ELECTRICAL SITE PLAN
AD100	DEMOLITION PLAN	E201	ELECTRICAL LIGHTING PLAN
AD100a	OVERALL DEMOLITION PLAN	E202	ELECTRICAL POWER PLAN
A100a	DIMENSION PLAN	E203	ELECTRICAL ROOF PLAN
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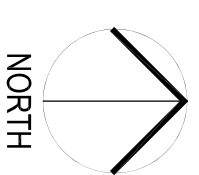
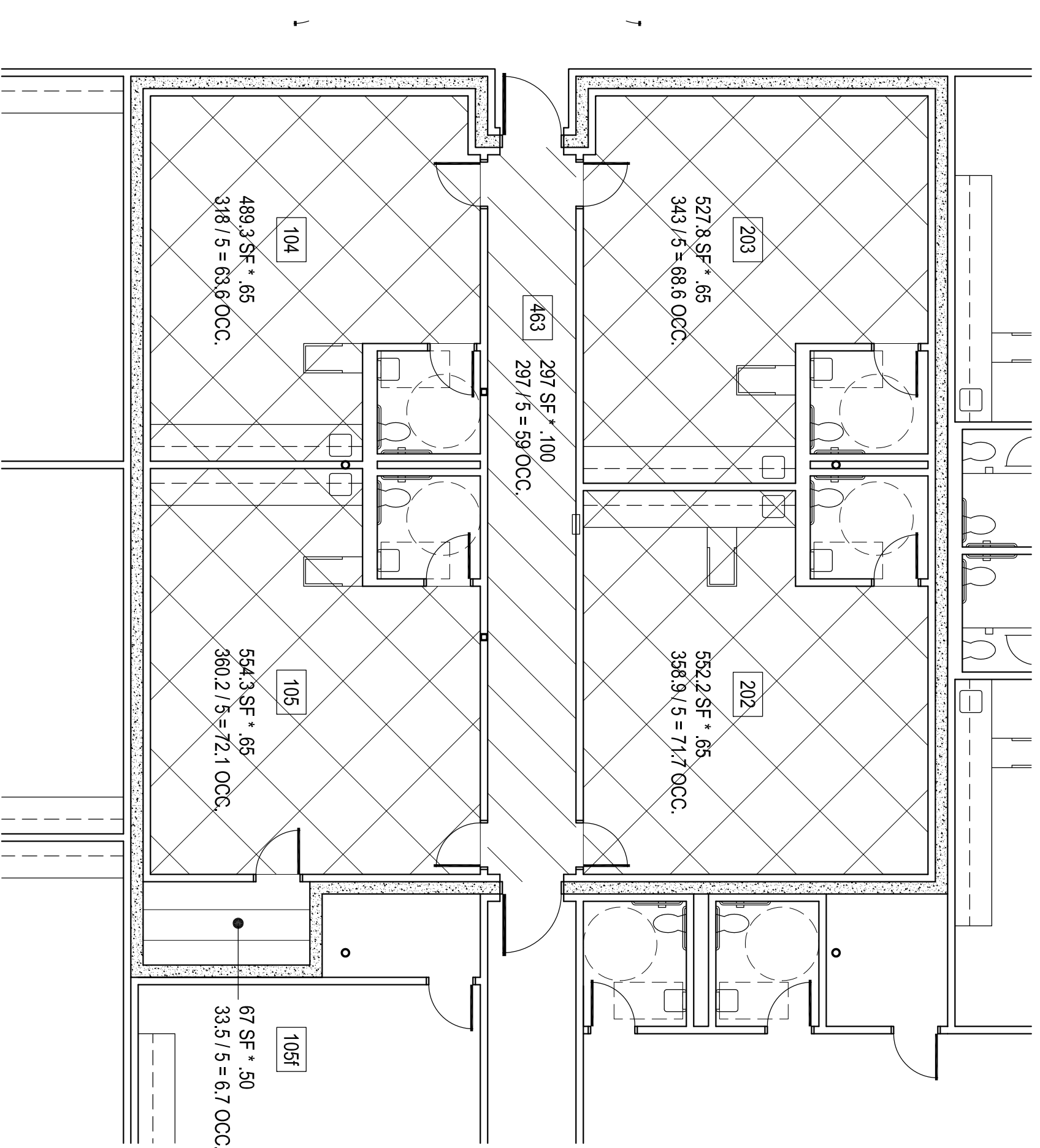
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CHILD CARE CENTER
SET NO.

Revisions:
ADDENDUM #1

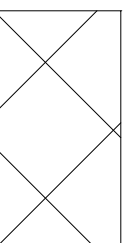
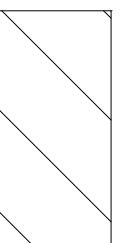
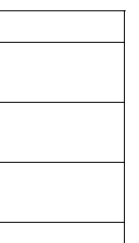
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date:
OCTOBER 2024



1 SHELTER CALCULATION PLAN
1/8" = 1'-0"

GENERAL NOTES:

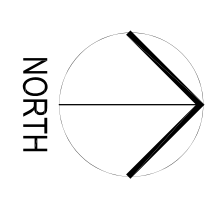
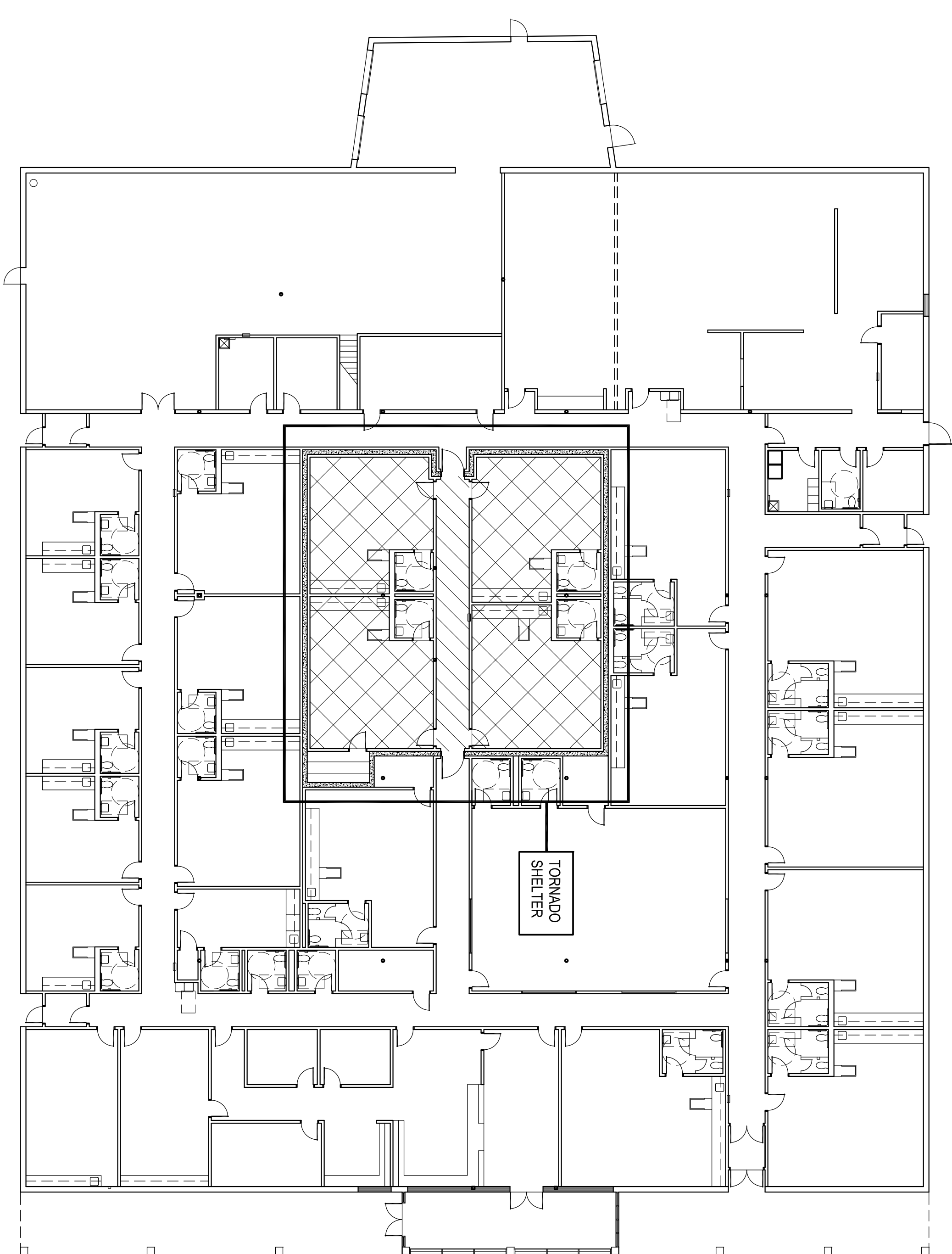
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 65% X 2,122 S.F. = 1,379.3 S.F.
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 100% X 297 S.F. = 297 S.F.
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 50% X 67 S.F. = 33.5 S.F.

TOTAL CALCULATION OF USABLE FLOOR AREA (ADJUSTED TO INCL. H.C.) = 1,709.5 S.F. / .5 = 339 OCCUPANTS + 2 H.C. = 341 TOTAL OCCUPANTS

PLUMBING FIXTURE REQUIREMENTS FOR ICC 500 2014 ARE EXCEEDED BY
IBC 2009 PLUMBING FIXTURE REQUIREMENTS

PLUMBING FIXTURES SHELTER CALCULATIONS:

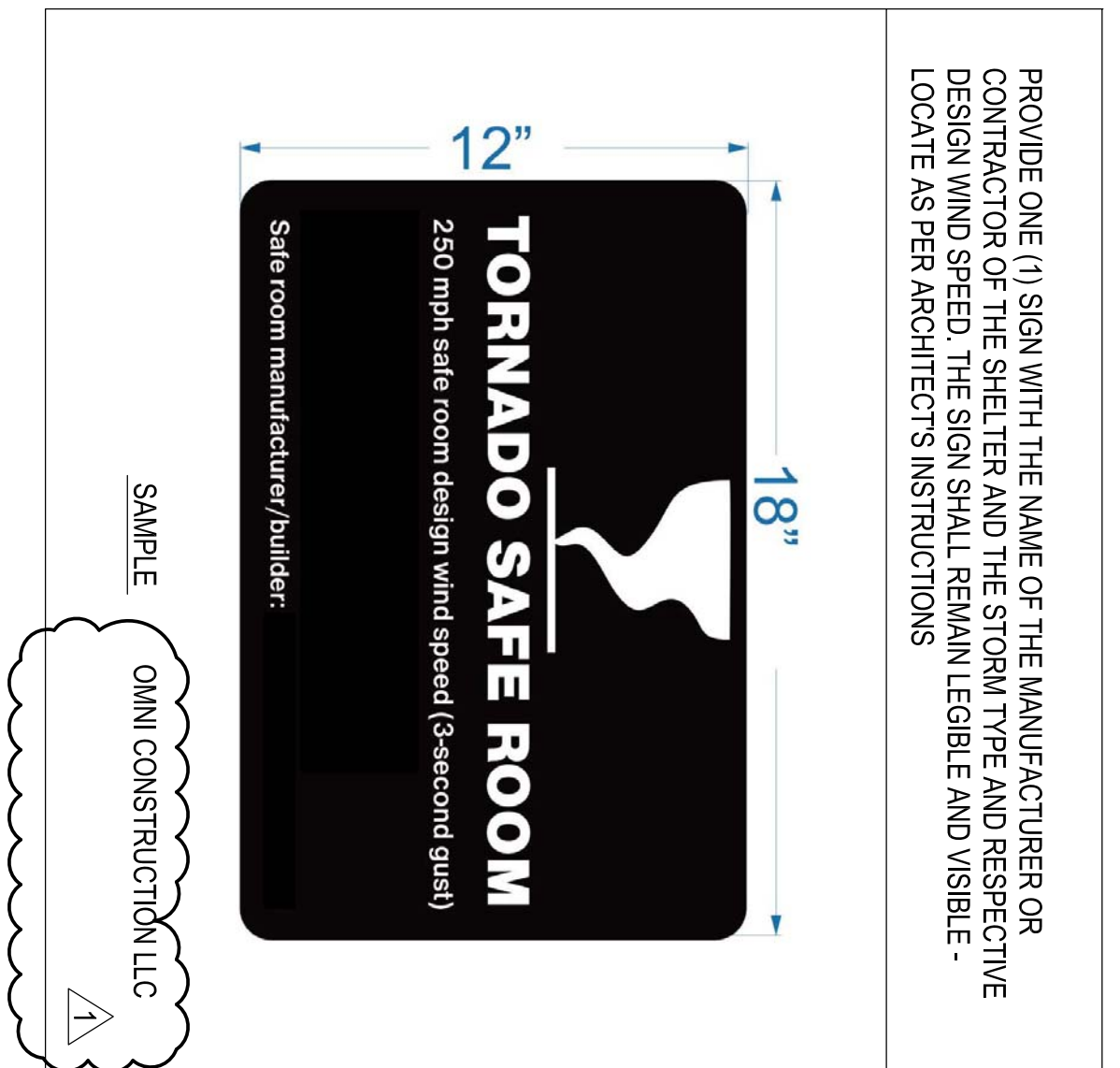
- TOTAL OCCUPANT LOAD = 341
- TOTAL REQUIRED: WATER CLOSETS = 2 LAVATORIES = 2
- TOTAL PROVIDED: WATER CLOSETS = 4 LAVATORIES = 4



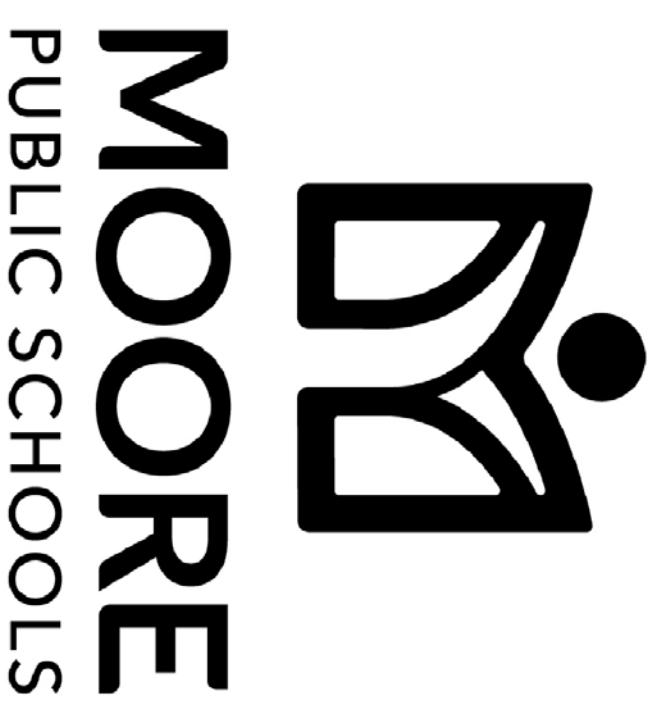
2 SHELTER LOCATION PLAN
NO SCALE

Tornado Storm Shelter Construction:
Storm shelter has been designed and engineered to meet all applicable codes and standards including the following:

1. ICC 500-2014 (International Code Council), ICC / NSSA Standard for the Design and Construction of Storm Shelters, American National Standard.
 2. All construction shall comply with the above standards and guidelines including ICC-500 Section 107.2.1:
 3. Tornado - Community
 4. Re: Structural
 5. Re: Structural
 6. Re: Structural
 7. Re: Structural
 8. Re: Structural
 9. The storm shelter is not located within an area susceptible to flooding.
 10. Not applicable
 11. components meet pressure & missile impact test requirements.
 12. **refer specifications, structural drawings & mechanical drawings
 13. Re: Sheet G101
 14. Re: Sheet A301
 15. Finish floor elevation - Re: Sheet C300
 16. occupant load of shelter = 339 + 2 handicap
 17. useable shelter floor area = 1,709.5 s.f.
 18. Re: mechanical drawings
 19. Re: sheet G101
 20. Re: Structural
 21. Not applicable
 22. Not applicable
- First aid kit shall be provided by owner & stored in the shelter & accessible by occupants



PROVIDE ONE (1) SIGN WITH THE NAME OF THE MANUFACTURER OR CONTRACTOR OF THE SHELTER AND THE STORM TYPE AND RESPECTIVE DESIGN WIND SPEED. THE SIGN SHALL REMAIN LEGIBLE AND VISIBLE - LOCATE AS PER ARCHITECT'S INSTRUCTIONS.



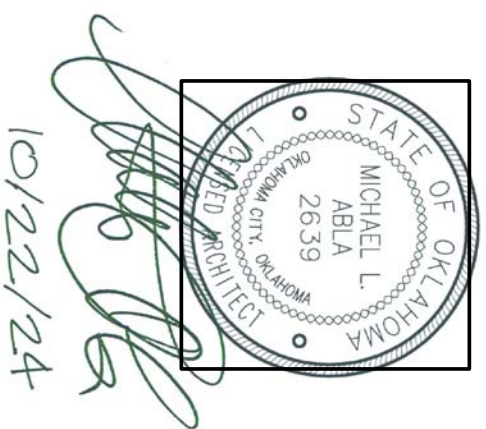
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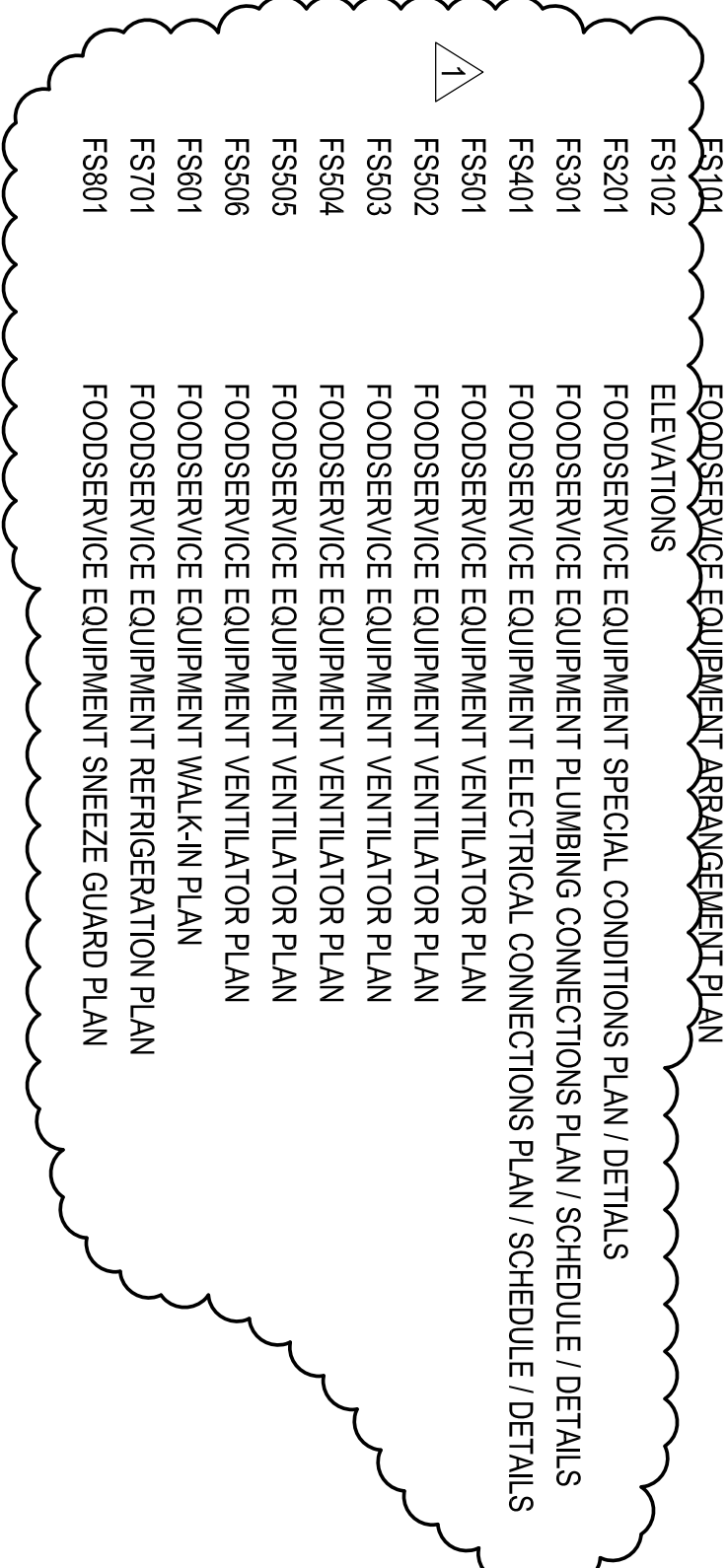
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Revisions:

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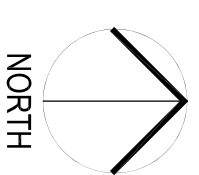
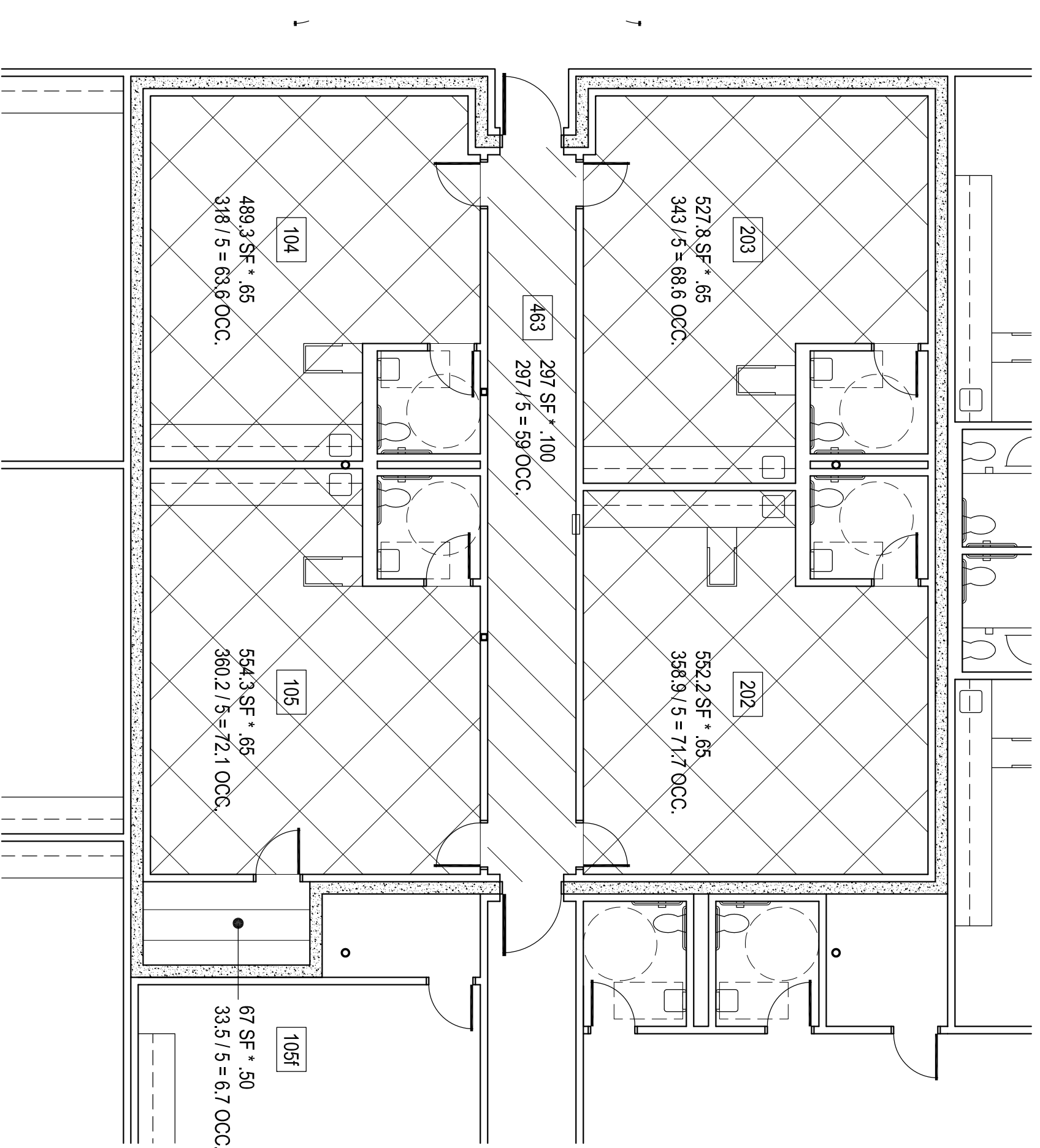
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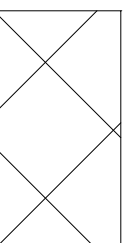
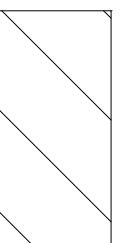
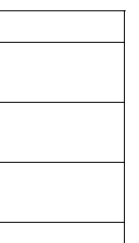
OCTOBER 2024

CHILD CARE CENTER
SET NO.



1 SHELTER CALCULATION PLAN
1/8" = 1'-0"

GENERAL NOTES:

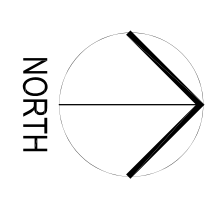
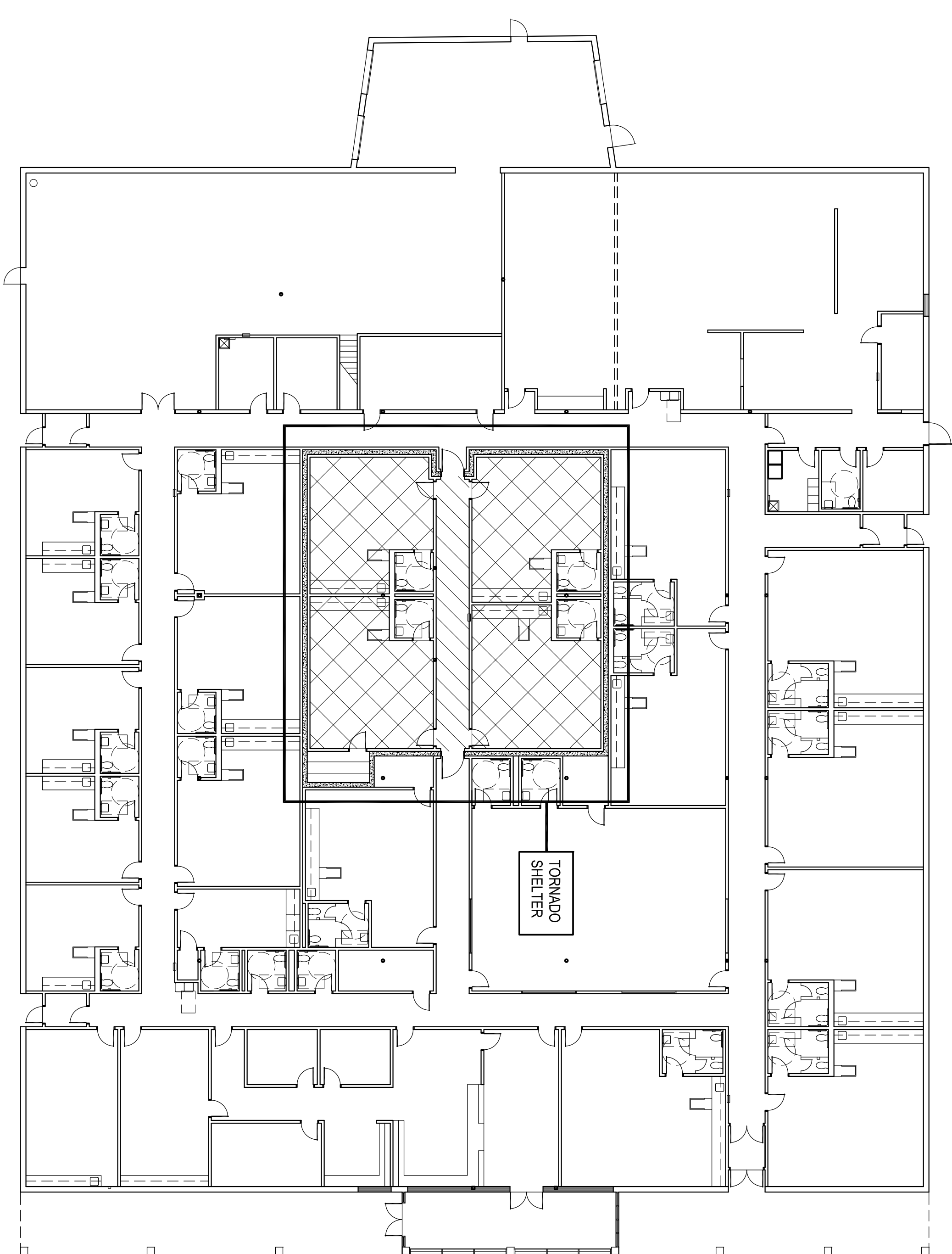
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 65% X 2,122 S.F. = 1,379.3 S.F.
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 100% X 297 S.F. = 297 S.F.
-  INDICATES AREA USED TO CALCULATE USABLE SHELTER FLOOR AREA - 50% X 67 S.F. = 33.5 S.F.

TOTAL CALCULATION OF USABLE FLOOR AREA (ADJUSTED TO INCL. H.C.) = 1,709.5 S.F. / .5 = 339 OCCUPANTS + 2 H.C. = 341 TOTAL OCCUPANTS

PLUMBING FIXTURE REQUIREMENTS FOR ICC 500 2014 ARE EXCEEDED BY
IBC 2009 PLUMBING FIXTURE REQUIREMENTS

PLUMBING FIXTURES SHELTER CALCULATIONS:

- TOTAL OCCUPANT LOAD = 341
- TOTAL REQUIRED: WATER CLOSETS = 2 LAVATORIES = 2
- TOTAL PROVIDED: WATER CLOSETS = 4 LAVATORIES = 4

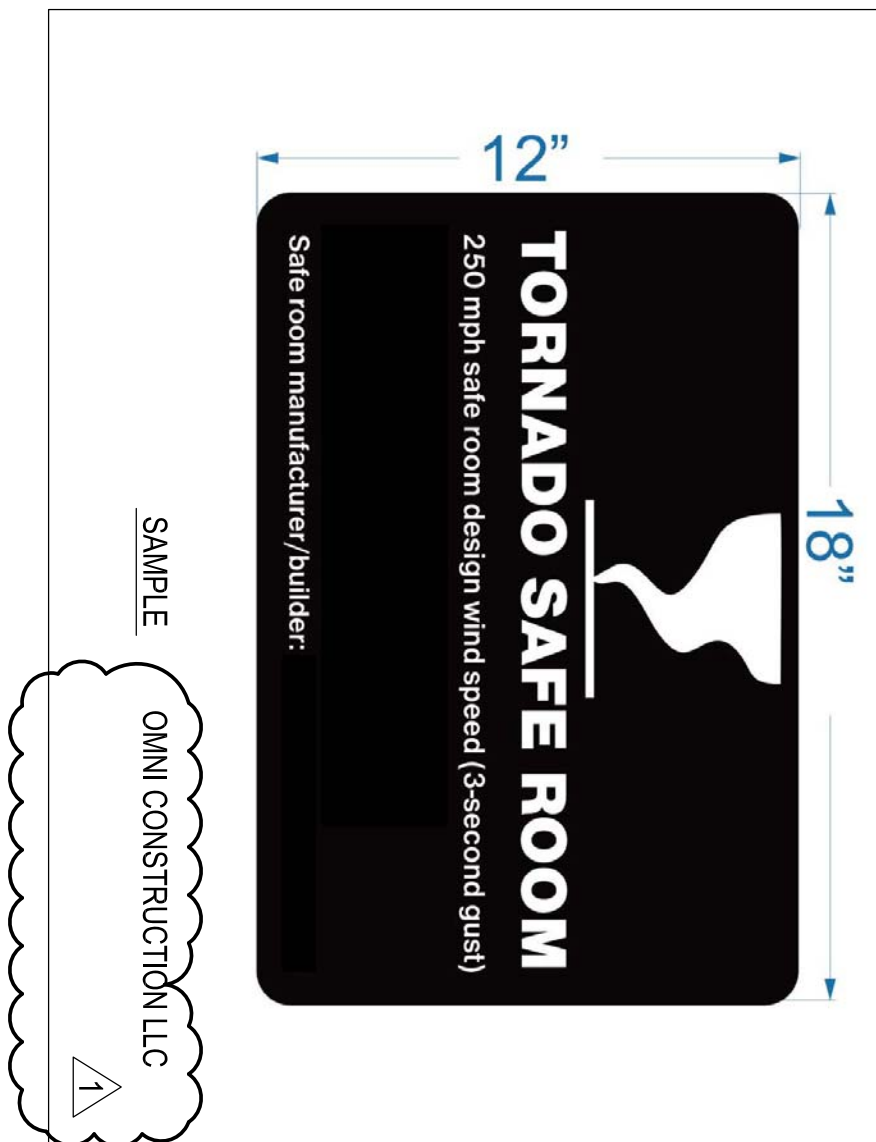


2 SHELTER LOCATION PLAN
NO SCALE

Tornado Storm Shelter Construction:
Storm shelter has been designed and engineered to meet all applicable codes and standards including the following:

1. ICC 500-2014 (International Code Council), ICC / NSSA Standard for the Design and Construction of Storm Shelters, American National Standard.
 2. All construction shall comply with the above standards and guidelines including ICC-500 Section 107.2.1:
 3. Tornado - Community
 4. Re: Structural
 5. Re: Structural
 6. Re: Structural
 7. Re: Structural
 8. The storm shelter is not located within an area susceptible to flooding.
 9. Not applicable
 10. components meet pressure & missile impact test requirements.
 11. **refer specifications, structural drawings & mechanical drawings
 12. Re: Sheet G101
 13. Re: Sheet A301
 14. Finish floor elevation - Re: Sheet C300
 15. occupant load of shelter = 339 + 2 handicap
 16. useable shelter floor area = 1,709.5 s.f.
 17. Re: mechanical drawings
 18. Re: sheet G101
 19. Re: Structural
 20. Not applicable
 21. Not applicable
 22. Not applicable
- First aid kit shall be provided by owner & stored in the shelter & accessible by occupants

PROVIDE ONE (1) SIGN WITH THE NAME OF THE MANUFACTURER OR CONTRACTOR OF THE SHELTER AND THE STORM TYPE AND RESPECTIVE DESIGN WIND SPEED. THE SIGN SHALL REMAIN LEGIBLE AND VISIBLE - LOCATE AS PER ARCHITECT'S INSTRUCTIONS.



ADDENDUM 02

Issue Date: November 22, 2024

Project Information

Client: Abla Griffin Partnership
 Project Name: MPS Daycare
 Project Location: Moore, OK
 Owner: Moore Public Schools
 Engineer: Salas O'Brien, LLC

Project No. 2450-70304-00



To Prospective Bidders

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated November 12, 2024, (and previous addenda), with amendments and additions noted below.

This Addendum consists of (3) pages and (26) attachments.

- Index of Attachments

• M000	P001	E101	T101
• M101	P101	E201	T201
• M201	P110	E202	
• M601	P201	E203	
• M602	P301	E401	
• M603	P302	E601	
• M604	P601	E602	
• M605	E000	T000	

Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may disqualify Bidder.



CHANGES TO THE DRAWINGS

Revisions have been made to the following drawings and are issued in the form of full-size plans. Edits are indicated by a revision delta and a cloud surrounding the affected portion of the drawing.

M000 – MECHANICAL LEGEND AND NOTES

- Refer to clouds and deltas on plan.

M101 – MECHANICAL FLOOR PLAN

- Refer to clouds and deltas on plan.

M201 – MECHANICAL ROOF PLAN

- Refer to clouds and deltas on plan.

M601 – MECHANICAL SCHEDULES

- Refer to clouds and deltas on plan.

M602 – MECHANICAL SCHEDULES

- Entire sheet.

M603 – MECHANICAL SCHEDULES

- Entire sheet.

M604 – MECHANICAL SCHEDULES

- Entire sheet.

M605 – MECHANICAL SCHEDULES

- Entire sheet.

P001 – PLUMBING SITE PLAN

- Refer to clouds and deltas on plan.

P101 - PLUMBING PLAN BELOW GRADE

- Refer to clouds and deltas on plan.

P110 - PLUMBING PLAN ABOVE GRADE

- Refer to clouds and deltas on plan.

P201 – PLUMBING ROOF PLAN

- Refer to clouds and deltas on plan.

P301 – PLUMBING ISOMETRIC – WASTE & VENT

- Refer to clouds and deltas on plan.

P302 – PLUMBING ISOMETRIC – WATER SUPPLY

- Refer to clouds and deltas on plan.



P601 – PLUMBING SCHEDULES

- Refer to clouds and deltas on plan.

E000 – ELECTRICAL TITLE SHEET

- Refer to clouds and deltas on plan.

E101 – ELECTRICAL LIGHTING PLAN

- Refer to clouds and deltas on plan.

E201 – ELECTRICAL POWER PLAN

- Refer to clouds and deltas on plan.

E202 – ELECTRICAL ROOF PLAN

- Refer to clouds and deltas on plan.

E203 – ELECTRICAL KITCHEN PLAN

- Refer to clouds and deltas on plan.

E401 – ELECTRICAL ONE-LINE DIAGRAM

- Refer to clouds and deltas on plan.

E601 – ELECTRICAL SCHEDULES

- Refer to clouds and deltas on plan.

E602 – ELECTRICAL SCHEDULES

- Refer to clouds and deltas on plan.

T000 – TECHNOLOGY NOTES AND LEGENDS

- Refer to clouds and deltas on plan.

T101 – TECHNOLOGY SITE PLAN

- Refer to clouds and deltas on plan.

T201 – TECHNOLOGY FLOOR PLAN

- Refer to clouds and deltas on plan.

END OF ADDENDUM [02]



KF
drawn by
DG
checked by
OCTOBER 24
date

revisions
11/22/2024 AD 02



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

M000

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Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

GENERAL MECHANICAL NOTES	
1. ALL WORK SHALL BE IN COMPLIANCE WITH STATE AND LOCAL CODES.	14. DUCT MATERIAL SHALL BE GALVANIZED OR ALUMINUM CONSTRUCTION IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARD 2005 FOR THE PRESSURE AND SEAL CLASS LISTED IN DUCTWORK/INSULATION SCHEDULE.
2. THE CONTRACTOR SHALL PAY FOR ALL FEES, PERMITS, LICENSES, ETC., NECESSARY FOR PROPER COMPLETION OF THE WORK.	15. DUCT SIZES LISTED ON PLANS ARE THE REQUIRED CLEAR INTERIOR DIMENSIONS.
3. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.	16. SUPPLY AND RETURN BRANCH DUCTS MAY BE INSULATED FLEX DUCT IF THE RUN IS LESS THAN 5 FEET IN LENGTH, ANY LENGTHS OVER 5 FEET SHALL BE RIGID DUCTWORK. DUCT SHALL BE THE SAME SIZE AS THE LISTED DIFFUSER THROAT UNLESS NOTED OTHERWISE.
4. VERIFY ALL EXISTING CONDITIONS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN CONTRACT DRAWINGS AND ACTUAL CONDITIONS.	17. PROVIDE VOLUME CONTROL DAMPERS WHERE INDICATED AND AT ALL TAKEOFFS, BOTH SUPPLY AND RETURN SYSTEMS, AND MAJOR DUCT RUNS. DAMPERS SHALL BE FACTORY-FABRICATED WITH ZINC-PLATED, DIE-CAST CONTROL HARDWARE. CONTROL HARDWARE SHALL INCLUDE HEAVY GAUGE DIAL AND HANDLE WITH ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.
5. EXISTING UTILITIES TO BE ABANDONED SHALL BE PROPERLY DISCONNECTED AND CAPPED AS REQUIRED BY CODE OR LOCAL ORDINANCE.	18. PROVIDE TURNING VANES IN ALL RECTANGULAR ELBOWS CONFORMING TO SMACNA DUCT CONSTRUCTION STANDARD 2005 FIG. 4-2 TYPE RE-3 WITH STANDARD RADIUS. WHERE SPACE PERMITS, PROVIDE RADIUS ELBOWS IN ACCORDANCE WITH FIGURES 4-2, TYPE RE-1.
6. THESE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. ADDITIONAL DATA SHALL BE FROM THE ENGINEER THROUGH WRITTEN CLARIFICATION ONLY. VERIFY ALL EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS BEFORE PROCEEDING WITH ANY PORTION OF ANY WORK. THE CONTRACTOR SHALL PROVIDE ALL OFFSETS AND TRANSITIONS REQUIRED TO MEET EXISTING CONDITIONS.	19. ALL RECTANGULAR MAIN TO RECTANGULAR BRANCH CONNECTIONS, BOTH CONVERGING AND DIVERGING CONFIGURATIONS, SHALL HAVE A 45 DEG. ENTRY TAP CONSTRUCTED IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARD 2005 FIG. 4-6.
7. THE CONTRACTOR SHALL PERFORM WORK IN A SKILLED AND PROFESSIONAL MANNER.	20. DIFFUSER PATTERN 4-WAY UNLESS OTHERWISE INDICATED. PROVIDE FIBERGLASS DUCT INSULATION WITH VAPOR BARRIER AS SCHEDULED UNLESS NOTED OTHERWISE.
8. ALL CONTRACTORS ARE RESPONSIBLE TO FIELD COORDINATE WORK SCHEDULE WITH OWNER REPRESENTATIVE.	21. MECHANICAL CONTRACTOR TO REPAIR ANY DAMAGE DONE TO THE FIRE PROOFING WHILE INSTALLING THE MECHANICAL TRUNKS. SEAL ALL PENETRATIONS THROUGH RATED STRUCTURES WITH UL LISTED FIRE SEAL DESIGNED FOR THE SPECIFIED APPLICATION.
9. THE CONTRACTOR SHALL WORK AND COORDINATE WITH THE OTHER TRADES.	22. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE PUBLIC AND ADJACENT PROPERTIES FROM DAMAGE THROUGHOUT CONSTRUCTION.
10. ALL EQUIPMENT SHALL BE NEW AND IN UNDAMAGED CONDITION. ANY EQUIPMENT FOUND DEFECTIVE SHALL BE IMMEDIATELY REMOVED FROM THE PROJECT.	23. THE CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OR AS OTHERWISE REQUIRED IN THE SPECIFICATIONS.
11. PROVIDE 3 COPIES OF AN OPERATION AND MAINTENANCE MANUAL FOR ALL MAJOR EQUIPMENT REQUIRING SERVICE. MAJOR EQUIPMENT INCLUDES BUT IS NOT LIMITED TO COILS, FANS, AND CONTROL WIRING DIAGRAMS. EACH PIECE OF EQUIPMENT SHALL STATE THE CONTRACT DATE AND THE NAME, ADDRESS AND PHONE NUMBER FOR THE FRAME CONTRACTOR, SUBCONTRACTOR PERFORMING THE INSTALLATION, AND THE LOCAL VENDOR FOR SPARE PARTS. THE MANUALS SHALL CONTAIN MAINTENANCE INSTRUCTIONS REQUIRED FOR THE INSTALLED EQUIPMENT. MANUALS SHALL BE BOUND IN A THREE RING HARD COVER BINDER. O & M MANUALS SHALL BE SUBMITTED TO THE OWNER PRIOR TO FINAL WALK THROUGH OF THE PROJECT.	24. MECHANICAL CONTRACTOR TO INCLUDE THE TEST AND BALANCE, AND ANY PERMIT FEES IN THEIR BID.
12. PROVIDE 8 HOURS OF OWNER TRAINING FOR THE INSTALLED EQUIPMENT. TRAINING SHALL BE HELD ONLY AFTER ALL OF THE EQUIPMENT IS INSTALLED AND PROPER OPERATION IS VERIFIED.	25. MECHANICAL CONTRACTOR SHALL VERIFY ALL ROOFTOP EQUIPMENT WEIGHTS, SIZES, LOCATIONS AND OPENINGS REQUIRED AND SHALL COORDINATE ANY CHANGES WITH THE ARCHITECT.
13. CONTRACTOR SHALL SUBMIT A CERTIFIED REPORT INDICATING SYSTEM PERFORMANCE INCLUDING, BUT NOT LIMITED TO, VOLTAGE AND AMPERAGE MEASUREMENTS OF ALL EQUIPMENT GREATER THAN 1/3 H.P. AIR BALANCE MEASUREMENTS OF OUTSIDE AIR DELIVERY, AIR HANDLING UNIT SUPPLY, SUPPLY DIFFUSERS, EXHAUST AND RETURN GRILLES. AIR BALANCE SHALL BE WITHIN 10% OF DESIGN CONDITIONS. THE REPORT CERTIFICATION SHALL BE AS FOLLOWS: I (name) of (company) CERTIFY THAT ALL MEASUREMENTS, FIGURES AND STATEMENTS INDICATED IN THIS REPORT WERE TAKEN BY ME OR UNDER MY SUPERVISION AND ARE ACCURATE AS OF (date). DESIGN FLOWS WERE BASED UPON PLANS DATED (x/y/z/z).	26. UPON PROJECT COMPLETION, RECORD (AS-BUILT) DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR TO THE BUILDING OWNER. ALL CHANGES MADE TO EQUIPMENT, DUCTWORK, AND GENERAL DESIGN SHALL BE NOTED ON THE DRAWINGS. PROVIDE IN PDF FORMAT OR PRINTED SET AT THE OWNER'S REQUEST.

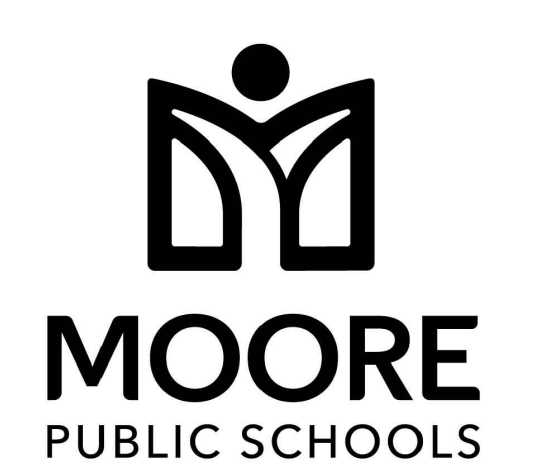
ABBREVIATIONS	
A	AMP
ADD	ADDENDUM
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLER UNIT
AI	ANALOG INPUT
ALT	ALTERNATE
AO	ANALOG OUTPUT
APPRX	APPROXIMATE
ARCH	ARCHITECT, ARCHITECTURAL
BDD	BACK DRAFT DAMPER
BLDG	BUILDING
BTUH	BRITISH THERMAL UNIT PER HOUR
C	CENTER
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CO	CLEAN OUT
COND	CONDENSATE
CONT	CONTINUOUS
COP	Coefficient of Performance
DB	DRY BULB
DET	DETAIL
DG	DOOR GRILLE
DI	DIGITAL INPUT
DIA OR Ø	DIAMETER
DM	DIMENSION
DN	DOWN
DO	DIGITAL OUTPUT
DWG	DRAWING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ELEC	ELECTRICAL
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
EXT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
FA	FRESH AIR
FBM	FEET PER MINUTE
FT	FOOT (FEET)
GA	GAUGE/GAGE
GLW	GALVANIZED
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GYP	GYP-SUM
HORIZ	HORIZONTAL
HP	HORSEPOWER
HT	HEIGHT
I/O	INPUT/OUTPUT
IN	INCH
LAT	LEAVING AIR TEMPERATURE
LB	POUND
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPS
MECH	MECHANICAL
MN	MINIMUM
MFR	MANUFACTURER
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OC	ON CENTER
P	PUMP
PC	PLUMBING CONTRACTOR
PLBG	PLUMBING
PSI	POUNDS PER SQUARE INCH
QTY	QUANTITY
RA	RETURN AIR
REQD	REQUIRED
REV	REVERSE OR REVISION
RG	RETURN AIR GRILLE
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SQFT	SQUARE FEET
SG	SUPPLY GRILLE
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
SS	STAINLESS STEEL
T&B	TEST AND BALANCE
TEMP	TEMPERATURE OR TEMPORARY
TC	TRANSFER GRILLE
TYP	TYPICAL
V	VOLT
VAR	VARIABLE OR VARIES
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THRU ROOF
W/	WITH
W/JN	WITHIN
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN (INCHES OF)
WT	WEIGHT

MECHANICAL HVAC LEGEND		
EXHAUST AIR DUCT (DOWN)		EXHAUST AIR DUCT (UP)
RETURN AIR DUCT (DOWN)		RETURN AIR DUCT (UP)
OUTSIDE OR SUPPLY AIR DUCT (DOWN)		OUTSIDE OR SUPPLY AIR DUCT (UP)
DUCT SIZE		NEW DUCTWORK
FLEX DUCT		EXISTING DUCTWORK
DEMOLITION LINETYPE		SUPPLY AIR CEILING DIFFUSER
RETURN AIR GRILLE		EXHAUST AIR GRILLE
DIFFUSER, GRILLE, AND REGISTER CALL-OUTS		SCHEDULED EQUIPMENT TAG
MANUAL BALANCING DAMPER		PIPE PENETRATION THROUGH FIRE RATED WALL
FIRE DAMPER		SMOKE DAMPER
MOTORIZED DAMPER		FIRE/SMOKE DAMPER
THERMOSTAT		HUMIDISTAT
REMOTE SENSOR		CARBON DIOXIDE SENSOR
DUCT SMOKE DETECTOR		CARBON MONOXIDE SENSOR

MECHANICAL SHEET INDEX	
M000	MECHANICAL LEGEND AND NOTES
M101	MECHANICAL FLOORPLAN
M201	MECHANICAL ROOF PLAN
M501	MECHANICAL DETAILS
M601	MECHANICAL SCHEDULES
M602	MECHANICAL SCHEDULES
M603	MECHANICAL SCHEDULES
M604	MECHANICAL SCHEDULES
M605	MECHANICAL SCHEDULES



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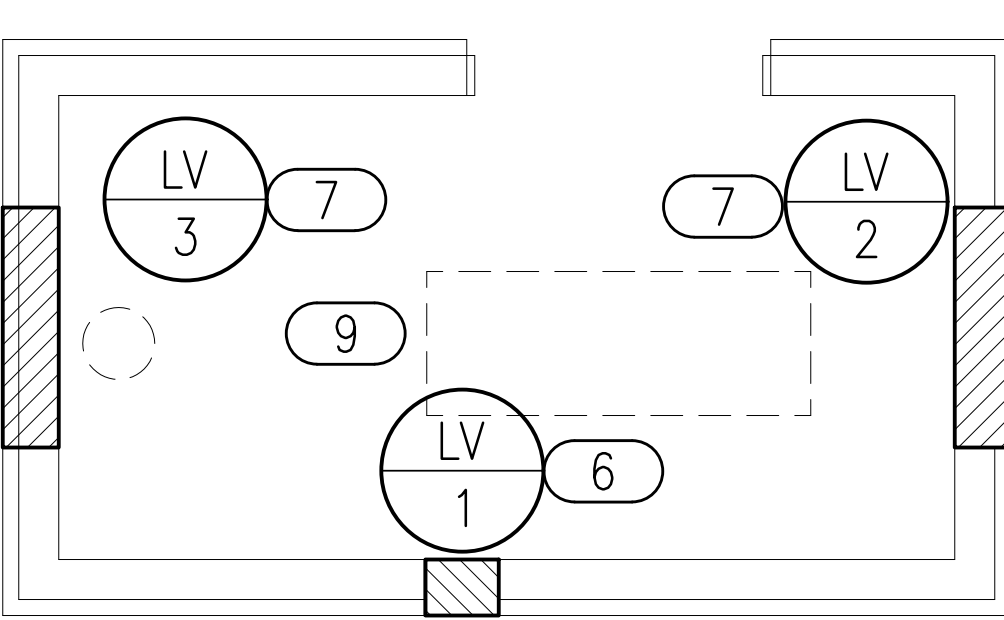
CHILD CARE FACILITY
201 N. EASTERN AVE.

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M101

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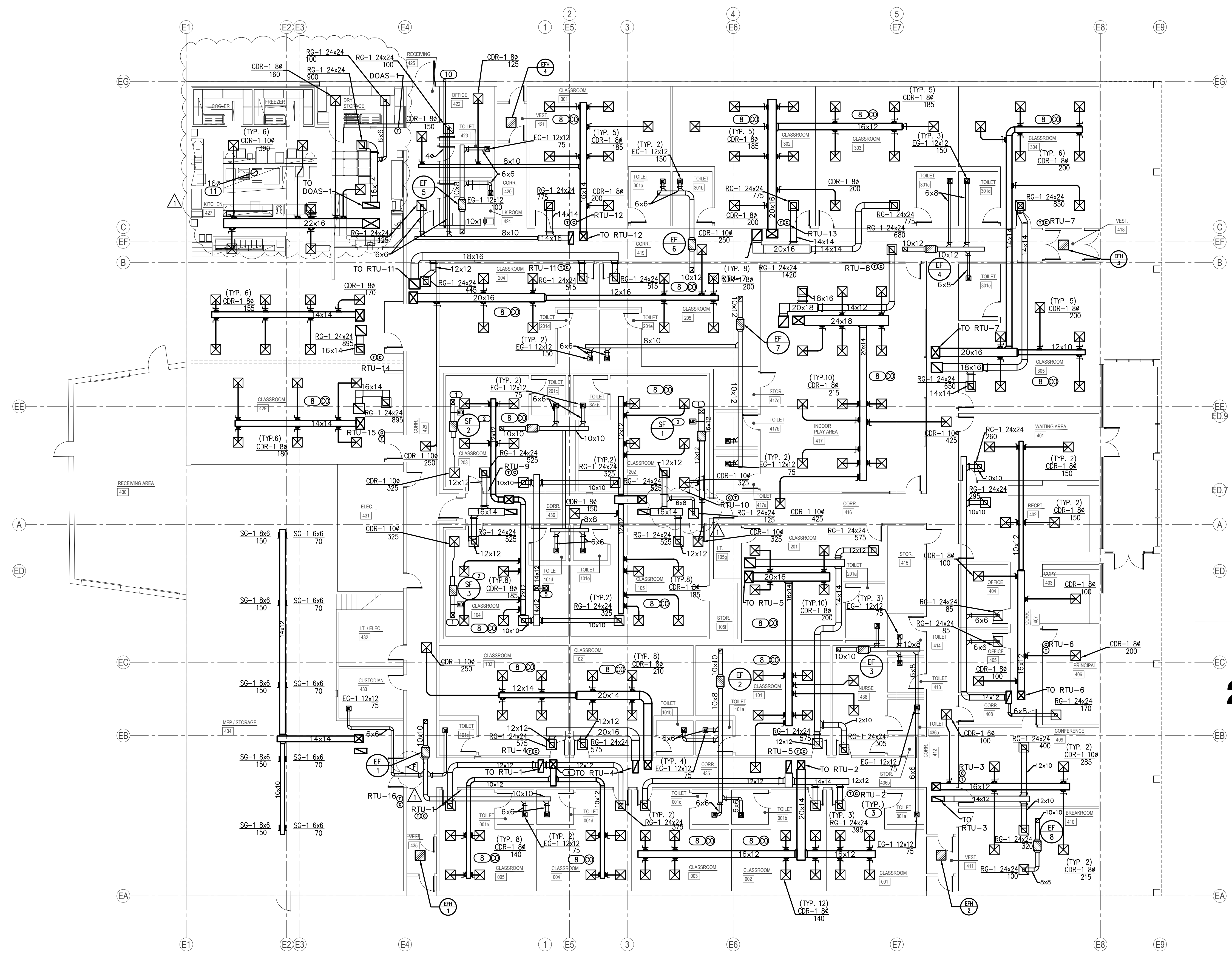
- ### GENERAL NOTES
- COORDINATE INSTALLATION OF EQUIPMENT AND DUCTWORK WITH ALL TRADES.
 - COORDINATE LOCATION OF THERMOSTATS WITH E.C. ROUGH-IN BY E.C.
 - ALL PENETRATIONS OVER 3 1/2" SQUARE INCHES OR 2 1/16" INCHES IN DIAMETER IN/OUT OF SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
 - M.C. IS RESPONSIBLE TO ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
 - E.C. TO PROVIDE, LOCATE, AND INSTALL SWITCH FOR EMERGENCY VENTILATION FAN. M.C. SHALL PROVIDE CALL OUT LETTERING "EMERGENCY VENTILATION" ON PLACARD ABOVE SWITCH WITH 3/4" LETTERING FOR INSTALLATION BY GC. COORDINATE WITH GC AND EC.

- ### KEYED NOTES
- ROOF HOOD IS PART OF EMERGENCY VENTILATION SYSTEM. DUCT UP 16X12 TO TRANSITION INTO ROOF HOOD OPENING 18X16.
 - MOTORIZED DAMPER TO BE 120V CONNECTED TO EMERGENCY POWER. DAMPER SHALL OPEN WHEN SUPPLY FAN TURNS ON.
 - PROVIDE LOCKABLE COVER FOR THERMOSTAT.
 - DUCT 18X20 SUPPLY AND 12X28 RETURN UP TO RTU.
 - ROOF HOOD PART OF THE EMERGENCY VENTILATION SYSTEM TO PROVIDE RELIEF AIR. MOTORIZED DAMPER SHALL OPERATE ON INVERTER. INTERLOCK WITH SF-1. DUCT DOWN TO 16X12.
 - MOUNT BOTTOM OF LOUVER 8'-0" AFF.
 - MOUNT BOTTOM OF LOUVER MINIMUM 18" AFF.
 - CARBON MONOXIDE DETECTOR TO BE INSTALLED ACCORDING TO ALL APPLICABLE CODES. DETECTOR SHALL BE INSTALLED CENTRALLY ON CEILING. ALSO INCLUDE BATTERY BACKUP IN EVENT PRIMARY POWER IS INTERRUPTED. ALARM SIGNAL SHALL BE ROUTED TO ADMINISTRATION OFFICE. COORDINATE WITH E.C. WITH PRIMARY POWER CONNECTION AND SYSTEM CONNECTION.
 - PROVIDE EXHAUST DUCT TO GENERATOR RADIATOR CONNECTION. COORDINATE DUCT SIZE WITH GENERATOR MANUFACTURER DRAWINGS.
 - PROVIDE DRYER VENT EXHAUST HOOD TERMINATION AT EXTERIOR WALL IN ACCORDANCE WITH DRYER MANUFACTURER'S REQUIREMENTS. PROVIDE WALL CAP WITH BIRD FILTER.
 - DUCT 14" DIA. UP TO ROOF EXHAUST FAN OPENING. TRANSITION TO HOOD COLLAR PER KITCHEN SPECIFICATIONS.
 - DOAS UNIT SHALL CYCLE DOWN TO TEMPER KITCHEN WHILE HOODS ARE OFF.



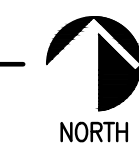
2 MECHANICAL GENERATOR PLAN

SCALE: 1/4" = 1'-0"



1 MECHANICAL FLOOR PLAN

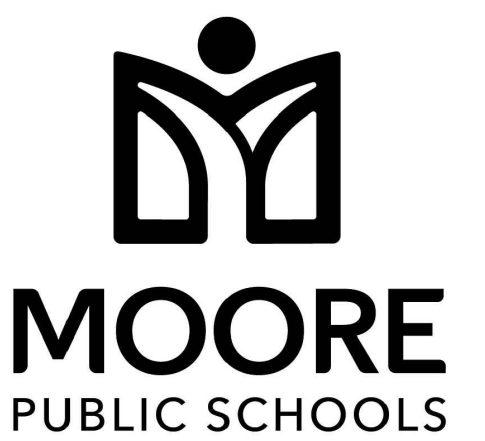
SCALE: 3/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



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CHILD CARE FACILITY
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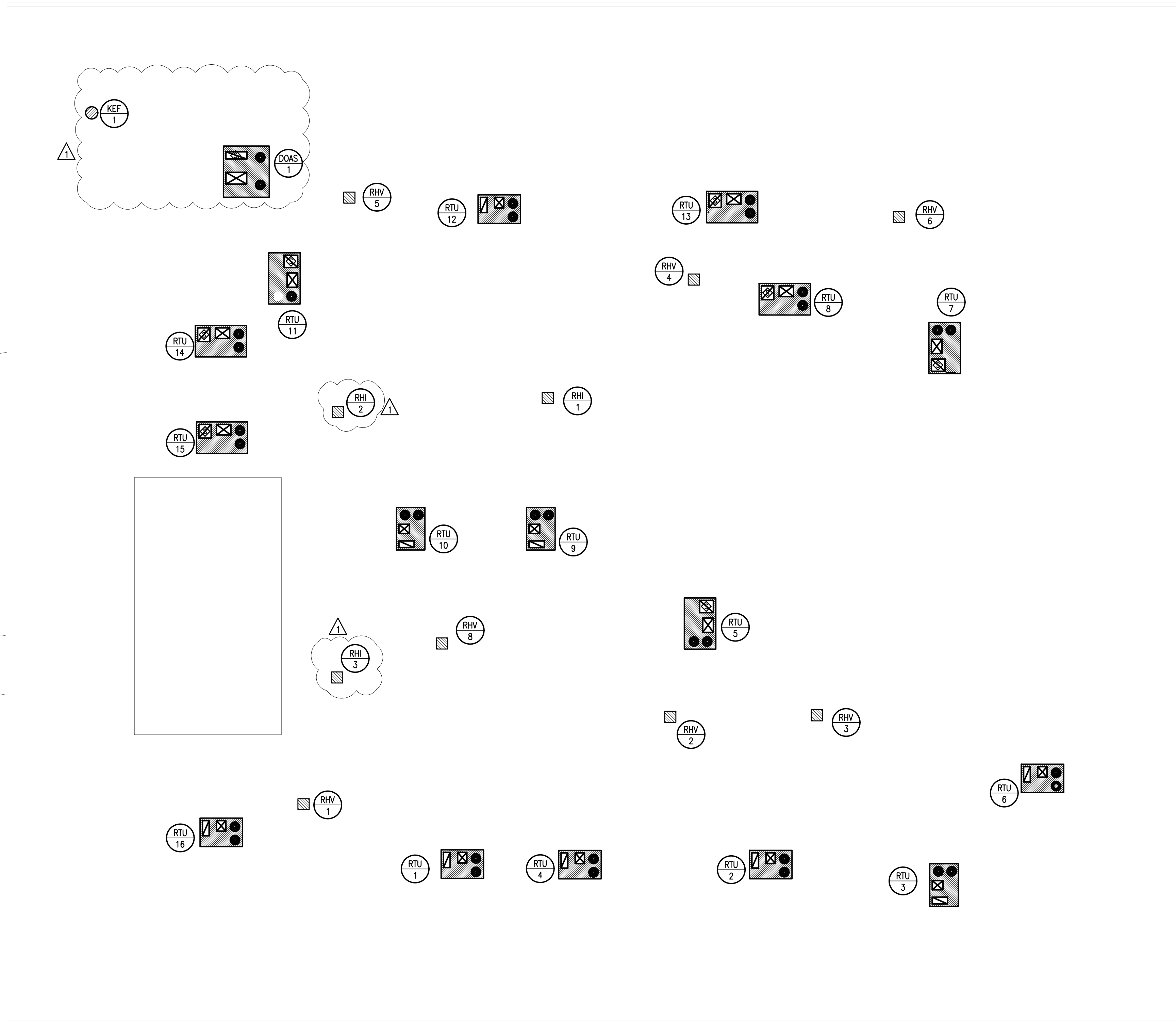
sheet no:

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GENERAL NOTES

1. ALL ROOF TOP EQUIPMENT TO BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ROOF EDGE.
2. MAINTAIN A MINIMUM OF 10'-0" HORIZONTAL CLEARANCE BETWEEN ALL EXHAUST OUTLETS AND ANY FRESH AIR INTAKES.
3. MOUNT ROOF CURBS LEVEL ON PITCHED ROOF.
4. ALL ROOF SUPPORT SYSTEMS ARE TO BE MANUFACTURED FOR THE ROOF MATERIAL/SYSTEM TO BE INSTALLED. REFER TO ARCH PLANS FOR THE ROOF SYSTEM. CURB INSTALLATION TO BE WARRANTIED BY ROOFING CONTRACTOR.
5. ALL PENETRATIONS OVER 3 1/2 SQUARE INCHES OR 2 1/16 INCHES IN DIAMETER IN/OUT OF THE SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
6. MC IS RESPONSIBLE FOR ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
7. ROUTE ALL CONDENSATE TO NEAREST OPEN SITE DRAIN.



1 MECHANICAL ROOF PLAN

SCALE: 3/32" = 1'-0"



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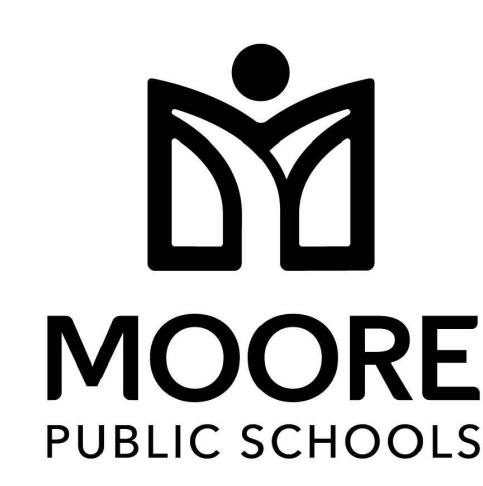
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CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

M601

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RTU	THROAT SIZE DIMENSION (IN)	THROAT AREA (SQ FT)	DAMPER BDD OR MOD	CONSTRUCTION	MANUFACTURER & MODEL NO.	COMMENTS	NOTES
RHH-1	14X14	1.36	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHH-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHH-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-1	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-4	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-5	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-6	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-7	14X14	1.36	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3

NOTES:
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2. M.C. SHALL PROVIDE ROOF HOOD WITH ALUMINUM BRISCREEN.
3. M.C. SHALL PROVIDE ROOF CURB, CURB INSTALLATION BY G.C.
4. M.C. SHALL PROVIDE LOW VOLTAGE MOTORIZED DAMPER.

CONNECTED TO	SIZE (IN)	MINIMUM FREE AREA (SQ FT)	FLANGE	CONSTRUCTION	INCLUDE MOD	MANUFACTURER AND MODEL NUMBER	COMMENTS	NOTES
1 GEN ENCLOSURE	18X18	0.71	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
2 GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
3 GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2

NOTES:
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2. PROVIDE PAINTED KYNAR FINISH COLOR BY ARCHITECT.
3. PROVIDE BRD SCREEN.

EXHAUST		OUTDOOR AIR	
SOURCE	CFM	SOURCE	CFM
KEF-1	2500	DOAS-1	2400
EF-1	225	RTU-1	350
EF-2	300	RTU-2	520
EF-3	375	RTU-3	280
EF-4	450	RTU-4	535
EF-5	300	RTU-5	645
EF-6	175	RTU-6	205
EF-7	300	RTU-7	700
EF-8	100	RTU-8	900
-	-	RTU-9	450
-	-	RTU-10	535
-	-	RTU-11	625
-	-	RTU-12	400
-	-	RTU-13	710
-	-	RTU-14	205
-	-	RTU-15	205
-	-	RTU-16	205
TOTAL:	4725		9870

RTU	LOCATION	INPUT MBH	OUTPUT MBH	COOLING NOMINAL TONS	MIN. EER	CAPACITY STAGES	TOTAL CFM	MIN. F.A. CFM	ELEC. CHGR	MCA	MOCP	ESP (IN)	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES
1	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	350	208 / 3	19	25	1.0	900	LENNOX LGM36USE	1,2,4-12
2	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1680	520	208 / 3	26	40	1.0	905	LENNOX LGM36USE	1,2,4-12
3	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	280	208 / 3	19	25	1.0	900	LENNOX LGM36USE	1,2,4-12
4	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM36USE	1,2,4-12
5	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2100	645	208 / 3	46	50	1.0	1500	LENNOX LGM36USE	1-12
6	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM36USE	1,2,4-12
7	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2200	700	208 / 3	46	50	1.0	1500	LENNOX LGM36USE	1-12
8	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	3000	900	208 / 3	48	50	1.0	1500	LENNOX LGM102USE	1-12
9	ROOF-SEE PLANS	108	87	4	13.2	2(H)/1(C)	1500	450	208 / 3	25	35	1.0	905	LENNOX LGM36USE	1,2,4-12
10	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM36USE	1,2,4-12
11	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2100	625	208 / 3	46	50	1.0	1500	LENNOX LGM36USE	1-12
12	ROOF-SEE PLANS	108	87	4	13.2	2(H)/1(C)	1400	400	208 / 3	25	35	1.0	905	LENNOX LGM36USE	1,2,4-12
13	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2200	710	208 / 3	46	50	1.0	1500	LENNOX LGM36USE	1-12
14	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM36USE	1,2,4-12
15	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM36USE	1,2,4-12
16	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM36USE	1,2,4-12

NOTES:
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2. PROVIDE FACTORY-INSTALLED UNIT DISCONNECT SWITCH.
3. PROVIDE FACTORY-INSTALLED RETURN DUCT SMOKE DETECTOR WITH REMOTE TEST STATION TO BE LOCATED IN OCCUPIED SPACE. INSTALLATION OF REMOTE TEST STATION AND CONNECTION TO FIRE ALARM SYSTEM BY E.C.
4. PROVIDE FACTORY-INSTALLED 120V GFCI CONVENIENCE OUTLET. GFCI POWERED FROM UNIT. RECEPTACLE SHALL BE COMPLIANT WITH NEC 210.83.
5. PROVIDE ANTI-SHORT CYCLE TIMER AND LOW AMBIENT CONTROLS.
6. PROVIDE FACTORY ROOF CURB SO THAT THE BOTTOM OF THE ROOFTOP UNIT IS A MINIMUM OF 14" ABOVE FINISHED ROOF. ROOF MOUNT LEVEL ON SLOPED ROOF.
7. PROVIDE HINGED AND TOOL-LESS ACCESS DOORS.
8. PROVIDE PHASE MONITOR.
9. PROVIDE FULL ENTHALPHY ECONOMIZER WITH POWERED EXHAUST.
10. PROVIDE DIGITAL, W-FI ACCESSIBLE 7-DAY PROGRAMMABLE THERMOSTAT WITH OCCUPIED/OCCUPIED SETTINGS CAPABLE OF CONTROLLING THE 1/3 STAGES OF SPECIFIED UNIT.
11. PROVIDE UNIT WITH HGRH.
12. MODULATE OUTSIDE AIR BASED ON DEMAND REPORTED BY CO2 SENSOR.

PLAN SYMBOL	DESCRIPTION	MANUFACTURER & MODEL NO.	MATERIAL	FINISH	NOISE CRITERIA
GR-1	SQUARE FACE, ROUND NECK, 4-WAY DEFLECTION CEILING DIFFUSER, SPRING LOCK INNER CORE, FOR LAY-IN CEILING INSTALLATION.	PRICE 520	STEEL	WHITE	-
SG-1	DOUBLE DEFLECTION SIDEWALL GRILLE, ADJUSTABLE DEFLECTION BLADES, 3/4" O.C. FLAT FRAME WITH 1 1/4" MARGIN, HORIZONTAL FRONT.	PRICE 520	STEEL	COLOR BY ARCHITECT	-
RG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	-
RG-2	SQUARE PATTERN GRILLE, ZERO DEGREE DEFLECTION, FLAT STEEL FRAME WITH 1 1/4" BORDER, FOR SURFACE MOUNT INSTALLATION.	PRICE 80	STEEL	WHITE	-
EG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	-

NOTES:
SEE PLANS FOR QUANTITY AND SIZES.
M.C. TO FIELD VERIFY CEILING TYPE FOR ALL GRD BEFORE PURCHASING EQUIPMENT. PROVIDE REQUIRED MOUNTING.

SYSTEM	LOW PRESSURE			MED. PRESS.			HIGH PRESS.			INSULATION			NOTES
	MAX. PRES.	A	B	MAX. PRES.	SEAL A	SEAL B	MAX. PRES.	SEAL A	INTERNAL	THICKNESS	EXTERNAL	THICKNESS	
SUPPLY AIR WITHIN 10' OF UNIT	2"	X	-	-	-	-	-	-	YES	1"	NO	-	-
SUPPLY AIR BEYOND 10' OF UNIT	2"	X	-	-	-	-	-	-	NO	-	YES	2" FSK	-
RETURN AIR WITHIN 10' OF UNIT	2"	-	X	-	-	-	-	-	YES	1"	NO	-	-
RETURN AIR BEYOND 10' OF UNIT	2"	-	X	-	-	-	-	-	NO	-	YES	2" FSK	-
OUTSIDE AIR/MIXED AIR	2"	-	X	-	-	-	-	-	NO	-	YES	3" FSK	-
EXHAUST AIR	2"	-	X	-	-	-	-	-	NO	-	YES	2" FSK	-
GREASE AIR	2"	X	-	-	-	-	-	-	NO	-	YES	SEE NOTE	1

NOTES:
1. PROVIDE CODE-COMPLIANT FIRE WRAP.

CFM	SP	FAN RPM	ELECTRICAL				DAMPER BDD OR MOD	DRIVE	FAN TYPE	INTERLOCK/CONTROL	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES		
			VOLTAGE & PHASE	H.P.	FLA/AMPS	MCA								MOCP	
EF-1	225	0.5	1253	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-2	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-3	375	0.5	1435	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-4	450	0.5	1332	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-99-VG	1,2,3
EF-5	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-6	175	0.5	1489	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-97-VG	1,2,3
EF-7	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-8	100	0.3	1670	115/1	0.07	1.3	2	15	BDD	DIRECT	INLINE	SWITCH	30	GREENHECK SO-60-VG	1,2,3
SF-1	750	0.5	1089	115/1	0.5	6.4	8	15	MOD	DIRECT	INLINE	SWITCH	65	GREENHECK SO-120-VG	4-7
SF-2	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	4-7
SF-3	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	4-7

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2. PROVIDE ELECTRONIC SPEED CONTROL MOUNTED ABOVE ACCESSIBLE CEILING.
3. M.C. SHALL PROVIDE AND INSTALL LOW VOLTAGE MOTORIZED DAMPER.
4. OPERATION OF DEVICE ON OCCUPIED MODE OF RTU OR SWITCH WITH LIGHTS. SEE INTERLOCK/CONTROL COLUMN FOR TYPE.
5. PROVIDE UNIT MOUNTED DISCONNECT.
6. FAN AND MOTORIZED DAMPER ARE PART OF EMERGENCY POWER SYSTEM. COORDINATE ALL CIRCUITS WITH E.C.
7. PROVIDE 120 V DAMPER.

ROOM NO.	CFM	WALL OR CEILING	KW	MOUNTING	ELECTRICAL CHGR	AMPS	SPEEDS	CONTROL	RPM	MANUFACTURER & MODEL NUMBER	NOTES	
1	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
2	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
3	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
4	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3

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2. PROVIDE INTERNAL THERMOSTAT.
3. RECESSED MOUNTED UNIT. PROVIDE RECESSED MOUNTING KIT.
4. PROVIDE BUILT-IN DISCONNECT.

Salas O'Brien
2800 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



KF
drawn by
DG
checked by
OCTOBER 2024
date
revisions
11/22/2024 AD 02



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
M602

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EXHAUST FAN INFORMATION - JOB#7174241

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	KEF-1	1	DU180HFA	CAPTIVEAIRE	2500	1.700	1307	TEFC,PREMIUM	2.000	1.4750	3	208	7.3	577 FPM	200	18.4

FAN ACCESSORIES

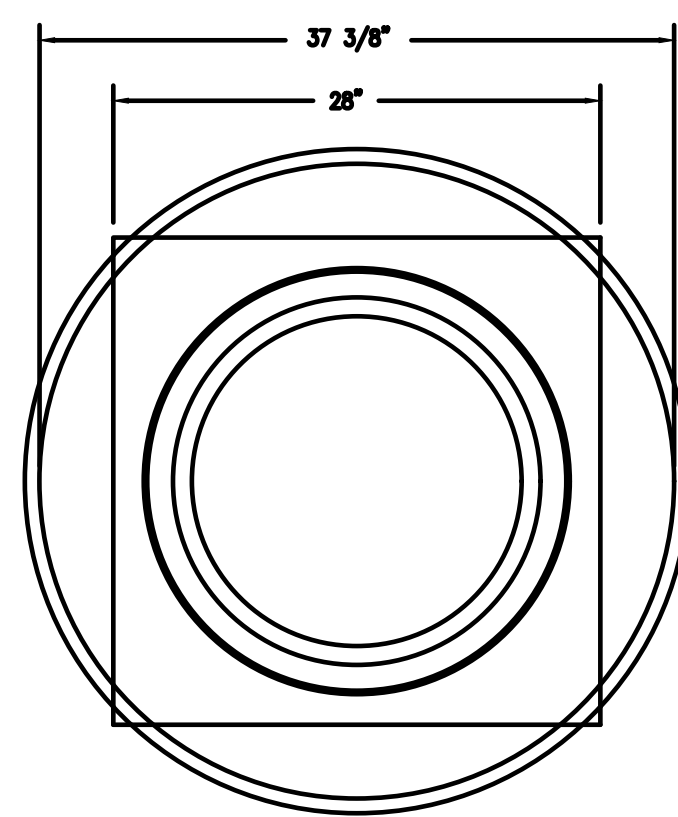
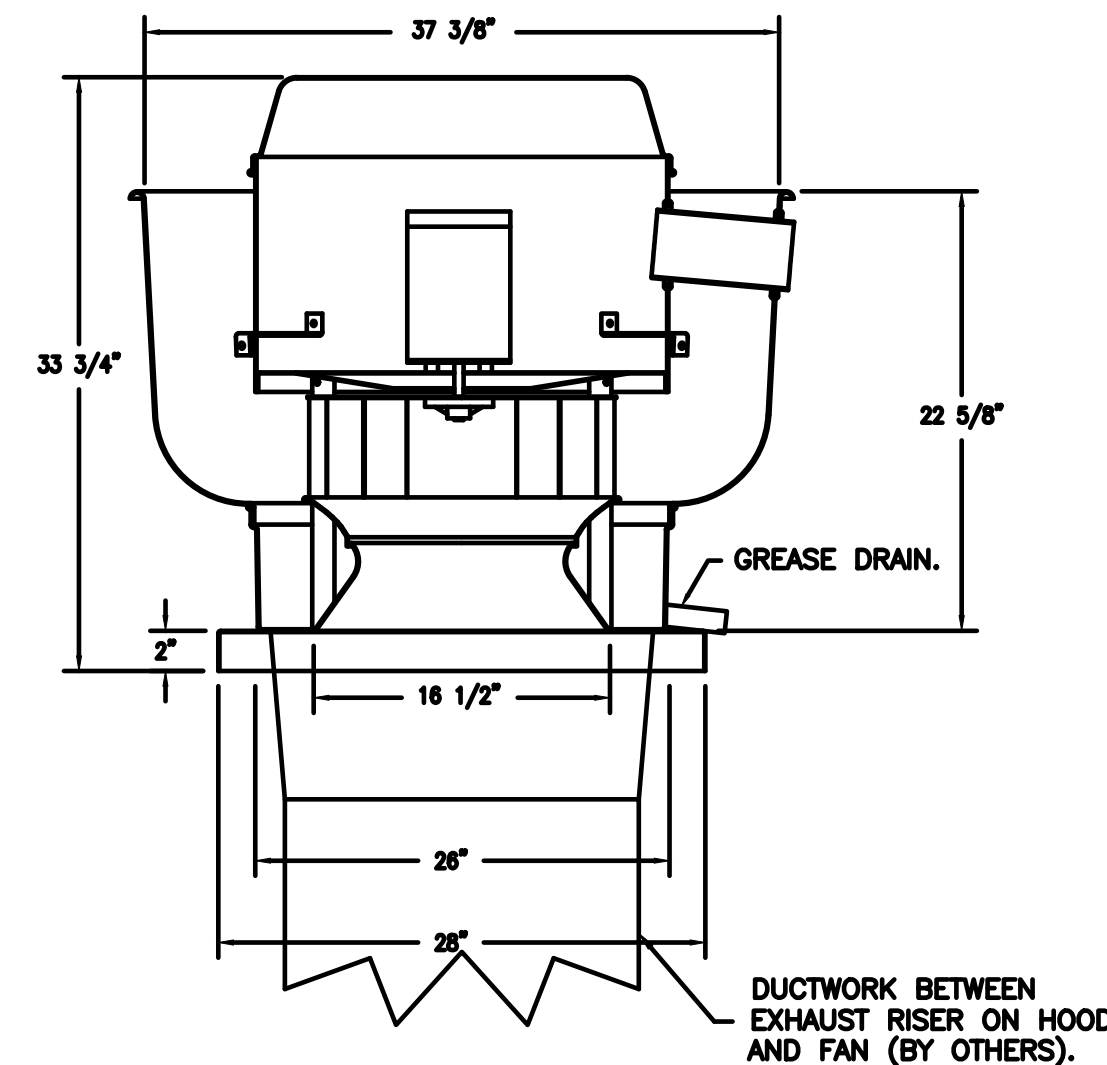
FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	KEF-1	YES						

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	52 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2	DOAS-01	130 LBS	CURB	59.500"W X 91.000"L X 20.000"H 0.250:12.000 PITCH ALONG WIDTH, RIGHT INSULATED.

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #2	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55
FAN #2	HMI #2 - SPACE		AVERAGED	56

FAN #1 DU180HFA - EXHAUST FAN (KEF-1)



TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL782 AND ULC-S845
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST

EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

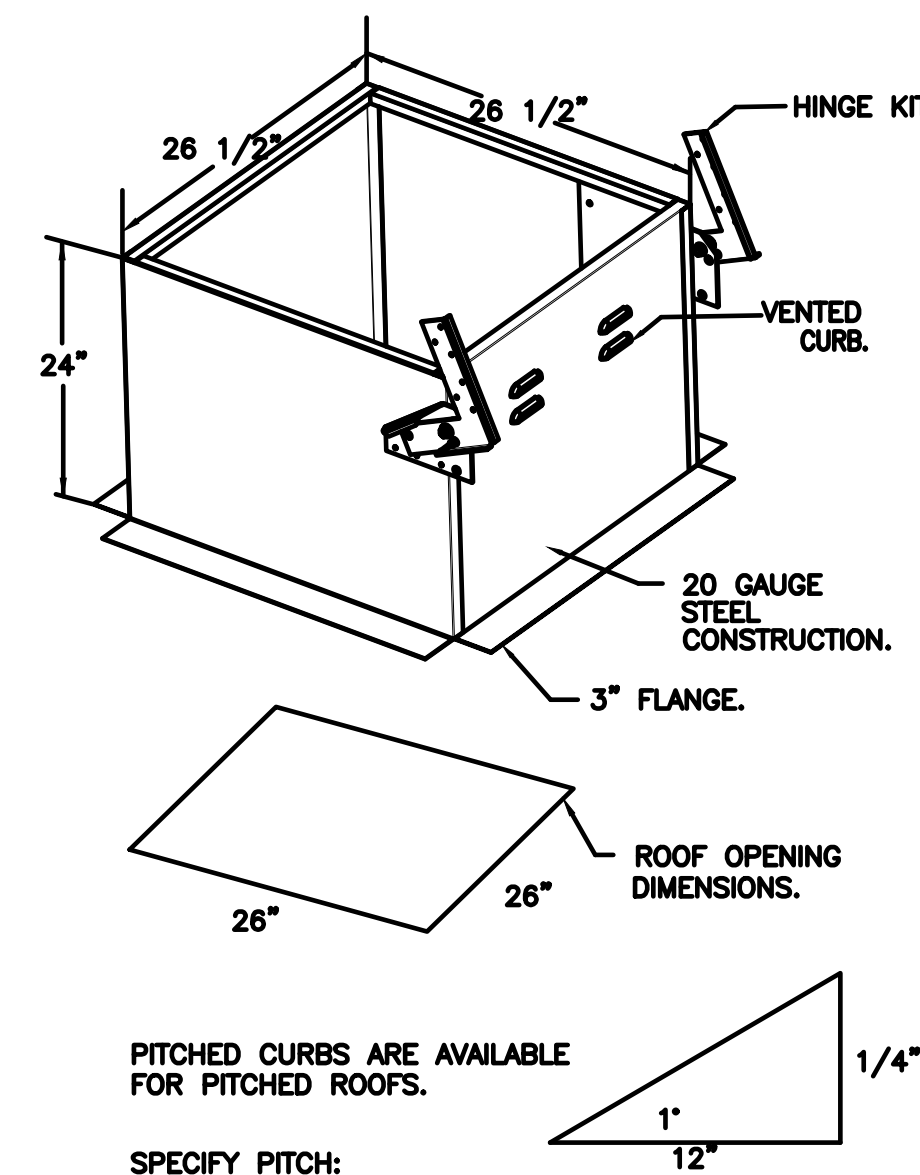
ABNORMAL FLARE-UP TEST

EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX.
- FAN BASE CERAMIC SEAL - DU/DR180HFA
- INSTALLED AT PLANT - FOR GREASE DUCTS.
- 2 YEAR PARTS WARRANTY.

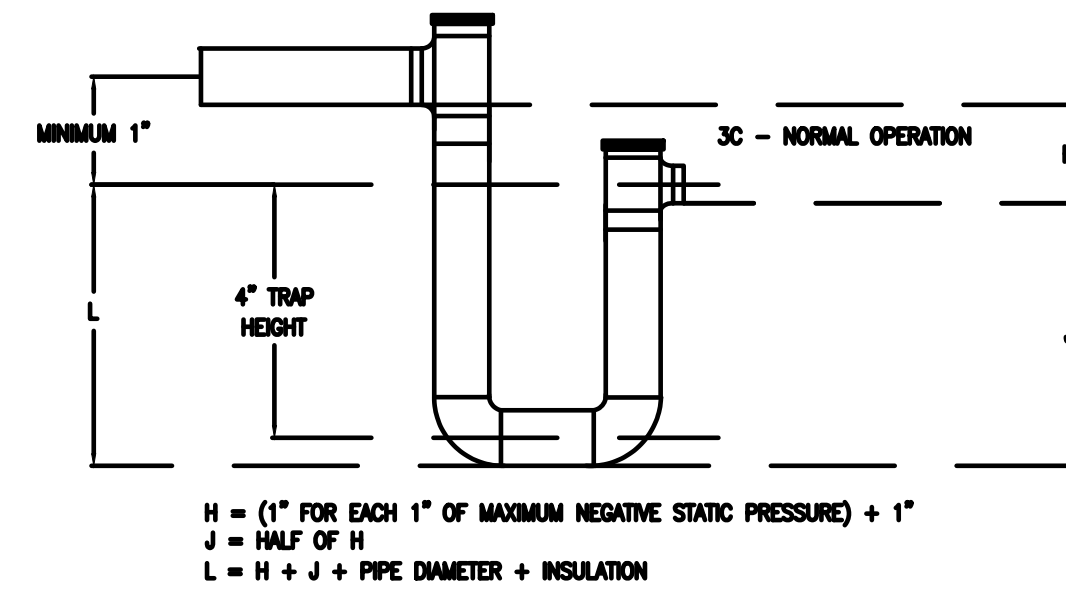
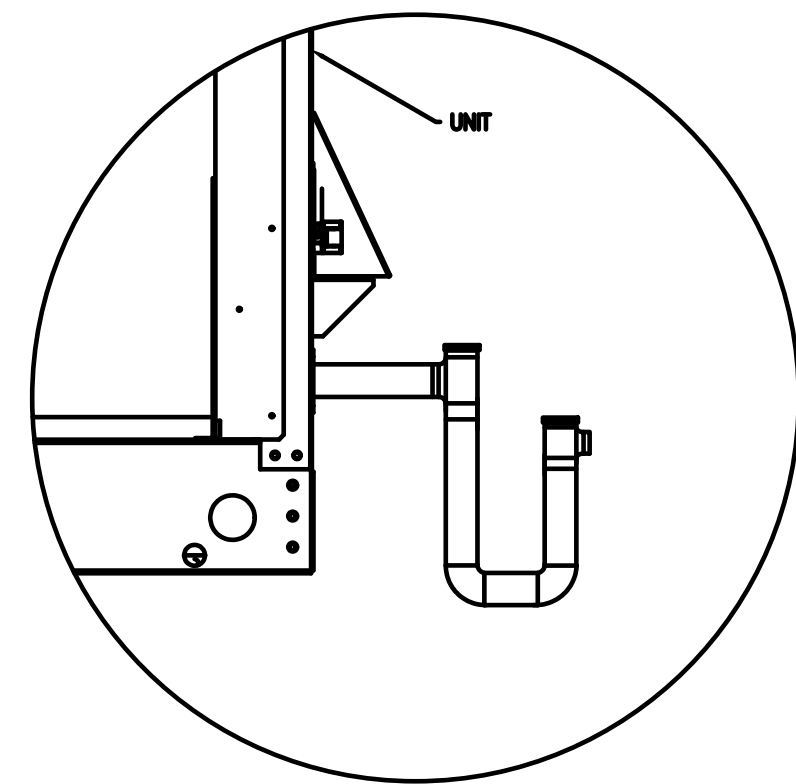
DUCTWORK BETWEEN EXHAUST RISER ON HOOD AND FAN (BY OTHERS).



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.

RU CONDENSATE DRAIN TRAP DETAIL



GREASE DUCT & CHIMNEY SPECIFICATIONS:
 PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.
 PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".
 DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.
 IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

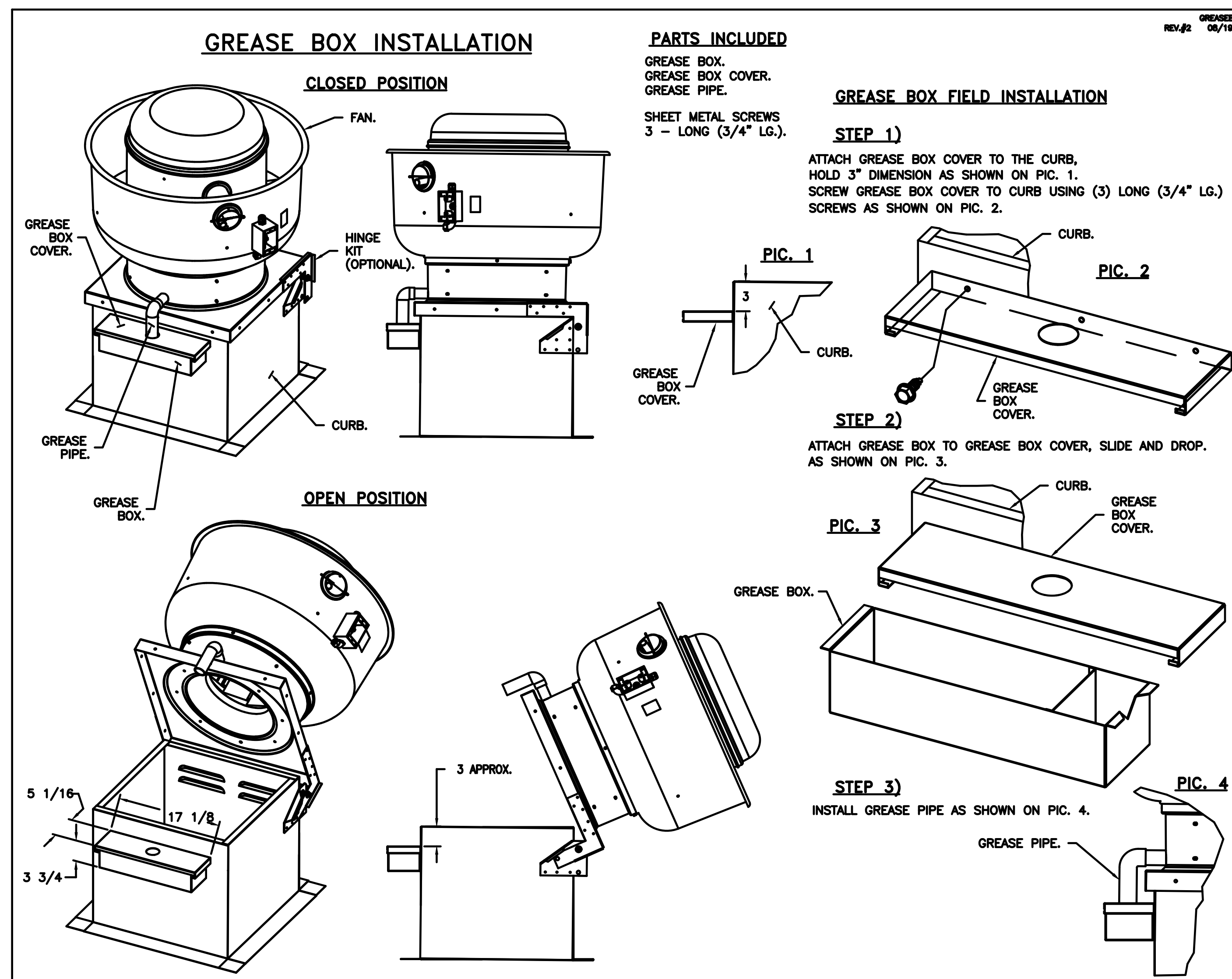
CUSTOMER APPROVAL TO MANUFACTURE:

APPROVED AS NOTED	<input type="checkbox"/>
APPROVED WITH NO EXCEPTION TAKEN	<input type="checkbox"/>
REVISE AND RESUBMIT	<input type="checkbox"/>
SIGNATURE _____	_____
YOUR TITLE _____	DATE _____

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KFC ENGINEERING
 STRUCTURAL

SALAS O'BRIEN
 MECHANICAL / ELECTRICAL



KF
 drawn by
 DG
 checked by
 OCTOBER 2024
 date
 revisions
 11/22/2024 AD 02



CHILD CARE FACILITY
 201 N. EASTERN AVE.

sheet no:
M603

Salas O'Brien
 2900 S. Telephone Road, Suite 120
 Moore, OK 73160
 Salas O'Brien Registration: CA# 7058
 Expiration Date: 6/30/2025
 Salas O'Brien Project Number: 2450-70304-00

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DOAS/RTU FAN SCHEDULE - JOB#7174241

FAN UNIT NO	TAG	QTY	DOAS/RTU MODEL #	FAN INFORMATION										ELECTRICAL INFORMATION										COOLING INFORMATION										REHEAT INFORMATION										GAS HEAT INFORMATION										A2L MINIMUM ROOM VOLUME			NOTES
				MANUFACTURER	BLOWER	RETURN AIR CFM	MAX OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	HP	PHASE	VOLT	MCA	MOCP	OUTSIDE AIR		MIXED AIR		LEAVING AIR		CAPACITY		IEER	ISMRE	DISCHARGE		CAPACITY		MOISTURE REMOVAL RATE	GAS TYPE	INPUT BTU _s	OUTPUT BTU _s	TEMP RISE	REQUIRED INPUT GAS PRESSURE	ROOM AREA (FT ²)	AIRFLOW (CFM)	HEIGHT (FT)																			
																DB	WB	DB	WB	DB	WB	DP	TOTAL			SENS.	DB	WB	DESIRED										MAX	DB	WB																
2	DOAS-01	1	CAS-HVAC3-L250-15-15T	CAPTIVEAIRE	15P-3	0	2400	2400	2585	0.500	1.50	3	208	57.1A	60A	104.0F	79.0F	104.0F	79.0F	52.9F	52.4F	52.1F	204.7 MBH	121.3 MBH	18.8	5.7	70.0F	59.0F	44.2 MBH	129.6 MBH	75.5 LBS/HR	NATURAL	207407	168000	61F	7 IN. W.C. - 14 IN. W.C.	602.1	1084	7.2	1-16																	

- NOTES:**
1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
 2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
 3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
 4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
 5. ECM MOTOR CONDENSING FANS
 6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
 7. SUCTION LINE ACCUMULATOR
 8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
 9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
 10. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE
 11. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 15:1 TURNDOWN WITH NG AND 12:1 TURNDOWN WITH LP
 12. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
 13. FULLY MODULATING HOT GAS REHEAT
 14. HAIL GUARD FOR CONDENSING COIL
 15. DOWN DISCHARGE/DOWN RETURN
 16. MINIMUM ROOM AREA ASSUMED 7.2' SUPPLY DIFFUSER HEIGHT AND IS CALCULATED PER UL60335-2-40 4TH ED. VALUES BASED ON FACTORY CHARGE. ACTUAL SITE CHARGE MAY DIFFER.

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - DU/DR180HFA - INSTALLED AT PLANT - FOR GREASE DUCTS
2	DOAS-01	1	2 YEAR PARTS WARRANTY
		1	INLET PRESSURE GAUGE, 0-35"
		1	SHIP LOOSE GAS STRAINER 1"
		1	SINGLE POINT ELECTRICAL CONNECTION FOR RTU, 750VA TRANSFORMER USED. IF A NON-DCV PREWIRED CONTROLS THIS UNIT, THE #28, #47, "MA", OR "E2" PREWIRED OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRED
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED
		1	RTU3 DOWN DISCHARGE
		1	2" MERV 13 FILTERS FOR RTU3 (QTY. 4)
		1	2" MERV 8 FILTERS FOR RTU3 (QTY. 4)
		1	OVERHEAT STAT
		1	TOTAL CFM MONITORING
		1	OCCUPIED SCHEDULING
		1	INTAKE FIRESTAT SET TO 135F
		1	FREZEZSTAT
		1	DISCHARGE FIRESTAT SET TO 240F
		1	RTU3 CURB DUCT HANGER
		1	24VAC FIRE INPUT
		1	RTU RETURN MOUNTED SMOKE DETECTOR AND SAMPLING TUBE - FACTORY INSTALLED
		1	HIGH TURNDOWN OPTION FOR DOAS UNITS
		1	MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 2 FURNACES
		1	CLOGGED FILTER SWITCH - NOTIFICATION ON HMI
		1	RTU3 CONVENIENCE OUTLET (GFCI), 15 AMP - REQUIRES SEPARATE 120V CONNECTION. INCLUDES RECEPTACLE, COVER AND J-BOX
		1	RTU INTAKE/RETURN DAMPER - MANUAL CONTROL VIA HMI
		1	RTU3 DOWN RETURN
		1	RTU3 HAIL GUARD
		1	R454B - 15 TON MODULATING COOLING OPTION, 208/230V. R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS
		1	R454B LEAK DETECTOR OPTION FOR RTU3
		1	R454B - 15 TON MODULATING REHEAT OPTION - SPACE DEWPOINT CONTROL - R454B
		1	UNIT MOUNTED VFD CONFIGURED FOR DCV
1	5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS)		
1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET		

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CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
M604

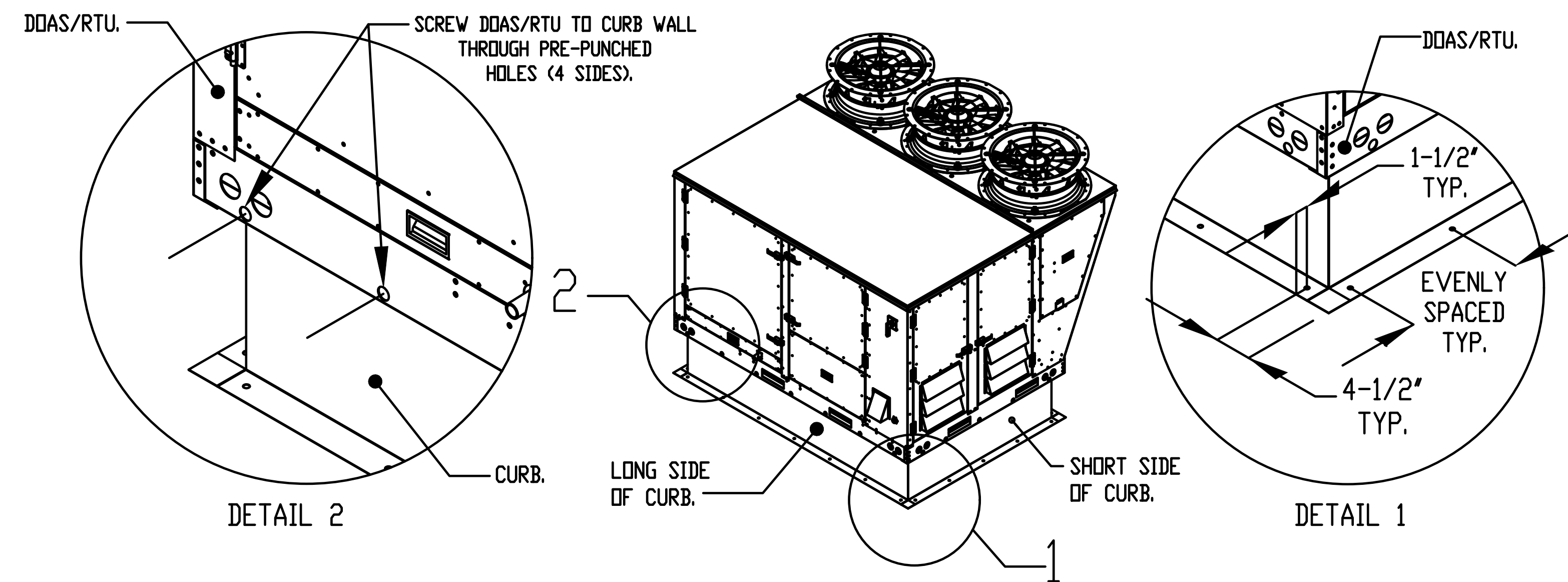
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2800 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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TYPICAL DOAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

1. SECURE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW. USING 3/8" X 2" ZINC PLATED STEEL LAG BOLTS, AND ZINC PLATED WASHERS, SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF (5) LAG BOLTS ON EACH SHORT SIDE, AND (7) LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
2. SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4"-14 X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.



AIR DIFFUSION SUPPLY DUCT SPECIFICATIONS:
 PROVIDE AIR DIFFUSION SUPPLY DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL DW-S0(HC), DW-S90(HC), & DW-S180(HC).
 THREE DISTINCT HOLE PATTERN OPTIONS TO COVER A VARIETY OF CEILING HEIGHTS.
 NO ADDITIONAL DIFFUSERS REQUIRED, AS THE DUCT ITSELF PROVIDES AIR DIFFUSION.
 MADE OF HIGH QUALITY STAINLESS STEEL DESIGNED TO LAST 20+ YEARS.
 HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 24 GAUGE, 430 SS - 5" THRU 24".
 HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 20 GAUGE, 430 SS - 26" THRU 36".
 QUICK ONSITE ASSEMBLY USING EPDM GASKETS & UNIVERSAL V-BANDS.
 DOUBLE WALL SUPPLY DUCT AVAILABLE FOR INTERIOR AND EXTERIOR SPACES, EITHER CONDITIONED OR UNCONDITIONED.
 DOUBLE WALL SUPPLY DUCT AVAILABLE IN DW-1S, DW-2S, & DW-3S TO MEET SPECIFIC REGIONAL "R" VALUE REQUIREMENTS.

Insulation R-Value Recommendations		
Supply Duct Type	Minimum R-value	Space Type
Single Wall - S & -HC	N/A	Conditioned Space Only
Double Wall - 1S	R-4	Unconditioned Interior Space Only
Double Wall - 2S	R-8	Unconditioned Space Climate Zones 1-4
Double Wall - 3S	R-12	Unconditioned Space Climate Zones 5-8

DOUBLE WALL SUPPLY DUCT IS INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.
 AIR DIFFUSION SUPPLY DUCT COMPLIES WITH SMACNA (SHEET METAL AND AIR CONDITIONING CONTRACTORS) BEST PRACTICES.
 POSITIONING OF SPRINKLERS TO AVOID OBSTRUCTION TO DISCHARGE, SEE NFPA 13, TABLE 8.12.5.1.1.

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CHILD CARE FACILITY
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GENERAL NOTES	
1.	COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
2.	FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
3.	PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
4.	COORDINATE ALL BELOW GRADE NATURAL GAS PIPE ROUTING WITH EXISTING SITE CONDITIONS.

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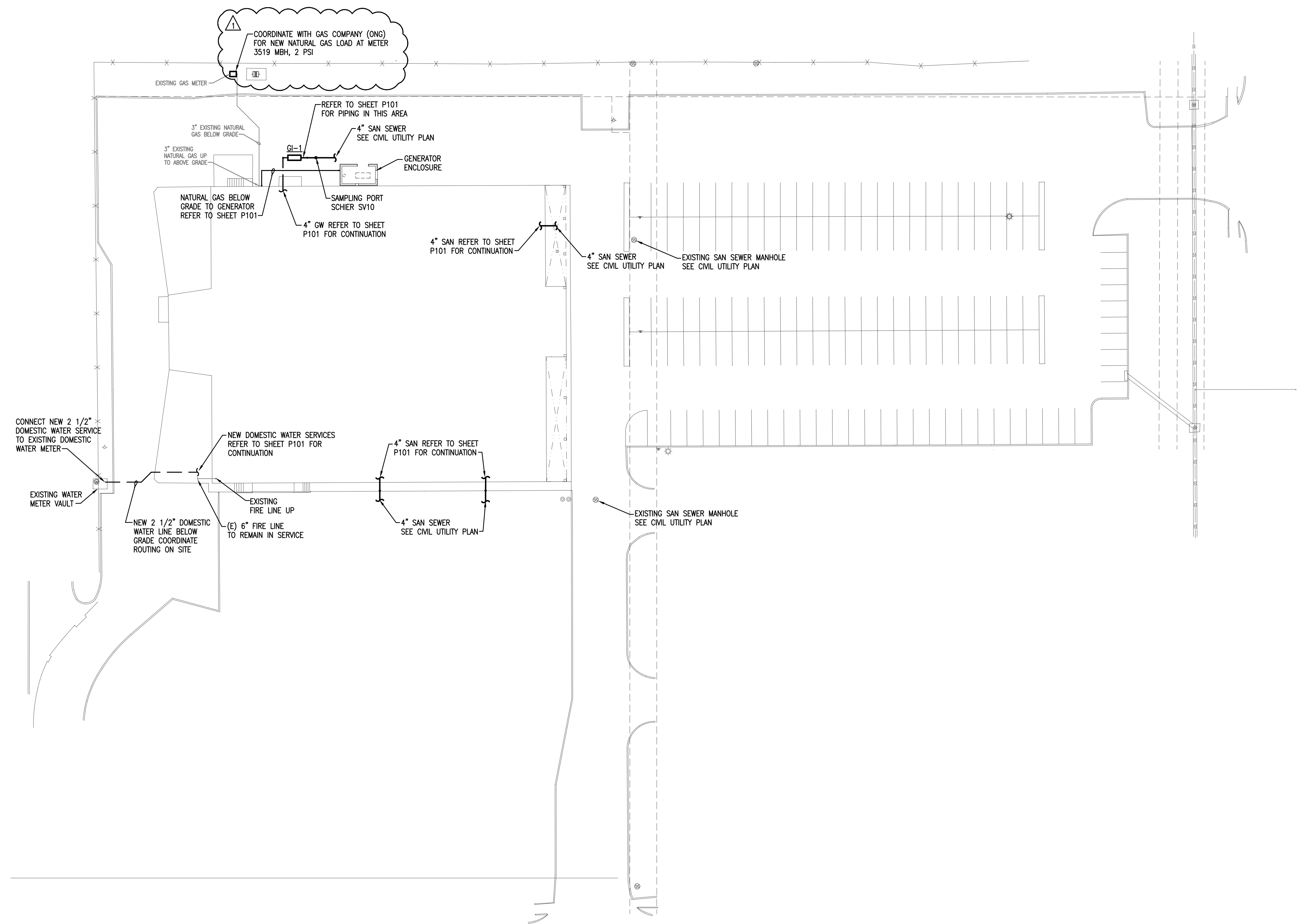
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1 PLUMBING SITE PLAN
SCALE: 1/32" = 1'-0"



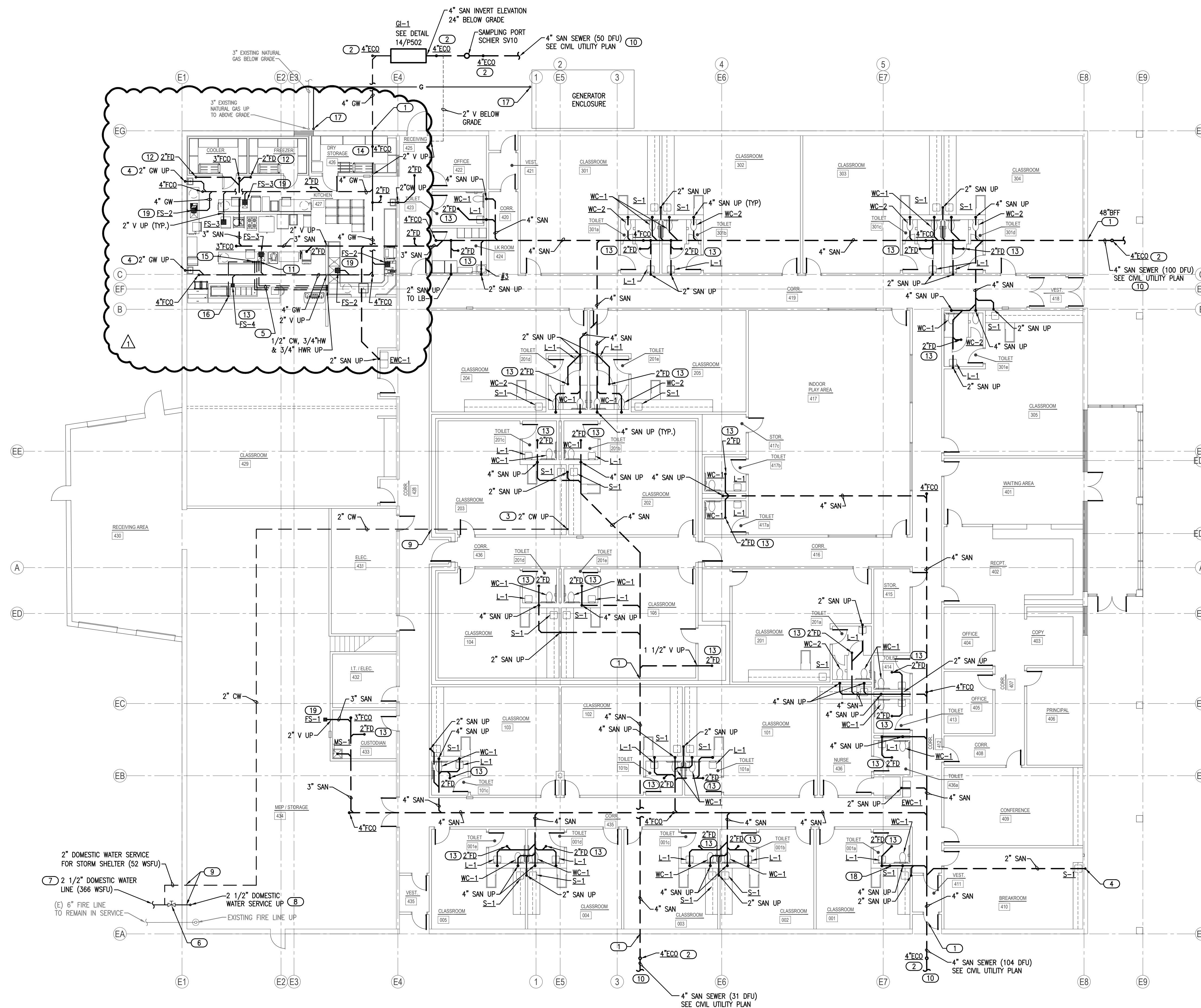


GENERAL NOTES

- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
- COORDINATE ALL BELOW GRADE PIPE ROUTING WITH STRUCTURAL FOUNDATIONS AND REQUIRED PIPE SLEEVES THRU FOUNDATION PENETRATIONS.
- FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
- PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
- REFER TO PLUMBING FIXTURE SCHEDULE ON SHEET P601 FOR FIXTURE ROUGH-IN PIPE SIZES. REFER TO ISOMETRIC SHEETS P301 AND P302 FOR ADDITIONAL PIPE SIZES.
- PIPE TRENCHES SHALL HAVE SAND BEDDING TO A MINIMUM POINT 6" ABOVE THE TOP OF PIPE. REFER TO SPECIFICATIONS.
- TRAP PRIMER LINES SHALL BE COPPER TYPE "K" OR PEX-o TUBING WITH CONTINUOUS SLOPE TOWARDS DRAIN CONNECTION.
- COORDINATE WITH GENERAL CONTRACTOR FOR ALL REQUIRED FLOOR CUTTING AND PATCHING TO INSTALL NEW BELOW GRADE/FLOOR PIPING.
- INSTALL TRAP PRIMER LINES TO ALL FLOOR DRAINS AND FLOOR SINKS. SEE DETAIL 1/P501.

KEYED NOTES

- PROVIDE CAST IRON PIPE SLEEVE FOR SANITARY OR GREASE WASTE PIPE BELOW OR THRU FOUNDATION WALL OR GRADE BEAM. INSTALL FOAM SPACER BLOCKS TO MAINTAIN PIPE IN CENTER OF SLEEVE. COORDINATE PIPE SLEEVE INSTALLATION WITH STRUCTURAL.
- INSTALL 4" EXTERIOR CLEANOUT IN CONCRETE PAD AT GRADE. COORDINATE INVERT ELEVATION WITH CIVIL. SEE DETAIL 4/P501.
- INSTALL PVC PIPE SLEEVE THRU CONCRETE FLOOR AND STUB UP 2" AFF FOR WATER LINE. INSTALL FOAM PIPE INSULATION ON WATER LINE IN SLEEVE. SEAL SLEEVE OPENINGS WATERTIGHT.
- ROUTE 2" SANITARY OR GREASE WASTE UP INTO FUR OUT OF EXISTING CMU WALL. COORDINATE PIPE ROUTING WITH EXISTING WALL FOOTING.
- ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR (PEX-o TUBING) BELOW FLOOR TO COOK'S TABLE PREP SINK.
- INSTALL DOMESTIC WATER CURB STOP IN NEW WATER SERVICE WITH ACCESS COVER AT GRADE.
- REMOVE EXISTING BELOW GRADE 1 1/2" DOMESTIC WATER SERVICE PIPE FROM BUILDING OUT TO WATER METER CONNECTION. REPLACE WITH 2 1/2" PIPE. COORDINATE WORK WITH SITE CONTRACTOR AND CITY WATER UTILITY DEPARTMENT. SEE SHEET P001 FOR CONTINUATION.
- REMOVE EXISTING 1 1/2" DOMESTIC WATER SERVICE PIPE AND REPLACE WITH 2 1/2" PIPE. INSTALL PIPE IN PVC PIPE SLEEVE THRU CONCRETE FLOOR. INSULATE PIPE IN SLEEVE WITH CELLULAR FOAM INSULATION.
- COORDINATE WITH STRUCTURAL FOR ROUTING WATER LINE IN PIPE SLEEVE THRU FOOTING OR FOUNDATION WALL IN THIS AREA.
- COORDINATE 4" SANITARY SEWER CONNECTION TO EXISTING SEWER MANHOLE WITH SITE CONTRACTOR.
- ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR (PEX-o TUBING) FROM BELOW FLOOR UP TO SERVE COOK'S TABLE PREP SINK. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINES WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
- INSTALL FUNNEL FASTENED TO STRAINER FOR CONDENSATE DRAIN LINES FROM FREEZER AND COOLER. MINIMUM FUNNEL HEIGHT 3" AND TOP DIAMETER 4". PROVIDE TRAP PRIMER LINE TO FLOOR DRAIN.
- INSTALL TRAP PRIMER LINE TO FLOOR DRAIN. SEE DETAIL 1/P501.
- INSTALL 4" FLOOR CLEANOUT AND ROUTE 4" GREASE WASTE DOWN AND THRU EXISTING WALL FOOTING. COORDINATE WITH STRUCTURAL.
- ROUTE 1/2" HW (PEX-o TUBING) FROM BELOW FLOOR UP TO HW LINE SERVING SINK. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINE WITH FOAM INSULATION IN SLEEVE.
- ROUTE 1/2" HW (PEX-o TUBING) FROM BELOW FLOOR UP SERVING FOOD WELL FAUCET. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINE WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
- INSTALL 1" NATURAL GAS (2 PS) ANODELESS GAS RISER FOR TRANSITION FROM BELOW GRADE MOPE TUBING TO ABOVE GRADE BLACK IRON PIPE. COORDINATE LOCATION ON SITE.
- ROUTE 3" SANITARY UP TO OPEN SITE DRAIN IN CHASE FOR CONDENSATE DRAIN LINES.
- ROUTE TRAP PRIMER LINE ABOVE FLOOR AND OVER FLOOR SINK WITH AIR GAP. SEE DETAIL 1/P501.



1 PLUMBING PLAN - BELOW GRADE
SCALE: 3/32" = 1'-0"

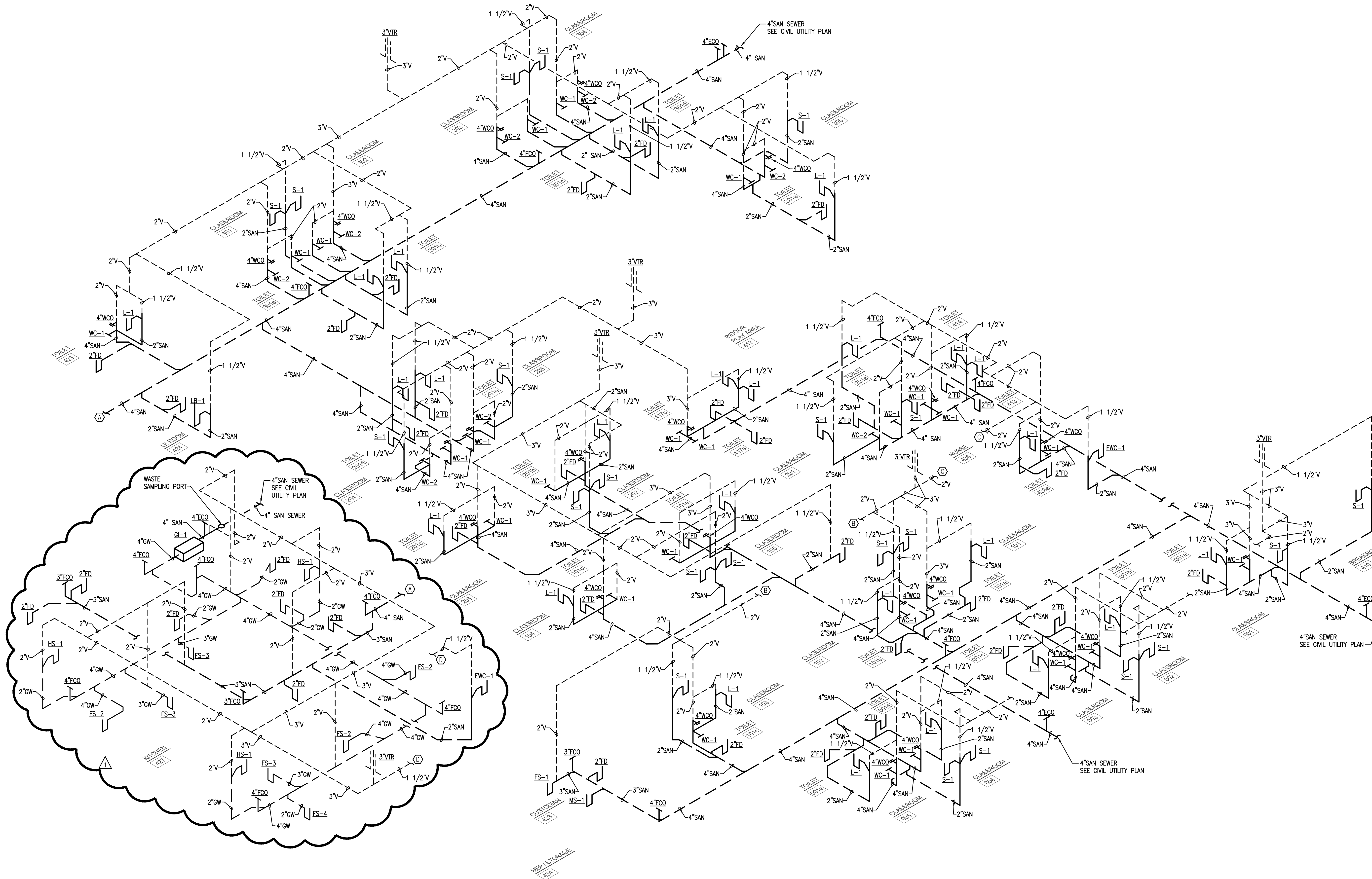
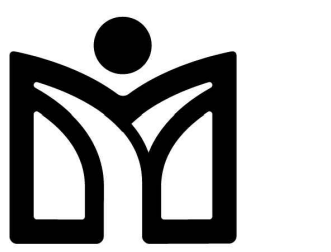
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1 PLUMBING ISOMETRIC - WASTE & VENT NO SCALE



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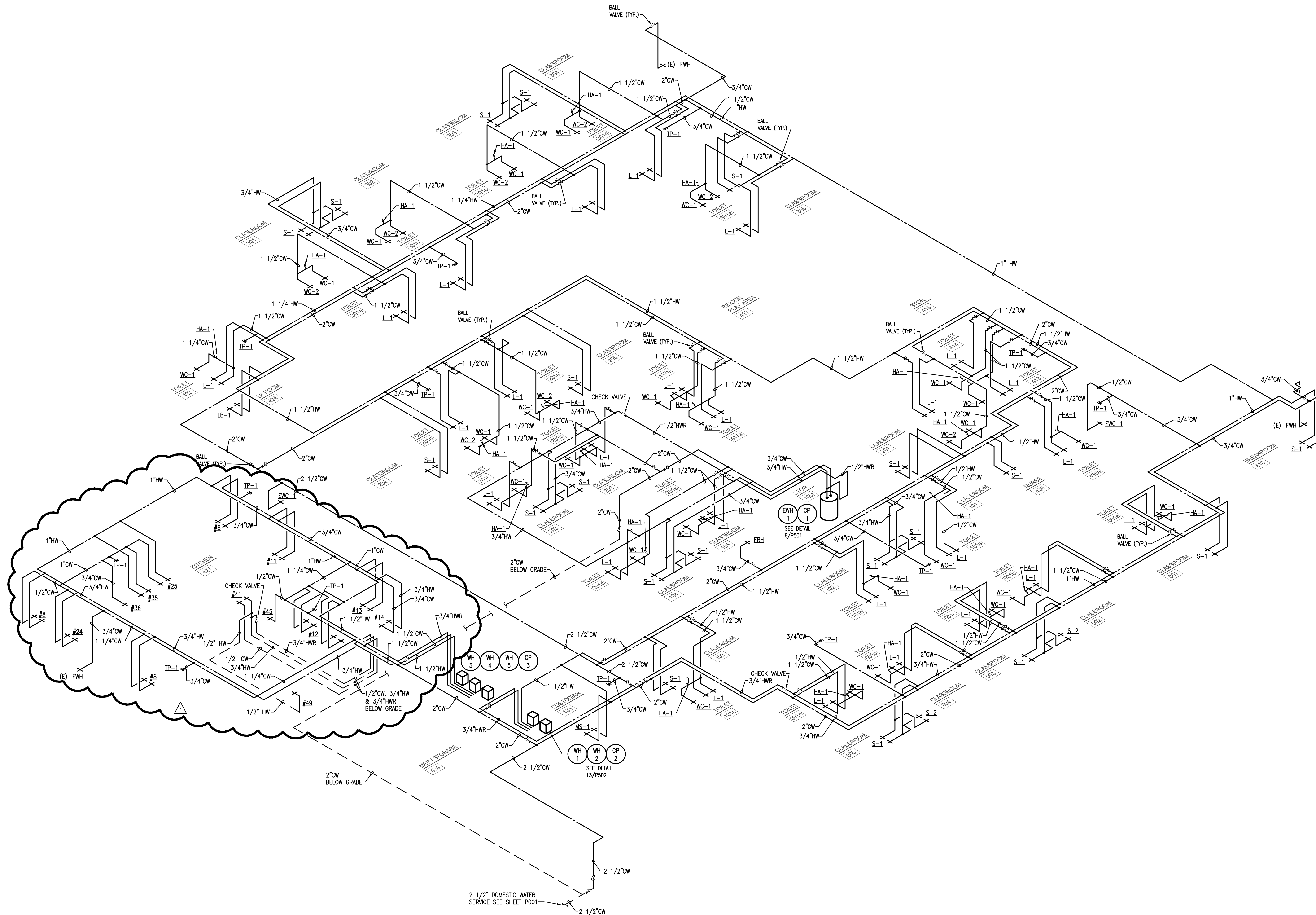
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1 PLUMBING ISOMETRIC - WATER SUPPLY

NO SCALE



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GAS LOAD TABLE					
MARK	INPUT (MBH)	REQUIRED PRESSURE	REQUIRED REGULATOR	SYSTEM PRESSURE	NOTES
RTU-1	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-2	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-3	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-4	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-5	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-6	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-7	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-8	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-9	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-10	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-11	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-12	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-13	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-14	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-15	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-16	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
DOAS-1	208	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
WH-1	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-2	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-3	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-4	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
KITCHEN	254	10"	MAXITROL 325-5L	2 PSI	1,2,5
DRYER	50	7"	MAXITROL 325-3L	2 PSI	1,2,5
GEN SET	377	10"	MAXITROL 325-5L	2 PSI	1,2,5
TOTAL LOAD	3519 MBH				

NOTES:
1. INSTALL AND VENT REGULATOR PER MANUFACTURER'S RECOMMENDATIONS.
2. PROVIDE VENT LIMITING DEVICE FOR INDOOR REGULATORS EQUIPPED WITH INTEGRAL VENT LIMITING GRIPICE MODEL 12A09 OR 12A39.
3. COORDINATE WITH MECHANICAL CONTRACTOR FOR EQUIPMENT LOCATIONS AND REQUIRED CONNECTION.
4. PROVIDE VENT PROTECTOR DEVICE FOR OUTDOOR REGULATORS MODEL 13A15 OR 13A15-5.
5. GAS SYSTEM DESIGN FOR INITIAL METER OUTLET PRESSURE OF 2 PSIG WITH PRESSURE DROP OF 1 PSIG AND TOTAL LENGTH OF 450 FEET.

PLUMBING KITCHEN EQUIPMENT SCHEDULE							
ITEM	DESCRIPTION	INDIRECT DRAIN	DIRECT DRAIN	VENT	CW	HW	GAS
3	MOP SINK	-	2"	1 1/2"	1/2"	1/2"	-
5	WASHER BY OWNER	-	2"	1 1/2"	1/2"	1/2"	-
6	DRYER BY OWNER	-	-	-	-	-	1/2" 50 MBH
8	HAND SINK	-	2"	1 1/2"	1/2"	1/2"	-
11	DISHWASHER	2"	-	-	1/2"	1/2"	-
12	SOILED DISHTABLE	(3) 2"	-	-	(2) 3/4"	(2) 3/4"	-
13	HOSE REEL	-	-	-	1/2"	1/2"	-
14	WATER TROUGH	2"	-	-	3/4"	3/4"	-
24	PREP TABLE	2"	-	-	1/2"	1/2"	-
25	FOOD ALLERGY WORKTABLE	2"	-	-	1/2"	1/2"	-
33	CONVECTION OVEN	-	-	-	-	-	(2) 3/4" 55 MBH
34	RANGE	-	-	-	-	-	3/4" 144 MBH
35	KETTLE	-	-	-	1/2"	1/2"	-
36	CONVECTION STEAMER	(2) 3/4"	-	-	3/4"	-	-
41	COOKS TABLE SINK	2"	-	-	1/2"	1/2"	-
45	ICEMAKER	3/4"	-	-	1/2"	-	-
47	MILK COOLER	3/4"	-	-	-	-	-
48	SERVING COUNTER	-	-	-	1/2"	-	-
49	COLD FOOD WELL	3/4"	-	-	-	-	-
51	HOT FOOD WELL	3/4"	-	-	-	1/2"	-

EQUIPMENT LISTED PROVIDED BY FOOD SERVICE CONTRACTOR (FSC). COORDINATE WITH FSC FOR REQUIRED CONNECTIONS.

GAS WATER HEATER SCHEDULE									
MARK	LOCATION	TEMPERATURE RISE	FLOW RATE GAL/MIN	CAPACITY (GALLONS)	MBH INPUT MAX	AIR INTAKE	FLUE EXHAUST	MANUFACTURER & MODEL NO.	NOTES
WH 1	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 2	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 3	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 4	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 5	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL

NOTES:
1. INSTALL AND VENT PER MANUFACTURER'S RECOMMENDATIONS.
2. COORDINATE POWER SUPPLY WITH ELECTRICAL CONTRACTOR. POWER SUPPLY TO UNIT 120V, 2 AMP (GFCI OUTLET).
3. PROVIDE AMTROL ST-12 THERMAL EXPANSION TANK ON COLD WATER LINE. REFER TO DETAILS SHEET P501.
4. PROVIDE CLEAR WATER ENVIRO TECHNOLOGIES SCALEBLASTER MODEL SB-250 ELECTRONIC DESCALER. COORDINATE 120 VOLT OUTLETS WITH EC.
5. PROVIDE CIRCULATION PUMP WIRING FROM WATER HEATERS. COORDINATE POWER CONNECTIONS WITH EC.
6. PROVIDE NAVIEN CONDENSATE NEUTRALIZER KIT AND OVERFLOW BY-PASS PIPING TO FLOOR SINK PER MANUFACTURER'S RECOMMENDATIONS.
7. PROVIDE ONE COMMUNICATION CABLE FOR WH-1 / WH-2 AND TWO CABLES FOR WH-3, WH-4 & WH-5.
8. PROVIDE NAVIEN READY-LINK WALL MOUNT PIPING MANIFOLD SYSTEM FOR WATER HEATERS.
9. PROVIDE NAVIEN EXHAUST/INTAKE CONCENTRIC VENT KIT THRU ROOF.
10. SEE DETAIL 13/P502 FOR MORE INFORMATION.

ELECTRIC WATER HEATER SCHEDULE									
MARK	LOCATION	TEMPERATURE RISE	CAPACITY GALLONS	AMPS	ELEMENT KW	VOLTAGE	PHASE	MANUFACTURER & MODEL NO.	NOTES
EW 1	ELEC RM IN SAFEROOM	70 DEG @ 25 GPH	20	22	4.5	208	1	A.O. SMITH DEL-20	ALL

NOTES:
1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
2. WATER HEATER OUTLET TEMPERATURE SET TO 120°F. VERIFY TEMPERATURE WITH OWNER.
3. PROVIDE AMTROL ST-5 THERMAL EXPANSION TANK ON COLD WATER LINE TO WATER HEATER.
4. PROVIDE HOLD RITE WALL SUPPORT PLATFORM MODEL 50-SWHP-W & RESTRAINT STRAP FOR WATER HEATER.
5. COORDINATE WIRING WITH E.C.
6. SEE DETAIL 6/P501 FOR MORE INFORMATION.

CIRCULATION PUMP SCHEDULE										
MARK	MAXIMUM WORKING PRESSURE	MAXIMUM OPERATING TEMP (°F)	MOTOR				FLANGE SIZE (INCHES)	MATERIAL	MANUFACTURER & MODEL NO.	NOTES
			ELECTRICAL CHAR	F.L. AMPS	HP	RPM				
CP 1	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	
CP 2	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	
CP 3	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	

NOTES:
1. PROVIDE GRUNDFOS BRONZE 3/4" FLANGE SET.
2. DATA: CP-1: 0.5 GPM AT 10 FEET HEAD.
3. DATA: CP-2: 1.5 GPM AT 8 FEET HEAD.
4. DATA: CP-3: 1 GPM AT 10 FEET HEAD.
5. PROVIDE 24 HOUR TIMER AND AQUASTAT - SET TIMER PER OWNER'S REQUIREMENTS.
6. COORDINATE WIRING WITH E.C.
7. SEE DETAIL 7/P501 FOR MORE INFORMATION.

GREASE INTERCEPTOR SCHEDULE											
MARK	LOCATION	FLOW RATE (GPM)	LIQUID CAP. (GAL)	GREASE CAP. (LBS)	STANDARD CONNECTION LENGTH	DIMENSIONS (INCHES)			MANUFACTURER & MODEL NO.	NOTES	
						WIDTH	HEIGHT	WEIGHT (LBS)			
GI 1	EXTERIOR BELOW GRADE	100	277	1,865	4"	87	33	44	376	SCHIER GB-250	ALL

NOTES:
1. INSTALL AND VENT PER MANUFACTURER'S RECOMMENDATION AND LOCAL PLUMBING CODE.
2. INSTALL EXTERIOR BELOW GRADE GREASE INTERCEPTOR SO COVERS ARE FLUSH WITH FINISHED CONCRETE. PROVIDE EXTENSION RISER ASSEMBLY AS REQUIRED.
3. INSTALL GREASE INTERCEPTOR WITH REQUIRED CLEARANCES FOR ACCESS AND CLEANING.
4. PROVIDE SAMPLING PORT SCHIER SV10 WITH EXTENSION RISER DOWNSTREAM OF INTERCEPTOR PER MANUFACTURER'S RECOMMENDATIONS.
5. SEE DETAIL 14/P502 FOR ADDITIONAL INFORMATION.

GREASE INTERCEPTOR SIZING
GREASE INTERCEPTOR SIZED TO COMPLY WITH INTERNATIONAL PLUMBING CODE 2018 AND PDI-G101. FIXTURES DRAINING TO GREASE INTERCEPTOR:
3-COMPARTMENT SINK: 20" x 20" x 14" x 3 = 16,800 CU INCHES / 231 = 58 GAL x 75% = 54.5 GALLONS
HANDSINKS: 3 FIXTURES x 1.5 GPM = 4.5 GPM
COOKS TABLE SINK #41: 18" x 18" x 12" = 3,888 CU INCHES / 231 x 75% = 13 GALLONS
PREP TABLE SINK #25: 12" x 15" x 10" = 1,800 CU INCHES / 231 x 75% = 6 GALLONS
DISHWASHER: 36 GALLONS
PREP DOUBLE SINK: 18" x 18" x 14" = 4,536 CU INCHES x 2 / 231 x 75% = 30 GALLONS
FLOOR SINKS WITH 2" OUTLET: 2 FIXTURES: 2 GPM x 2 = 4 GPM
PRE-RINSE SINK: 18" x 18" x 10" = 3,240 CU INCHES / 231 x 75% = 10.5 GALLONS
TOTAL DRAIN FLOW PER 2 MINUTES = 158.5 GALLONS / 2 MIN = 80 GALLONS
USE INTERCEPTOR SIZED FOR FLOW RATE OF 100 GPM.

PLUMBING FIXTURE SCHEDULE									
MARK	FIXTURE	MANUFACTURER	MODEL	MOUNT	ROUGH-IN SCHEDULE				FITTINGS AND REMARKS
					COLD	HOT	WASTE	VENT	
L-1	LAVATORY ADA	AMERICAN STANDARD	0355.012	WALL	1/2"	1/2"	1 1/2"	1 1/2"	COLOR WHITE. PROVIDE CHICAGO FAUCET 420-ABCP. MCGUIRE HD155A GRID STRAINER, 8902C P-TRAP, LFBV2165SC 1/4 TURN SUPPLY STOPS. TRUEBRO LAV GUARD2 PIPE COVERS. ZURN WALL FIXTURE CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE. INSTALL THERMOSTATIC MIXING VALVE TMV-1 UNDER FIXTURE. SEE DETAIL 5/P501.
WC-1	WATER CLOSET ADA	AMERICAN STANDARD	2257.101	WALL	1 1/4"	-	4"	-	COLOR WHITE. PROVIDE SLOAN ROYAL 111-1.6 SFSM BATTERY OPERATED FLUSH VALVE. PROVIDE BEIMS 1655SCT OPEN FRONT ELONGATED SEAT. EXTERNAL CHECK HINGE, COLOR WHITE. ZURN NARROW WALL CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE. ADA INSTALLATION.
WC-2	WATER CLOSET	AMERICAN STANDARD	2257.101	WALL	1 1/4"	-	4"	-	COLOR WHITE. PROVIDE SLOAN ROYAL 111-1.6 SFSM BATTERY OPERATED FLUSH VALVE. PROVIDE BEIMS 1655SCT OPEN FRONT ELONGATED SEAT. EXTERNAL CHECK HINGE, COLOR WHITE. ZURN NARROW WALL CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE.
S-1	SINK	ELKAY	LRAD1919602	COUNTERTOP	1/2"	1/2"	1 1/2"	1 1/2"	SINGLE BOWL, 6" DEEP, 2 FAUCET HOLES, REAR CENTER DRAIN. PROVIDE ELKAY LK035 DRAIN & ELKAY LK4060Q814 FAUCET. MCGUIRE 8912 P-TRAP & LFBV2165 SUPPLY STOPS. INSTALL MIXING VALVE TMV-1 UNDER SINK.
MS-1	MOP SINK	FIAT	TSB-3000 24x24x12	FLOOR	1/2"	1/2"	3"	1 1/2"	MOLDED STONE, 6" DROP FRONT, SS THRESHOLD. PROVIDE FIAT 832AA HOSE & WALL BRACKET, 889-CC MOP BRACKET, MCG2424 SS WALL GUARDS, PROVIDE T&S BRASS FAUCET B-0665-BSTR. PROVIDE ASSE 1011 APPROVED HOSE CONNECTION VACUUM BREAKER.
EW-1	ELECTRIC WATER COOLER	ELKAY	LZSTLBWSSK	WALL	1/2"	-	1 1/2"	1 1/2"	DUAL LEVEL WITH SENSOR WATER BOTTLE FILLING STATION ON LOWER UNIT. VANDAL-RESISTANT, FILTERED, PUSH BUTTON ACTIVATION, 120 VOLT. PVC P-TRAP AND 1/4 TURN SUPPLY STOP. REFER TO ARCHITECT'S PLANS FOR MOUNTING HEIGHT. ADA INSTALLATION.
FD	FLOOR DRAIN	ZURN	ZN415-BZ1-P -VP	FLOOR	-	-	SEE PLANS	-	6" ROUND NICKEL BRONZE STRAINER, CAST IRON BODY ANCHOR FLANGE, CLAMP COLLAR, ADJUSTABLE COLLAR, ADJUSTABLE STRAINER HEIGHT, VANDAL-PROOF SECURED TOP, 1/2" TRAP PRIMER CONNECTION. SEE DETAIL 1/P501.
FS-1	FLOOR SINK	ZURN	ZN1910-K-2 -23	FLOOR	-	-	3"	-	8"x8" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, 1/2" GRATE WITH NICKEL BRONZE FINISH & SEDIMENT BUCKET.
FS-2	FLOOR SINK	ZURN	ZS1901-K-2 -23	FLOOR	-	-	4"	-	12"x12" TOP, 8" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, STAINLESS STEEL FRAME, 1/2" GRATE, & SEDIMENT BUCKET.
FS-3	FLOOR SINK	ZURN	ZS1900-K-2 -23	FLOOR	-	-	2"	-	12"x12" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, STAINLESS STEEL FRAME WITH 1/2" GRATE & SEDIMENT BUCKET.
FS-4	FLOOR SINK	ZURN	ZS1910-K-P -2-23	FLOOR	-	-	2"	-	8"x8" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, 1/2" TRAP PRIMER CONNECTION, STAINLESS STEEL FRAME WITH 1/2" GRATE & SEDIMENT BUCKET.
FCO	FLOOR CLEANOUT	ZURN	ZN1400-K-VP	FLOOR	-	-	SEE PLANS	-	ADJUSTABLE, CAST IRON BODY, ANCHOR FLANGE, ABS THREAD PLUG, ROUND SCORiated TOP WITH NICKEL BRONZE FINISH, VANDAL RESISTANT COVER SCREWS.
WCO	WALL CLEANOUT	ZURN	Z1446-VP	WALL	-	-	SEE PLANS	-	CAST IRON CLEANOUT TEE, THREAD ABS PLUG, STAINLESS STEEL ROUND ACCESS COVER WITH VANDAL RESISTANT SECURING SCREW.
ECO	EXTERIOR CLEANOUT	ZURN	Z1474-N-VP	GRADE	-	-	SEE PLANS	-	CAST IRON CLEANOUT ACCESS HOUSING, ANCHOR FLANGE, SECURED GASKETED COVER WITH CLEANOUT FERRULE WITH ABS PLUG. VANDAL PROOF COVER SCREWS.
HA-1	HAMMER ARRESTOR	WATTS	LF15M2	PIPE	VARIES	-	-	-	LEAD-FREE DESIGN, PDI WH201 LISTED, MAINTENANCE FREE, INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
TP-1	TRAP PRIMER (ELECTRIC)	PRECISION PLUMBING PRODUCTS	PTS-4	PIPE	3/4"	-	-	-	ELECTRONIC UNIT ENCLOSED IN METAL CABINET WITH 24 HOUR TIMER, SOLENOID VALVE, VACUUM BREAKER, 3/4" CW INLET, HAMMER ARRESTOR & 1/2" OUTLETS, WATER, 120V POWER HARDWIRED. PROVIDE STRAINER PRIOR TO UNIT. COORDINATE 120 VOLT POWER OUTLET WITH EC. SEE DETAIL 1/P501.
TP-2	TRAP PRIMER	PRECISION PLUMBING PRODUCTS	PRO1-ULP500	PIPE	1/2"	-	-	-	UNDER FIXTURE TRAP PRIMER VALVE, CHROME PLATED, 1/2" CW INLET WITH ANGLE STOP, 3/8" OUTLET TO FAUCET, AIR GAP WITH 1/2" OUTLET TO FLOOR DRAIN. WALL ESCUTCHEON. MOUNT MINIMUM 12" ABOVE FLOOR. SEE DETAIL 11/P501.
TMV-1	THERMOSTATIC MIXING VALVE	WATTS	LFMMV-M1	BELOW FIXTURE	1/2"	1/2"	-	-	LEAD FREE MIXING VALVE WITH ADJUSTABLE TEMPERATURE SET-POINT & LOCKABLE, INTEGRAL CHECK STOPS & STRAINERS, 1/2" INLETS & OUTLET. SET OUTLET TEMP AT 105 DEGREES F. ASSE 1070 LISTED.
AP-1	ACCESS PANEL	ACUDOR	UF-5000 14x14 CLSS	WALL	-	-	-	-	14"x14" STEEL, 16 GAGE DOOR & FRAME, 18 GAGE MOUNTING FRAME. CONCEALED HINGE, CYLINDER LOCK & KEY, STAINLESS STEEL FINISH. CONCEALED FASTENING POINTS.
CD-1	CLOTHES DRYER	PROVIDED BY OTHERS	-	FLOOR	-	-	-	-	DRYER INSTALLED BY OTHERS. PC SHALL ROUGH-IN & MAKE FINAL CONNECTIONS. PROVIDE 1/2" DORMANT NATURAL GAS FLEXIBLE GAS LINE WITH BALL VALVE, SWIVEL CONNECTIONS & 36" LENGTH. LOW PRESSURE GAS. COORDINATE WITH UNIT SUPPLIER. 20 MBH GAS LOAD.
WM-1	WASHING MACHINE	PROVIDED BY OTHERS	-	FLOOR	3/4"	3/4"	3"	-	MACHINE INSTALLED BY OTHERS. PC SHALL ROUGH-IN & MAKE FINAL CONNECTIONS. ROUTE DRAIN HOSE TO LAUNDRY BOX DRAIN. CONNECT FLEXIBLE WATER HOSES TO WALL BOX & MACHINE. COORDINATE WITH UNIT SUPPLIER.
LB-1	LAUNDRY BOX	SIOUX CHIEF	696R2313WF	WALL	1/2"	1/2"	2"	1 1/2"	FIRE RATED RECESSED WALL MOUNTED BOX WITH FLANGE, 1/4 TURN BALL VALVES WITH HAMMER ARRESTORS, 3/4" THREADED OUTLETS, DRAIN CONNECTION. COORDINATE INSTALL HEIGHT FOR CLOTHES WASHER.
GVB-1	GAS VALVE BOX	SIOUX CHIEF	696R1020GF	WALL	-	-	-	-	FIRE RATED RECESSED WALL MOUNTED BOX WITH FLANGE, NATURAL GAS 1/4 TURN BALL VALVE, 1/2" THREADED OUTLET. PROVIDE DORMANT FLEXIBLE GAS LINE. COORDINATE INSTALL HEIGHT FOR CLOTHES DRYER GAS CONNECTION



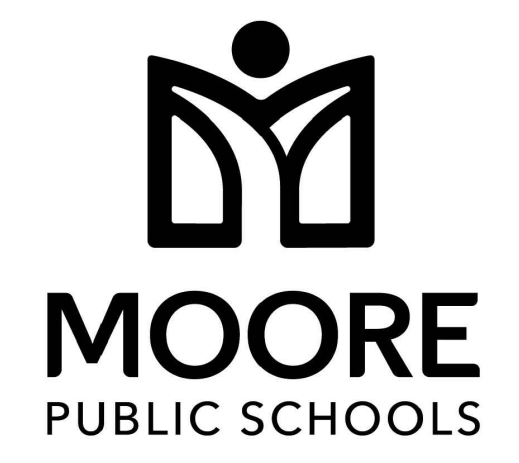
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KFC ENGINEERING STRUCTURAL SALAS O'BRIEN MECHANICAL / ELECTRICAL



KS drawn by KP checked by OCTOBER 2024 date

revisions 11/22/2024 AD 02



CHILD CARE FACILITY 201 N. EASTERN AVE.

sheet no: P601

Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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LIGHT FIXTURE SCHEDULE				
TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	REFERENCE CATALOG #
A1		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A1E		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2E		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3E		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A4		2X2 LED FLAT PANEL. 35W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X2 AL07 80CRI SSW7 SWL MVOLT
C		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING.	LITHONIA	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
CE		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITON	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
EX		LED EXIT SIGN, STAINLESS STEEL FACE WITH RED LETTERS, UNIVERSAL FACE AND MOUNTING. PROVIDE WITH UL924 DEVICE.	LIFE SAFETY LIGHTING	LSXDC 3 R A A EM SDT
L		2" X 4" LED EXTERIOR FIXTURE 1028 LUMENS/FT, 4000K CCT. SURFACE MOUNT	A-LIGHT	LIN 3 SP M4 LH 40 U HE F X D
LE		2" X 4" LED EXTERIOR FIXTURE 1028 LUMENS/FT, 4000K CCT. SURFACE MOUNT. PROVIDE WITH UL924 DEVICE.	A-LIGHT	LIN 3 SP M4 LH 40 U HE F X D EC
P2		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING.	DELRAY	UCCD6 W35 SR D
P2E		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	DELRAY	UCCD6 W35 SR D
S		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
SE		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
T		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
TE		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
V		2" LED VANITY FIXTURE. 9W, 300 LUMENS/FT DIRECT AND INDIRECT, 3500K CCT. 0-10V DIMMING.	MARK LIGHTING	S2WID LLP 2FT MSL2 80CRI 35K 300LMF I80 I35K I300LMF AS SCT MIN10 FL MVOLT WHTT ZT
W1E		2400 LUMEN, 4000K CT, LED WALL PACK PROVIDE WITH UL924 DEVICE.	LITHONIA	WPX1 LED P2 40K MVOLT DBLXD

GENERAL NOTES:
EQUIVALENT ALTERNATE LIGHT FIXTURES MAY BE PROVIDED FOR BIDDING PURPOSES. THE ENGINEER DOES NOT TAKE RESPONSIBILITY FOR ENSURING ALTERNATE LIGHT FIXTURES USED FOR BIDDING ARE EQUAL; THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALTERNATE FIXTURES ARE EQUIVALENT TO THOSE SPECIFIED PRIOR TO BID. THE WINNING BID PACKAGE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH THE SPECIFICATIONS.

ELECTRICAL ABBREVIATIONS			
AC	ABOVE COUNTERTOP	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCA	MINIMUM CIRCUIT AMPS
AFG	ABOVE FINISH GRADE	MCB	MAIN CIRCUIT BREAKER
ANNC	ANNUNCIATOR	MDP	MAIN DISTRIBUTION PANEL
CC	CONTROLS CONTRACTOR	MLO	MAIN LUG ONLY
DF	DRINKING FOUNTAIN	MTD	MOUNTED
EC	ELECTRICAL CONTRACTOR	NIC	NOT IN CONTRACT
EF	EXHAUST FAN	OCC	OCCUPANCY
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH	PNL	PLUMBING CONTRACTOR PANEL
EX	EXISTING	SPST	SINGLE POLE SINGLE THROW
EXR	EXISTING RELOCATED	TIB	TELEPHONE TERMINAL BOARD
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GFI	GROUND FAULT INTERRUPT	WG	WIRE GUARD
HP	HORSEPOWER	WP	WEATHER PROOF
IBC	INTERNATIONAL BUILDING CODE	20A	20 AMP
IG	ISOLATED GROUND	Ø	PHASE
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, AND GROUND	3W	3 WIRE
LV	LOW VOLTAGE	1P20A	SINGLE POLE 20 AMP
LVPR	LV RELAY PANEL		

GENERAL ELECTRICAL NOTES	
1.	CONTRACTOR TO VERIFY EXISTING ELECTRICAL CONDITIONS AND NOTIFY ARCHITECT/ENGINEER OF ANY ELECTRICAL OR CODE ISSUES PRIOR TO BID. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE AND OPERATIONAL CODE COMPLIANT SYSTEM.
2.	ALL WORK SHALL BE IN CONFORMANCE WITH NATIONAL, STATE, AND LOCAL CODES AND/OR ORDINANCES.
3.	ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER CONTRACTORS & LOCAL UTILITY. E.G. SHALL CONTACT LOCAL UTILITY FOR EXACT SERVICE REQUIREMENTS TO INCLUDE BUT NOT LIMITED TO TRANSFORMER, METERING AND CABLING. LOCAL UTILITY REQUIREMENTS SUPERSEDE DRAWINGS AND SPECIFICATIONS.
4.	SEE ARCHITECTURAL, MECHANICAL, & PLUMBING DRAWINGS FOR ADDITIONAL REQUIREMENTS.
5.	ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. THEY ARE INTENDED TO GIVE APPROXIMATE LOCATIONS AND OVERALL DESIGN INTENT. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCTS, MATERIALS, AND ELECTRICAL METHODS WHICH HAVE NOT BEEN SHOWN OR INDICATED BUT ARE REQUIRED FOR A COMPLETE SYSTEM TO THE STANDARDS OF THE INDUSTRY.
6.	INSTALL LIGHTING FIXTURES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE SUPPORTING DEVICES FOR ADEQUATE SUPPORT OF FIXTURES FROM STRUCTURE.
7.	UPON COMPLETION OF THE ELECTRICAL WORK, THE INSTALLATION SHALL BE TESTED FOR CONTINUITY, GROUNDS, AND SHORT CIRCUITS. THE ELECTRICAL CONTRACTOR SHALL DEMONSTRATE PROPER PERFORMANCE OF ALL SYSTEMS. ALL DEFECTIVE WORK OR MATERIALS SHALL BE REPLACED OR REPAIRED AS NECESSARY AND RETESTED.
8.	ELECTRICAL RACEWAYS THAT PENETRATE FIRE RATED ASSEMBLIES SHALL BE SLEEVED AND SEALED AS PER THE LOCAL BUILDING CODE.
9.	THE ELECTRICAL CONTRACTOR SHALL PROVIDE A TEMPORARY ELECTRICAL SYSTEM FOR THE PROJECT. AT LEAST ONE 120 VOLT SINGLE PHASE RECEPTACLE SHALL BE PROVIDED FOR EACH 500 SQUARE FEET OF FLOOR SPACE. SUFFICIENT TEMPORARY LIGHTING SHALL BE PROVIDED TO ALLOW ALL CONTRACTORS TO COMPLETE THEIR WORK. TEMPORARY ELECTRICAL CIRCUITS SHALL BE EQUIPPED WITH COMBINATION GROUND FAULT INTERRUPTER AND CIRCUIT BREAKER PER NEC. TEMPORARY ELECTRICAL SYSTEM SHALL BE INCLUDED IN THIS BID. USAGE CHARGES SHALL BE PAID FOR BY THE GENERAL CONTRACTOR.

SWITCH LEGEND	
SYMBOL	DESCRIPTION
\$	20A, SPST SWITCH
\$ _o	20A, LETTER INDICATES GROUP
\$ ₃	20A, 3-WAY
\$ ₄	20A, 4-WAY
\$ _D	DIMMER SWITCH
\$ _K	KEY OPERATED SWITCH
\$ _{OC}	OCCUPANCY SENSOR SWITCH

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

RECEPTACLE SCHEDULE	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE
	20A, 120V, 2P, 3W GROUNDING DUPLEX RECEPTACLE
	RECEPTACLE MTD. 6" ABOVE COUNTER OR HGT SHOWN
	GFCI RECEPTACLE
	GFCI RECEPTACLE, MTD. 6" ABOVE COUNTER OR HGT SHOWN
	20A, 120V, 2P, 3W GROUNDING DUPLEX GFCI RECEPTACLE - WEATHER PROOF (IN USE COVER)
	JUNCTION BOX, AS NOTED
	QUADPLEX RECEPTACLE

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

ELECTRICAL LEGEND	
	PANEL BOARD
	DISTRIBUTION PANEL BOARD
	TRANSFORMER
	UTILITY METER
	SEPARATE CIRCUIT BREAKER
	DISCONNECT
	FUSED DISCONNECT SWITCH
	EMERGENCY FUSED DISCONNECT SWITCH
	MOTOR STARTER/CONTRACTOR
	COMBINATION MOTOR STARTER
	PUSH BUTTON STATION AS NOTED
	PULL BOX, SIZE AS REQUIRED BY CODE
	ELECTRICAL CONNECTION
	MOTOR CONNECTION
	HOME RUN TO PANEL BOARD

ELECTRICAL SHEET INDEX	
E000	ELECTRICAL TITLE SHEET
E100	ELECTRICAL SITE PLAN
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL POWER PLAN
E202	ELECTRICAL ROOF PLAN
E203	ELECTRICAL KITCHEN PLAN
E401	ELECTRICAL ONE-LINE DIAGRAM
E501	ELECTRICAL DETAILS SHEET
E502	ELECTRICAL DETAILS SHEET
E601	ELECTRICAL SCHEDULES
E602	ELECTRICAL SCHEDULES

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KFC ENGINEERING
STRUCTURAL
SALAS O'BRIEN
MECHANICAL / ELECTRICAL



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drawn by
TVO
checked by
OCTOBER 2024
date
revisions
11/22/2024 AD 02



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

E000

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Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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GENERAL NOTES

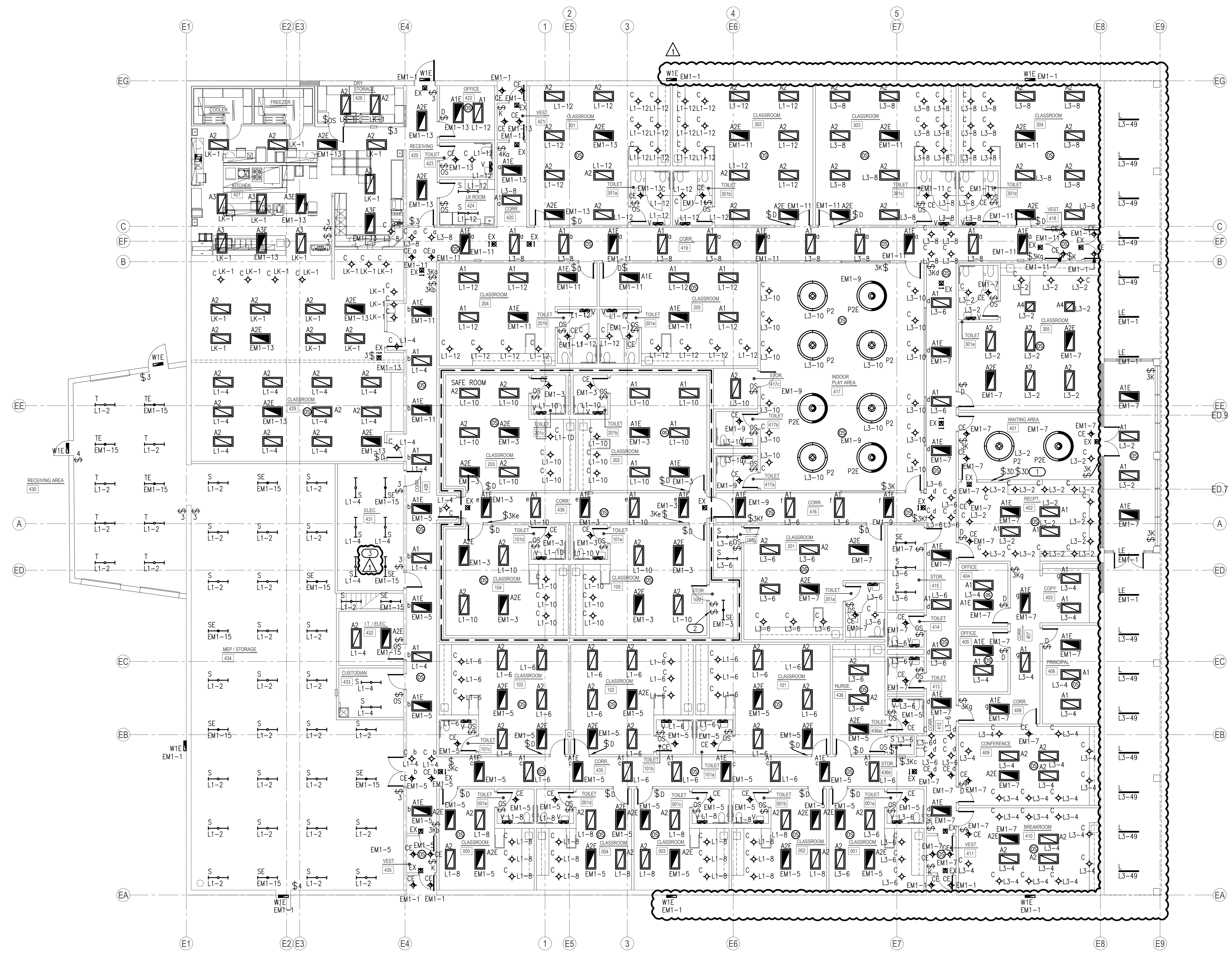
- OCCUPANCY SENSOR LOCATIONS SHOWN ARE FOR DESIGN INTENT ONLY. LOCATE OCCUPANCY SENSORS PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- CONNECT BATTERY PACKS TO UNSWITCHED HOT OF LOCAL LIGHTING CIRCUIT.
- COORDINATE WITH ALL ASSOCIATED TRADES FOR THE EXACT LOCATIONS OF LIGHT FIXTURES WITH HVAC EQUIPMENT AND OTHER DEVICES/EQUIPMENT.
- COORDINATE WITH THE ARCHITECT, OWNER, AND ASSOCIATED TRADES FOR THE EXACT HEIGHT/LOCATION OF EXTERIOR MOUNTED LIGHTING FIXTURES PRIOR TO ROUGH-IN.
- LABEL SWITCH PLATES AND J-BOXES WITH CIRCUIT PER SPECS.
- COORDINATE LIGHT SWITCHES WITH THERMOSTATS AND OTHER WALL MOUNT DEVICES.
- PROVIDE ELECTRONIC TIMER WITH INTEGRAL ASTRONOMICAL TIME CLOCK AND PHOTO CELL INPUT. LOCATE PHOTO CELL WITH CLEAR VIEW OF NORTHERN SKY AND SHIELD FROM ARTIFICIAL LIGHT SOURCES. TIMER SHALL CONTROL EXTERIOR LIGHTING.

SAFEROOM GENERAL NOTES

- PER ICC 500-2014, 309.1:
- PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
- 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
 - 2 1/16" IN DIAMETER
- SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- LIGHT SWITCH FOR 'WAITING AREA 401' LIGHT FIXTURES.
- SUPPLY VENTILATION FAN SWITCH. COORDINATE WITH MECHANICAL CONTRACTOR.
- DUPLICATE LIGHT FIXTURE PLACEMENT IN MEZZANINE AREA ABOVE. INSTALL LIGHT SWITCH IN MEZZANINE NEXT TO ENTRY WAY.



1 ELECTRICAL LIGHTING PLAN
SCALE: 3/32" = 1'-0"



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GENERAL NOTES

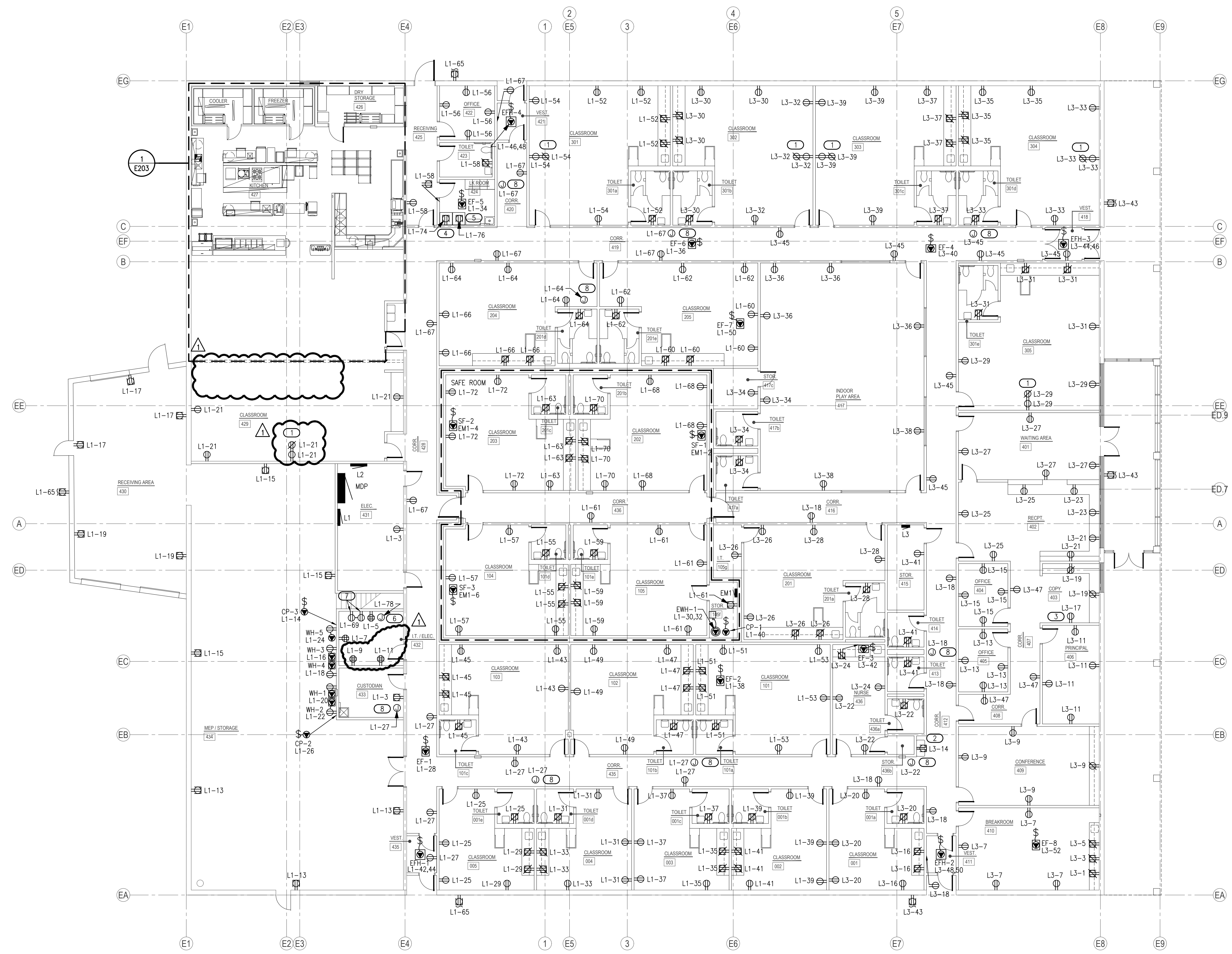
- COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT. COORDINATE EXACT LOCATION OF CEILING MOUNTED DEVICES WITH LIGHTS, HVAC EQUIPMENT, AND OTHER DEVICES.
- COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER CONTROL DEVICES.
- COORDINATE EXACT LOCATION OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR. REFER TO MECHANICAL PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- COORDINATE EXACT LOCATION OF PLUMBING EQUIPMENT WITH PLUMBING CONTRACTOR. REFER TO PLUMBING PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- ALL RECEPTACLES LOCATED AT COUNTERTOP HEIGHT SHALL BE ORIENTED HORIZONTALLY.
- FIRE STOP ALL PENETRATIONS IN FIRE AND SMOKE RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND ADDITIONAL INFORMATION

SAFEROOM GENERAL NOTES

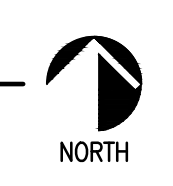
- PER ICC 500-2014, 309.1:
PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
1. 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
2. 2 1/16" IN DIAMETER
SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- PROVIDE 120V CONNECTION FOR SMARTBOARD. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH IN. REFER TO DETAIL '9/ES01' FOR ADDITIONAL INFORMATION.
- PROVIDE 120V WATER COOLER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V COPY MACHINE DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V GAS DRYER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V WASHER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V FIRE ALARM CONTROL PANEL. DEDICATED CONNECTION. COORDINATE RECEPTACLE TYPE AND LOCATION WITH FIRE ALARM CONTRACTOR.
- PROVIDE 120V TELECOM EQUIPMENT CONNECTION. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.



1 ELECTRICAL POWER PLAN
SCALE: 3/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
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GENERAL NOTES

1. COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT.
2. COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER DEVICES.
3. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR.
4. FIRMLY MOUNT WEATHERPROOF 120V CONVENIENCE OUTLET ON UNISTRUT/KINDORF. COORDINATE WITH OTHER TRADES PRIOR TO ROUGH-IN. REDUNDANT RECEPTACLES WHETHER STAND-ALONE OR INTEGRAL TO A UNIT, MAY BE OMITTED SO LONG AS ALL OF THE REQUIREMENTS OF NEC 210.63 ARE SATISFIED.

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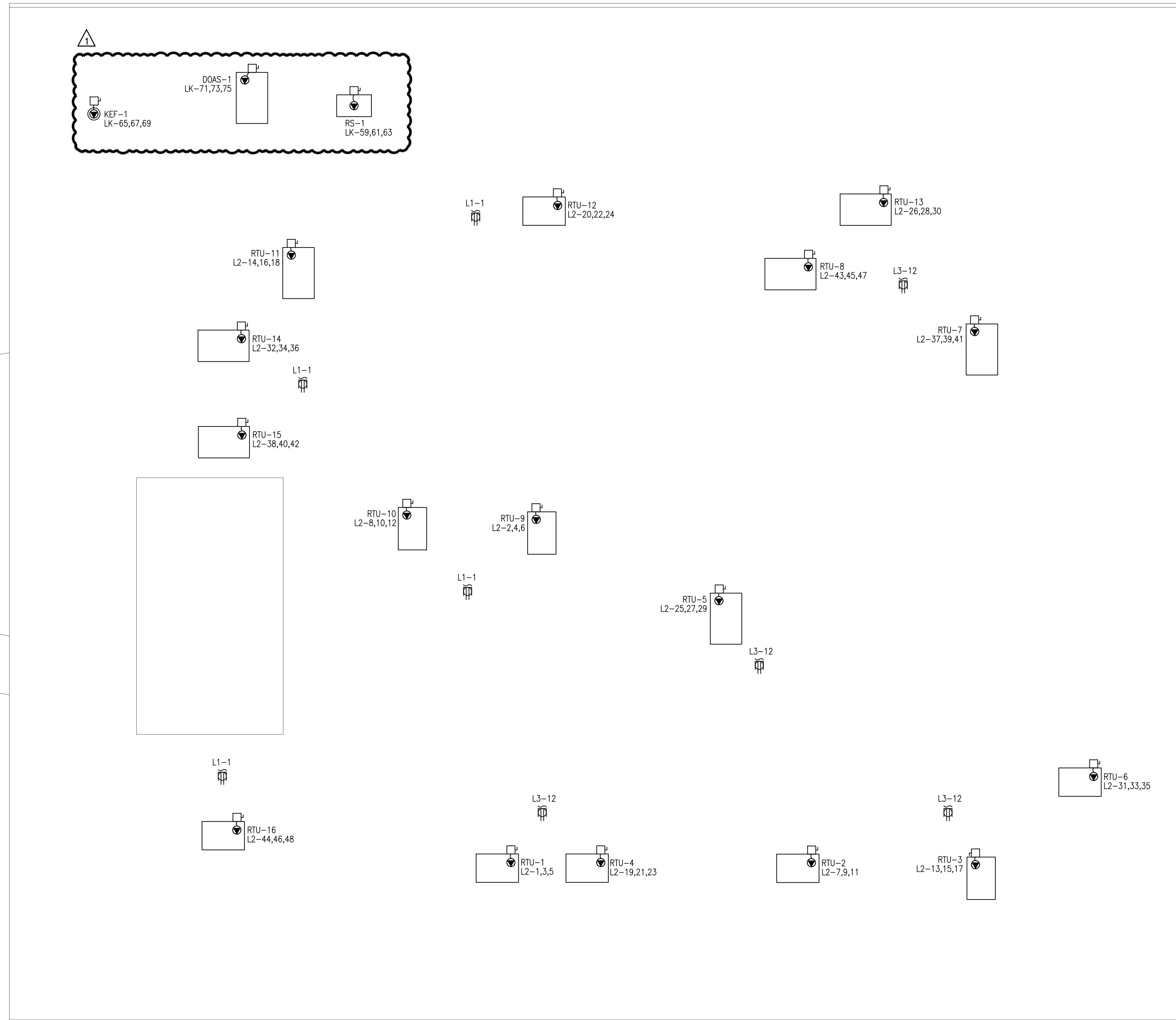
CHILD CARE FACILITY
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sheet no:

E202

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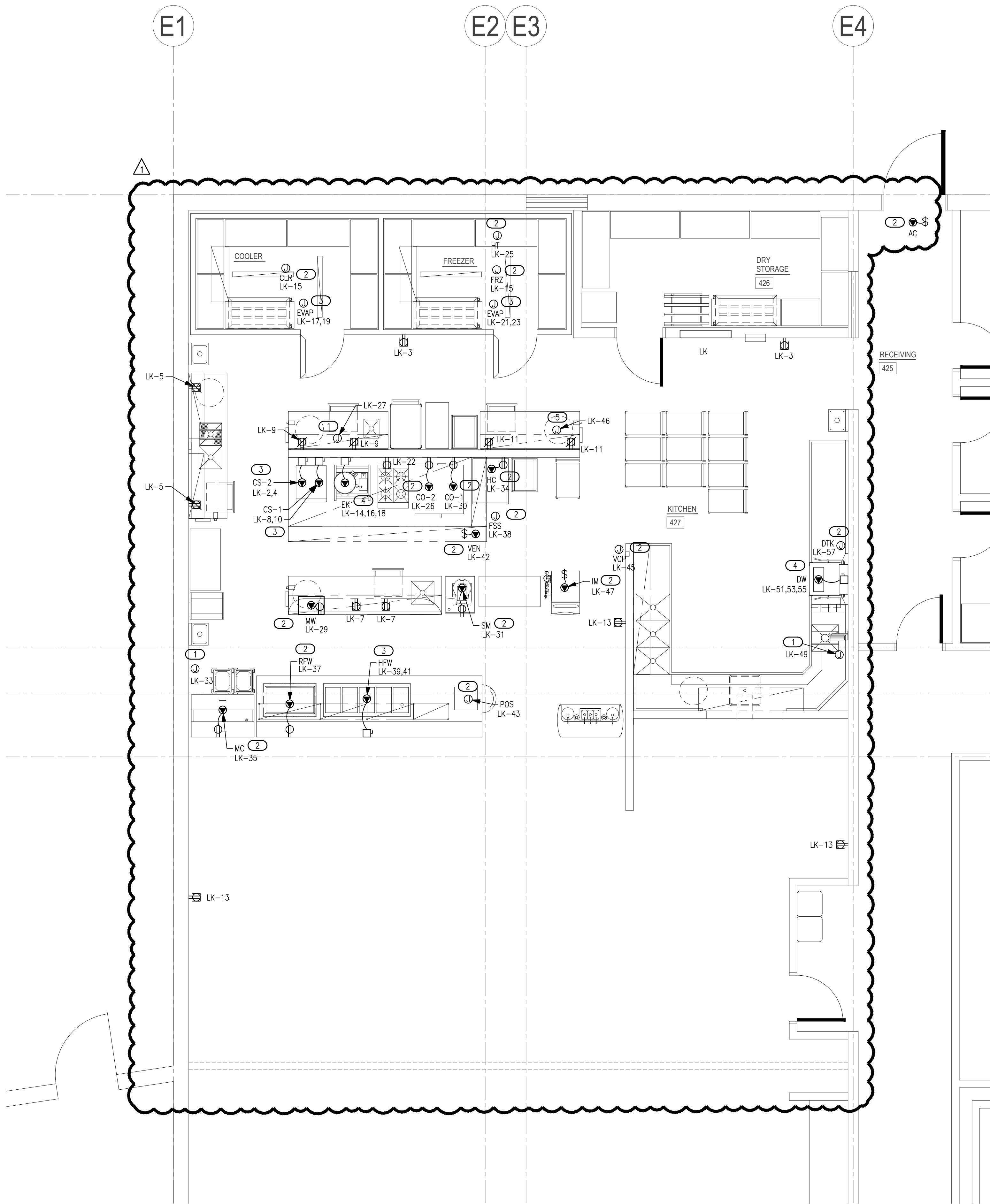
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1 ELECTRICAL ROOF PLAN

SCALE: 3/32" = 1'-0"





KITCHEN GENERAL NOTES

- COORDINATE KITCHEN/FOODSERVICE EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MANUFACTURER, AND FOOD SERVICE CONTRACTOR PRIOR TO BEGINNING WORK. REFER TO FOOD SERVICE PLANS FOR ADDITIONAL INFORMATION.
- COORDINATE KITCHEN HVAC EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MECHANICAL CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO MECHANICAL PLANS FOR ADDITIONAL INFORMATION.
- COORDINATE KITCHEN PLUMBING EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION.
- E.C. SHALL COORDINATE WITH OWNER, KITCHEN EQUIPMENT PROVIDER, AND OTHER TRADES PRIOR TO ROUGH IN TO ENSURE ALL ROUGH IN LOCATIONS ARE CONCEALED IN THE WALL AND STUBBED OUT IN THE PROPER LOCATIONS.
- GFCI PROTECTION REQUIRED FOR ALL 120V 15 AND 20A RECEPTACLES, BY GFCI FUNCTION ON BREAKER OR RECEPTACLE, PER NEC 210.8 (B) (2).
- HOOD STAND ALONE FIRE SUPPRESSION SYSTEM SHALL HAVE INPUT TO BUILDING FIRE ALARM SYSTEM.
- PROVIDE A 20 A MP, 1 HP, 120V POWER SUPPLY FOR KITCHEN EXHAUST FAN ANSUL SYSTEM. THE ACTIVATION OF THE FIRE SUPPRESSION SYSTEM SHALL AUTOMATICALLY SHUT DOWN THE FUEL AND ELECTRICAL POWER SUPPLY TO THE COOKING EQUIPMENT UNDER THE KITCHEN HOOD. THE FUEL AND ELECTRICAL POWER SUPPLY RESET SHALL BE MANUAL. SHUNT TRIP CIRCUIT BREAKERS SHALL BE USED FOR ELECTRICALLY SUPPLIED APPLIANCES LOCATED UNDER THE HOOD.

KEYED NOTES

- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
- PROVIDE 120V CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
- PROVIDE 208V SINGLE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
- PROVIDE 208V THREE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
- PROVIDE 120V CONNECTION FOR GAS SOLENOID VALVE ON SHUNT TRIP BREAKER. INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION.

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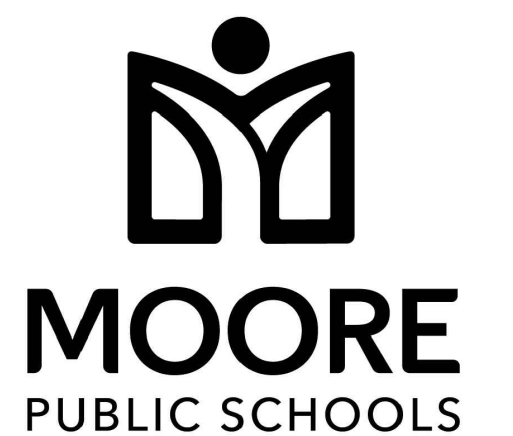


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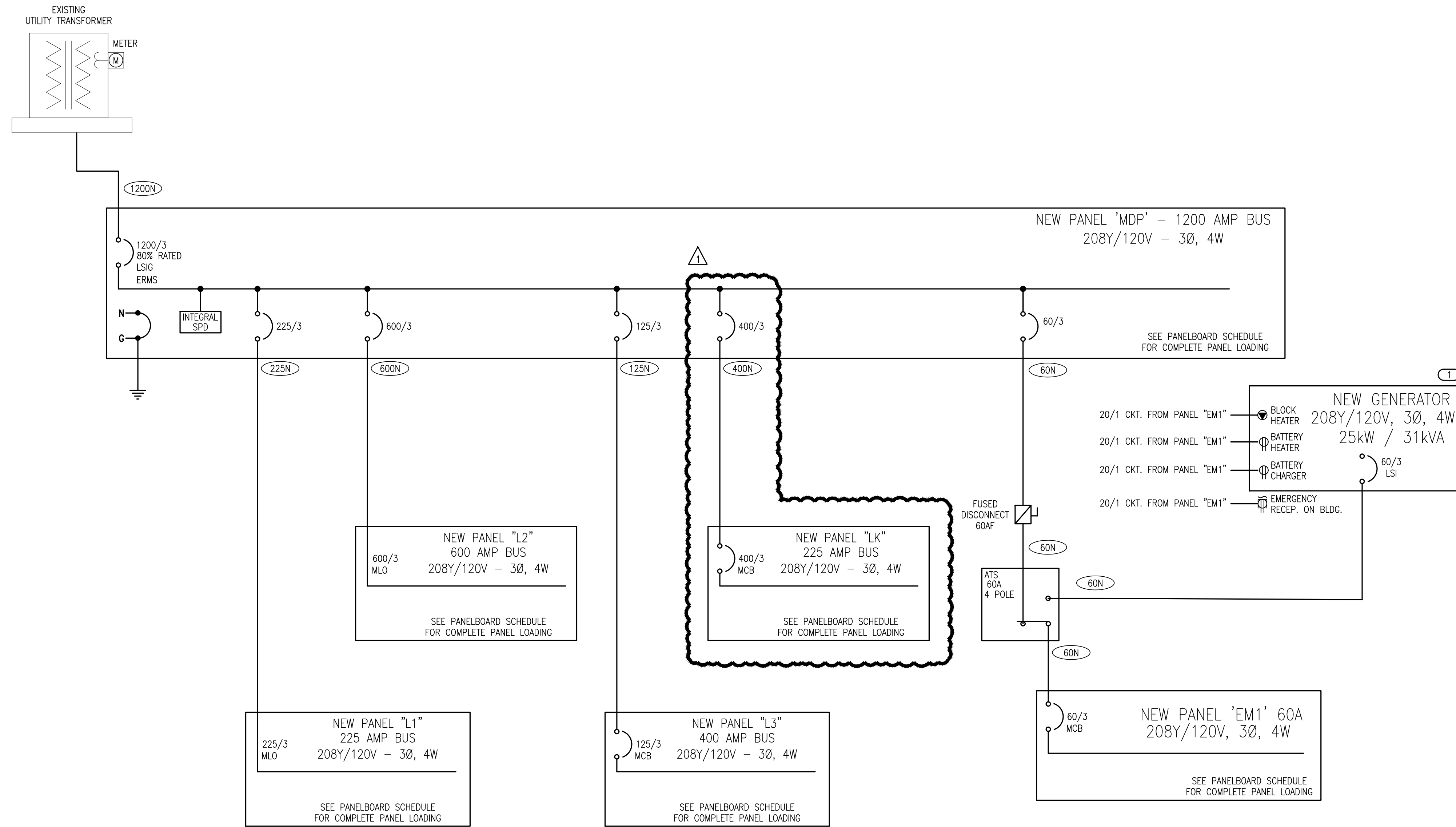
E203

1 ENLARGED ELECTRICAL KITCHEN PLAN
SCALE: 1/4" = 1'-0"



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1 ONE-LINE DIAGRAM
NO SCALE

FEEDER SCHEDULE				
AMPS	CONDUIT SIZE 4W	CONDUIT SIZE 3W	PHASE CONDUCTORS	EQUIPMENT GROUND CONDUCTOR
20	3/4"	3/4"	#12	#12
25	3/4"	3/4"	#10	#10
30	3/4"	3/4"	#10	#10
35	1"	3/4"	#8	#10
40	1"	3/4"	#8	#10
45	1"	1"	#6	#10
50	1"	1"	#6	#10
60	1 1/4"	1 1/4"	#4	#10
70	1 1/4"	1 1/4"	#4	#8
80	1 1/4"	1 1/4"	#3	#8
90	1 1/2"	1 1/4"	#2	#8
100	1 1/2"	1 1/4"	#2	#8
110	2"	1 1/2"	#1	#6
125	2"	1 1/2"	#1	#6
150	2"	1 1/2"	#1/0	#6
175	2"	2"	#2/0	#6
200	2"	2"	#3/0	#6
225	2 1/2"	2"	#4/0	#4
250	3"	2 1/2"	250 kcmil	#4
300	3"	3"	350 kcmil	#4
350	3 1/2"	3"	500 kcmil	#3
400	(2) 2"	(2) 2"	2 SETS OF #3/0	#3
450	(2) 2 1/2"	(2) 2"	2 SETS OF #4/0	#2
500	(2) 2 1/2"	(2) 2 1/2"	2 SETS OF 250 kcmil	#2
600	(2) 3"	(2) 3"	2 SETS OF 350 kcmil	#1
700	(2) 3 1/2"	(2) 3"	2 SETS OF 500 kcmil	#1/0
800	(3) 3"	(3) 2 1/2"	3 SETS OF 300 kcmil	#1/0
900	(3) 3 1/2"	(3) 3"	3 SETS OF 400 kcmil	#2/0
1000	(3) 3 1/2"	(3) 3"	3 SETS OF 500 kcmil	#2/0
1200	(4) 3"	(4) 3"	4 SETS OF 350 kcmil	#3/0
1600	(5) 3 1/2"	(5) 3"	5 SETS OF 500 kcmil	#4/0
1800	(6) 3 1/2"	(6) 3"	6 SETS OF 400 kcmil	250 kcmil
2000	(6) 3 1/2"	(6) 3"	6 SETS OF 500 kcmil	250 kcmil
2500	(7) 3 1/2"	(7) 3"	7 SETS OF 500 kcmil	350 kcmil

NOTES:

- FEEDER SIZES ARE ON THE PLAN WHERE 60 REFERS TO A 60A FEEDER WITHOUT NEUTRAL AND 60N REFERS TO A 60A FEEDER WITH NEUTRAL.
- SOME FEEDER SIZES DO NOT MATCH BREAKER SIZE DUE TO UP-SIZING OF THE FEEDER FOR VOLTAGE DROP.
- CONDUITS ARE SIZED PER NEC TABLES FOR THHN/THWN AND MAY BE UPSIZED FOR EASE OF PULLING OR DOWNSIZED AS ALLOWED PER NEC FOR CONDUIT TYPE(S) BEING INSTALLED.
- ALL CONDUCTORS 100A AND LESS ARE SIZED PER 60 DEGREE LUGS, EC MAY SIZE CONDUCTORS FOR ACTUAL RATING OF LUGS PER NEC.

GENERAL NOTES

- AIC RATINGS ARE ESTIMATED BASED ON AVAILABLE DATA DURING DESIGN. CONTRACTOR TO VERIFY AVAILABLE FAULT CURRENT WITH UTILITY.

KEYED NOTES

(1) GENERATOR SHALL BE DUAL FUEL - NATURAL GAS AND PROPANE. GENERATOR SHALL HAVE FUEL TYPE AUTOMATIC SWITCHOVER CAPABILITY. BASIS OF DESIGN - KOHLER MODEL 250CL 25/31 KW/KVA.

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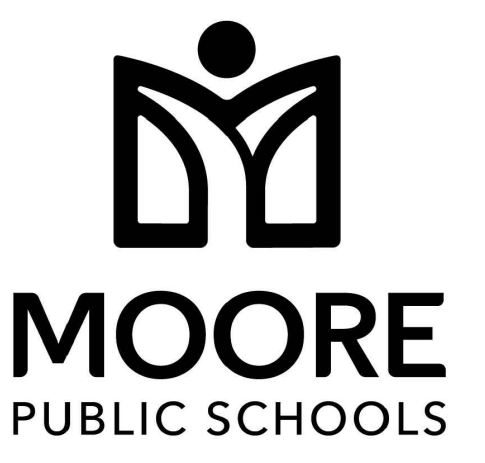
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CHILD CARE FACILITY
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Panel L2		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 600	MAIN BKR MLO				
NOTE			LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	25/3	5.48	RTU-1	a	2	35/3	7.21	RTU-9
3				b	4			
5				c	6			
7	40/3	7.49	RTU-2	a	8	40/3	7.49	RTU-10
9				b	10			
11				c	12			
13	25/3	5.48	RTU-3	a	14	50/3	13.3	RTU-11
15				b	16			
17				c	18			
19	40/3	7.49	RTU-4	a	20	35/3	7.21	RTU-12
21				b	22			
23				c	24			
25	50/3	13.3	RTU-5	a	26	50/3	13.3	RTU-13
27				b	28			
29				c	30			
31	25/3	5.48	RTU-6	a	32	25/3	7.21	RTU-14
33				b	34			
35				c	36			
37	50/3	13.3	RTU-7	a	38	25/3	5.48	RTU-15
39				b	40			
41				c	42			
43	50/3	13.8	RTU-8	a	44	25/3	5.48	RTU-16
45				b	46			
47				c	48			
49	20/1	0	SPACE	a	50	20/1	0	SPACE
51	20/1	0	SPACE	b	52	20/1	0	SPACE
53	20/1	0	SPACE	c	54	20/1	0	SPACE
55	20/1	0	SPACE	a	56	20/1	0	SPACE
57	20/1	0	SPACE	b	58	20/1	0	SPACE
59	20/1	0	SPACE	c	60	20/1	0	SPACE

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LARGEST MOTOR	13.8	3.46 (25%)	TOTAL LOAD	142
MOTORS	138	138 (100%)	BALANCED 3-PHASE LOAD	394 A
			PHASE A	100%
			PHASE B	100%
			PHASE C	100%

Panel EM1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 60	MAIN BKR 60				
NOTE			LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.432	LIGHTING	a	2	15/1	1.18	SF-1
3	20/1	0.441	LIGHTING	b	4	15/1	0.696	SF-2
5	20/1	1	LIGHTING	c	6	15/1	0.696	SF-3
7	20/1	0.981	LIGHTING	a	8	20/1	0.5	BLOCK HEATER
9	20/1	0.55	LIGHTING	b	10	20/1	0.5	BATTERY HEATER
11	20/1	0.647	LIGHTING	c	12	20/1	0.5	BATTERY CHARGER
13	20/1	0.572	LIGHTING	a	14	20/1	0.18	RECEPTACLE
15	20/1	0.477	LIGHTING	b	16	20/1	0	SPACE
17	20/1	0	SPACE	c	18	20/1	0	SPACE
19	20/1	0	SPACE	a	20	20/1	0	SPACE
21	20/1	0	SPACE	b	22	20/1	0	SPACE
23	20/1	0	SPACE	c	24	20/1	0	SPACE
25	20/1	0	SPACE	a	26	20/1	0	SPACE
27	20/1	0	SPACE	b	28	20/1	0	SPACE
29	20/1	0	SPACE	c	30	20/1	0	SPACE

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	5.1	6.38 (125%)	MOTORS	2.57
LARGEST MOTOR	1.18	0.294 (25%)	RECEPTACLES	1.68
			BALANCED 3-PHASE LOAD	10.9
			PHASE A	123%
			PHASE B	85.5%
			PHASE C	91.3%

Panel L1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 225	MAIN BKR MLO				
NOTE			LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.72	ROOFTOP RECEPTACLE	a	2	20/1	1.28	LIGHTING
3	20/1	0.36	RM 431 RECEPTACLE, RM 433 RECEPTACLE	b	4	20/1	0.793	LIGHTING
5	20/1	0.36	I.T. RECEPTACLE	c	6	20/1	0.706	LIGHTING
7	20/1	0.36	I.T. RECEPTACLE	a	8	20/1	0.48	LIGHTING
9	20/1	0.36	I.T. RECEPTACLE	b	10	20/1	0.636	LIGHTING
11	20/1	0.36	I.T. RECEPTACLE	c	12	20/1	1.06	LIGHTING
13	20/1	0.54	RM 434 RECEPTACLE	a	14	20/1	0.528	CP-3
15	20/1	0.54	RM 434 RECEPTACLE	b	16	20/1	0.1	WH-3
17	20/1	0.54	RM 430 RECEPTACLE	c	18	20/1	0.1	WH-4
19	20/1	0.36	RM 430 RECEPTACLE	a	20	20/1	0.1	WH-1
21	20/1	0.9	RM 429 RECEPTACLE, SMARTBOARD	b	22	20/1	0.1	WH-2
23	20/1	0	SPACE	c	24	20/1	0.1	WH-5
25	20/1	0.72	RM 1E RECEPTACLE, RM 5 RECEPTACLE	a	26	20/1	0.528	CP-2
27	20/1	0.93	CORRIDOR 428 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 435 RECEPTACLE, TRAP PRIMER	b	28	15/1	0.696	EF-1
29	20/1	0.54	RM 5 RECEPTACLE	c	30	30/2	4.5	EW-1
31	20/1	0.72	RM 1D RECEPTACLE, RM 4 RECEPTACLE	a	32			
33	20/1	0.54	RM 4 RECEPTACLE	b	34	15/1	0.696	EF-5
35	20/1	0.54	RM 3 RECEPTACLE	c	36	15/1	0.696	EF-6
37	20/1	0.72	RM 1C RECEPTACLE, RM 3 RECEPTACLE	a	38	15/1	0.696	EF-2
39	20/1	0.72	RM 1B RECEPTACLE, RM 2 RECEPTACLE	b	40	20/1	0.528	CP-1
41	20/1	0.54	RM 2 RECEPTACLE	c	42	20/2	2	EFH-1
43	20/1	0.54	RM 103 RECEPTACLE	a	44			
45	20/1	0.72	RM 101C RECEPTACLE, RM 103 RECEPTACLE	b	46	20/2	2	EFH-4
47	20/1	0.72	RM 101B RECEPTACLE, RM 102 RECEPTACLE	c	48			
49	20/1	0.54	RM 102 RECEPTACLE	a	50	15/1	0.696	EF-7
51	20/1	0.72	RM 101A RECEPTACLE, RM 101 RECEPTACLE	b	52	20/1	0.9	RM 301A RECEPTACLE, RM 301 RECEPTACLE, RM 303 RECEPTACLE
53	20/1	0.54	RM 101 RECEPTACLE	c	54	20/1	0.72	RM 301 RECEPTACLE, SMARTBOARD
55	20/1	0.72	RM 101D RECEPTACLE, RM 104 RECEPTACLE	a	56	20/1	0.72	RM 422 RECEPTACLE
57	20/1	0.54	RM 104 RECEPTACLE	b	58	20/1	0.54	RM 423 RECEPTACLE, RM 424 RECEPTACLE, RM 425 RECEPTACLE
59	20/1	0.72	RM 101E RECEPTACLE, RM 105 RECEPTACLE	c	60	20/1	0.72	RM 205 RECEPTACLE
61	20/1	0.9	CORRIDOR 436 RECEPTACLE, RM 105F RECEPTACLE, RM 105 RECEPTACLE	a	62	20/1	0.72	RM 201E RECEPTACLE, RM 205 RECEPTACLE
63	20/1	0.72	RM 201C RECEPTACLE, RM 203 RECEPTACLE	b	64	20/1	0.73	RM 201D RECEPTACLE, RM 204 RECEPTACLE, TRAP PRIMER
65	20/1	0.54	EXTERIOR RECEPTACLE	c	66	20/1	0.72	RM 204 RECEPTACLE
67	20/1	1.1	CORRIDOR 419 RECEPTACLE, CORRIDOR 420 RECEPTACLE, CORRIDOR 428 RECEPTACLE, RM 421 RECEPTACLE, TRAP PRIMER	a	68	20/1	0.72	RM 202 RECEPTACLE
69	20/1	0.36	TELECOM EQ	b	70	20/1	0.72	RM 201B RECEPTACLE, RM 202 RECEPTACLE
71	20/1	0	SPACE	c	72	20/1	0.72	RM 203 RECEPTACLE
73	20/1	0	SPACE	a	74	20/1	0.35	DRYER
75	20/1	0	SPACE	b	76	20/1	0.84	WASHER
77	20/1	0	SPACE	c	78	20/1	0.18	FACP
79	20/1	0	SPACE	a	80	20/1	0	SPACE
81	20/1	0	SPACE	b	82	20/1	0	SPACE
83	20/1	0	SPACE	c	84	20/1	0	SPACE

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	4.96	6.2 (125%)	MOTORS	5.56
LARGEST MOTOR	0.696	0.174 (25%)	RECEPTACLES	30
			HEATING	8.5
			BALANCED 3-PHASE LOAD	40.5
			PHASE A	112 A
			PHASE B	110%
			PHASE C	95.7%
				94%

Panel MDP		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM UTILITY		NEUTRAL 100%	BUS AMPS 1200	MAIN BKR 1200				
NOTE		PROVIDE INTEGRAL SPD	LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	225/3	49.1	PANEL L1	a	2	600/3	138	PANEL L2
3				b	4			
5				c	6			
7	125/3	35	PANEL L3	a	8	400/3	93.3	PANEL LK
9				b	10			
11				c	12			
13	20/1	0	SPACE	a	14	60/3	9.35	TRANSFER SWITCH ATS
15	20/1	0	SPACE	b	16			
17	20/1	0	SPACE	c	18			
19	20/1	0	SPACE	a	20	20/1	0	SPACE
21	20/1	0	SPACE	b	22	20/1	0	SPACE
23	20/1	0	SPACE	c	24	20/1	0	SPACE
25	20/1	0	SPACE	a	26	20/1	0	SPACE
27	20/1	0	SPACE	b	28	20/1	0	SPACE
29	20/1	0	SPACE	c	30	20/1	0	SPACE

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	15.4	19.2 (125%)	MOTORS	236
LARGEST MOTOR	18	4.5 (25%)	RECEPTACLES	58.7
			HEATING	15.3
			TOTAL LOAD	309
			BALANCED 3-PHASE LOAD	858 A
			PHASE A	104%
			PHASE B	100%
			PHASE C	95.6%

Panel L3		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 125	MAIN BKR 125				
NOTE			LUGS STANDARD					
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.18	RM 410 RECEPTACLE	a	2	20/1	0.73	LIGHTING
3	20/1	0.18	RM 410 RECEPTACLE	b	4	20/1	0.619	LIGHTING
5	20/1	0.18	RM 410 RECEPTACLE	c	6	20/1	0.838	LIGHTING
7	20/1	0.72	RM 410 RECEPTACLE	a	8	20/1	0.931	LIGHTING
9	20/1	0.72	RM 409 RECEPTACLE	b	10	20/1	0.99	LIGHTING
11	20/1	0.72	RM 406 RECEPTACLE	c	12	20/1	0.72	ROOFTOP RECEPTACLE
13	20/1	0.72	RM 405 RECEPTACLE	a	14	20/1	0.37	WATER COOLER RECEPTACLE
15	20/1	0.72	RM 404 RECEPTACLE	b	16	20/1	0.54	RM 1 RECEPTACLE
17	20/1	1.2	COPY MACHINE	c	18	20/1	1.09	CORRIDOR 412 RECEPTACLE, CORRIDOR 416 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 411 RECEPTACLE, TRAP PRIMER
19	20/1	0.36	RM 403 RECEPTACLE	a	20	20/1	0.72	RM 1A RECEPTACLE, RM 1 RECEPTACLE
21	20/1	0.36	RM 402 RECEPTACLE	b	22	20/1	0.55	RM 436A RECEPTACLE, RM 436 RECEPTACLE, TRAP PRIMER
23	20/1	0.36	RM 402 RECEPTACLE	c	24	20/1	0.36	RM 436 RECEPTACLE
25	20/1	0.54	RM 402 RECEPTACLE	a				

MECHANICAL EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
CP-1	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-40	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
CP-2	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-26	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
CP-3	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-14	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-1	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-28	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-38	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-42	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-4	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-40	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-5	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-34	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-6	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-36	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-7	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-50	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-8	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-52	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EFH-1	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-42,44	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-2	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-48,50	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-3	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-44,46	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-4	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-46,48	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EWH-1	ELECTRIC WATER HEATER	208V 2P 2W		4.5			L1-30,32	3/4"C,2#10,1#10G	NON-FUSED	EC	EC
RTU-1	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-1,3,5	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-2	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-7,9,11	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-3	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-13,15,17	3/4"C,3#8,1#10G	NON-FUSED	MFR	EC
RTU-4	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-19,21,23	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-5	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-25,27,29	3/4"C,3#6,1#10G	NON-FUSED	MFR	EC
RTU-6	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-31,33,35	3/4"C,3#8,1#10G	NON-FUSED	MFR	EC
RTU-7	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-37,39,41	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-8	ROOF TOP UNIT	208V 3P 3W		13.83	48	50	L2-43,45,47	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-9	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-2,4,6	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-10	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-8,10,12	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-11	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-14,16,18	3/4"C,3#6,1#10G	NON-FUSED	MFR	EC
RTU-12	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-20,22,24	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-13	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-26,28,30	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-14	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-32,34,36	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-15	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-38,40,42	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-16	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-44,46,48	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
SF-1	EXHAUST FAN	120V 1P 2W	1/2 HP	1.18	2	15	EM1-2	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
SF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-4	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
SF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-6	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
WH-1	WATER HEATER	120V 1P 2W	F HP	0.1			L1-20	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-2	WATER HEATER	120V 1P 2W	F HP	0.1			L1-22	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-3	WATER HEATER	120V 1P 2W	F HP	0.1			L1-16	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-4	WATER HEATER	120V 1P 2W	F HP	0.1			L1-18	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-5	WATER HEATER	120V 1P 2W	F HP	0.1			L1-24	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC

KITCHEN EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
AC	AIR CURTAIN	120V 1P 2W	1 HP	1.92					TOGGLE SWITCH	EC	EC
CLR	COOLER	120V 1P 2W		0.3			LK-15	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
CO-1	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-30	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
CO-2	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-26	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
CS-1	CONVECTION STEAMER	208V 2P 2W		6			LK-8,10	3/4"C,2#8,1#10G	NON-FUSED	EC	EC
CS-2	CONVECTION STEAMER	208V 2P 2W		8			LK-2,4	3/4"C,2#6,1#10G	NON-FUSED	EC	EC
DOAS-1	ROOF TOP UNIT	208V 3P 3W		16.43	57.1	60	LK-71,73,75	1"C,3#4,1#10G	NON-FUSED	MFR	EC
DTK	DRAIN WATER TEMPERING KIT	120V 1P 2W		0.6			LK-57	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
DW	DISHWASHER	208V 3P 3W		18			LK-51,53,55	1"C,3#4,1#8G	NON-FUSED	EC	EC
EK	ELECTRIC KETTLE	208V 3P 3W		10.8			LK-14,16,18	3/4"C,3#8,1#10G	NON-FUSED	EC	EC
EVAP	EVAPORATOR	208V 2P 2W		0.21			LK-17,19	3/4"C,2#12,1#12G	JUNCTION BOX	EC	EC
EVAP	EVAPORATOR	208V 2P 2W		0.21			LK-21,23	3/4"C,2#12,1#12G	JUNCTION BOX	EC	EC
FRZ	FREEZER	120V 1P 2W		0.3			LK-15	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
FSS	FIRE SUPPRESSION SYSTEM	120V 1P 2W		0.12			LK-38	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
HC	HOT CABINET	120V 1P 2W		1.92			LK-34	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
HPW	HOT FOOD WELL	208V 2P 2W		2.81			LK-39,41	3/4"C,2#12,1#12G	NON-FUSED	EC	EC
HT	HEAT TAPE	120V 1P 2W		1.92			LK-25	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
IM	ICE MAKER	120V 1P 2W		1.62			LK-47	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
KEF-1	KITCHEN EXHAUST FAN	208V 3P 3W		2.63			LK-65,67,69	3/4"C,3#10,1#10G	NON-FUSED	EC	EC
MC	MILK COOLER	120V 1P 2W		0.33			LK-35	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
MW	MICROWAVE	120V 1P 2W		1.5			LK-29	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
POS	POINT OF SALE SYSTEM	120V 1P 2W		0.12			LK-43	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
RFW	REFRIGERATED FOOD WELL	120V 1P 2W		0.84			LK-37	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
RS-1	REFRIGERATION SYSTEM	208V 3P 3W		9.73	29	40	LK-59,61,63	3/4"C,3#10,1#10G	NON-FUSED	EC	EC
SM	STAND MIXER	120V 1P 2W	1/2 HP	1.18			LK-31	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
VCP	VENTILATOR CONTROL PANEL	120V 1P 2W		0.12			LK-45	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
VEN	VENTILATOR	120V 1P 2W		1.8			LK-42	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC

Panel		ROOM	RECESSED	VOLTS	208Y/120V 3P 4W	AIC	65,000
LK		MOUNTING	FED FROM	BUS AMPS	400	MAIN BKR	400
		NOTE	[DOUBLE TUB]	NEUTRAL	100%	LUGS	STANDARD
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	20/1	0.752	LIGHTING	2	50/2	8	CS-2
3	20/1	0.36	RECEPTACLE	4		0	
5	20/1	0.36	RECEPTACLE	6	-/1	0	SHUNT TRIP
7	20/1	0.36	RECEPTACLE	8	40/2	6	CS-1
9	20/1	0.36	RECEPTACLE	10		0	
11	20/1	0.36	RECEPTACLE	12	-/1	0	SHUNT TRIP
13	20/1	0.54	RECEPTACLE	14	40/3	10.8	EK
15	20/1	0.6	CLR, FRZ	16		0	
17	20/2	0.208	EVAP	18		0	
19				20	-/1	0	SHUNT TRIP
21	20/2	0.208	EVAP	22	20/1	0.18	RECEPTACLE
23				24	-/1	0	SHUNT TRIP
25	20/1	1.92	HT	26	20/1	1.18	CO-2
27	20/1	0.01	TRAP PRIMER	28	-/1	0	SHUNT TRIP
29	20/1	1.5	MW	30	20/1	1.18	CO-1
31	20/1	1.18	SM	32	-/1	0	SHUNT TRIP
33	20/1	0.01	TRAP PRIMER	34	20/1	1.92	HC
35	20/1	0.325	MC	36	-/1	0	SHUNT TRIP
37	20/1	0.84	RFW	38	20/1	0.12	FSS
39	20/2	2.81	HPW	40	-/1	0	SHUNT TRIP
41				42	20/1	1.8	VEN
43	20/1	0.12	POS	44	-/1	0	SHUNT TRIP
45	20/1	0.12	VCP	46	20/1	0.18	GAS VALVE
47	20/1	1.62	IM	48	-/1	0	SHUNT TRIP
49	20/1	0.01	TRAP PRIMER	50	20/1	0	SPACE
51	70/3	18	DW	52	20/1	0	SPACE
53				54	20/1	0	SPACE
55				56	20/1	0	SPACE
57	20/1	0.6	DTK	58	20/1	0	SPACE
59	40/3	9.73	RS-1	60	20/1	0	SPACE
61				62	20/1	0	SPACE
63				64	20/1	0	SPACE
65	20/3	2.63	KEF-1	66	20/1	0	SPACE
67				68	20/1	0	SPACE
69				70	20/1	0	SPACE
71	60/3	16.4	DOAS-1	72	20/1	0	SPACE
73				74	20/1	0	SPACE
75				76	20/1	0	SPACE
77	20/1	0	SPACE	78	20/1	0	SPACE
79	20/1	0	SPACE	80	20/1	0	SPACE
81	20/1	0	SPACE	82	20/1	0	SPACE
83	20/1	0	SPACE	84	20/1	0	SPACE

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	0.752	0.94	(125%)	MOTORS	87
LARGEST MOTOR	18	4.5	(25%)	RECEPTACLES	2.73
				HEATING	2.81
				TOTAL LOAD	98
				BALANCED 3-PHASE LOAD	272 A
				PHASE A	107%
				PHASE B	103%
				PHASE C	89.5%

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KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL



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CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
E602

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Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
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TEXT	DESCRIPTION
WP	DEVICE SHALL BE WEATHER PROOF AND RATED FOR EXTERIOR CONDITIONS
•	FIELD COORDINATE ELEVATION.
AFF	ABOVE FINISHED FLOOR
UC	DEVICE IS TO BE MOUNTED ON THE UNDERSIDE OF THE ELEVATED CANOPY.
WM	DEVICE IS TO BE WALL MOUNTED.
WG	WIRE GUARD TO BE PROVIDED AND INSTALLED TO PROTECT ASSOCIATED DEVICE.

TEXT	DESCRIPTION
E	EXISTING TO REMAIN.
D	DEVICE IS EXISTING AND IS TO BE REMOVED. CONTRACTOR TO REMOVE THE DEVICE AND RETURN TO OWNER.
R	REMOVE EXISTING DEVICE AND RELOCATE TO A LOCATION INDICATED ON THE DRAWINGS.

NOTES TO CONTRACTOR	
1.	EVERY SYMBOL SHOWN ON LEGEND MAY NOT APPEAR ON DRAWINGS.
2.	SYSTEM INSTALLERS SHALL COORDINATE LOCATIONS AND CONNECTIONS WITH THE PROJECTS ELECTRICAL CONTRACTOR.
3.	CONTRACTOR TO PROVIDE PROPERLY GROUNDED LIGHTING PROTECTION ON ALL CABLING ENTERING AND EXITING THE BUILDING.

SCOPE ITEM	RESPONSIBILITY			NOTES
	OFI	CFI	OFI	
COMMUNICATIONS - DIVISION 27				
CATEGORY 6 STRUCTURED CABELLING SYSTEM		X		
BUILDING INTERCOMPA, BELL, AND CLOCK SYSTEM		X		
NETWORK EQUIPMENT				
-- MDF/IDF NETWORK EQUIPMENT		X		
-- VOIP TELEPHONES		X		
-- WIRELESS ACCESS POINTS		X		
-- UNINTERRUPTABLE POWER SUPPLIES (UPS)		X		
RACEWAY, CONDUIT, BACK BOXES, SLEEVES, ETC.		X		SEE NOTE 1.
ELECTRICAL POWER		X		SEE NOTE 1.
LIFE SAFETY AND SECURITY - DIVISION 28				
ACCESS CONTROL SYSTEM(ACS)		X		
INTRUSION DETECTION SYSTEM		X		
VIDEO SURVEILLANCE SYSTEM (VSS)				
-- VSS SERVERS		X		
-- VSS CAMERAS		X		
-- VSS PROGRAMMING		X		
-- VSS CABLING		X		SEE NOTE 2.
FIRE ALARM SMOKE DETECTION WITH VOICE EVACUATION		X		SEE NOTE 1.
RACEWAY, CONDUIT, BACK BOXES, SLEEVES, ETC.		X		SEE NOTE 1.
ELECTRICAL POWER		X		SEE NOTE 1.
OFI - OWNER FURNISHED AND OWNER INSTALLED CFI - CONTRACTOR FURNISHED AND CONTRACTOR INSTALLED OFI - OWNER FURNISHED AND CONTRACTOR INSTALLED				
RESPONSIBILITY MATRIX NOTES:				
1. BY DIVISION 26. 2. BY DIVISION 27.				

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
ACP	ACCESS CONTROL SYSTEM, CONTROL PANEL.	+60" AFF TO CENTER	AS REQUIRED	COORDINATE POWER, NOTE #4.
CR	ACCESS CONTROL PROXIMITY CARD READER. DEFAULT SYMBOL INDICATES WALL MOUNTED "M" - INDICATES MULLION MOUNTED READER	+42" A.F.F.	1-G, 3/4" C	
CR	DOOR MOUNTED ACCESS CONTROL PROXIMITY CARD READER THAT IS INTEGRATED INTO THE DOOR HARDWARE.	+42" AFF	N/A	
ES	2-WAY AUDIO/VIDEO INTERCOM DOOR STATION. *DEFAULT INDICATES WALL MOUNTED "M" - INDICATES MULLION MOUNTED DEVICE	+42" AFF	"W: 1-G, 3/4" C "M: 3/4" C	COORDINATE POWER, NOTE #4 & #5.
ES	DOOR MOUNTED, 2-WAY AUDIO/VIDEO INTERCOM DOOR STATION.	+42" AFF, FIELD COORDINATE		COORDINATE POWER, NOTE #4 & #5
IS	2-WAY AUDIO/VIDEO INTERCOM MASTER STATION.	DESK MOUNTED UNO		COORDINATE POWER, NOTE #4
DR	DOOR RELEASE BUTTON	COORDINATE WITH GC	1-G, 3/4" C	
DH	PIR MOTION REQUEST TO EXIT DEVICE, DOOR CONTACT AND ELECTRIC STRIKE.			ACCESS CONTROL ONLY DOOR SHALL BE SPST. DOOR WITH BOTH ACCESS CONTROL AND INTRUSION SHALL BE DPDT. ONLY 1 DOOR CONTACT PER DOOR IF DH AND DC SYMBOL ARE SHOWN

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK
5. AVIGLON PART # 3.0C-H4V-RD1-R.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
W	WALL/CORNER MOUNT 4-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5 AND 6
W	CEILING MOUNTED 4-SENSOR CAMERA	CEILING		NOTE #5
W	3-SENSOR CAMERA	CEILING UNO		NOTE #5 AND 6
W	2-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5
W	1-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
+	SYMBOL ADDED TO CAMERA TO INDICATE WALL MOUNT.	+9" AFF UNO		NOTE #6
VRS	VIDEO RECORDING SERVER			
HMU	VIDEO SURVEILLANCE MAIN UNIT	ABOVE CEILING		NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK
6. EXTERIOR WALL MOUNT SPEAKERS SHALL BE MOUNTED +10" AFF.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
IDP	INTRUSION DETECTION SYSTEM CONTROL PANEL.	+60" AFF	TWO(2) - 1" C TO CONTRACTOR PROVIDED BACK BOX	COORDINATE POWER WITH EC, NOTE #5
KP	INTRUSION DETECTION SYSTEM KEYPAD.	+60" AFF TO TOP	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
W	WALL MOUNTED MOTION DETECTOR *# = LR IF LONG RANGE	REFERENCE FLOOR PLAN	N/A	
W	CEILING MOUNTED GLASS BREAK DETECTOR	CEILING	N/A	
DC	DOOR CONTACT	FLUSH MOUNTED IN DOOR FRAME	N/A	INTRUSION ONLY DOOR SHALL BE DPDT. DOOR WITH BOTH ACCESS CONTROL AND INTRUSION SHALL BE (1) DPDT FOR INTRUSION AND (1) SPST FOR ACCESS CONTROL. SPACE CONTACTS AT LEAST 2" APART.
DDC	OVERHEAD DOOR MOUNT MAGNETIC DOOR CONTACT.	SURFACE MOUNTED ON DOOR FRAME	N/A	
HU	DMP WIRELESS HOLDUP BUTTON	UNDER DESK UNO	N/A	
SS	SECURITY SIREN	+9" AFF	SINGLE GANG BACKBOX	

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. REFERENCE DIVISION 28 SPECIFICATION FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

FIRE ALARM	
*PROJECT SCOPE INCLUDES REPLACING EXISTING FIRE ALARM SYSTEM IN ITS ENTIRETY WITH NEW VOICE EVACUATION FIRE ALARM SYSTEM. FIRE ALARM SYSTEM SHALL BE FULLY OPERATIONAL THROUGHOUT ALL PHASES OF CONSTRUCTION. DEMOUSH EXISTING SYSTEM ONCE NEW SYSTEM IS INSTALLED, TESTED, AND ACCEPTED BY THE AHJ.	
LEGEND	
SYMBOL	DESCRIPTION
ACP	FIRE ALARM CONTROL. PROVIDE AND INSTALL 1 CATEGORY CABLE TO CONNECT PANEL TO NETWORK.
FAP	FIRE ALARM ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE
NOTES:	
1. REFERENCE SHEET SPECIFICATIONS	
2. A LICENSED FIRE ALARM PLANNING SUPERINTENDENT CERTIFIED TO A MINIMUM LEVEL 3, IN THE SUBFIELD OF FIRE ALARM SYSTEMS THROUGH THE NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET), SHALL PROVIDE PLANS AND CALCULATIONS FOR A MANUAL AND AUTOMATIC FIRE DETECTION AND ALARM SYSTEM TO COMPLY WITH THE BUILDING SPACE LAYOUT, BUILDING OCCUPANCY, CURRENT NFPA 72, LOCAL AND STATE CODE REQUIREMENTS, AND THE FIRE ALARM AND DETECTION SYSTEM SPECIFICATIONS.	

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
W	WALL MOUNTED NETWORK OUTLET D#: NUMBER OF DATA DROPS IN OUTLET AP. WIRELESS ACCESS POINT	+18" AFF, UNLESS OTHERWISE NOTED	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
W	COMMUNICATIONS OUTLET	FIELD COORDINATE	FIELD COORDINATE	
W	WALL MOUNTED NETWORK OUTLET	+44" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
B	WALL MOUNTED BOX FOR FUTURE USE.	+18" AFF UNO	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
D#	FLOOR MOUNTED NETWORK OUTLET	N/A	COORDINATE WITH ELECTRICAL CONTRACTOR	FINISHED HARDWARE PROVIDED BY DIV 27
D#	CEILING MOUNTED NETWORK OUTLET D#: NETWORK OUTLET	ABOVE CEILING	CEILING BRACKET WITH BISCUIT BLOCK	
D#	CEILING MOUNTED NETWORK OUTLET FOR ACCESS POINT D#: NETWORK DROP QUANTITY	ABOVE CEILING	CEILING BRACKET WITH BISCUIT BLOCK	

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. CONDUIT STUB UP AND SLEEVES SHALL HAVE A SOLID UNCOATED PLASTIC PROTECTIVE BUSHING.
5. NO CONDUITS SHALL EXCEED FOR 40% MAXIMUM FILL RATIO. CONTRACTOR TO PROVIDE ADDITIONAL CONDUITS REQUIRED.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
WMP	WALL MOUNTED PROJECTOR AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLANS.	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
CMP	CEILING MOUNTED PROJECTOR AUDIOVISUAL OUTPUT OUTLET	CEILING MOUNTED	N/A	NOTE #5
AV-1	WALL MOUNTED AUDIO/VIDEO INPUT OUTLET	+18" AFF UNO	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	
FSD-1	WALL MOUNTED FLAT SCREEN DISPLAY AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLAN	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5
FSD-2	WALL MOUNTED FLAT SCREEN DISPLAY AUDIOVISUAL OUTPUT OUTLET ASSOCIATED WITH AV-1 INPUT OUTLET	REFERENCE FLOOR PLAN	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
IVD	INTERACTIVE VIDEO DISPLAY AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLAN	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
CP	AV CONTROL PANEL	+48" AFF TO TOP	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
ES	LOCAL INSTRUCTIONAL SPACE PRESENTATION SPEAKER	CEILING	CONTRACTOR PROVIDED CEILING BOX	COORDINATE POWER WITH EC
SC	STREAMING CAMERA	CEILING UNO	N/A	NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
ICS	INTERCOM COMMUNICATIONS SYSTEM HEAD END UNIT.	FLOOR MOUNTED	COORDINATE WITH EC	COORDINATE POWER WITH EC
S	CEILING MOUNT INTERCOM SPEAKER, LAY-IN CEILING	CEILING	CONTRACTOR PROVIDED	
S	CEILING MOUNT INTERCOM SPEAKER, HARD CEILING.	CEILING	CONTRACTOR PROVIDED	
S	WALL MOUNT INTERIOR INTERCOM SPEAKER	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
S	WALL MOUNT EXTERIOR INTERCOM SPEAKER	+10" AFF UNO	CONTRACTOR PROVIDED	
S	PENDANT MOUNT INTERCOM SPEAKER	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
S	SURFACE MOUNT INTERCOM SPEAKER, MOUNT TO STRUCTURE	CEILING	CONTRACTOR PROVIDED	
S	CEILING MOUNTED EXTERIOR INTERCOM SPEAKER.	CEILING	CONTRACTOR PROVIDED	
IP	IP BASED SPEAKER. # TO BE REPLACED WITH S, S2, S3, S4 INDICATING THE SPECIFIC TYPE OF SPEAKER.	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	NOTE #5
IP	SPEAKER CONNECTED TO IP MODULE AND AMPLIFIER. # TO BE REPLACED WITH S, S2, S3, S4 INDICATING THE SPECIFIC TYPE OF SPEAKER.	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
VC	WALL MOUNTED VOLUME CONTROL.	+48" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
CB	INTERCOM CALL BUTTON	+48" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
C	SINGLE FACE CLOCK	90" AFF UNO.	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
C	DOUBLE FACE CLOCK	90" AFF UNO.	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
RPS	REMOTE PROGRAM SOURCE	DESK TOP	COORDINATE WITH EC	NOTE #5
ACS	ADMINISTRATIVE CALL STATION.	DESK TOP	N/A	NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

NY	drawn by
NY	checked by
OCTOBER 2024	date
11/22/2024 AD 02	revisions



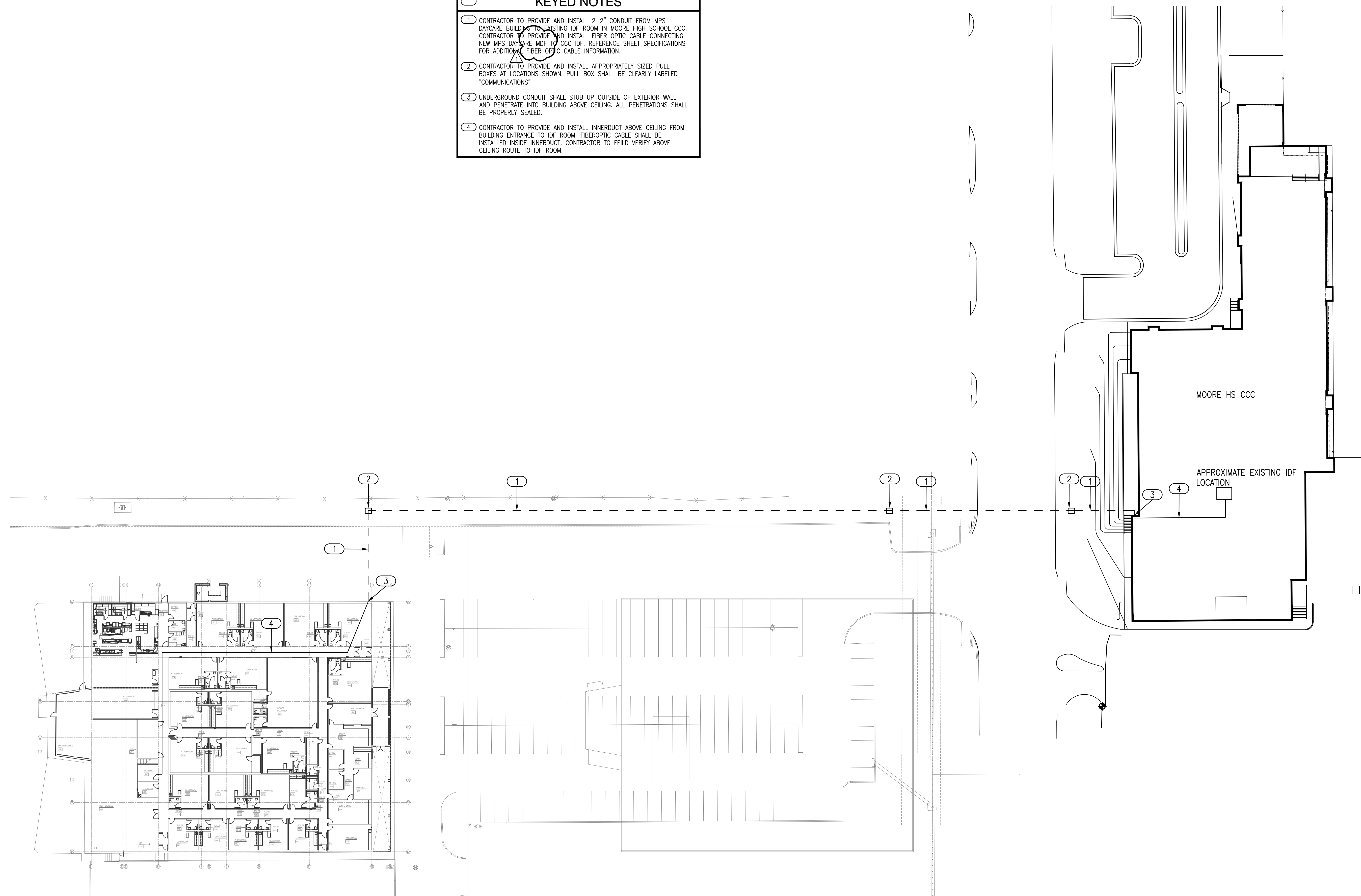
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KEYED NOTES	
1	CONTRACTOR TO PROVIDE AND INSTALL 2-2" CONDUIT FROM MPS DAYCARE BUILDING TO EXISTING IDF ROOM IN MOORE HIGH SCHOOL CCC. CONTRACTOR TO PROVIDE AND INSTALL FIBER OPTIC CABLE CONNECTING NEW MPS DAYCARE MDF TO CCC IDF. REFERENCE SHEET SPECIFICATIONS FOR ADDITIONAL FIBER OPTIC CABLE INFORMATION.
2	CONTRACTOR TO PROVIDE AND INSTALL APPROPRIATELY SIZED PULL BOXES AT LOCATIONS SHOWN. PULL BOX SHALL BE CLEARLY LABELED "COMMUNICATIONS"
3	UNDERGROUND CONDUIT SHALL STUB UP OUTSIDE OF EXTERIOR WALL AND PENETRATE INTO BUILDING ABOVE CEILING. ALL PENETRATIONS SHALL BE PROPERLY SEALED.
4	CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING FROM BUILDING ENTRANCE TO IDF ROOM. FIBEROPTIC CABLE SHALL BE INSTALLED INSIDE INNERDUCT. CONTRACTOR TO FIELD VERIFY ABOVE CEILING ROUTE TO IDF ROOM.



1 TECHNOLOGY SITE PLAN
SCALE: 1/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

SAFEROOM NOTE

PER ICC 500-2014, 309.1:

PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:

- 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
- 2 1/16" IN DIAMETER

SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

GENERAL NOTES

- FIRE ALARM: CONNECT NEW FIRE ALARM DEVICES TO NEW SILENT KNIGHT 6820XL SUPPLY 6820XL PANEL AND ALL NAC PANELS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE AN CODE COMPLIANT SYSTEM. SYSTEM SHALL USE SK PROTOCOL DEVICES ONLY. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- SECURITY ALARM: CONNECT ALL NEW SECURITY ALARM DEVICES TO NEW DMP SECURITY ALARM PANEL. SUPPLY DMP PANEL AND ALL ZONE EXPANDERS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. SYSTEM SHALL BE WIRED WITH 2 ZONES PER SINGLE DOOR OR DOUBLE DOOR. ONE ZONE FOR SECURITY ALARM AND ONE ZONE FOR DOOR HOLD OPEN ALERTS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- INTERCOM: INTERCOM DEVICES SHALL BE RAULAND. CONNECT ALL NEW INTERCOM DEVICES TO EXISTING RAULAND TELECENTER U.I.P. SUPPLY ALL MASTER CONSOLES, AMPLIFIERS, POWER SUPPLIES, MODULES, CALL BUTTONS, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. ROOM SPEAKERS AND RESTROOM SPEAKERS SHALL BE TIED TOGETHER ON ONE TALK ZONE PER ROOM CALL BUTTON. EACH ROOM WITH A CALL BUTTON SHALL HAVE A STATUS LIGHT INSTALLED ABOVE ROOM DOOR ON HALLWAY SIDES. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- CLOCKS: CLOCKS SHALL BE RAULAND. SEE SHEET SPECIFICATIONS FOR APPROVED PART NUMBERS.
- ACCESS CONTROL: CONNECT ALL NEW ACCESS CONTROL DEVICES TO NEW KEYSCAN CONTROLLERS. SUPPLY KEYSCAN CONTROLLERS AND ALL POWER SUPPLIES, READERS, STRIKES, ETC. NEEDED TO FURNISH A COMPLETE SYSTEM. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- CAMERA: CONNECT ALL NEW CAMERAS TO NEW MDF. CAMERA SYSTEM IS AVIGILON. CONTRACTOR TO PROVIDE DELL AVIGILON SERVER IN MDF ROOM LOCATED ON 2 POST RACK. CONTACT JACK PHILLIPS WITH MOORE PUBLIC SCHOOLS @ 405-473-5225 FOR EXACT CAMERA MOUNTING LOCATIONS AND SPECIFICATIONS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- DATA: CONNECT NEW DATA, WIFI AND CAMERA NETWORK DROPS TO NEW MDF. CONNECT NEW DATA, WIFI TO EXISTING IDF LOCATED IN MOORE HIGH SCHOOL CCC VIA FIBER AND CAT 6 CABLE. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.

KEYED NOTES

- CONTRACTOR TO EXTEND ENTRANCE CONDUIT ABOVE CEILING. CONTRACTOR TO MATCH NEW CONDUIT SIZE WITH EXISTING CONDUIT SIZE.
- CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING AT THE INDICATED ROUTE TO THE NEW IT ROOM. PENETRATE AND SEAL WALLS AS NEEDED.
- INDICATES NEW DEMARC LOCATION. PLYWOOD IS RESERVED FOR SERVICE PROVIDER EQUIPMENT.
- INDICATES THE LOCATION OF A 8" TALL, 3/4" FIRE RATED PLYWOOD CONTRACTOR TO PROVIDE AND INSTALL PLYWOOD AND ALL REQUIRED MOUNTING HARDWARE. PLYWOOD SHALL BE PAINTED WHITE WITH FIRE RATED PAINT. TYPICAL FOR ALL SHOWN ON DRAWING.
- INDICATES THE LOCATION OF A NEW WALL MOUNTED TELECOMMUNICATION GROUND BUS BAR (TGBB). CABLING CONTRACTOR TO PROVIDE BUS BAR AND ALL REQUIRED MATERIAL TO MOUNT AT THE LOCATION SHOWN. TGBB TO BE MOUNTED AT +93" A.F.F.
- PROVIDE AND INSTALL A 12" WIDE, UNIVERSAL LADDER TRAY AND ALL REQUIRED MOUNTING HARDWARE. LADDER TRAY SHALL BE BLACK IN COLOR. TYPICAL FOR ALL SHOWN ON ENTIRE PROJECT.
- PROVIDE AND INSTALL ONE (1) 2-POST, FLOOR MOUNTED, 7' RELAY RACK (BLACK IN COLOR). PROVIDE BONDING WASHERS, BOLTS, AND NUTS AT ALL MECHANICALLY CONNECTED LOCATIONS OF THE RACK TO ENSURE THAT ALL PIECES OF THE RACK ARE COMPLETELY BONDED. SCRAPING PAINT FROM RACKS TO MAKE A BOND WILL NOT BE ACCEPTED. ALL RACK MOUNTED COMPONENTS SHALL BE MOUNTED WITH BONDING SCREWS AND THE CONTRACTOR SHALL PROVIDE THE OWNER WITH (50) ADDITIONAL BONDING SCREWS FOR THE INSTALLATION OF OWNER EQUIPMENT. NO DANGEROUS CHANGING GROUNDS FROM RACK TO CABLE TRAY OR TO OTHER RACKS WILL BE ACCEPTED. ALL GROUNDS SHALL BE HOME RUN TO THE TELECOMMUNICATIONS GROUND BUS BAR (TGBB). TYPICAL FOR ALL SHOWN ON THE ENTIRE PROJECT.
- PROVIDE AND INSTALL ONE (1) 7'X6", FRONT AND REAR MANAGED, VERTICAL CABLE MANAGER (BLACK IN COLOR). CABLE MANAGERS SHALL BE INSTALLED ON EACH END OF THE RACK SYSTEMS AND BETWEEN EACH RACK. CABLE MANAGERS SHALL HAVE A SINGLE, SOLID, FULL HEIGHT HINGED DOOR IN THE FRONT AND WIDE SPACED CABLE RINGS WITH SPIN-OPEN LATCHES IN THE REAR. TYPICAL FOR ALL SHOWN IN THE ENTIRE PROJECT.
- DOOR HARDWARE SPECIFIED FOR INDICATED DOORS SHOULD HAVE KEY ACCESS FROM BOTH SIDES ALLOWING EACH SIDE TO BE LOCKED AND UNLOCKED INDEPENDENTLY.
- CONTRACTOR TO PROVIDE AND INSTALL A DMP WIRELESS HOLD UP BUTTON AT EACH LOCATION INDICATED.

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STRUCTURAL

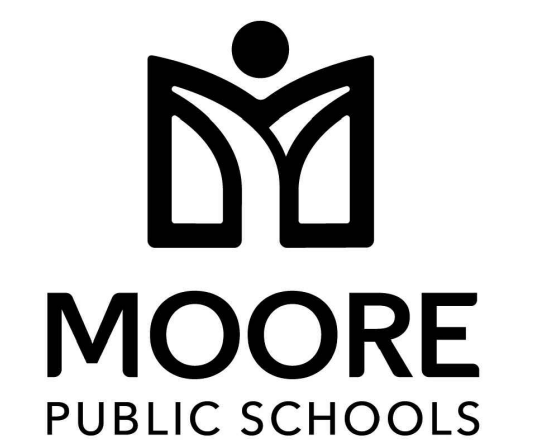
SALAS O'BRIEN
MECHANICAL / ELECTRICAL

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date

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11/22/2024 AD 02



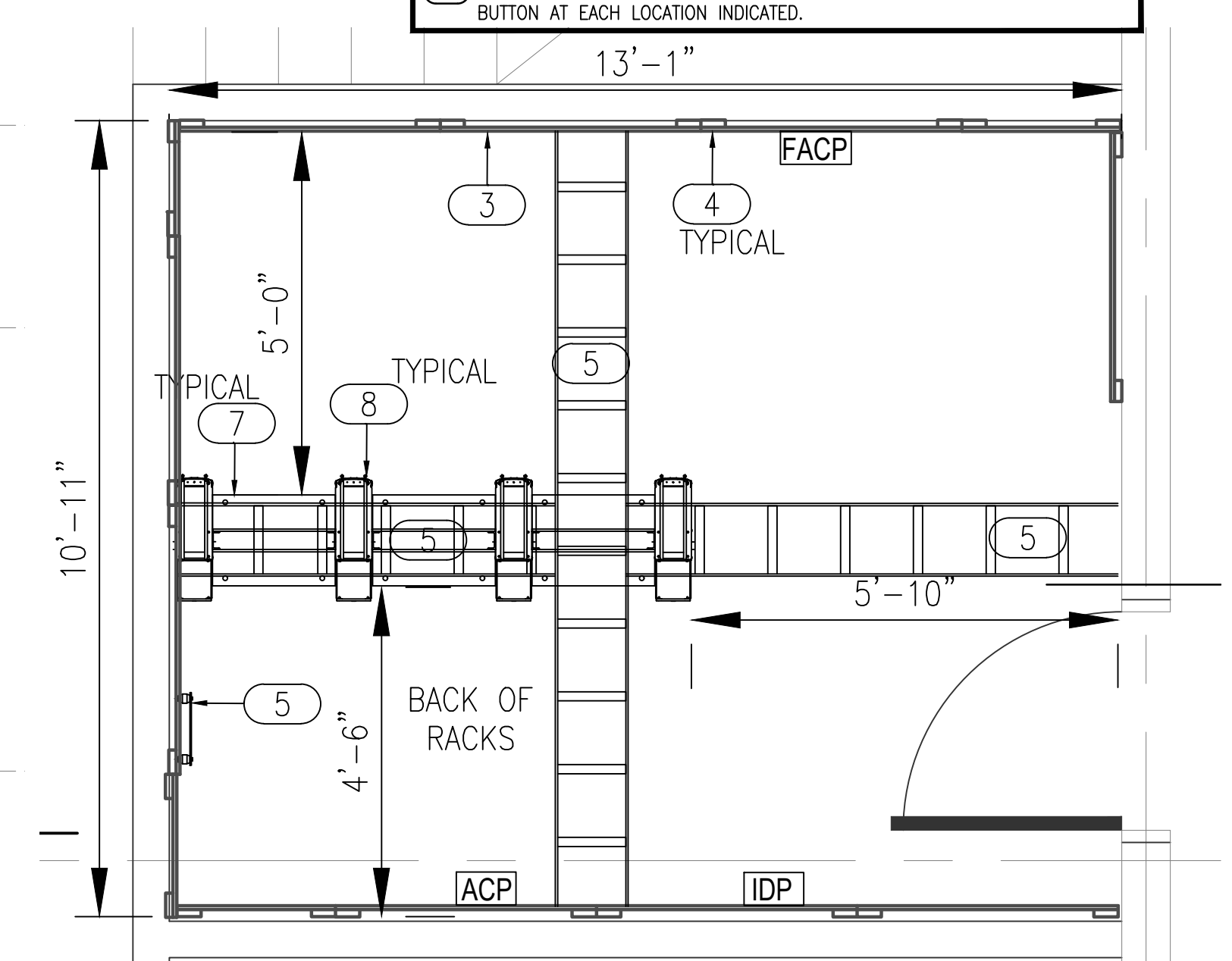
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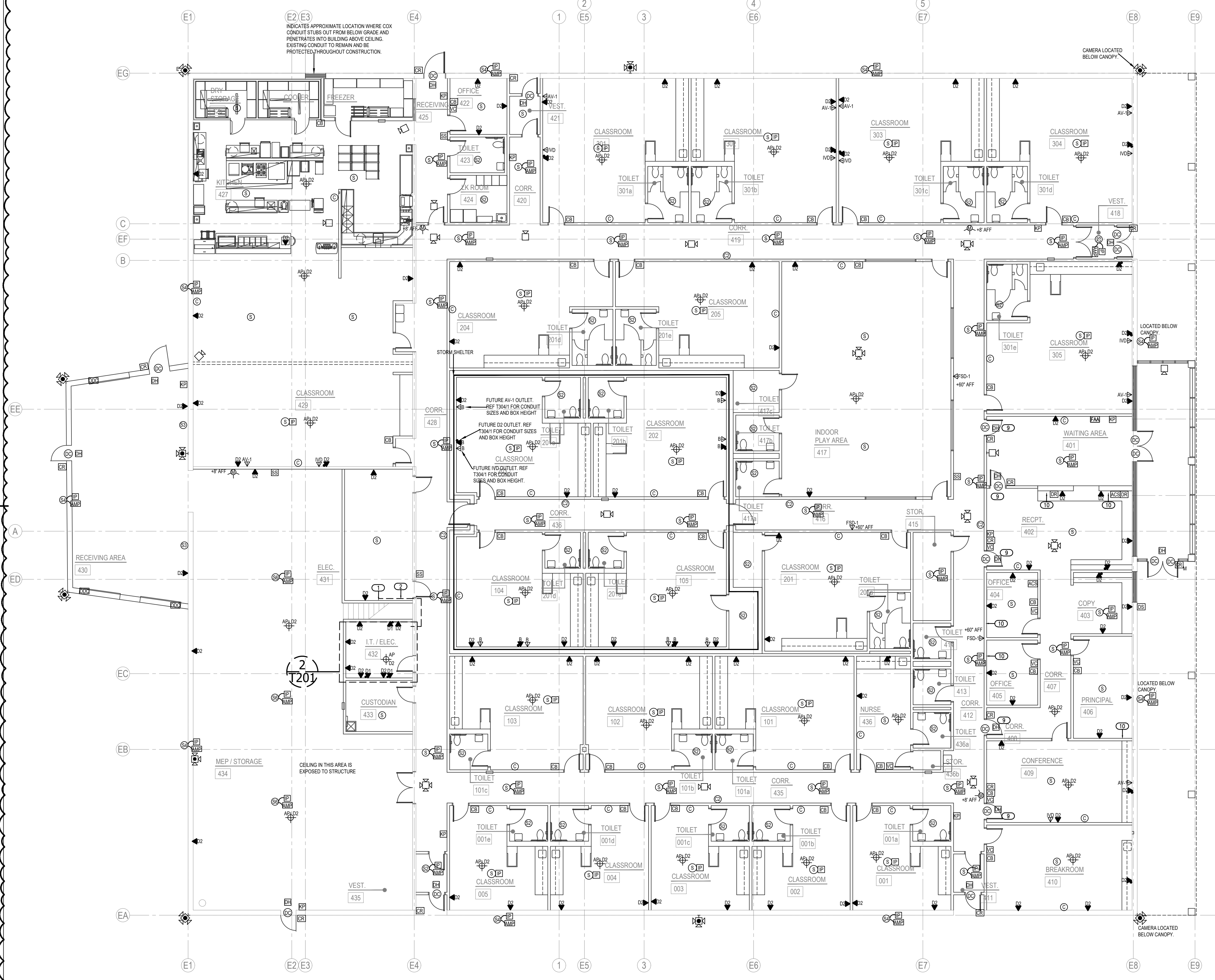
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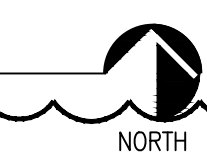
Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



2 TECHNOLOGY ENLARGED PLAN - I.T./ELEC. 432
SCALE: 1/2" = 1'-0"



1 TECHNOLOGY FLOOR PLANS
SCALE: 3/32" = 1'-0"





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MA
checked by
OCTOBER 2024
date

revisions
A ADDENDUM #1
B ADDENDUM #2



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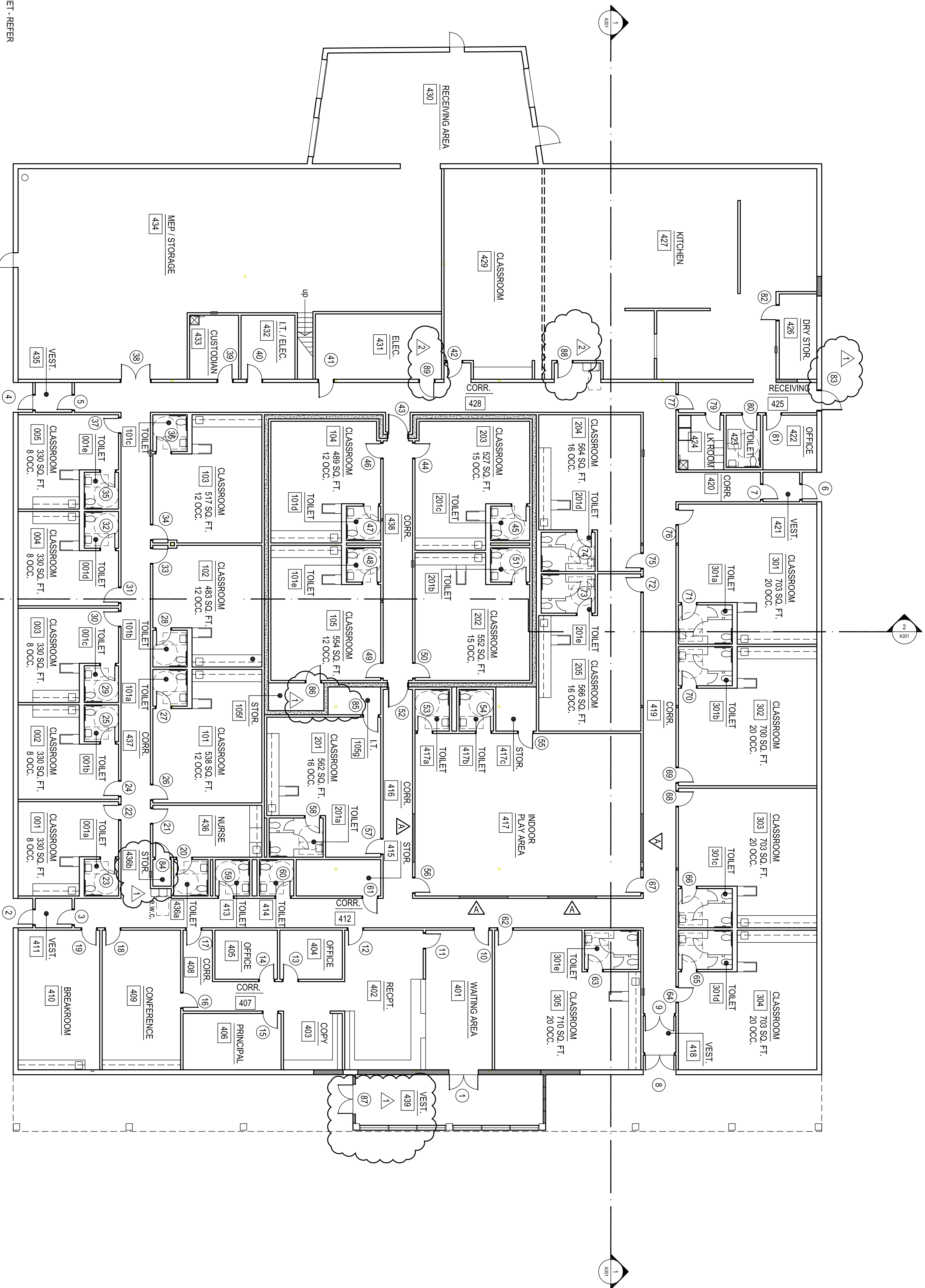
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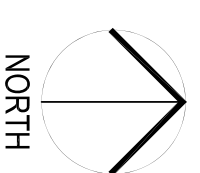
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- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. REFER SHEETS A100a FOR DIMENSION PLAN
 5. NUMBER OF CLASSROOM STUDENT OCCUPANTS ARE BASED ON DEPARTMENT OF HUMAN SERVICES' 2022 LIMITS



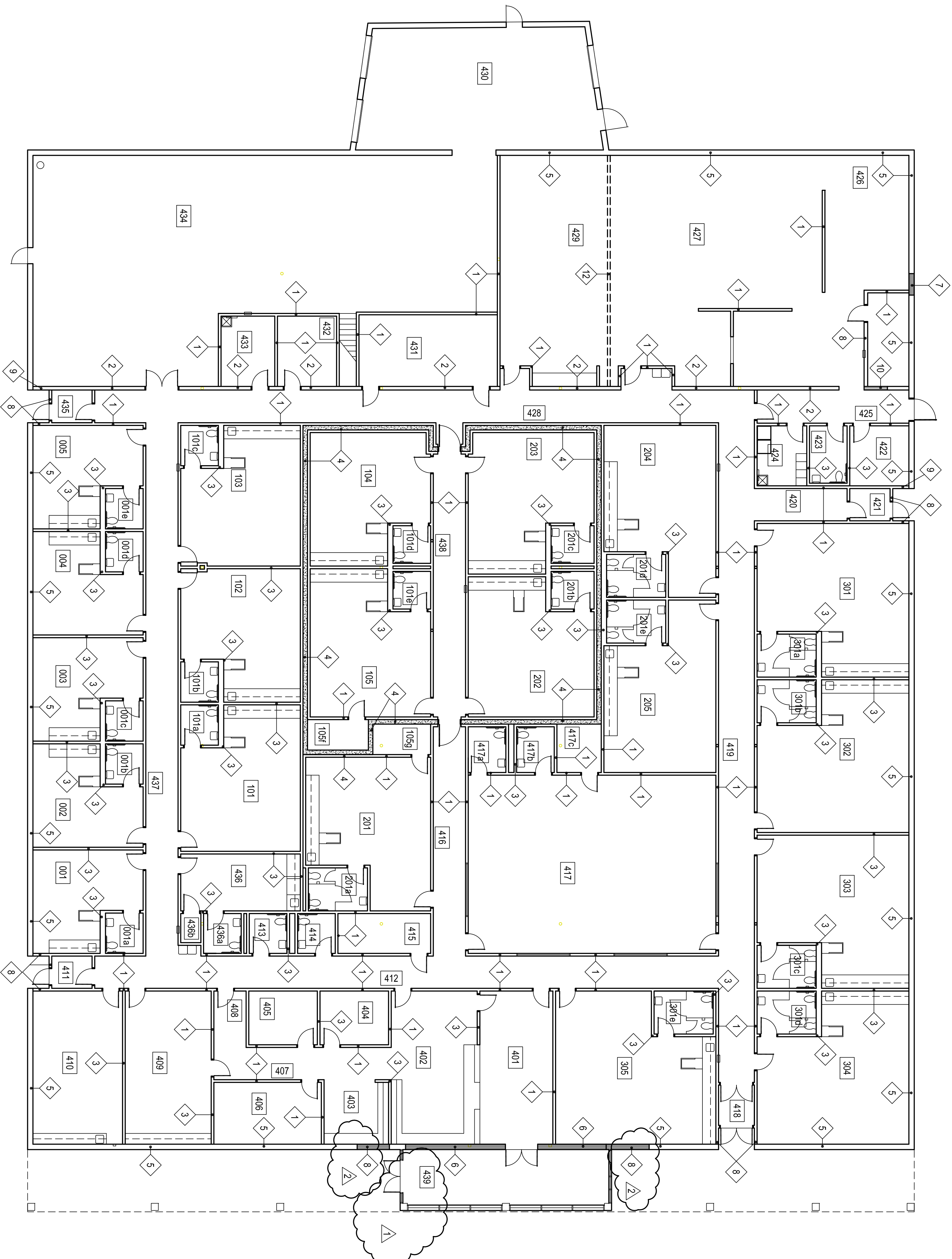
OVERALL FLOOR PLAN
3/82" = 1'-0"

WALL / PARTITION LEGEND

- 1 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 2 EXISTING LOAD BRNG, 6" CMU WALL
1 LAYER FIRE RATED GYP. BD. EA.SIDE ON 7/8" FURRING STRIPS
HEIGHT: 6" ABOVE CEILING
PROVIDE FIRE STOPPING AS REQUIRED AT TOP OF EXISTING CMU WALL
- 3 STUD WALL / CHASE WALL (12" CLEAR)
1 LAYERS GYPSUM BOARD EACH SIDE, 3.58" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
- 4 SHELTER WALL
1 LAYER GYP. BD. EA. SIDE ON 3/8" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
10" CONC. WALL TO SLAB ABOVE - 12'-6", RE. STRUCT.
- 5 EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. ON 2" FURRING STRIPS W/ 2" BATT INSULATION
HEIGHT: SLAB TO 6" ABOVE CEILING
- 6 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO MATCH
EXISTING CMU WIDTH
HEIGHT: SLAB TO DECK ABOVE
- 7 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. AND EXTERIOR SHEATHING ON METAL STUDS TO
MATCH EXISTING CMU WIDTH. MATCH EXISTING E.F.I.S. THICKNESS
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 8 STUD WALL / METAL WALL PANEL
1 LAYERS GYPSUM BOARD, 6" METAL STUDS, EXTERIOR SHEATHING W/
METAL WALL PANELS
HEIGHT: 6" STUDS AND GYP. BD.- SLAB TO DECK ABOVE. SHEATHING
AND METAL WALL PANEL TO SOFFIT ABOVE
- 9 EXISTING CMU WALL / METAL WALL PANEL
7/8" FURRING STRIPS, EXTERIOR SHEATHING W/ METAL WALL PANELS
HEIGHT: SHEATHING AND METAL WALL PANEL TO SOFFIT ABOVE
- 10 NEW STUD IN-FILL AT EXISTING 8" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO
MATCH EXISTING CMU WIDTH.
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 11 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 12 MOVABLE PARTITION
REFER SPECIFICATIONS

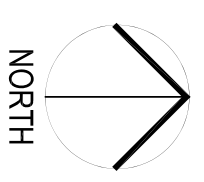
REFER ROOM FINISH SCHEDULE, COLOR SCHEDULE,
INTERIOR ELEVATIONS & SPECIFICATIONS FOR ADDITIONAL
WALL FINISH INFORMATION

CONSTRUCTION MANAGER & SUBCONTRACTORS SHALL
COORDINATE FINAL CONSTRUCTION OF ALL WALLS
PRIOR TO BEGINNING WORK



WALL TYPE PLAN

3/32" = 1'-0"



NORTH

CONSTRUCTION DATA (TABLE 603):

OCCUPANCY -	E & I-4
CONSTRUCTION TYPE -	TYPE II - B
BASIC ALLOWABLE AREA -	E - 58,000 S.F. / I-4 - 52,000 S.F. PER FLOOR
ALLOWABLE STORIES -	3 / 3
ACTUAL STORIES -	1 / 1
ACTUAL HEIGHT -	23'-4"

BUILDING SIZES:
BUILDING : 1 STORY @ 32,200 S.F.

STRUCTURAL FIRE PROTECTION (TABLE 601):	0 HOUR
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
COLUMNS	0 HOUR
BEAMS	0 HOUR
PERMANENT PARTITIONS	NONCOMBUSTIBLE
FLOOR ASSEMBLIES	0 HOUR
ROOF ASSEMBLIES	0 HOUR
EXTERIOR OPENINGS	N/A

PASSIVE FIRE SAFETY SYSTEM:
PORTABLE FIRE EXTINGUISHERS (REF: SHEETS A104)
TRAVEL DISTANCE = 250'-0" MAX.
ACTUAL MAX. TRAVEL DISTANCE = 170'-0"
DEADEND - 50'-0" MAX.
ACTUAL DEADEND - NONE

ACTIVE FIRE SAFETY SYSTEMS (EXISTING & NEW ADDITION):
FIRE SPRINKLER SYSTEM THROUGHOUT
FIRE ALARM SYSTEM
SMOKE DETECTION
AUTOMATIC AIR HANDLING EQUIP. SHUTDOWN
EXIT LIGHTS/EMERGENCY LIGHTS BATTERY

CODES/REGULATIONS USED: (CITY OF MOORE):
2018 IBC - INTERNATIONAL BUILDING CODE
AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE
2009 ENERGY CONSERVATION CODE
ASSOCIATED SUPPLEMENTS TO EACH CODE

OCCUPANT LOAD (TABLE 1004.1.1.1):

BUILDING RENOVATION: 278 CHILDREN
12 ADMIN / STAFF
40 TEACHERS
330 TOTAL OCCUPANTS

EGRESS WIDTH:

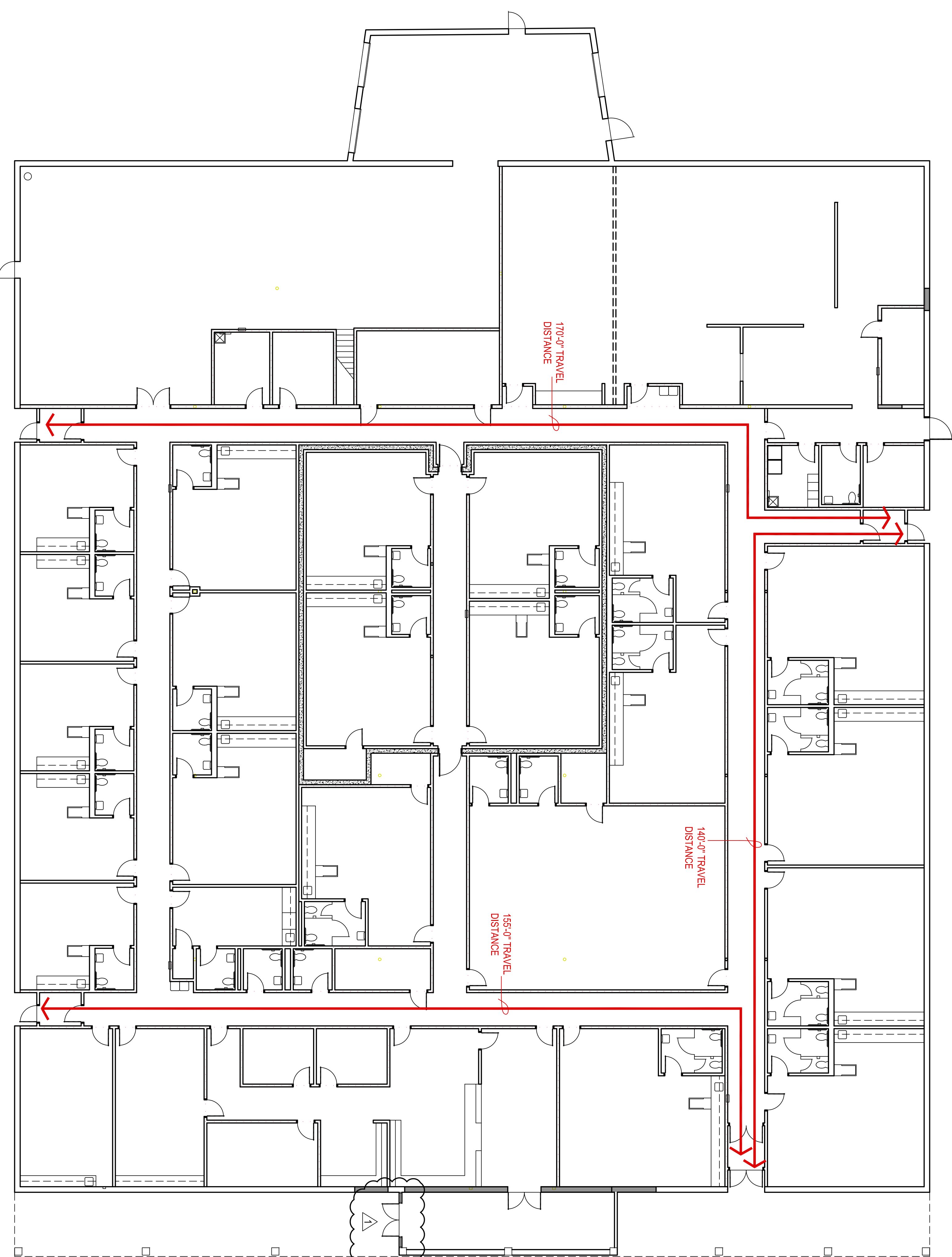
BUILDING RENOVATION: REQUIRED 66"
BUILDING RENOVATION: PROVIDED 432"

PLUMBING FIXTURES (TABLE 2902.1):

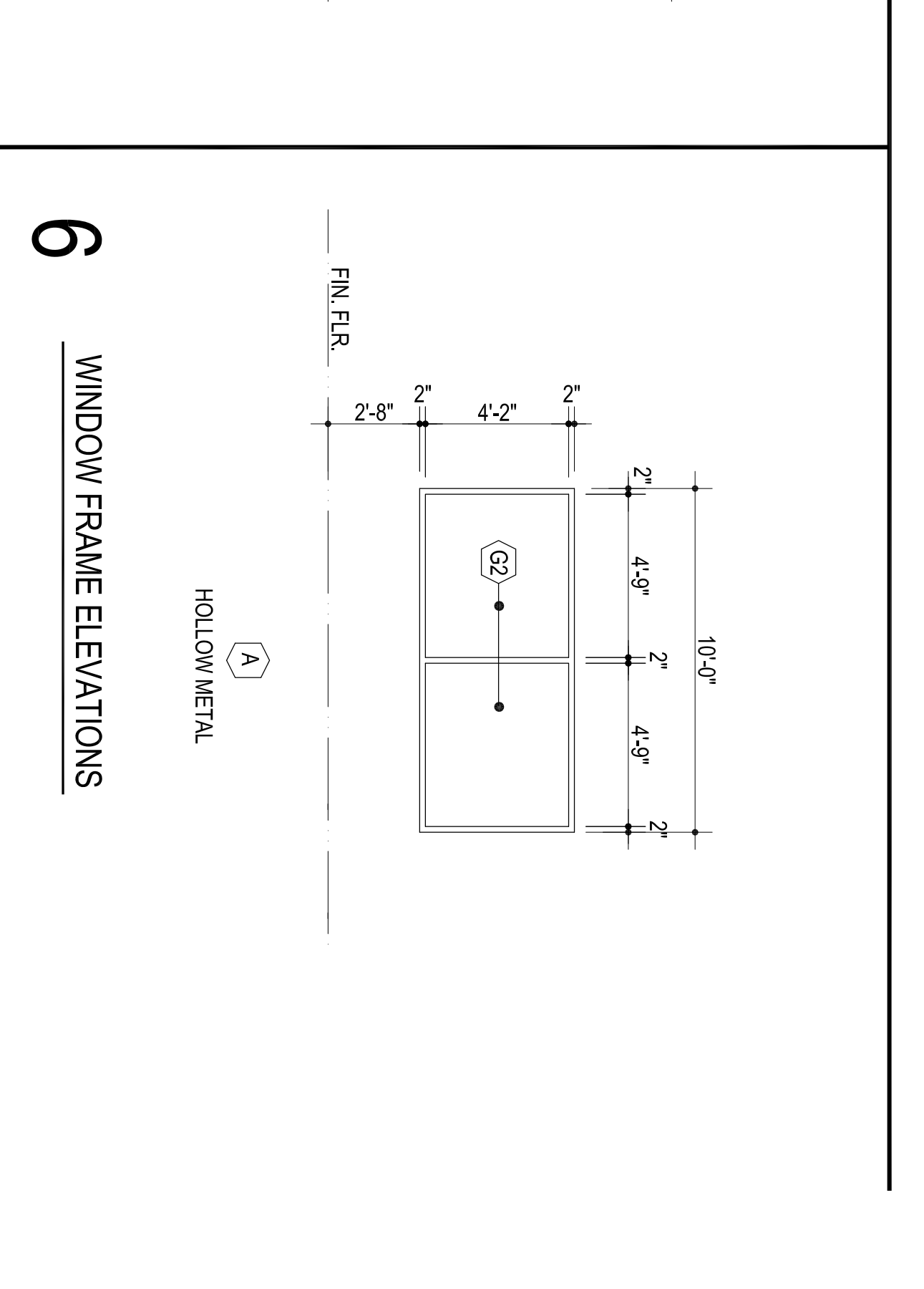
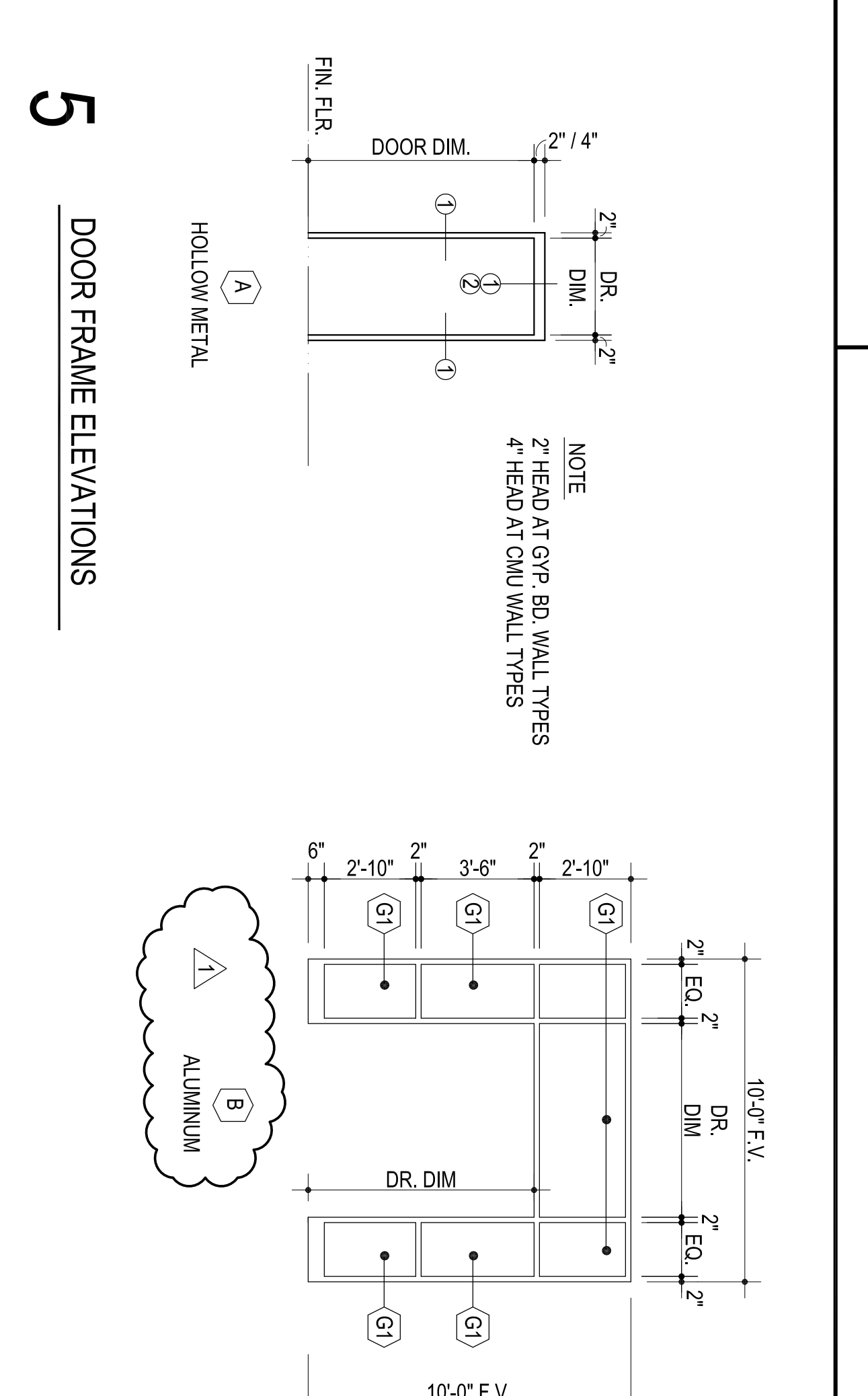
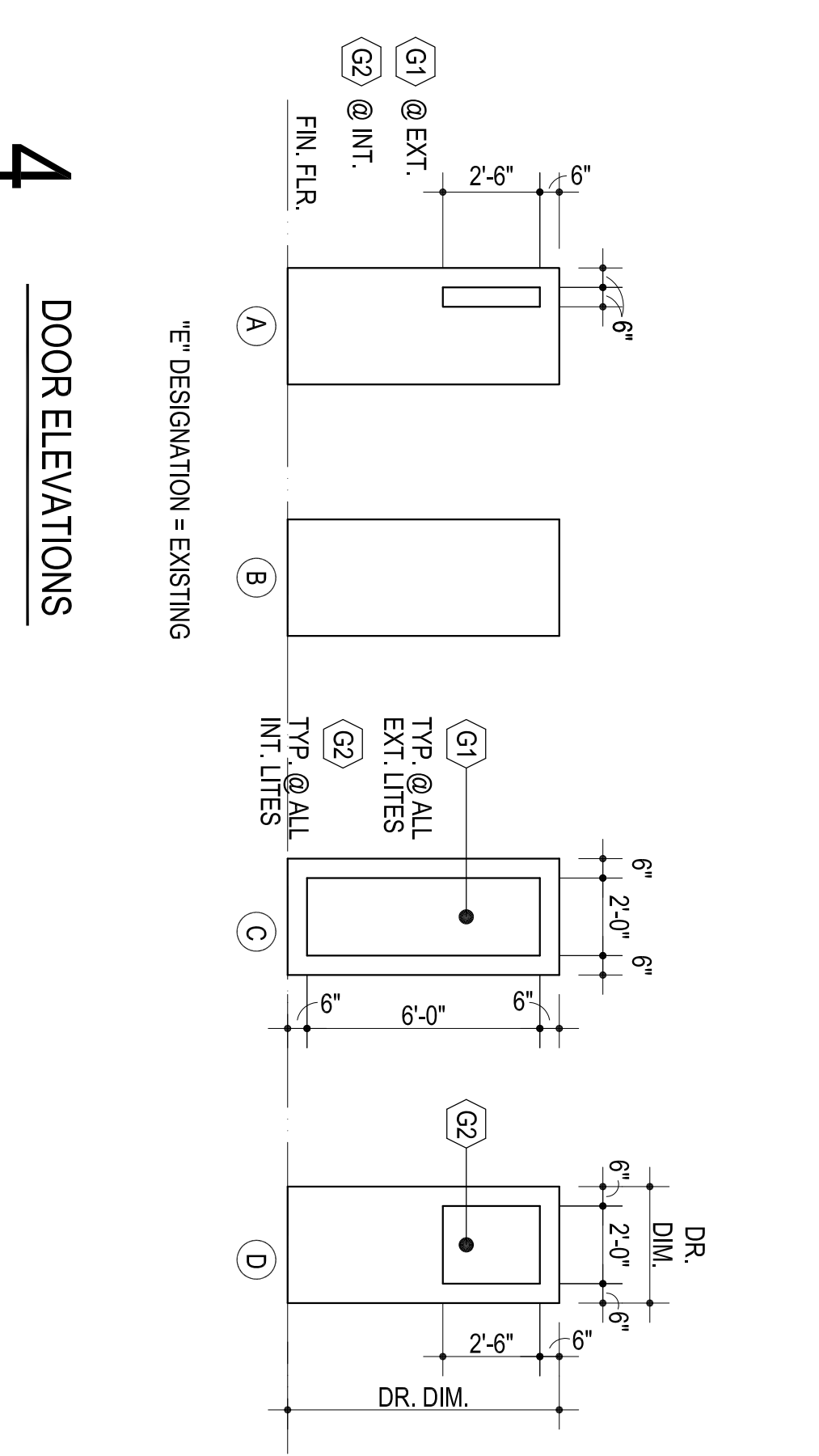
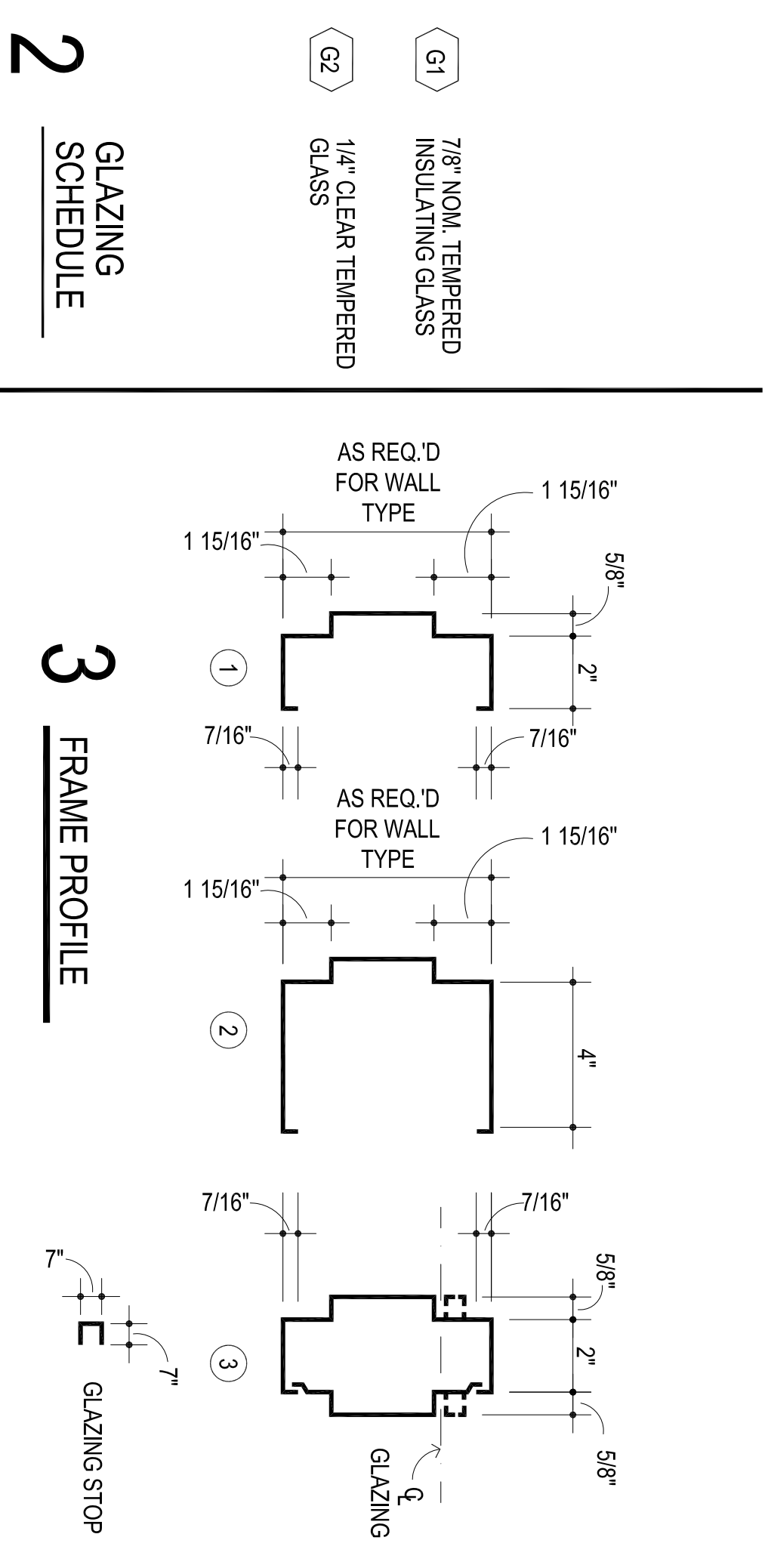
TOTAL OCCUPANT LOAD (INSTITUTIONAL) = 330

TOTAL REQUIRED:	TOTAL PROVIDED
WATER CLOSETS = 22	WATER CLOSETS = 34
LAVATORIES = 22	URINALS = 0
DRINKING FOUNTAINS = 4	LAVATORIES = 49
SERVICE SINKS = 1	DRINKING FOUNTAINS = 4
	SERVICE SINKS = 2

DEVOTES 1 HR. RATED PARTITIONS CLOSE-OUT TO
BOTTOM OF DECKING - CLOSE-OUT PARTITIONS TO
BE CMU WHERE INDICATED ON STRUCTURAL FOR
LOAD BEARING CONDITIONS. ALL OTHER INDICATED
LOCATIONS TO BE CONSTRUCTED OF 1 LAYER
OF 5/8" FIRE RATED GYP. BOARD EACH SIDE
ON 6" METAL STUDS @ 16" O.C. STAGGER ALL
JOINTS & PROVIDE FIRE TAPE SEAL ALL PENETRATIONS
W/ CONTINUOUS FIRE STOPPING INSULATION
& OR SEALANT.



DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
1	401 EXT. C	A	HM.	3'-0"	7'-0"	1 3/4"	A	16A501	16A501	29A501	29A501	20 MIN. DR & FRAME	7
2	411 EXT. A	C	<	<	<	<	<	22A501	15A501	11A501	11A501		5
3	412 411	<	<	<	<	<	<	4A501	16A501	11A501	11A501		10
4	435 EXT.							22A501	16A501	29A501	29A501		5
5	428 435							4A501	16A501	11A501	11A501		10
6	421 EXT.							22A501	15A501	29A501	29A501		5
7	420 421							4A501	16A501	11A501	11A501		10
8	418 EXT.							22A501	15A501	29A501	29A501		13
9	419 418							4A501	16A501	11A501	11A501		15
10	412 401							4A501	16A501	11A501	11A501		16
11	402 401							3A501	10A501	10A501	10A501		16
12	412 402							4A501	11A501	11A501	11A501		5
13	407 404							4A501	11A501	11A501	11A501		11
14	407 405							4A501	11A501	11A501	11A501		11
15	407 406							4A501	11A501	11A501	11A501		11
16	409 407							4A501	11A501	11A501	11A501		12
17	412 408							4A501	11A501	11A501	11A501		8
18	412 410							4A501	11A501	11A501	11A501		14
19	412 410							4A501	11A501	11A501	11A501		14
20	436 436a							3A501	10A501	10A501	10A501		2
21	435 436							4A501	11A501	11A501	11A501		14
22	435 001							4A501	11A501	11A501	11A501		9
23	001 001a							3A501	10A501	10A501	10A501		12
24	435 002							4A501	11A501	11A501	11A501		9
25	002 001b							3A501	10A501	10A501	10A501		12
26	435 101							4A501	11A501	11A501	11A501		9
27	101 101a							3A501	10A501	10A501	10A501		12
28	102 101b							3A501	10A501	10A501	10A501		12
29	003 101c							3A501	10A501	10A501	10A501		12
30	435 003							4A501	11A501	11A501	11A501		9
31	435 004							4A501	11A501	11A501	11A501		9
32	004 001d							3A501	10A501	10A501	10A501		12
33	435 102							4A501	11A501	11A501	11A501		9
34	435 103							4A501	11A501	11A501	11A501		9
35	005 001e							3A501	10A501	10A501	10A501		12
36	103 101c							3A501	10A501	10A501	10A501		12
37	435 005							4A501	11A501	11A501	11A501		9
38	428 434							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	3
39	428 433							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
40	428 432							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
41	428 431							2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
42	429 428							4A501	11A501	11A501	11A501		9
43	428 436							19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
44	436 203							4A501	11A501	11A501	11A501		9
45	203 201c							3A501	10A501	10A501	10A501		12
46	436 104							4A501	11A501	11A501	11A501		9
47	104 201d							3A501	10A501	10A501	10A501		12
48	105 201e							3A501	10A501	10A501	10A501		12
49	436 105							4A501	11A501	11A501	11A501		9
50	436 202							4A501	11A501	11A501	11A501		9
51	202 201b							3A501	10A501	10A501	10A501		12
52	436 416							19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
53	417 417a							4A501	11A501	11A501	11A501		12
54	417 417b							4A501	11A501	11A501	11A501		12
55	417 417c							4A501	11A501	11A501	11A501		12
56	416 417							4A501	11A501	11A501	11A501		9
57	416 201							4A501	11A501	11A501	11A501		9
58	201 201a							3A501	10A501	10A501	10A501		12
59	412 413							4A501	11A501	11A501	11A501		2
60	412 414							4A501	11A501	11A501	11A501		2
61	415 412							4A501	11A501	11A501	11A501		4
62	412 305							4A501	11A501	11A501	11A501		9
63	305 301e							3A501	10A501	10A501	10A501		12
64	419 304							4A501	11A501	11A501	11A501		9
65	304 301d							3A501	10A501	10A501	10A501		12
66	303 301c							3A501	10A501	10A501	10A501		12
67	419 417							4A501	11A501	11A501	11A501		9
68	419 303							4A501	11A501	11A501	11A501		9
69	419 302							4A501	11A501	11A501	11A501		9
70	302 301b							3A501	10A501	10A501	10A501		12
71	301 301a							3A501	10A501	10A501	10A501		12
72	419 205							4A501	11A501	11A501	11A501		9
73	205 201e							3A501	10A501	10A501	10A501		12
74	204 201d							3A501	10A501	10A501	10A501		12
75	419 204							4A501	11A501	11A501	11A501		9
76	419 301							4A501	11A501	11A501	11A501		9
77	419 425							4A501	11A501	11A501	11A501		9
78	NUMBER NOT USED							NUMBER NOT USED					
79	425 424							4A501	16A501	11A501	11A501		2
80	425 423							4A501	16A501	11A501	11A501		2
81	425 422							4A501	16A501	11A501	11A501		11
82	427 426							4A501	16A501	11A501	11A501	8" GIP BD. WALL ADJUST FRAME AS REQUIRED	6
83	425 EXT.							1A501	15A501	8A501	8A501		5
84	436 436							4A501	16A501	11A501	11A501		12
85	105g 201							4A501	16A501	11A501	11A501		6



1 DOOR SCHEDULE

DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
86	105f 105	B	WD	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6
87	439 EXT.	C	ALUM	PR. 3'-0"	7'-0"	1 3/4"	A	17A501	15A501				1
88	427 428	A	WD	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		9
89	431 428	B	WD	3'-0"	7'-0"	1 3/4"	A	2A501	16A501	9A501	9A501		4

Sheet No. **A602**

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DEMOLITION PACKAGE
CHILD CARE FACILITY
201 N. EASTERN AVE.

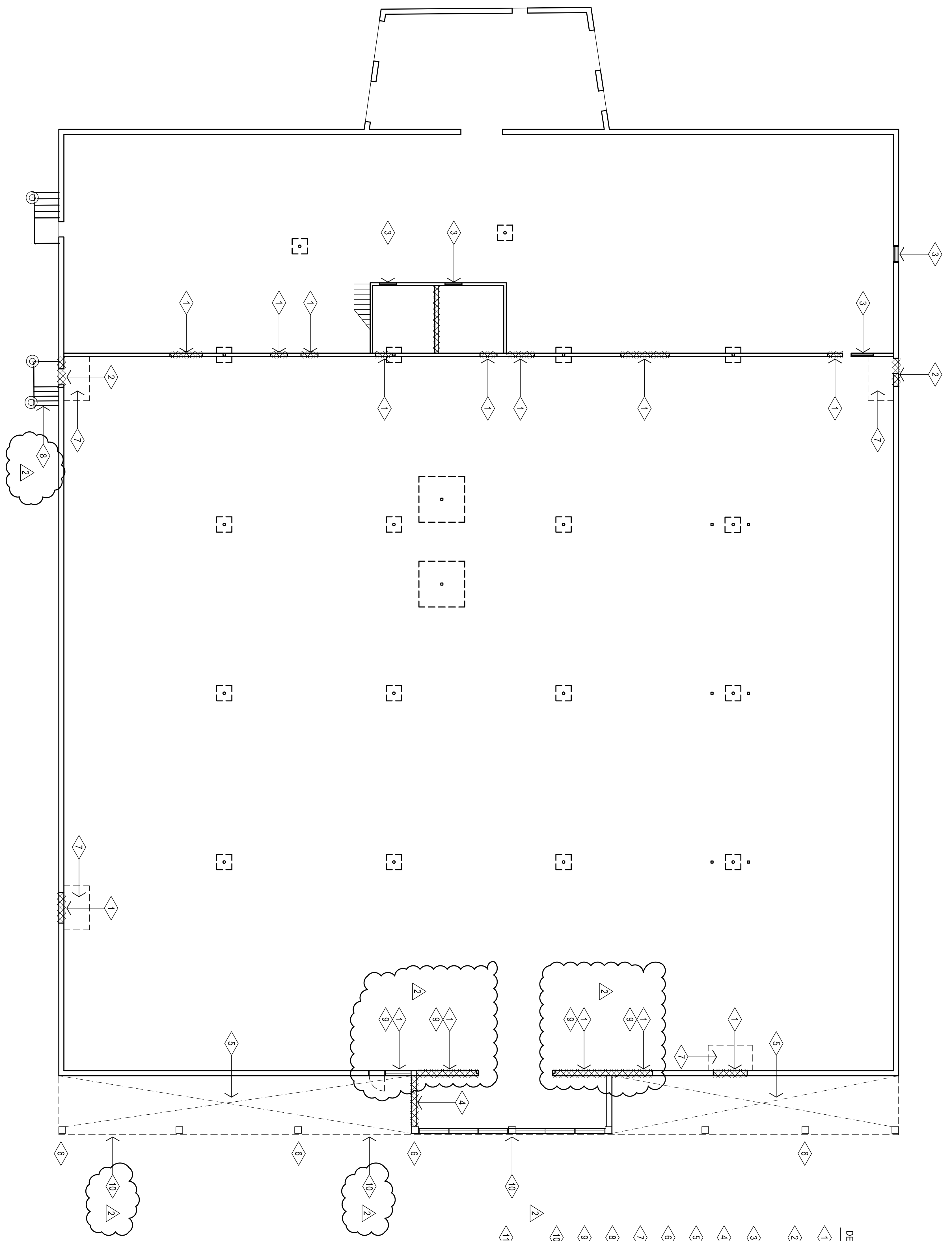
MOORE
PUBLIC SCHOOLS

Revisions:
ADDENDUM #1
ADDENDUM #2

CG
drawn by
MA
checked by
SEPTEMBER 2024
date

KFC ENGINEERING
STRUCTURAL
SALAS OBRIEN
MECHANICAL/ELECTRICAL

the Abia Griffin
Partnership L.L.C.
313 S. E. 5th Street
MOORE, OK. 73160
ACGP@theACP.net
www.theACP.net



- DEMOLITION NOTES:**
- 1. [Hatched symbol] INDICATES EXISTING WALLS TO BE DEMOLISH TO LIMITS INDICATED. RE: A1014 FOR LOCATIONS
 - 2. REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND EXISTING WALL SYSTEM. PREPARE OPENING TO RECEIVE NEW WALL INFILL AND NEW HM DOOR FRAME
 - 3. REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND PREPARE OPENING TO RECEIVE NEW WALL INFILL
 - 4. REMOVE EXISTING TEMPORARY WALL SYSTEM AND PREPARE OPENING TO RECEIVE NEW STOREFRONT
 - 5. REMOVE EXISTING SOFFIT SYSTEM AND ASSOCIATED FRAMING AS REQUIRED FOR NEW FRAMING AND PREFINISHED METAL SOFFIT PANEL
 - 6. REMOVE EXISTING "NO PARKING" SIGN & REINSTALL AFTER EXTERIOR WORK IS COMPLETE
 - 7. REMOVE EXISTING SLAB AT NEW DOOR LOCATIONS RE: A1008 & a100b. PREPARE AREA TO RECEIVE NEW CONCRETE SLAB AND STOOP. RE: 3A4303
 - 8. REMOVE EXISTING STEEL STEPS AND ALL ASSOCIATED FOOTINGS, BOLLARDS, ETC. AND PREPARE AREA TO RECEIVE NEW CONC. STOOP AND RAMP. RE: SHEET C300
 - 9. REMOVE EXISTING STOREFRONT SYSTEM AS REQUIRED FOR NEW WALL INFILL SYSTEM.
 - 10. REMOVE EXISTING EXTERIOR SIGNAGE & ASSOCIATED BRACKETS AS REQUIRED. REMOVE EXISTING E.L.F.S. SYSTEM AS REQUIRED FOR NEW PLYWOOD BLOCKING FOR NEW SIGNAGE. REPAIR / PROVIDE NEW E.L.F.S. SYSTEM AS REQUIRED - MATCH EXISTING SYSTEM. RE: SHEET A201 FOR LOCATIONS
 - 11. REMOVE EXISTING CONCRETE SIDEWALK TO LIMITS INDICATED AND PREPARE AREA TO RECEIVE NEW CONCRETE SIDEWALK. RE: SHEET C300

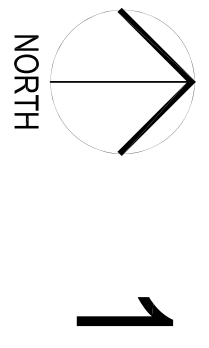
 ENTIRE SHEET

GENERAL NOTES:

1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT PROVIDED TO THESE DOCUMENTS SHOULD BE BROUGHT TO THE ARCHITECT'S ATTENTION BY THE ARCHITECT AND INCLUDED IN THE BASE BID.
2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS INSTRUCTIONS.
3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED. PROTECT EXISTING CMU WALL TO REMAIN AS REQUIRED. PROTECT EXISTING EXTERIOR WALL TO REMAIN.

DEMOLITION FLOOR PLAN

3/32" = 1'-0"

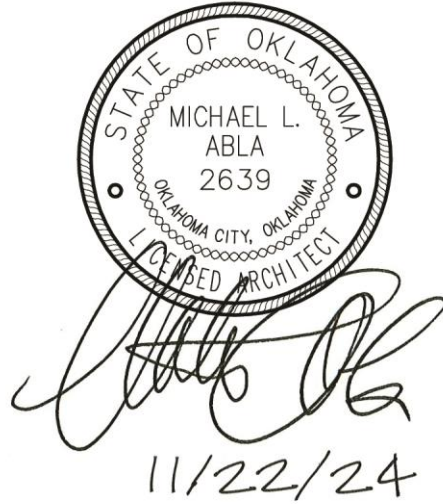


**MOORE PUBLIC SCHOOLS -
CHILD CARE CENTER**

Moore Public Schools - Moore, Oklahoma
AGP - Moore, Oklahoma

ADDENDUM NO. 2

November 22, 2024



This addendum applicable to work designated herein, shall be understood to be an Addendum, and as such shall be included in the Contract Agreement.

Receipt of this Addendum shall be acknowledged by the Construction Management Firm notifying this office in writing, and by any applicable subcontractor to the CM.

This addendum consists of two (2) pages with attachments of three (3) 8.5"x11" pages and forty (40) 24"x36" sheets.

A. Drawings:

Replaced Cover Sheet "C". Refer to attachment.

General

No changes.

Civil

1. Sheet C200, Demolition Site Plan and Notes: revised / demolition notes at front entry overhangs. Refer to attachment.
2. Sheet C300, Site Plan – Parking Requirements: added sheet in its entirety. Refer to attachment.
3. Sheet C900, Site Details: added sheet in its entirety. Refer to attachment.

Architectural Demolition

1. Sheet AD100, Demolition Floor Plan and Notes: revised / demolition notes at front entry overhangs. Refer to attachment.

Structural

Replace Sheet S602 in its entirety. Refer to attachment.

Architectural

1. Sheet A100, Detail 1, Overall Floor Plan: revised duplicate door number by adding Doors 88 & 89. Added "E" designation to indicate existing doors – no work.
2. Sheet A101, Detail 1, Wall Type Plan: provided infill information at demolished storefronts at sides of entry vestibule. Refer to attachment.
3. Sheet A102, Detail 1, Life Safety Plan: updated plan at infill / demolished storefronts at sides of entry vestibule. Refer to attachment.
4. Sheet A201, Detail 1, East Elevation: provided infill information at demolished storefronts at sides of entry vestibule. Refer to attachment.
5. Sheet A602, Detail 1, Door Schedule: revised duplicate door number by adding Doors 88 & 89.

Mechanical, Electrical, and Plumbing

Refer to attachments.

Food Service Documents

No changes.

B. Specifications:

No changes.

END OF ADDENDUM NO. 2

CIVIL

KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL



CJC	drawn by
BWB	checked by
OCTOBER 2024	date
ADDDENDUM 2	11/22/2024

MOORE PUBLIC SCHOOLS
BOARD OF EDUCATION
MOORE, OKLAHOMA



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

S602

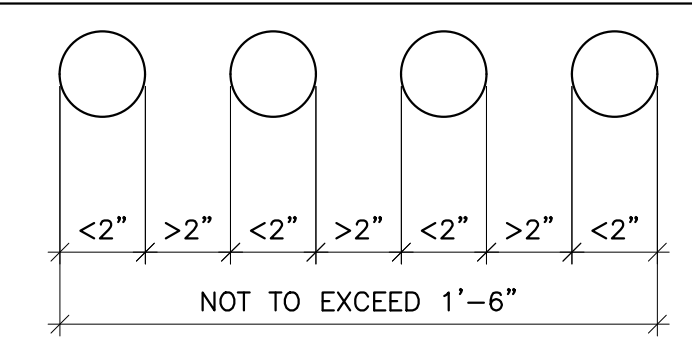
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KFC engineering
Kirkpatrick Forest Curtis PC
Structural Engineering
OK CA #3888, EXP. 06/30/25
525 Central Park Drive, Suite 202
Oklahoma City, OK 73105
405.528.4596 | kfcengr.com

NOTES:
1. WE ARE NOT AWARE OF ANY OPENINGS LARGER THAN 5'-0", IF AN OPENING LARGER THAN 5'-0" IS REQUIRED, CONTACT ENGINEER IMMEDIATELY FOR EVALUATION AND FURTHER INSTRUCTIONS.
2. REFER 6/S105 AND 7/S105 FOR ADDITIONAL INFORMATION.
3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

NOTES:
1. OPENINGS 18" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF AS SHOWN.
2. REFER 6/S105 AND 7/S105 FOR ADDITIONAL INFORMATION.
3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

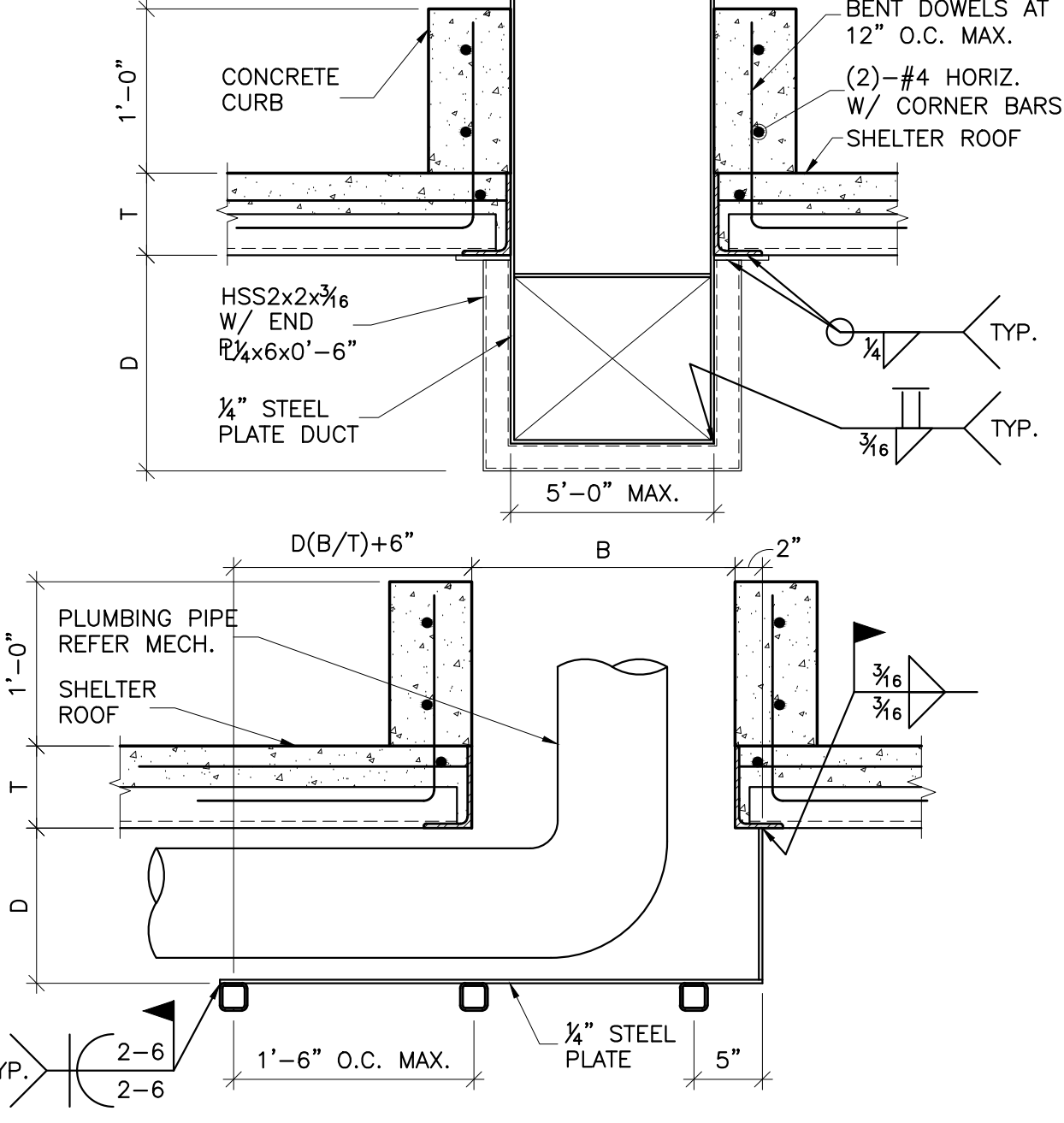
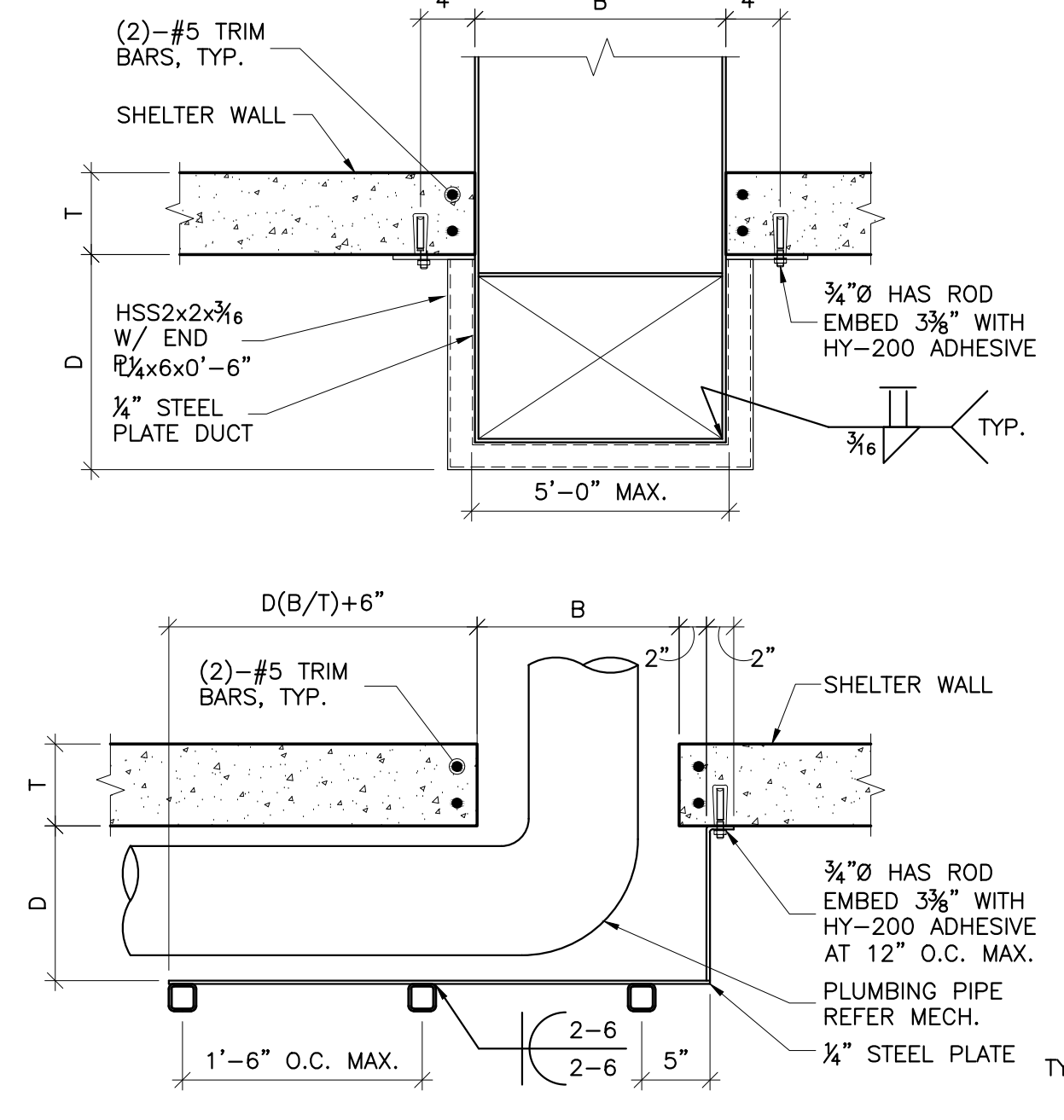
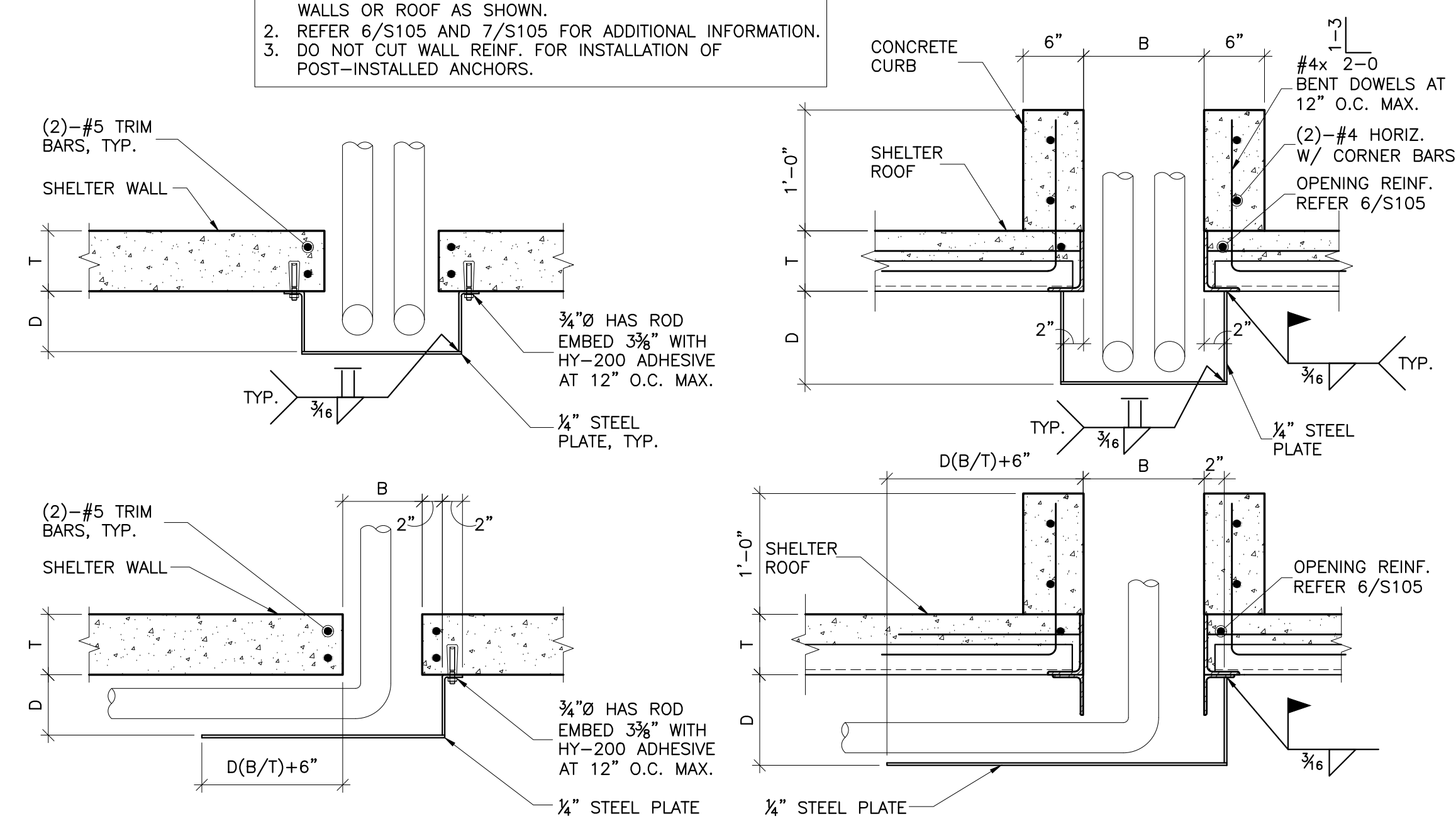
NOTE:
OPENINGS 2" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF WITHOUT PROTECTION OR REGARD TO THE TYPICAL REINFORCING (SPECIAL REINFORCING AROUND OPENINGS SHALL NOT BE CUT). GROUPS OF UP TO 4 OPENINGS 2" OR LESS MAY BE MADE PROVIDED THE CLEAR SPACE BETWEEN OPENINGS EXCEEDS 2" AND THE TOTAL LENGTH OF THE GROUP DOES NOT EXCEED 18". OPENINGS CAN BE HORIZONTAL (AS SHOWN) OR VERTICAL.



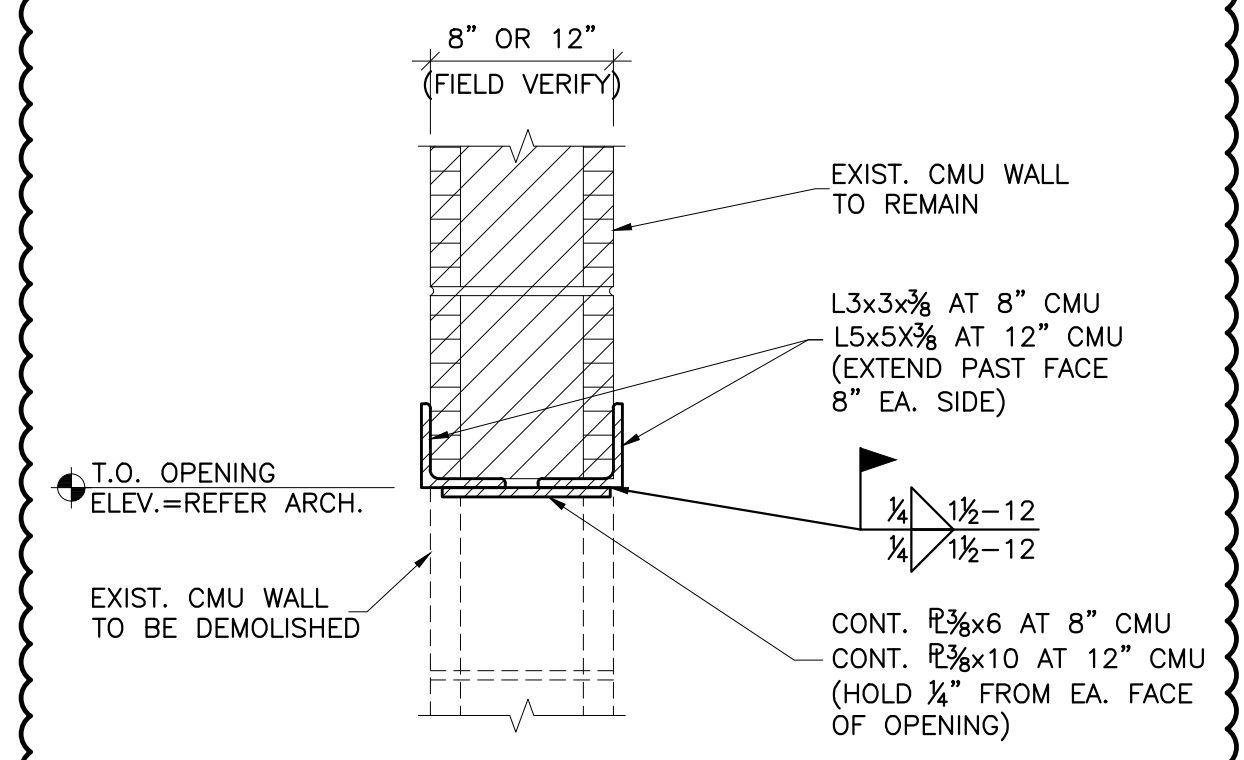
1 OPENINGS IN SHELTER 2" OR LESS
SCALE: 1"=1'-0"

2 OPENINGS IN SHELTER 2" TO 1'-6"
SCALE: 1"=1'-0"

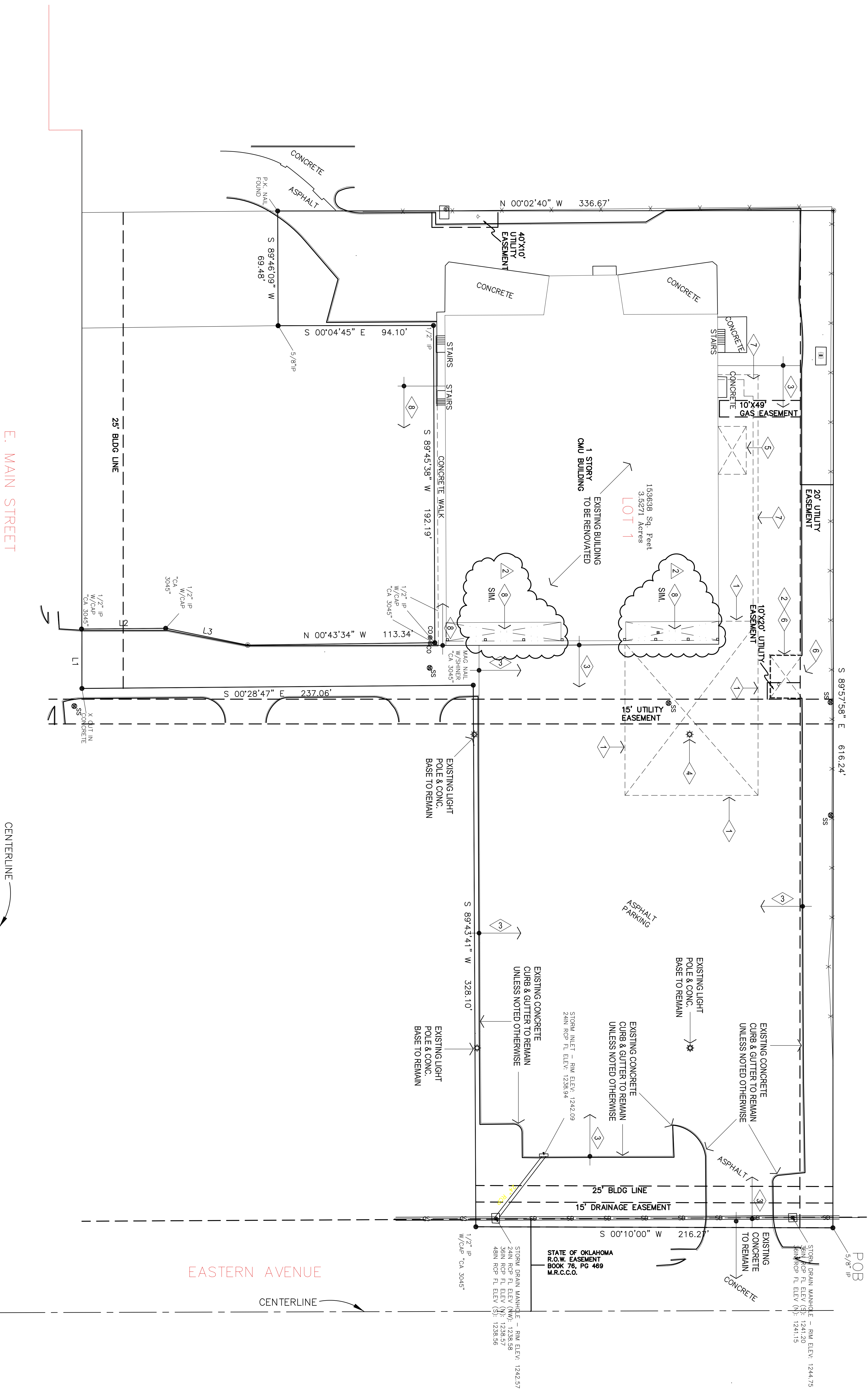
3 OPENINGS IN SHELTER TO 1'-6" TO 5'-0"
SCALE: 1"=1'-0"



SEQUENCING NOTES:
1. IDENTIFY 8" OR 12" CMU WALL AND USE PROPER ANGLE AND PLATE WIDTH ACCORDING TO EXIST. WALL WIDTH.
2. SAW-CUT HORIZONTAL SLOT INTO ONE SIDE OF EXISTING WALL FOR PLACEMENT OF NEW ANGLE. SAW-CUT SHALL EXTEND A MINIMUM OF 8" BEYOND NEW OPENING.
3. INSTALL NEW ANGLE TIGHT INTO SLOT. ANGLES SHALL EXTEND A MINIMUM OF 8" BEYOND OPENING.
4. REPEAT STEPS 1 AND 2 ON OPPOSITE SIDE OF WALL.
5. DEMOLISH MASONRY TO EXTENTS SPECIFIED BY ARCH., FOR NEW OPENING.
6. INSTALL BOTTOM PL TO WITHIN 1/4" OF EACH JAMB OF NEW OPENING.
7. PAINT ANY EXPOSED PORTIONS OF LINTEL, REFER ARCH FOR COLOR.



4 SECTION
SCALE: 1 1/2"=1'-0"



DEMOLITION SITE PLAN



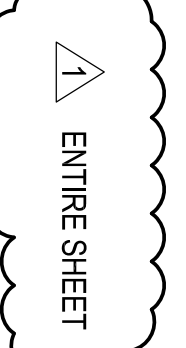
1" = 30'-0"

GENERAL NOTES:

1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT INCLUDED IN THESE DOCUMENTS SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT AND INCLUDED IN THE BASE BID.
2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS INSTRUCTIONS.
3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED.

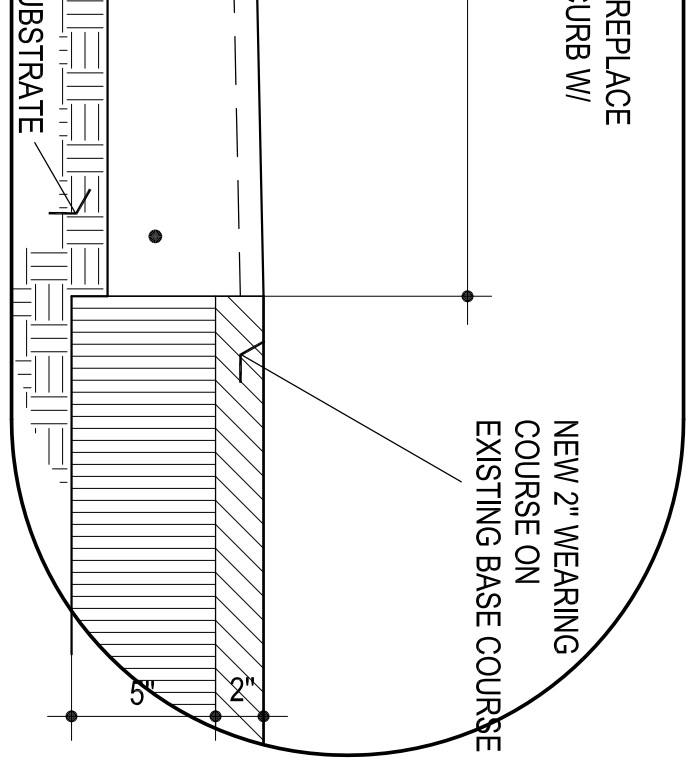
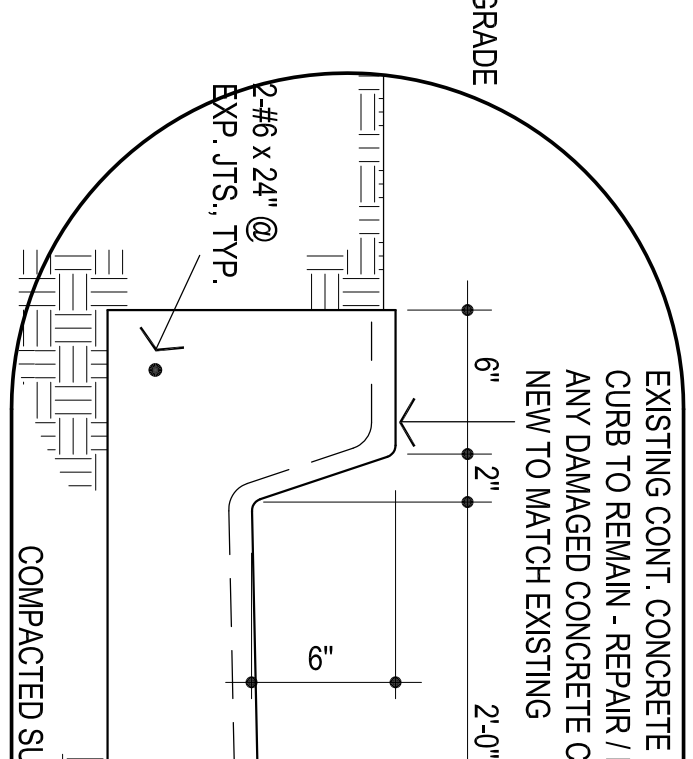
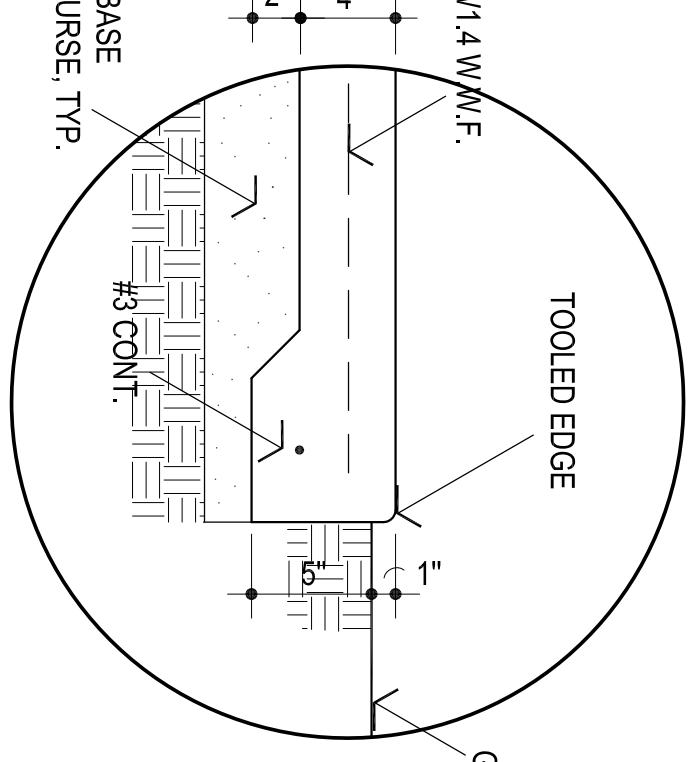
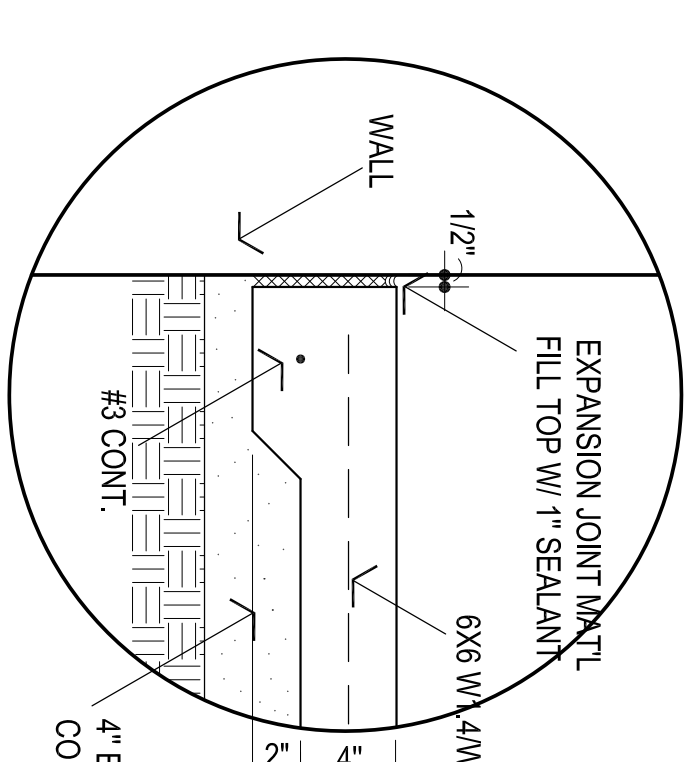
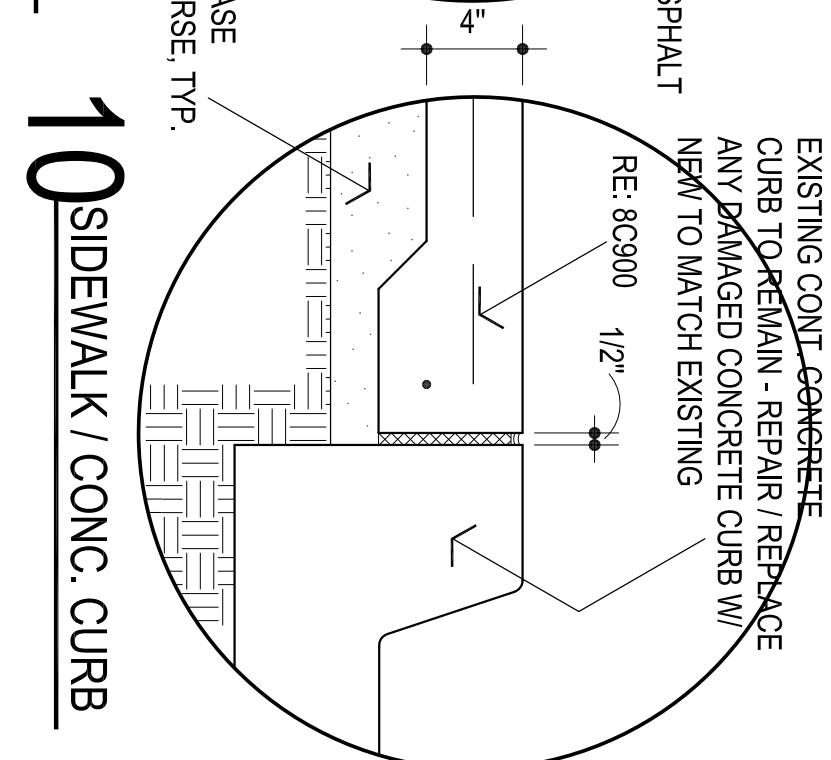
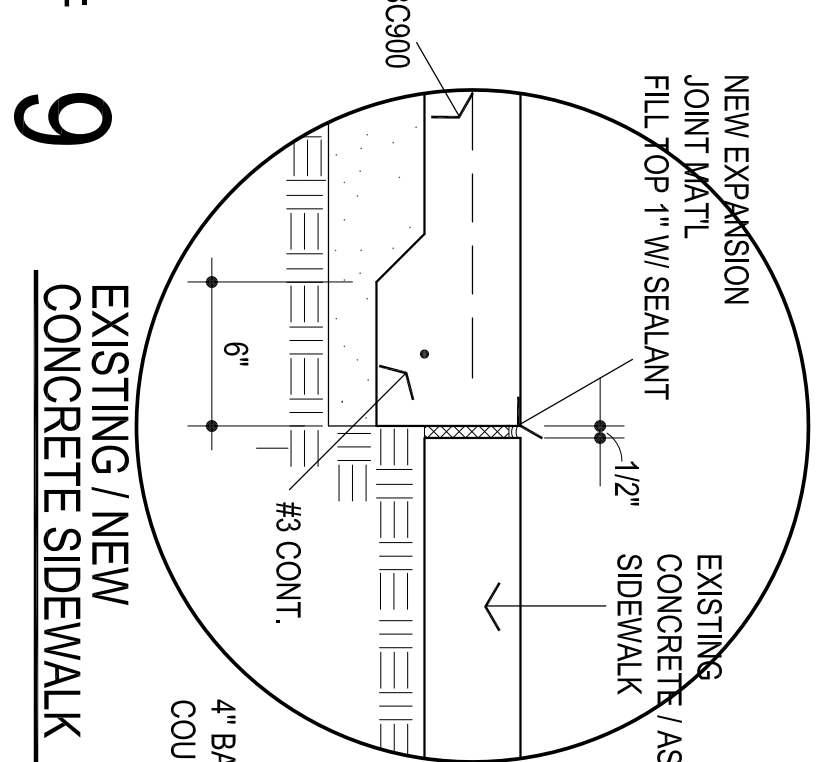
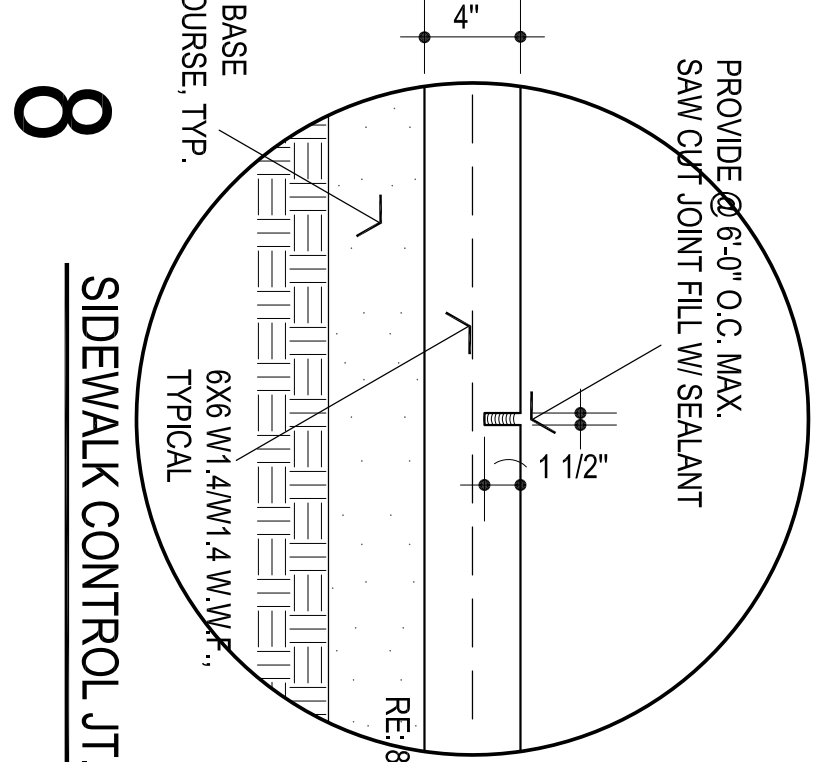
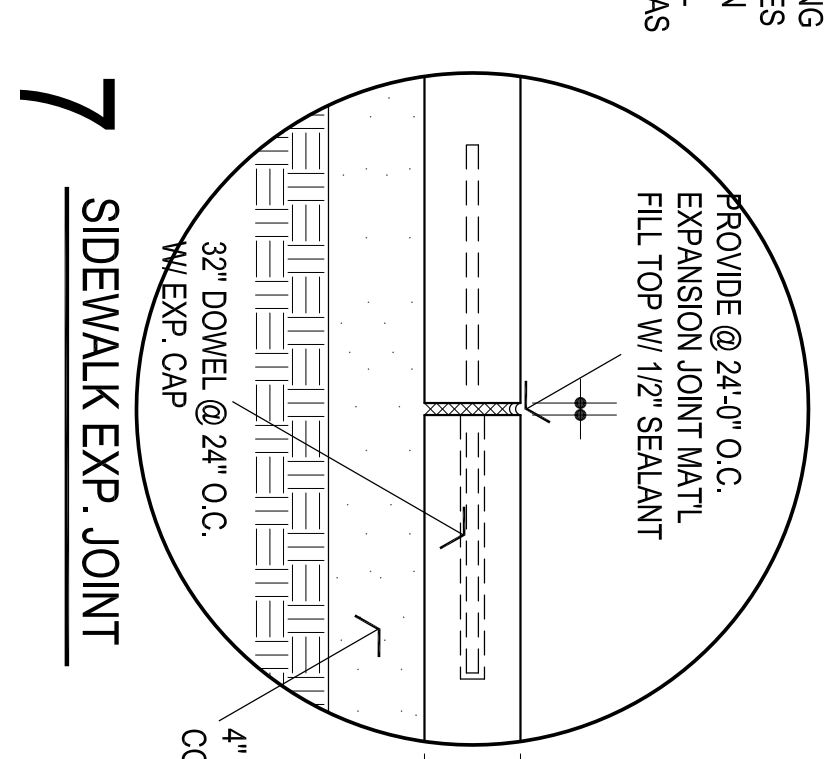
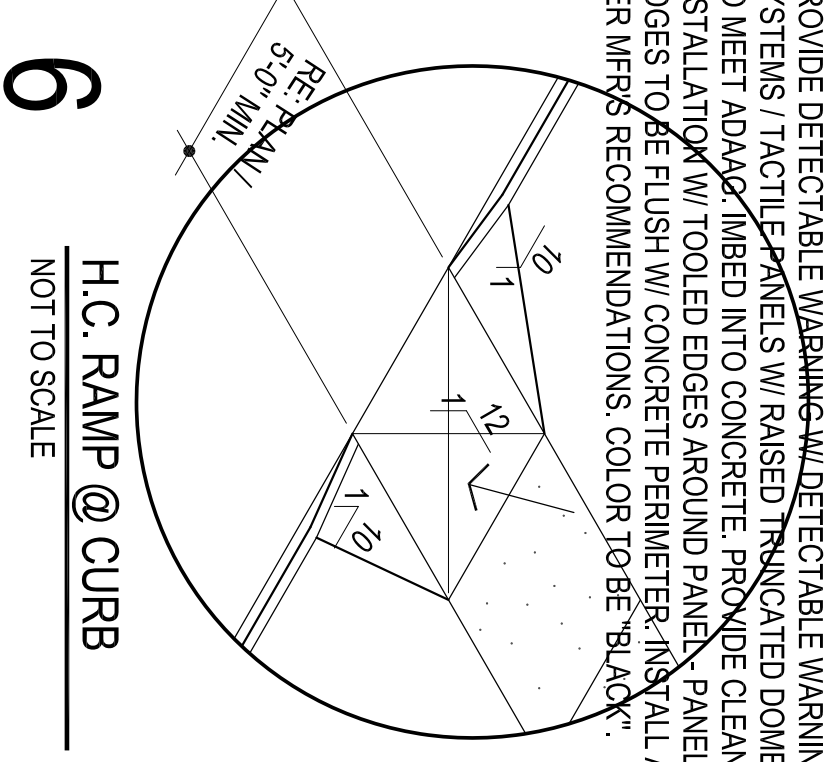
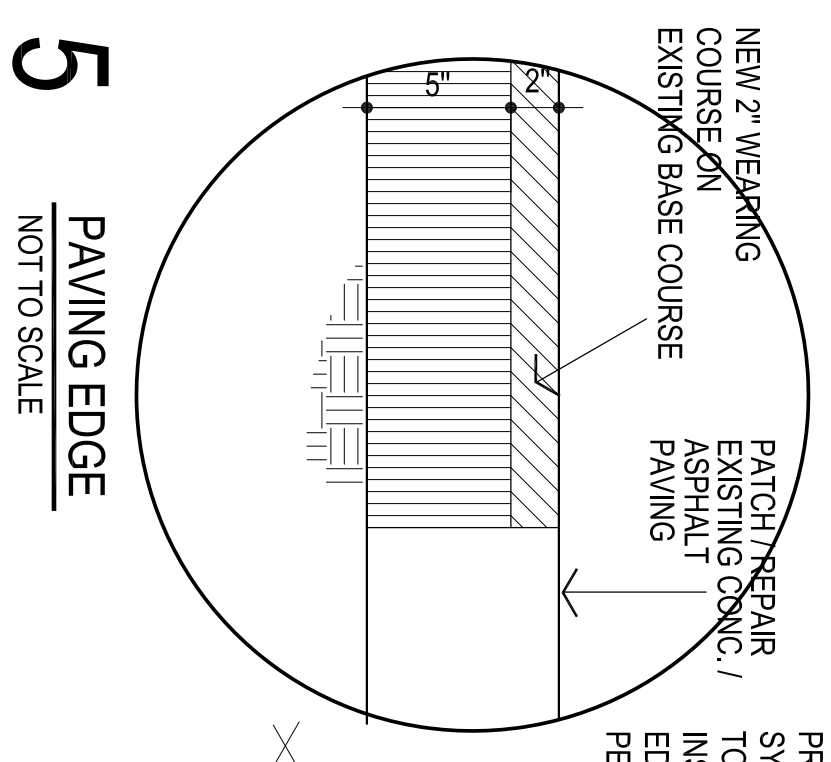
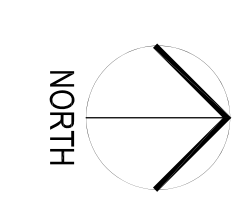
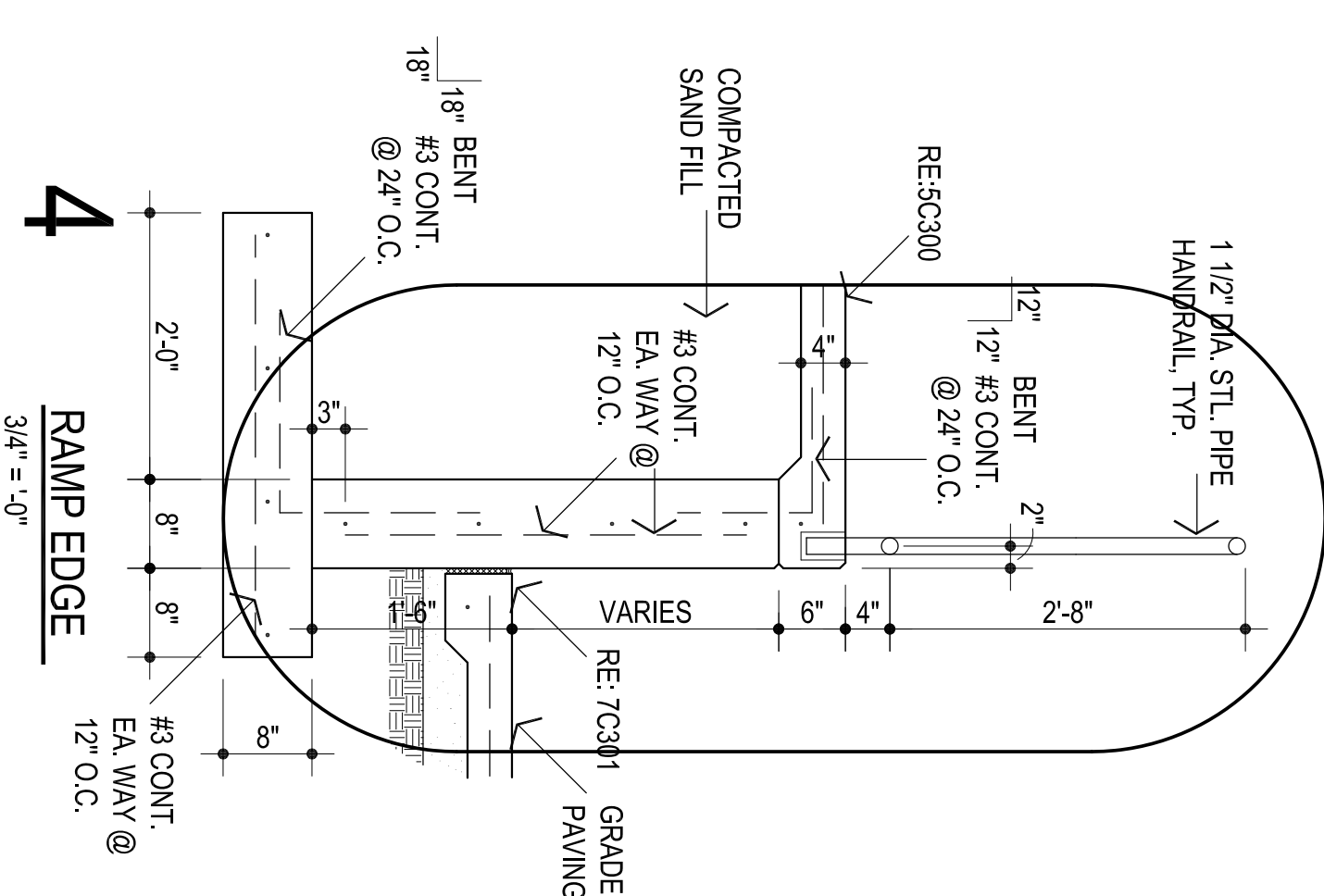
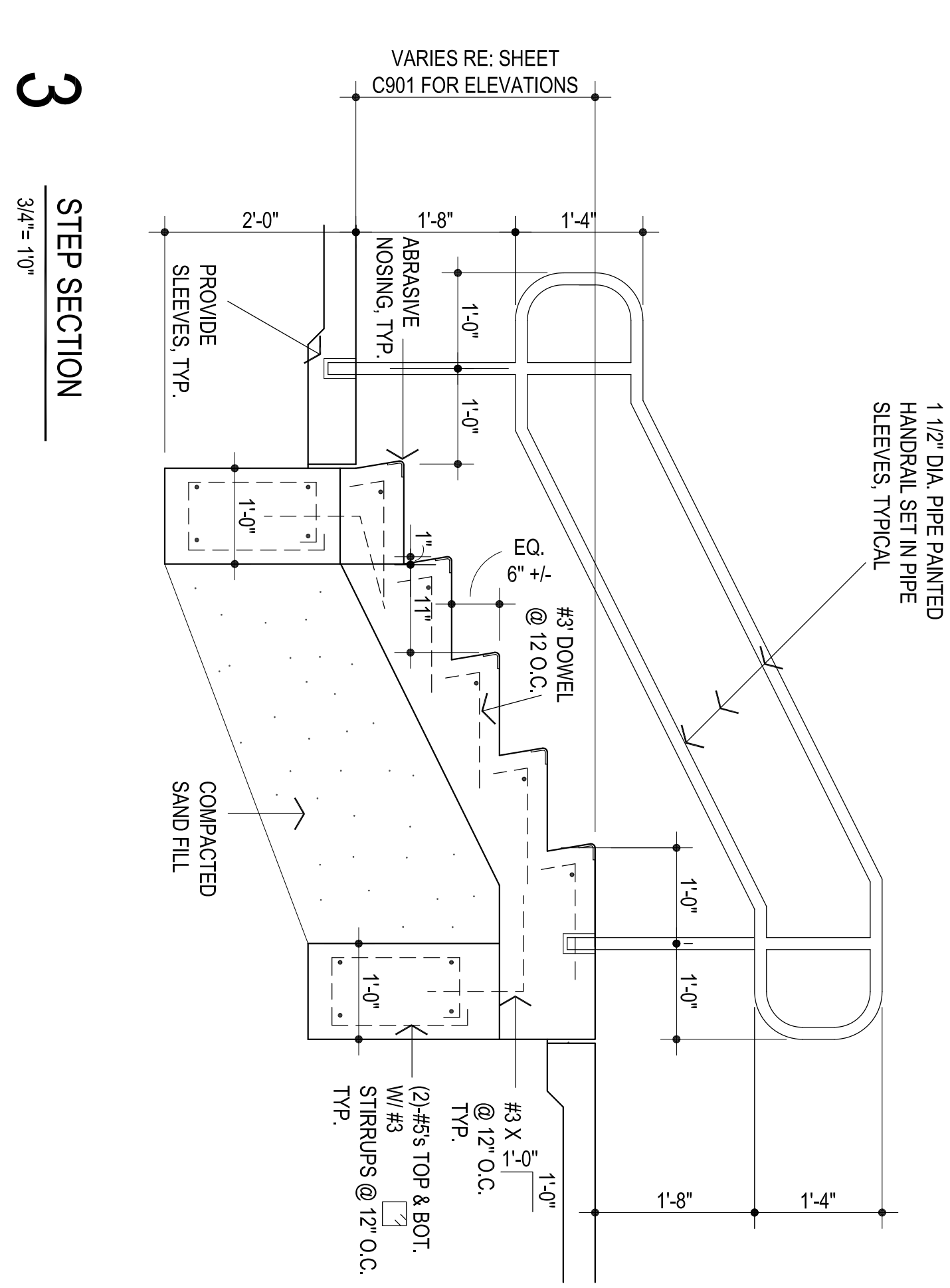
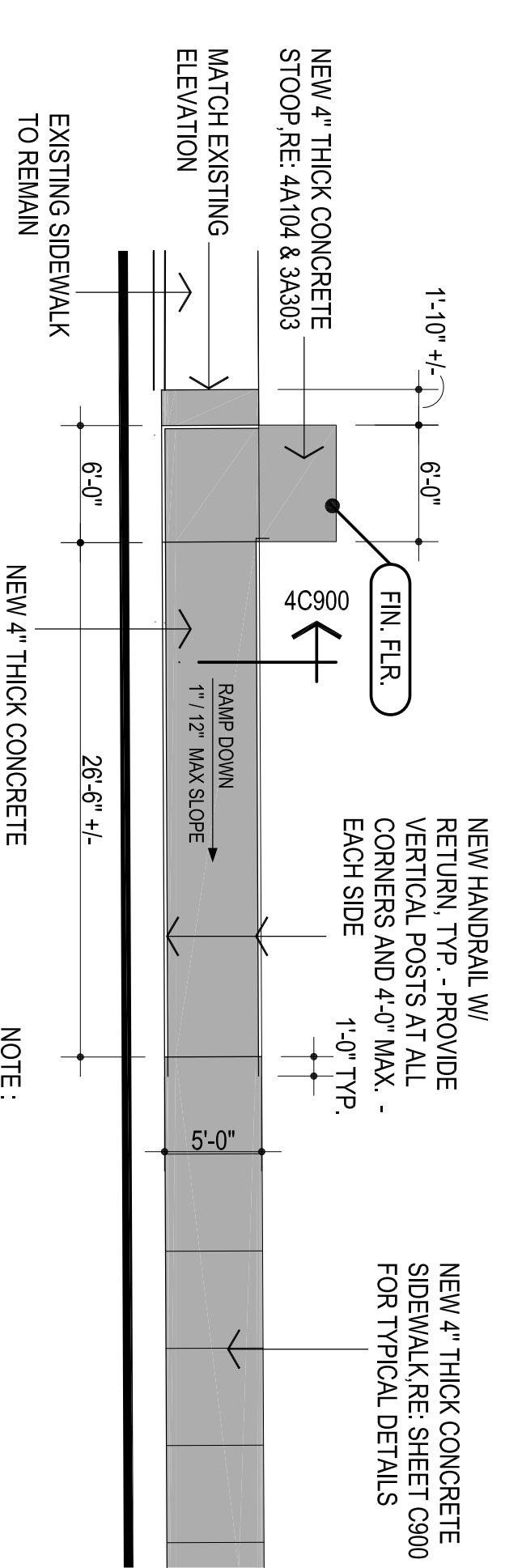
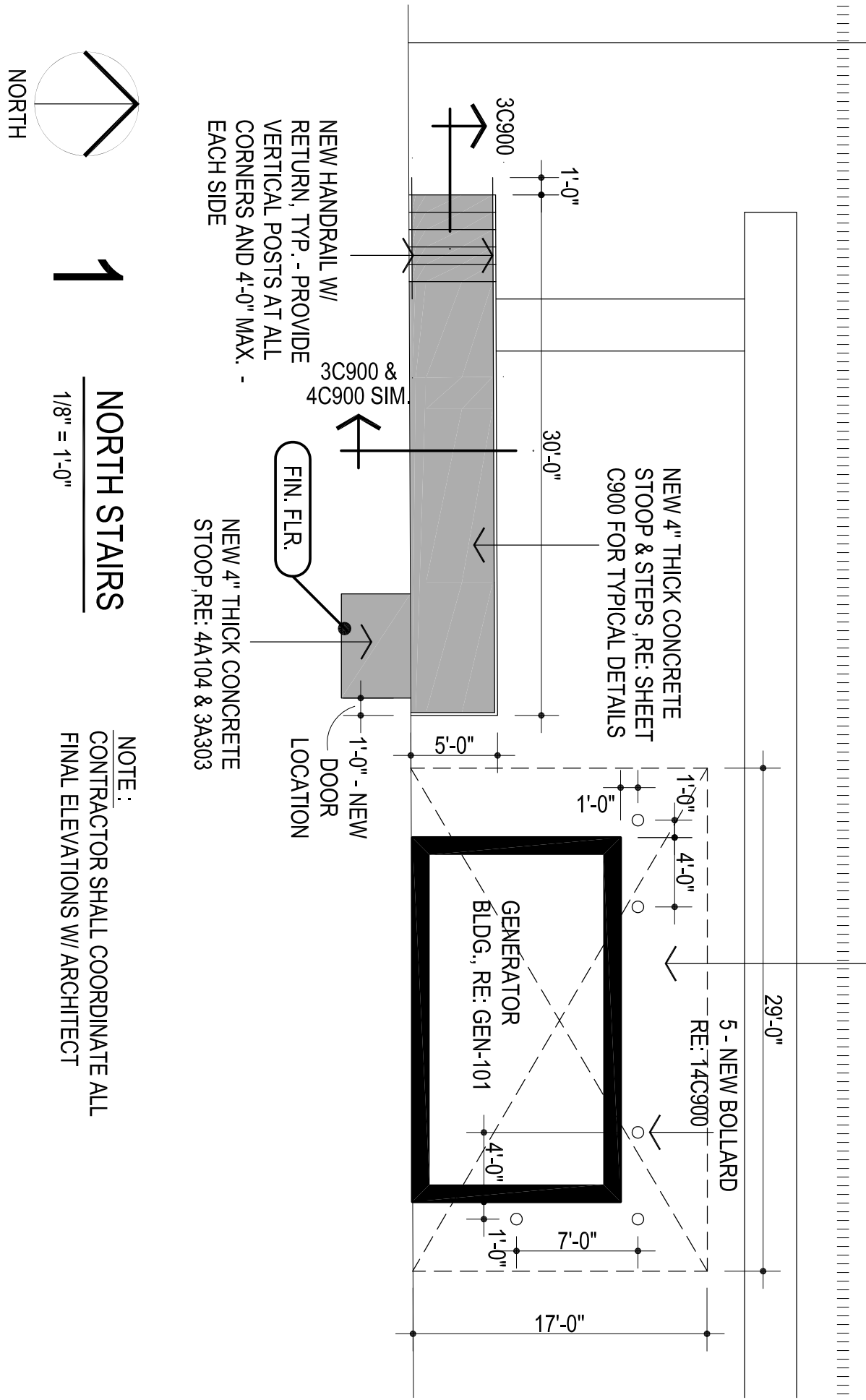
DEMOLITION NOTES:

1. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW POURED-IN-PLACE RUBBER PLAYGROUND SURFACE.
2. DEMOLISH EXISTING CONCRETE CURB & GUTTER AROUND EXISTING FIRE HYDRANT TO BE RELOCATED. RE: CIVIL.
3. DEMOLISH / REMOVE TOP 2" OF ASPHALT WEARING COURSE W/IN LIMITS INDICATED & REPAIR / PREPARE EXISTING ASPHALT BASE COURSE TO REMAIN TO RECEIVE NEW 2" WEARING COURSE.
4. DEMOLISH / REMOVE EXISTING LIGHT POLE & CONCRETE BASE. LOCATE EXISTING ELECTRICAL CONDUIT & PROVIDE ALL MATERIALS REQUIRED FOR REMAINING LIGHT POLES TO WORKING ORDER.
5. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW GENERATOR BUILDING.
6. REMOVE EXISTING SUBGRADE AND PREPARE AREA TO RECEIVE NEW ASPHALT PAVING. MATCH EXISTING THICKNESS. PROVIDE NEW CURB & GUTTER AS REQUIRED. MATCH EXISTING.
7. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED FOR NEW GREASE INTERCEPTOR AND ASSOCIATED PIPING. RE: PLUMBING.
8. DEMOLISH / REMOVE EXISTING SIDEWALK TO LIMITS INDICATED. PREPARE SUBSTRATE FOR NEW RAMPS & SIDEWALK.



ENTIRE SHEET

FILL IN AREA W/ NEW COMPACTED
SUBGRADE NEW ASPHALT BASE COURSE
& WEARING COURSE AFTER CONSTRUCTION
OF NEW BUILDING. PROVIDE NEW BOLLARDS
AS INDICATED



ENTIRE SHEET

AGP
the Abia Griffin
Partnership L.L.C.

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www.theAGP.net

CEDAR CREEK
CIVIL
KFC ENGINEERING
STRUCTURAL
SALAS ORBEN
MECHANICAL/ELECTRICAL

STATE OF OKLAHOMA
MICHAEL L. MOORE
2639
REGISTERED PROFESSIONAL ENGINEER
10/22/24

CG
drawn by
MA
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ADDENDUM #2

MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
201 N. EASTERN AVE.

Sheet no.:
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ADDENDUM 02

Issue Date: November 22, 2024

Project Information

Client: Abla Griffin Partnership
 Project Name: MPS Daycare
 Project Location: Moore, OK
 Owner: Moore Public Schools
 Engineer: Salas O'Brien, LLC

Project No. 2450-70304-00



To Prospective Bidders

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated November 12, 2024, (and previous addenda), with amendments and additions noted below.

This Addendum consists of (3) pages and (26) attachments.

- Index of Attachments

• M000	P001	E101	T101
• M101	P101	E201	T201
• M201	P110	E202	
• M601	P201	E203	
• M602	P301	E401	
• M603	P302	E601	
• M604	P601	E602	
• M605	E000	T000	

Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may disqualify Bidder.



CHANGES TO THE DRAWINGS

Revisions have been made to the following drawings and are issued in the form of full-size plans. Edits are indicated by a revision delta and a cloud surrounding the affected portion of the drawing.

M000 – MECHANICAL LEGEND AND NOTES

- Refer to clouds and deltas on plan.

M101 – MECHANICAL FLOOR PLAN

- Refer to clouds and deltas on plan.

M201 – MECHANICAL ROOF PLAN

- Refer to clouds and deltas on plan.

M601 – MECHANICAL SCHEDULES

- Refer to clouds and deltas on plan.

M602 – MECHANICAL SCHEDULES

- Entire sheet.

M603 – MECHANICAL SCHEDULES

- Entire sheet.

M604 – MECHANICAL SCHEDULES

- Entire sheet.

M605 – MECHANICAL SCHEDULES

- Entire sheet.

P001 – PLUMBING SITE PLAN

- Refer to clouds and deltas on plan.

P101 - PLUMBING PLAN BELOW GRADE

- Refer to clouds and deltas on plan.

P110 - PLUMBING PLAN ABOVE GRADE

- Refer to clouds and deltas on plan.

P201 – PLUMBING ROOF PLAN

- Refer to clouds and deltas on plan.

P301 – PLUMBING ISOMETRIC – WASTE & VENT

- Refer to clouds and deltas on plan.

P302 – PLUMBING ISOMETRIC – WATER SUPPLY

- Refer to clouds and deltas on plan.



P601 – PLUMBING SCHEDULES

- Refer to clouds and deltas on plan.

E000 – ELECTRICAL TITLE SHEET

- Refer to clouds and deltas on plan.

E101 – ELECTRICAL LIGHTING PLAN

- Refer to clouds and deltas on plan.

E201 – ELECTRICAL POWER PLAN

- Refer to clouds and deltas on plan.

E202 – ELECTRICAL ROOF PLAN

- Refer to clouds and deltas on plan.

E203 – ELECTRICAL KITCHEN PLAN

- Refer to clouds and deltas on plan.

E401 – ELECTRICAL ONE-LINE DIAGRAM

- Refer to clouds and deltas on plan.

E601 – ELECTRICAL SCHEDULES

- Refer to clouds and deltas on plan.

E602 – ELECTRICAL SCHEDULES

- Refer to clouds and deltas on plan.

T000 – TECHNOLOGY NOTES AND LEGENDS

- Refer to clouds and deltas on plan.

T101 – TECHNOLOGY SITE PLAN

- Refer to clouds and deltas on plan.

T201 – TECHNOLOGY FLOOR PLAN

- Refer to clouds and deltas on plan.

END OF ADDENDUM [02]



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CHILD CARE FACILITY
201 N. EASTERN AVE.

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M000

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Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

GENERAL MECHANICAL NOTES	
1. ALL WORK SHALL BE IN COMPLIANCE WITH STATE AND LOCAL CODES.	14. DUCT MATERIAL SHALL BE GALVANIZED OR ALUMINUM CONSTRUCTION IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARD 2005 FOR THE PRESSURE AND SEAL CLASS LISTED IN DUCTWORK/INSULATION SCHEDULE.
2. THE CONTRACTOR SHALL PAY FOR ALL FEES, PERMITS, LICENSES, ETC., NECESSARY FOR PROPER COMPLETION OF THE WORK.	15. DUCT SIZES LISTED ON PLANS ARE THE REQUIRED CLEAR INTERIOR DIMENSIONS.
3. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.	16. SUPPLY AND RETURN BRANCH DUCTS MAY BE INSULATED FLEX DUCT IF THE RUN IS LESS THAN 5 FEET IN LENGTH, ANY LENGTHS OVER 5 FEET SHALL BE RIGID DUCTWORK. DUCT SHALL BE THE SAME SIZE AS THE LISTED DIFFUSER THROAT UNLESS NOTED OTHERWISE.
4. VERIFY ALL EXISTING CONDITIONS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN CONTRACT DRAWINGS AND ACTUAL CONDITIONS.	17. PROVIDE VOLUME CONTROL DAMPERS WHERE INDICATED AND AT ALL TAKEOFFS, BOTH SUPPLY AND RETURN SYSTEMS, AND MAJOR DUCT RUNS. DAMPERS SHALL BE FACTORY-FABRICATED WITH ZINC-PLATED, DIE-CAST CONTROL HARDWARE. CONTROL HARDWARE SHALL INCLUDE HEAVY GAUGE DIAL AND HANDLE WITH ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.
5. EXISTING UTILITIES TO BE ABANDONED SHALL BE PROPERLY DISCONNECTED AND CAPPED AS REQUIRED BY CODE OR LOCAL ORDINANCE.	18. PROVIDE TURNING VANES IN ALL RECTANGULAR ELBOWS CONFORMING TO SMACNA DUCT CONSTRUCTION STANDARD 2005 FIG. 4-2 TYPE RE-3 WITH STANDARD RADIUS. WHERE SPACE PERMITS, PROVIDE RADIUS ELBOWS IN ACCORDANCE WITH FIGURES 4-2, TYPE RE-1.
6. THESE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. ADDITIONAL DATA SHALL BE FROM THE ENGINEER THROUGH WRITTEN CLARIFICATION ONLY. VERIFY ALL EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS BEFORE PROCEEDING WITH ANY PORTION OF ANY WORK. THE CONTRACTOR SHALL PROVIDE ALL OFFSETS AND TRANSITIONS REQUIRED TO MEET EXISTING CONDITIONS.	19. ALL RECTANGULAR MAIN TO RECTANGULAR BRANCH CONNECTIONS, BOTH CONVERGING AND DIVERGING CONFIGURATIONS, SHALL HAVE A 45 DEG. ENTRY TAP CONSTRUCTED IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARD 2005 FIG. 4-6.
7. THE CONTRACTOR SHALL PERFORM WORK IN A SKILLED AND PROFESSIONAL MANNER.	20. DIFFUSER PATTERN 4-WAY UNLESS OTHERWISE INDICATED. PROVIDE FIBERGLASS DUCT INSULATION WITH VAPOR BARRIER AS SCHEDULED UNLESS NOTED OTHERWISE.
8. ALL CONTRACTORS ARE RESPONSIBLE TO FIELD COORDINATE WORK SCHEDULE WITH OWNER REPRESENTATIVE.	21. MECHANICAL CONTRACTOR TO REPAIR ANY DAMAGE DONE TO THE FIRE PROOFING WHILE INSTALLING THE MECHANICAL TRUNKS. SEAL ALL PENETRATIONS THROUGH RATED STRUCTURES WITH UL LISTED FIRE SEAL DESIGNED FOR THE SPECIFIED APPLICATION.
9. THE CONTRACTOR SHALL WORK AND COORDINATE WITH THE OTHER TRADES.	22. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE PUBLIC AND ADJACENT PROPERTIES FROM DAMAGE THROUGHOUT CONSTRUCTION.
10. ALL EQUIPMENT SHALL BE NEW AND IN UNDAMAGED CONDITION. ANY EQUIPMENT FOUND DEFECTIVE SHALL BE IMMEDIATELY REMOVED FROM THE PROJECT.	23. THE CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OR AS OTHERWISE REQUIRED IN THE SPECIFICATIONS.
11. PROVIDE 3 COPIES OF AN OPERATION AND MAINTENANCE MANUAL FOR ALL MAJOR EQUIPMENT REQUIRING SERVICE. MAJOR EQUIPMENT INCLUDES BUT IS NOT LIMITED TO COILS, FANS, AND CONTROL WIRING DIAGRAMS. EACH PIECE OF EQUIPMENT SHALL STATE THE CONTRACT DATE AND THE NAME, ADDRESS AND PHONE NUMBER FOR THE FRAME CONTRACTOR, SUBCONTRACTOR PERFORMING THE INSTALLATION, AND THE LOCAL VENDOR FOR SPARE PARTS. THE MANUALS SHALL CONTAIN MAINTENANCE INSTRUCTIONS REQUIRED FOR THE INSTALLED EQUIPMENT. MANUALS SHALL BE BOUND IN A THREE RING HARD COVER BINDER. O & M MANUALS SHALL BE SUBMITTED TO THE OWNER PRIOR TO FINAL WALK THROUGH OF THE PROJECT.	24. MECHANICAL CONTRACTOR TO INCLUDE THE TEST AND BALANCE, AND ANY PERMIT FEES IN THEIR BID.
12. PROVIDE 8 HOURS OF OWNER TRAINING FOR THE INSTALLED EQUIPMENT. TRAINING SHALL BE HELD ONLY AFTER ALL OF THE EQUIPMENT IS INSTALLED AND PROPER OPERATION IS VERIFIED.	25. MECHANICAL CONTRACTOR SHALL VERIFY ALL ROOFTOP EQUIPMENT WEIGHTS, SIZES, LOCATIONS AND OPENINGS REQUIRED AND SHALL COORDINATE ANY CHANGES WITH THE ARCHITECT.
13. CONTRACTOR SHALL SUBMIT A CERTIFIED REPORT INDICATING SYSTEM PERFORMANCE INCLUDING, BUT NOT LIMITED TO, VOLTAGE AND AMPERAGE MEASUREMENTS OF ALL EQUIPMENT GREATER THAN 1/3 H.P. AIR BALANCE MEASUREMENTS OF OUTSIDE AIR DELIVERY, AIR HANDLING UNIT SUPPLY, SUPPLY DIFFUSERS, EXHAUST AND RETURN GRILLES. AIR BALANCE SHALL BE WITHIN 10% OF DESIGN CONDITIONS. THE REPORT CERTIFICATION SHALL BE AS FOLLOWS: I (name) of (company) CERTIFY THAT ALL MEASUREMENTS, FIGURES AND STATEMENTS INDICATED IN THIS REPORT WERE TAKEN BY ME OR UNDER MY SUPERVISION AND ARE ACCURATE AS OF (date). DESIGN FLOWS WERE BASED UPON PLANS DATED (x/y/z/z).	26. UPON PROJECT COMPLETION, RECORD (AS-BUILT) DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR TO THE BUILDING OWNER. ALL CHANGES MADE TO EQUIPMENT, DUCTWORK, AND GENERAL DESIGN SHALL BE NOTED ON THE DRAWINGS. PROVIDE IN PDF FORMAT OR PRINTED SET AT THE OWNER'S REQUEST.

ABBREVIATIONS	
A AMP	IN INCH
ADD ADDENDUM	LAT LEAVING AIR TEMPERATURE
ADJ ADJUSTABLE	LB POUND
AFF ABOVE FINISH FLOOR	LWT LEAVING WATER TEMPERATURE
AHU AIR HANDLER UNIT	MAX MAXIMUM
AI ANALOG INPUT	MWH 1000 BTU PER HOUR
ALT ALTERNATE	MC MECHANICAL CONTRACTOR
AO ANALOG OUTPUT	MCA MINIMUM CIRCUIT AMPS
APPROX APPROXIMATE	MECH MECHANICAL
ARCH ARCHITECT, ARCHITECTURAL	MCA MINIMUM CIRCUIT AMPS
BDD BACK DRAFT DAMPER	MEN MINIMUM
BLDG BUILDING	MFR MANUFACTURER
BTUH BRITISH THERMAL UNIT PER HOUR	NTS NOT TO SCALE
C CENTER	OA OUTSIDE AIR
CD CEILING DIFFUSER	OC ON CENTER
CFM CUBIC FEET PER MINUTE	P PUMP
CO CLEAN OUT	PC PLUMBING CONTRACTOR
COND CONDENSATE	PLBG PLUMBING
CONT CONTINUOUS	PSI POUNDS PER SQUARE INCH
COP COEFFICIENT OF PERFORMANCE	QTY QUANTITY
DB DRY BULB	RA RETURN AIR
DET DETAIL	REQD REQUIRED
DG DOOR GRILLE	REV REVERSE OR REVISION
DI DIGITAL INPUT	RG RETURN AIR GRILLE
DIA OR # DIAMETER	RPM REVOLUTIONS PER MINUTE
DM DIMENSION	RTU ROOF TOP UNIT
DN DOWN	SA SUPPLY AIR
DO DIGITAL OUTPUT	SQFT SQUARE FEET
DWG DRAWING	SG SUPPLY GRILLE
EA EXHAUST AIR	SP STATIC PRESSURE
EAT ENTERING AIR TEMPERATURE	SPEC SPECIFICATIONS
EC ELECTRICAL CONTRACTOR	SS STAINLESS STEEL
EER ENERGY EFFICIENCY RATIO	T&B TEST AND BALANCE
EF EXHAUST FAN	TEMP TEMPERATURE OR TEMPORARY
EG EXHAUST GRILLE	TC TRANSFER GRILLE
ELEC ELECTRICAL	TYP TYPICAL
ELEV ENERGY RECOVERY VENTILATOR	V VOLT
ESP EXTERNAL STATIC PRESSURE	VAR VARIABLE OR VARIES
EXT ENTERING WATER TEMPERATURE	VEL VELOCITY
EXIST EXISTING	VFD VARIABLE FREQUENCY DRIVE
FA FRESH AIR	VTR VENT THRU ROOF
FBM FEET PER MINUTE	W/ WITH
FT FOOT (FEET)	W/JN WITHIN
GA GAUGE/GAGE	W/O WITH OUT
GAU GALVANIZED	WB WET BULB
GC GENERAL CONTRACTOR	WC WATER COLUMN (INCHES OF)
GPM GALLONS PER MINUTE	WT WEIGHT
GYP GYPSUM	
HORIZ HORIZONTAL	
HP HORSEPOWER	
HT HEIGHT	
I/O INPUT/OUTPUT	

MECHANICAL HVAC LEGEND		
EXHAUST AIR DUCT (DOWN)		EXHAUST AIR DUCT (UP)
RETURN AIR DUCT (DOWN)		RETURN AIR DUCT (UP)
OUTSIDE OR SUPPLY AIR DUCT (DOWN)		OUTSIDE OR SUPPLY AIR DUCT (UP)
DUCT SIZE		NEW DUCTWORK
FLEX DUCT		EXISTING DUCTWORK
DEMOLITION LINETYPE		SUPPLY AIR CEILING DIFFUSER
RETURN AIR GRILLE		EXHAUST AIR GRILLE
DIFFUSER, GRILLE, AND REGISTER CALL-OUTS		SCHEDULED EQUIPMENT TAG
MANUAL BALANCING DAMPER		PIPE PENETRATION THROUGH FIRE RATED WALL
FIRE DAMPER		SMOKE DAMPER
MOTORIZED DAMPER		FIRE/SMOKE DAMPER
THERMOSTAT		HUMIDISTAT
REMOTE SENSOR		CARBON DIOXIDE SENSOR
DUCT SMOKE DETECTOR		CARBON MONOXIDE SENSOR

MECHANICAL SHEET INDEX	
M000	MECHANICAL LEGEND AND NOTES
M101	MECHANICAL FLOORPLAN
M201	MECHANICAL ROOF PLAN
M501	MECHANICAL DETAILS
M601	MECHANICAL SCHEDULES
M602	MECHANICAL SCHEDULES
M603	MECHANICAL SCHEDULES
M604	MECHANICAL SCHEDULES
M605	MECHANICAL SCHEDULES

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Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
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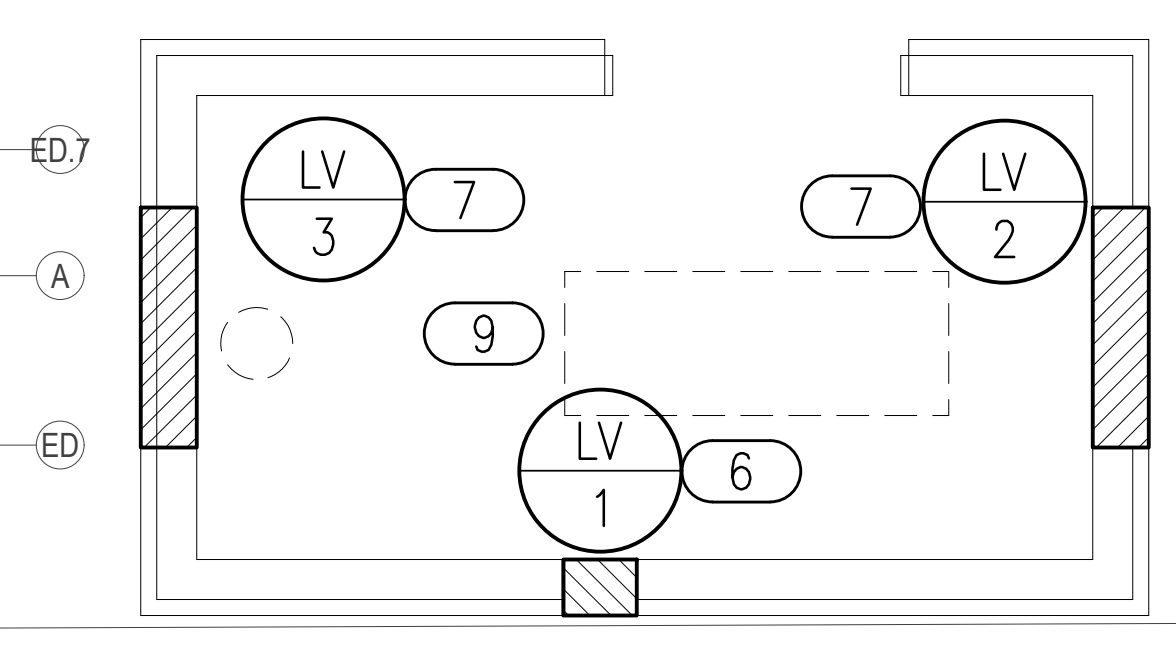
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GENERAL NOTES

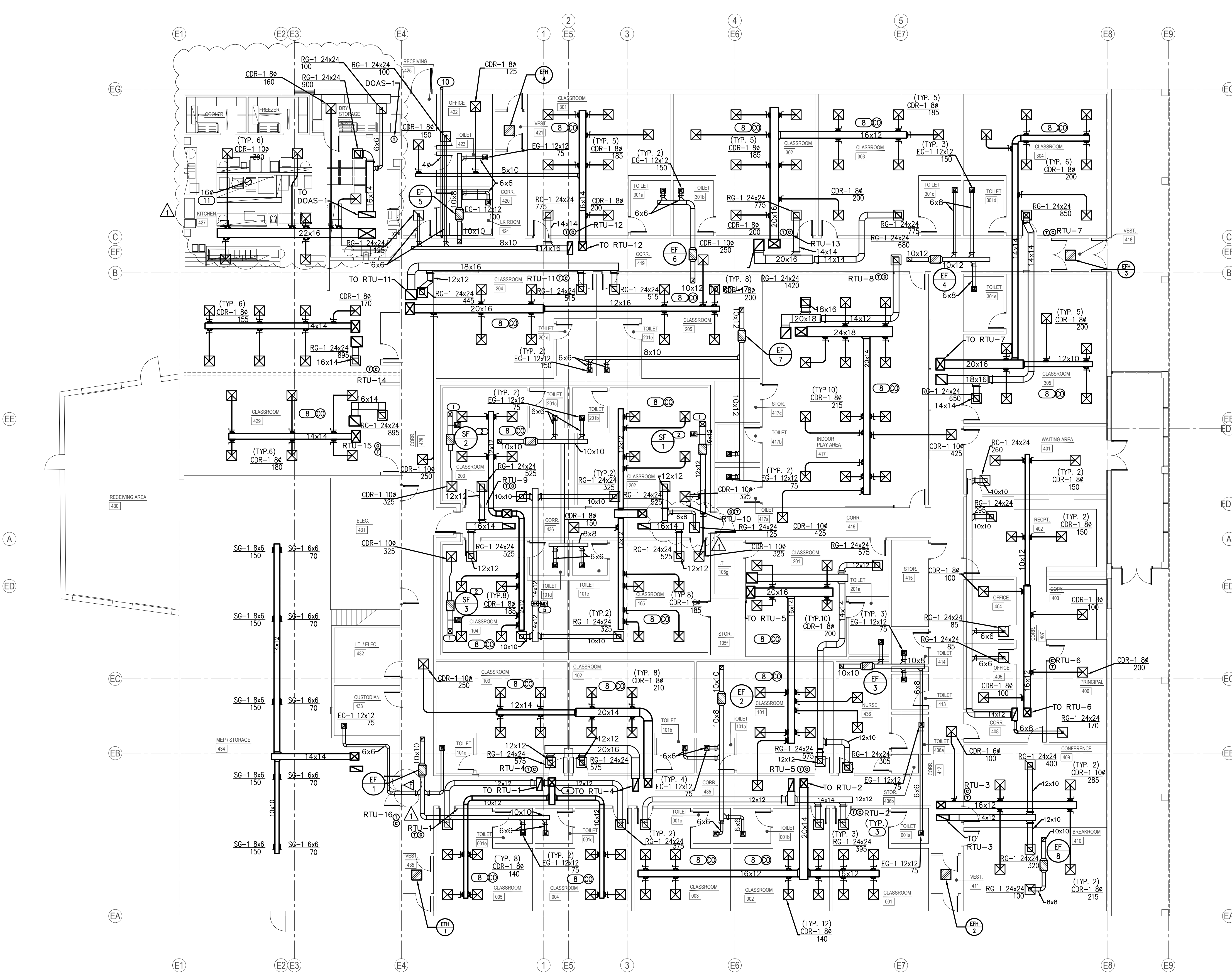
- COORDINATE INSTALLATION OF EQUIPMENT AND DUCTWORK WITH ALL TRADES.
- COORDINATE LOCATION OF THERMOSTATS WITH E.C. ROUGH-IN BY E.C.
- ALL PENETRATIONS OVER 3 1/2" SQUARE INCHES OR 2 1/16" INCHES IN DIAMETER IN/OUT OF SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
- M.C. IS RESPONSIBLE TO ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
- E.C. TO PROVIDE, LOCATE, AND INSTALL SWITCH FOR EMERGENCY VENTILATION FAN. M.C. SHALL PROVIDE CALL OUT LETTERING "EMERGENCY VENTILATION" ON PLACARD ABOVE SWITCH WITH 3/4" LETTERING FOR INSTALLATION BY GC. COORDINATE WITH GC AND EC.

KEYED NOTES

- ROOF HOOD IS PART OF EMERGENCY VENTILATION SYSTEM. DUCT UP 16X12 TO TRANSITION INTO ROOF HOOD OPENING 18X16.
- MOTORIZED DAMPER TO BE 120V CONNECTED TO EMERGENCY POWER. DAMPER SHALL OPEN WHEN SUPPLY FAN TURNS ON.
- PROVIDE LOCKABLE COVER FOR THERMOSTAT.
- DUCT 18X20 SUPPLY AND 12X28 RETURN UP TO RTU.
- ROOF HOOD PART OF THE EMERGENCY VENTILATION SYSTEM TO PROVIDE RELIEF AIR. MOTORIZED DAMPER SHALL OPERATE ON INVERTER. INTERLOCK WITH SF-1. DUCT DOWN TO 16X12.
- MOUNT BOTTOM OF LOUVER 8'-0" AFF.
- MOUNT BOTTOM OF LOUVER MINIMUM 18" AFF.
- CARBON MONOXIDE DETECTOR TO BE INSTALLED ACCORDING TO ALL APPLICABLE CODES. DETECTOR SHALL BE INSTALLED CENTRALLY ON CEILING. ALSO INCLUDE BATTERY BACKUP IN EVENT PRIMARY POWER IS INTERRUPTED. ALARM SIGNAL SHALL BE ROUTED TO ADMINISTRATION OFFICE. COORDINATE WITH E.C. WITH PRIMARY POWER CONNECTION AND SYSTEM CONNECTION.
- PROVIDE EXHAUST DUCT TO GENERATOR RADIATOR CONNECTION. COORDINATE DUCT SIZE WITH GENERATOR MANUFACTURER DRAWINGS.
- PROVIDE DRYER VENT EXHAUST HOOD TERMINATION AT EXTERIOR WALL IN ACCORDANCE WITH DRYER MANUFACTURER'S REQUIREMENTS. PROVIDE WALL CAP WITH BIRD FILTER.
- DUCT 14" DIA. UP TO ROOF EXHAUST FAN OPENING. TRANSITION TO HOOD COLLAR PER KITCHEN SPECIFICATIONS.
- DOAS UNIT SHALL CYCLE DOWN TO TEMPER KITCHEN WHILE HOODS ARE OFF.



2 MECHANICAL GENERATOR PLAN
SCALE: 1/4" = 1'-0"
NORTH

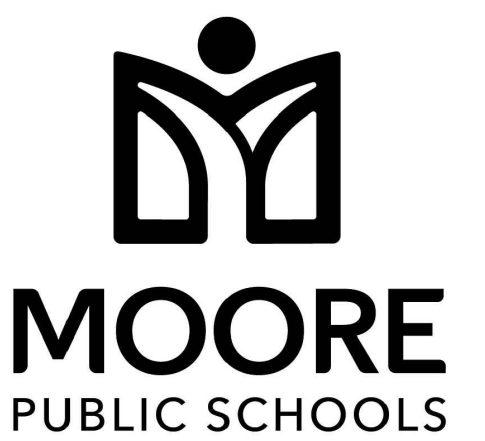


1 MECHANICAL FLOOR PLAN
SCALE: 3/32" = 1'-0"
NORTH

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CHILD CARE FACILITY
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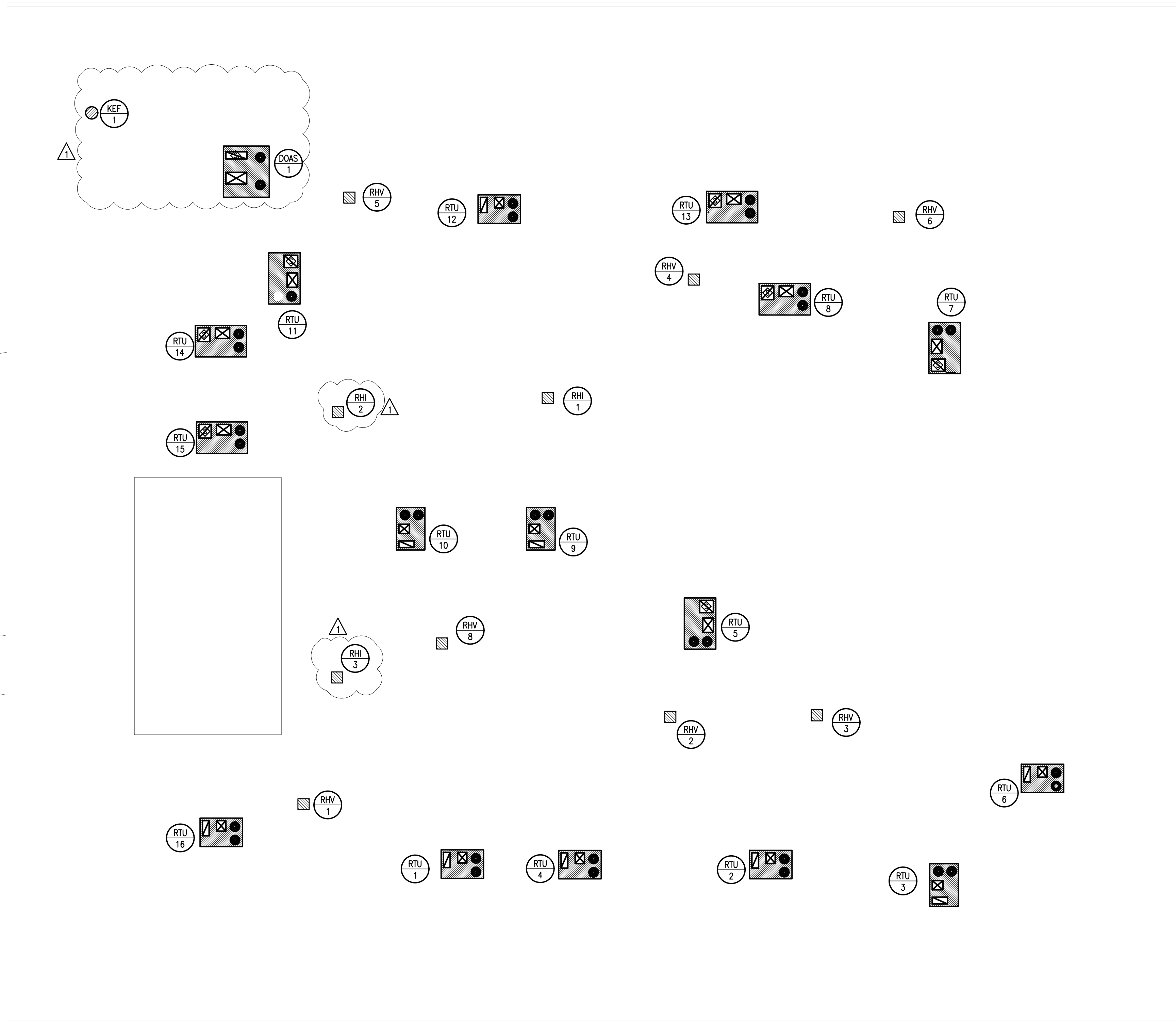
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GENERAL NOTES

1. ALL ROOF TOP EQUIPMENT TO BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ROOF EDGE.
2. MAINTAIN A MINIMUM OF 10'-0" HORIZONTAL CLEARANCE BETWEEN ALL EXHAUST OUTLETS AND ANY FRESH AIR INTAKES.
3. MOUNT ROOF CURBS LEVEL ON PITCHED ROOF.
4. ALL ROOF SUPPORT SYSTEMS ARE TO BE MANUFACTURED FOR THE ROOF MATERIAL/SYSTEM TO BE INSTALLED. REFER TO ARCH PLANS FOR THE ROOF SYSTEM. CURB INSTALLATION TO BE WARRANTIED BY ROOFING CONTRACTOR.
5. ALL PENETRATIONS OVER 3 1/2 SQUARE INCHES OR 2 1/16 INCHES IN DIAMETER IN/OUT OF THE SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
6. MC IS RESPONSIBLE FOR ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
7. ROUTE ALL CONDENSATE TO NEAREST OPEN SITE DRAIN.



1 MECHANICAL ROOF PLAN

SCALE: 3/32" = 1'-0"



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RTU	THROAT SIZE DIMENSION (IN)	THROAT AREA (SQ FT)	DAMPER BDD OR MOD	CONSTRUCTION	MANUFACTURER & MODEL NO.	COMMENTS	NOTES
RHH-1	14X14	1.36	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHH-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHH-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-1	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-4	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-5	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-6	10X10	0.69	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3
RHV-7	14X14	1.36	MOD	ALUMINUM	GREENHECK FGI	COLOR BY ARCHITECT	1-3

NOTES:
1. M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
2. M.C. SHALL PROVIDE ROOF HOOD WITH ALUMINUM BRASS SCREEN.
3. M.C. SHALL PROVIDE ROOF CURB, CURB INSTALLATION BY G.C.
4. M.C. SHALL PROVIDE LOW VOLTAGE MOTORIZED DAMPER.

CONNECTED TO	SIZE (IN)	MINIMUM FREE AREA (SQ FT)	FLANGE	CONSTRUCTION	INCLUDE MOD	MANUFACTURER AND MODEL NUMBER	COMMENTS	NOTES
1 GEN ENCLOSURE	18X18	0.71	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
2 GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
3 GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	-	GREENHECK AFL-501	5" FEMA RATED LOUVER- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2

NOTES:
1. M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
2. PROVIDE PAINTED KYNAR FINISH COLOR BY ARCHITECT.
3. PROVIDE BRD SCREEN.

EXHAUST		OUTDOOR AIR	
SOURCE	CFM	SOURCE	CFM
KEF-1	2500	DOAS-1	2400
EF-1	225	RTU-1	350
EF-2	300	RTU-2	520
EF-3	375	RTU-3	280
EF-4	450	RTU-4	535
EF-5	300	RTU-5	645
EF-6	175	RTU-6	205
EF-7	300	RTU-7	700
EF-8	100	RTU-8	900
-	-	RTU-9	450
-	-	RTU-10	535
-	-	RTU-11	625
-	-	RTU-12	400
-	-	RTU-13	710
-	-	RTU-14	205
-	-	RTU-15	205
-	-	RTU-16	205
TOTAL:	4725		9870

RTU	LOCATION	INPUT MBH	OUTPUT MBH	COOLING NOMINAL TONS	MIN. EER	CAPACITY STAGES	TOTAL CFM	MIN. F.A. CFM	ELEC. CHGR	MCA	MOCP	ESP (IN)	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES
1	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	350	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
2	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1680	520	208 / 3	26	40	1.0	905	LENNOX LGM3605E	1,2,4-12
3	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	280	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
4	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM3605E	1,2,4-12
5	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2100	645	208 / 3	46	50	1.0	1500	LENNOX LGM3605E	1-12
6	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
7	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2200	700	208 / 3	46	50	1.0	1500	LENNOX LGM3605E	1-12
8	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	3000	900	208 / 3	48	50	1.0	1500	LENNOX LGM10205E	1-12
9	ROOF-SEE PLANS	108	87	4	13.2	2(H)/1(C)	1500	450	208 / 3	25	35	1.0	905	LENNOX LGM3605E	1,2,4-12
10	ROOF-SEE PLANS	108	87	5	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM3605E	1,2,4-12
11	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2100	625	208 / 3	46	50	1.0	1500	LENNOX LGM3605E	1-12
12	ROOF-SEE PLANS	108	87	4	13.2	2(H)/1(C)	1400	400	208 / 3	25	35	1.0	905	LENNOX LGM3605E	1,2,4-12
13	ROOF-SEE PLANS	180	144	7.5	12.5	2(H)/1(C)	2200	710	208 / 3	46	50	1.0	1500	LENNOX LGM3605E	1-12
14	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
15	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12
16	ROOF-SEE PLANS	65	52	3	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM3605E	1,2,4-12

NOTES:
1. M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
2. PROVIDE FACTORY-INSTALLED UNIT DISCONNECT SWITCH.
3. PROVIDE FACTORY-INSTALLED RETURN DUCT SMOKE DETECTOR WITH REMOTE TEST STATION TO BE LOCATED IN OCCUPIED SPACE. INSTALLATION OF REMOTE TEST STATION AND CONNECTION TO FIRE ALARM SYSTEM BY E.C.
4. PROVIDE FACTORY-INSTALLED 120V GFCI CONVENIENCE OUTLET. GFCI POWERED FROM UNIT. RECEPTACLE SHALL BE COMPLIANT WITH NEC 210.83.
5. PROVIDE ANTI-SHORT CYCLE TIMER AND LOW AMBIENT CONTROLS.
6. PROVIDE FACTORY ROOF CURB SO THAT THE BOTTOM OF THE ROOFTOP UNIT IS A MINIMUM OF 14" ABOVE FINISHED ROOF. ROOF MOUNT LEVEL ON SLOPED ROOF.
7. PROVIDE HINGED AND TOOL-LESS ACCESS DOORS.
8. PROVIDE PHASE MONITOR.
9. PROVIDE FULL ENTHALPY ECONOMIZER WITH POWERED EXHAUST.
10. PROVIDE DIGITAL, W-FI ACCESSIBLE 7-DAY PROGRAMMABLE THERMOSTAT WITH OCCUPIED/OCCUPIED SETTINGS CAPABLE OF CONTROLLING THE 1/3 STAGES OF SPECIFIED UNIT.
11. PROVIDE UNIT WITH HORH.
12. MODULATE OUTSIDE AIR BASED ON DEMAND REPORTED BY CO2 SENSOR.

PLAN SYMBOL	DESCRIPTION	MANUFACTURER & MODEL NO.	MATERIAL	FINISH	NOISE CRITERIA
GR-1	SQUARE FACE, ROUND NECK, 4-WAY DEFLECTION CEILING DIFFUSER, SPRING LOCK INNER CORE, FOR LAY-IN CEILING INSTALLATION.	PRICE 520	STEEL	WHITE	-
SG-1	DOUBLE DEFLECTION SIDEWALL GRILLE, ADJUSTABLE DEFLECTION BLADES, 3/4" O.C. FLAT FRAME WITH 1 1/4" MARGIN, HORIZONTAL FRONT.	PRICE 520	STEEL	COLOR BY ARCHITECT	-
RG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	-
RG-2	SQUARE PATTERN GRILLE, ZERO DEGREE DEFLECTION, FLAT STEEL FRAME WITH 1 1/4" BORDER, FOR SURFACE MOUNT INSTALLATION.	PRICE 80	STEEL	WHITE	-
EG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	-

NOTES:
SEE PLANS FOR QUANTITY AND SIZES.
M.C. TO FIELD VERIFY CEILING TYPE FOR ALL GRD BEFORE PURCHASING EQUIPMENT. PROVIDE REQUIRED MOUNTING.

SYSTEM	LOW PRESSURE			MED. PRESS.			HIGH PRESS.			INSULATION			NOTES
	MAX. PRES.	SEAL A	SEAL B	MAX. PRES.	SEAL A	SEAL B	MAX. PRES.	SEAL A	SEAL B	INTERNAL	THICKNESS	EXTERNAL	
SUPPLY AIR WITHIN 10' OF UNIT	2"	X	-	-	-	-	-	-	-	YES	1"	NO	-
SUPPLY AIR BEYOND 10' OF UNIT	2"	X	-	-	-	-	-	-	-	NO	-	YES	2" FSK
RETURN AIR WITHIN 10' OF UNIT	2"	-	X	-	-	-	-	-	-	YES	1"	NO	-
RETURN AIR BEYOND 10' OF UNIT	2"	-	X	-	-	-	-	-	-	NO	-	YES	2" FSK
OUTSIDE AIR/MIXED AIR	2"	-	X	-	-	-	-	-	-	NO	-	YES	3" FSK
EXHAUST AIR	2"	-	X	-	-	-	-	-	-	NO	-	YES	2" FSK
GREASE AIR	2"	X	-	-	-	-	-	-	-	NO	-	YES	SEE NOTE 1

NOTES:
1. PROVIDE CODE-COMPLIANT FIRE WRAP.

CFM	SP	FAN RPM	ELECTRICAL				DAMPER BDD OR MOD	DRIVE	FAN TYPE	INTERLOCK/CONTROL	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES		
			VOLTAGE & PHASE	H.P.	FLA/AMPS	MCA								MOCP	
EF-1	225	0.5	1253	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-2	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-3	375	0.5	1435	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-4	450	0.5	1532	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-99-VG	1,2,3
EF-5	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-6	175	0.5	1489	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-97-VG	1,2,3
EF-7	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-8	100	0.3	1670	115/1	0.07	1.3	2	15	BDD	DIRECT	INLINE	SWITCH	30	GREENHECK SO-60-VG	1,2,3
SF-1	750	0.5	1089	115/1	0.5	6.4	8	15	MOD	DIRECT	INLINE	SWITCH	65	GREENHECK SO-120-VG	4-7
SF-2	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	4-7
SF-3	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	4-7

NOTES:
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2. PROVIDE ELECTRONIC SPEED CONTROL MOUNTED ABOVE ACCESSIBLE CEILING.
3. M.C. SHALL PROVIDE AND INSTALL LOW VOLTAGE MOTORIZED DAMPER.
4. OPERATION OF DEVICE ON OCCUPIED MODE OF RTU OR SWITCH WITH LIGHTS. SEE INTERLOCK/CONTROL COLUMN FOR TYPE.
5. PROVIDE UNIT MOUNTED DISCONNECT.
6. FAN AND MOTORIZED DAMPER ARE PART OF EMERGENCY POWER SYSTEM. COORDINATE ALL CIRCUITS WITH E.C.
7. ALL WIRING TO FAN AND DAMPER SHALL BE BY E.C.
8. PROVIDE 120 V DAMPER.

ROOM NO.	CFM	WALL OR CEILING	KW	MOUNTING	ELECTRICAL CHGR	AMPS	SPEEDS	CONTROL	RPM	MANUFACTURER & MODEL NUMBER	NOTES	
1	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
2	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
3	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
4	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3

NOTES:
1. M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
2. PROVIDE INTERNAL THERMOSTAT.
3. RECESSED MOUNTED UNIT. PROVIDE RECESSED MOUNTING KIT.
4. PROVIDE BUILT-IN DISCONNECT.



KF
drawn by
DG
checked by
OCTOBER 2024
date
revisions
11/22/2024 AD 02



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
M602

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EXHAUST FAN INFORMATION - JOB#7174241

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	KEF-1	1	DU180HFA	CAPTIVEAIRE	2500	1.700	1307	TEFC,PREMIUM	2.000	1.4750	3	208	7.3	577 FPM	200	18.4

FAN ACCESSORIES

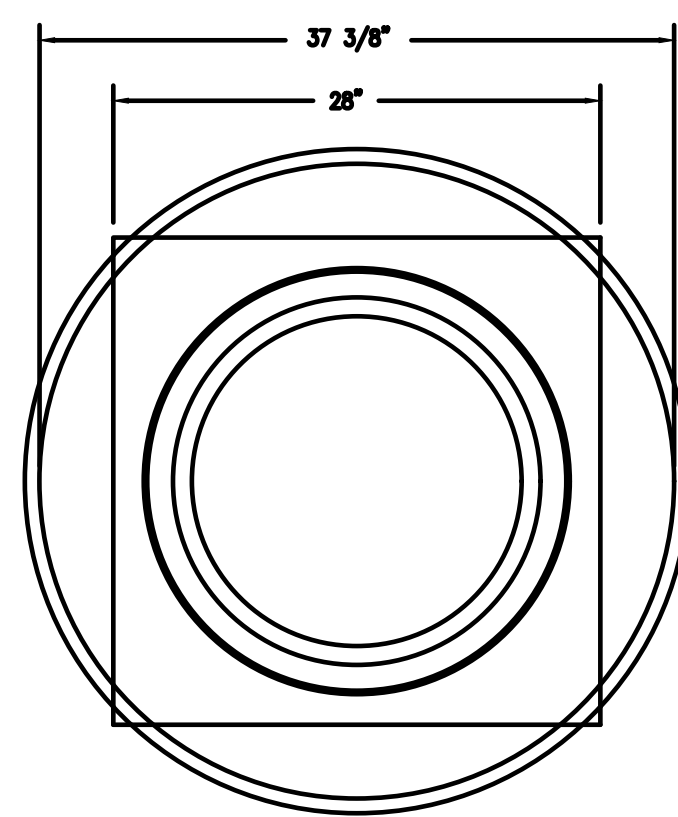
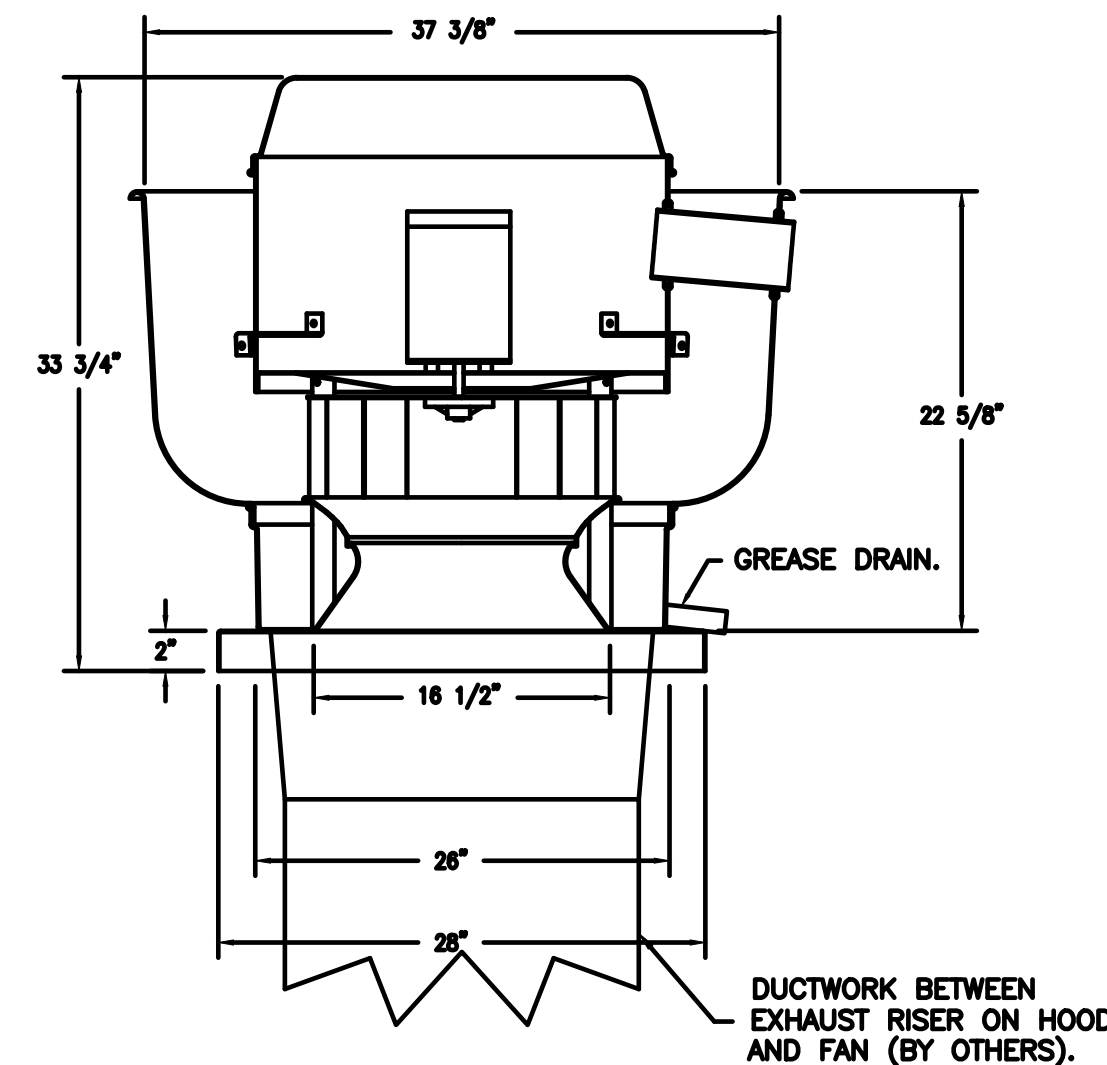
FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	KEF-1	YES						

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	52 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2	DOAS-01	130 LBS	CURB	59.500"W X 91.000"L X 20.000"H 0.250:12.000 PITCH ALONG WIDTH, RIGHT INSULATED.

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #2	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55
FAN #2	HMI #2 - SPACE		AVERAGED	56

FAN #1 DU180HFA - EXHAUST FAN (KEF-1)



TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL782 AND ULC-S845
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST

EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

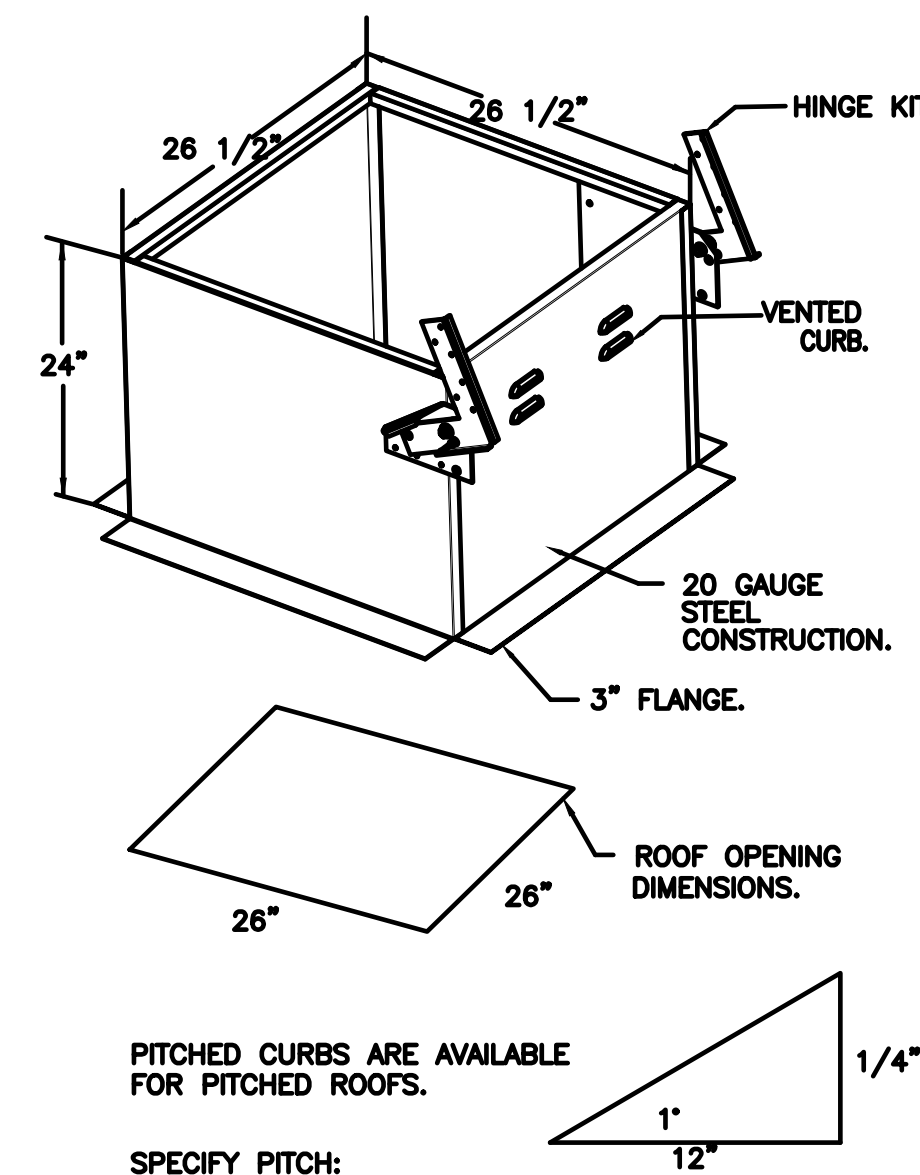
ABNORMAL FLARE-UP TEST

EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX.
- FAN BASE CERAMIC SEAL - DU/DR180HFA
- INSTALLED AT PLANT - FOR GREASE DUCTS.
- 2 YEAR PARTS WARRANTY.

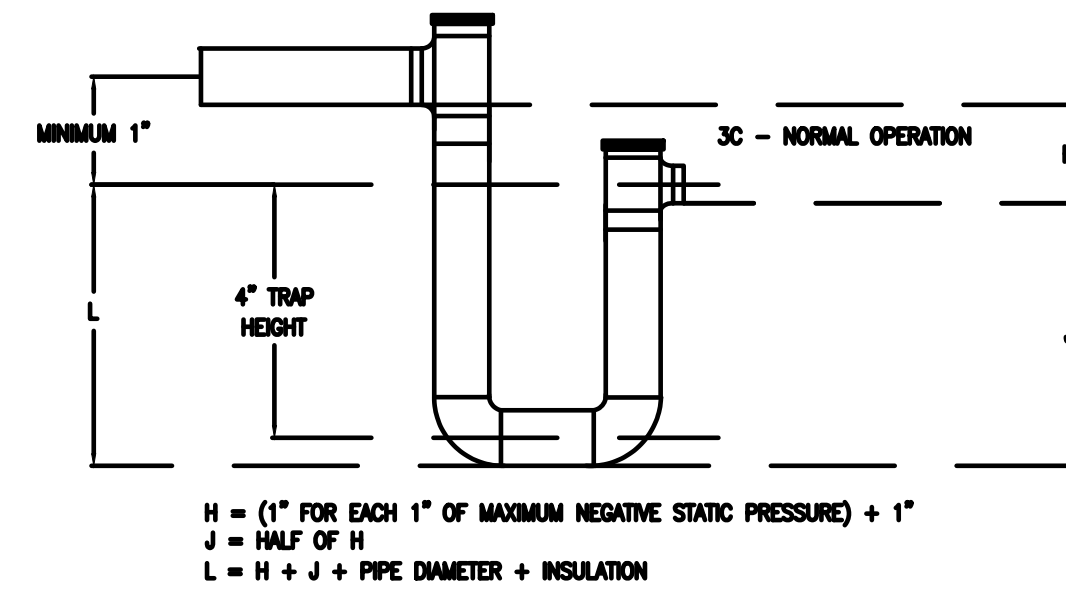
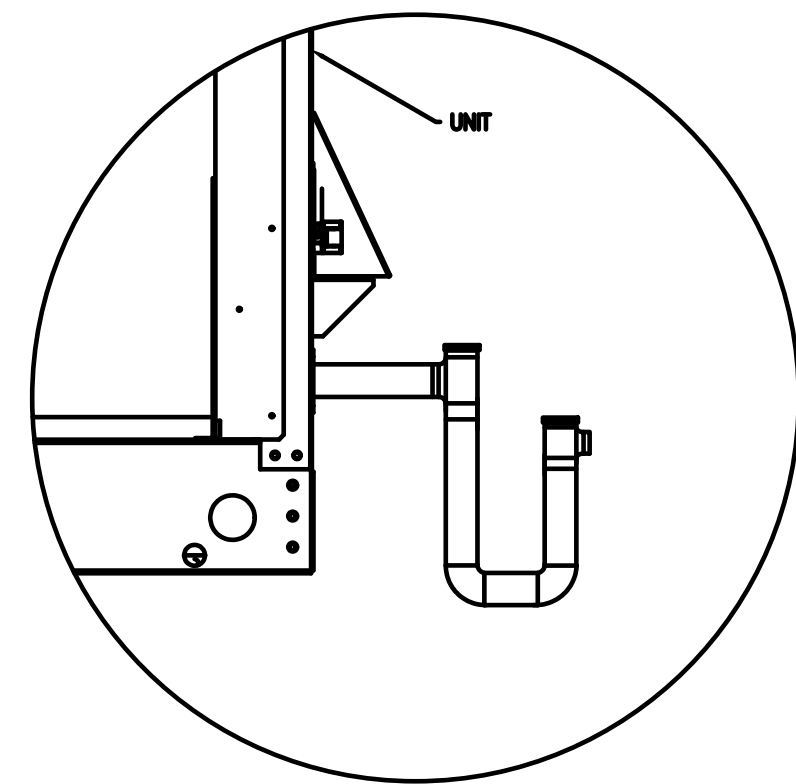
DUCTWORK BETWEEN EXHAUST RISER ON HOOD AND FAN (BY OTHERS).



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.

RU CONDENSATE DRAIN TRAP DETAIL



GREASE DUCT & CHIMNEY SPECIFICATIONS:
 PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.
 PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".
 DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.
 IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

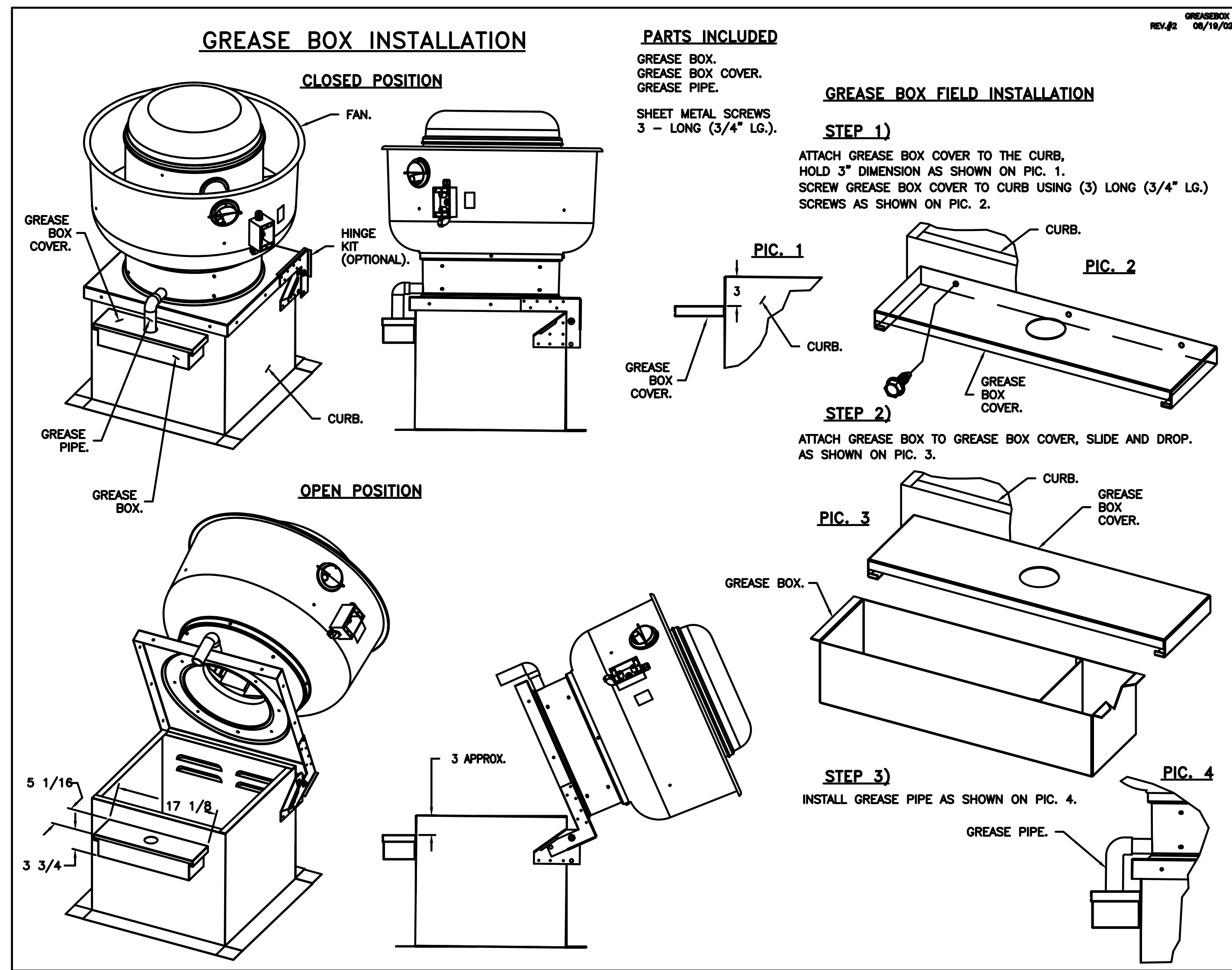
CUSTOMER APPROVAL TO MANUFACTURE:

APPROVED AS NOTED	<input type="checkbox"/>
APPROVED WITH NO EXCEPTION TAKEN	<input type="checkbox"/>
REVISE AND RESUBMIT	<input type="checkbox"/>
SIGNATURE _____	_____
YOUR TITLE _____	DATE _____

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KFC ENGINEERING
 STRUCTURAL

SALAS O'BRIEN
 MECHANICAL / ELECTRICAL



NOTE: III 705 INSTALL

KF
 drawn by
 DG
 checked by
 OCTOBER 2024
 date
 revisions
 11/22/2024 AD 02



CHILD CARE FACILITY
 201 N. EASTERN AVE.

sheet no:
M603

Salas O'Brien
 2900 S. Telephone Road, Suite 120
 Moore, OK 73160
 Salas O'Brien Registration: CA# 7058
 Expiration Date: 6/30/2025
 Salas O'Brien Project Number: 2450-70304-00

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DOAS/RTU FAN SCHEDULE - JOB#7174241

FAN UNIT NO	TAG	QTY	DOAS/RTU MODEL #	FAN INFORMATION										ELECTRICAL INFORMATION										COOLING INFORMATION										REHEAT INFORMATION										GAS HEAT INFORMATION										A2L MINIMUM ROOM VOLUME			NOTES
				MANUFACTURER	BLOWER	RETURN AIR CFM	MAX OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	HP	PHASE	VOLT	MCA	MOCP	OUTSIDE AIR		MIXED AIR		LEAVING AIR		CAPACITY		IEER	ISMRE	DISCHARGE		CAPACITY		MOISTURE REMOVAL RATE	GAS TYPE	INPUT BTU _s	OUTPUT BTU _s	TEMP RISE	REQUIRED INPUT GAS PRESSURE	ROOM AREA (FT ²)	AIRFLOW (CFM)	HEIGHT (FT)																			
																DB	WB	DB	WB	DB	WB	DP	TOTAL			SENS.	DB	WB	DESIRED										MAX	DB	WB																
2	DOAS-01	1	CAS-HVAC3-L250-15-15T	CAPTIVEAIRE	15P-3	0	2400	2400	2585	0.500	1.50	3	208	57.1A	60A	104.0F	79.0F	104.0F	79.0F	52.9F	52.4F	52.1F	204.7 MBH	121.3 MBH	18.8	5.7	70.0F	59.0F	44.2 MBH	129.6 MBH	75.5 LBS/HR	NATURAL	207407	168000	61F	7 IN. W.C. - 14 IN. W.C.	602.1	1084	7.2	1-16																	

- NOTES:**
1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
 2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
 3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
 4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
 5. ECM MOTOR CONDENSING FANS
 6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
 7. SUCTION LINE ACCUMULATOR
 8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
 9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
 10. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE
 11. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 15:1 TURNDOWN WITH NG AND 12:1 TURNDOWN WITH LP
 12. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
 13. FULLY MODULATING HOT GAS REHEAT
 14. HAIL GUARD FOR CONDENSING COIL
 15. DOWN DISCHARGE/DOWN RETURN
 16. MINIMUM ROOM AREA ASSUMED 7.2' SUPPLY DIFFUSER HEIGHT AND IS CALCULATED PER UL60335-2-40 4TH ED. VALUES BASED ON FACTORY CHARGE. ACTUAL SITE CHARGE MAY DIFFER.

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - DU/DR180HFA - INSTALLED AT PLANT - FOR GREASE DUCTS
2	DOAS-01	1	2 YEAR PARTS WARRANTY
		1	INLET PRESSURE GAUGE, 0-35"
		1	SHIP LOOSE GAS STRAINER 1"
		1	SINGLE POINT ELECTRICAL CONNECTION FOR RTU, 750VA TRANSFORMER USED. IF A NON-DCV PREWIRED CONTROLS THIS UNIT, THE #28, #47, "MA", OR "E2" PREWIRED OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRED
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED
		1	RTU3 DOWN DISCHARGE
		1	2" MERV 13 FILTERS FOR RTU3 (QTY. 4)
		1	2" MERV 8 FILTERS FOR RTU3 (QTY. 4)
		1	OVERHEAT STAT
		1	TOTAL CFM MONITORING
		1	OCCUPIED SCHEDULING
		1	INTAKE FIRESTAT SET TO 135F
		1	FREZEZSTAT
		1	DISCHARGE FIRESTAT SET TO 240F
		1	RTU3 CURB DUCT HANGER
		1	24VAC FIRE INPUT
		1	RTU RETURN MOUNTED SMOKE DETECTOR AND SAMPLING TUBE - FACTORY INSTALLED
		1	HIGH TURNDOWN OPTION FOR DOAS UNITS
		1	MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 2 FURNACES
		1	CLOGGED FILTER SWITCH - NOTIFICATION ON HMI
		1	RTU3 CONVENIENCE OUTLET (GFCI), 15 AMP - REQUIRES SEPARATE 120V CONNECTION. INCLUDES RECEPTACLE, COVER AND J-BOX
		1	RTU INTAKE/RETURN DAMPER - MANUAL CONTROL VIA HMI
		1	RTU3 DOWN RETURN
		1	RTU3 HAIL GUARD
		1	R454B - 15 TON MODULATING COOLING OPTION, 208/230V. R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS
		1	R454B LEAK DETECTOR OPTION FOR RTU3
		1	R454B - 15 TON MODULATING REHEAT OPTION - SPACE DEWPOINT CONTROL - R454B
		1	UNIT MOUNTED VFD CONFIGURED FOR DCV
1	5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS)		
1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET		

KFC ENGINEERING

STRUCTURAL

SALAS O'BRIEN

MECHANICAL / ELECTRICAL



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CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
M604

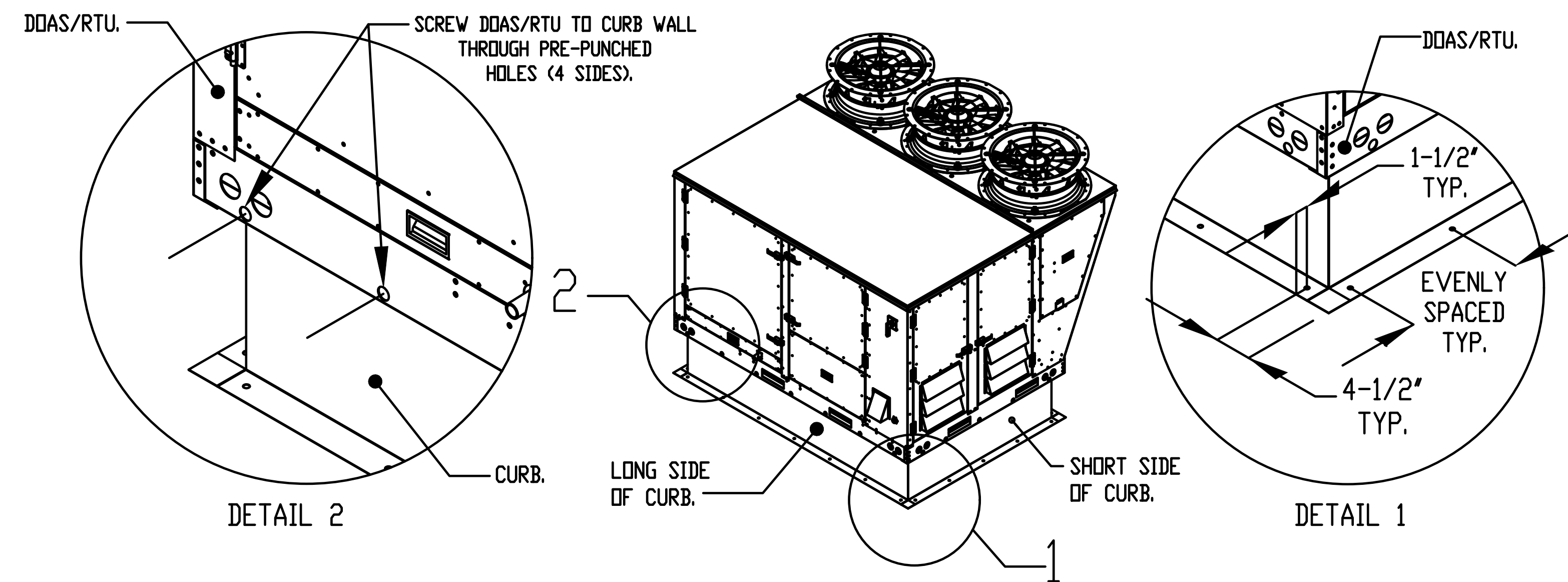
Salas O'Brien
2800 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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TYPICAL DOAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

1. SECURE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW. USING 3/8" X 2" ZINC PLATED STEEL LAG BOLTS, AND ZINC PLATED WASHERS, SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF (5) LAG BOLTS ON EACH SHORT SIDE, AND (7) LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
2. SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4"-14 X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.



AIR DIFFUSION SUPPLY DUCT SPECIFICATIONS:
 PROVIDE AIR DIFFUSION SUPPLY DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL DW-S0(HC), DW-S90(HC), & DW-S180(HC).
 THREE DISTINCT HOLE PATTERN OPTIONS TO COVER A VARIETY OF CEILING HEIGHTS.
 NO ADDITIONAL DIFFUSERS REQUIRED, AS THE DUCT ITSELF PROVIDES AIR DIFFUSION.
 MADE OF HIGH QUALITY STAINLESS STEEL DESIGNED TO LAST 20+ YEARS.
 HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 24 GAUGE, 430 SS - 5" THRU 24".
 HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 20 GAUGE, 430 SS - 26" THRU 36".
 QUICK ONSITE ASSEMBLY USING EPDM GASKETS & UNIVERSAL V-BANDS.
 DOUBLE WALL SUPPLY DUCT AVAILABLE FOR INTERIOR AND EXTERIOR SPACES, EITHER CONDITIONED OR UNCONDITIONED.
 DOUBLE WALL SUPPLY DUCT AVAILABLE IN DW-1S, DW-2S, & DW-3S TO MEET SPECIFIC REGIONAL "R" VALUE REQUIREMENTS.

Insulation R-Value Recommendations		
Supply Duct Type	Minimum R-value	Space Type
Single Wall - S & -HC	N/A	Conditioned Space Only
Double Wall - 1S	R-4	Unconditioned Interior Space Only
Double Wall - 2S	R-8	Unconditioned Space Climate Zones 1-4
Double Wall - 3S	R-12	Unconditioned Space Climate Zones 5-8

DOUBLE WALL SUPPLY DUCT IS INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.
 AIR DIFFUSION SUPPLY DUCT COMPLIES WITH SMACNA (SHEET METAL AND AIR CONDITIONING CONTRACTORS) BEST PRACTICES.
 POSITIONING OF SPRINKLERS TO AVOID OBSTRUCTION TO DISCHARGE, SEE NFPA 13, TABLE 8.12.5.1.1.

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CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

M605



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GENERAL NOTES	
1.	COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
2.	FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
3.	PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
4.	COORDINATE ALL BELOW GRADE NATURAL GAS PIPE ROUTING WITH EXISTING SITE CONDITIONS.

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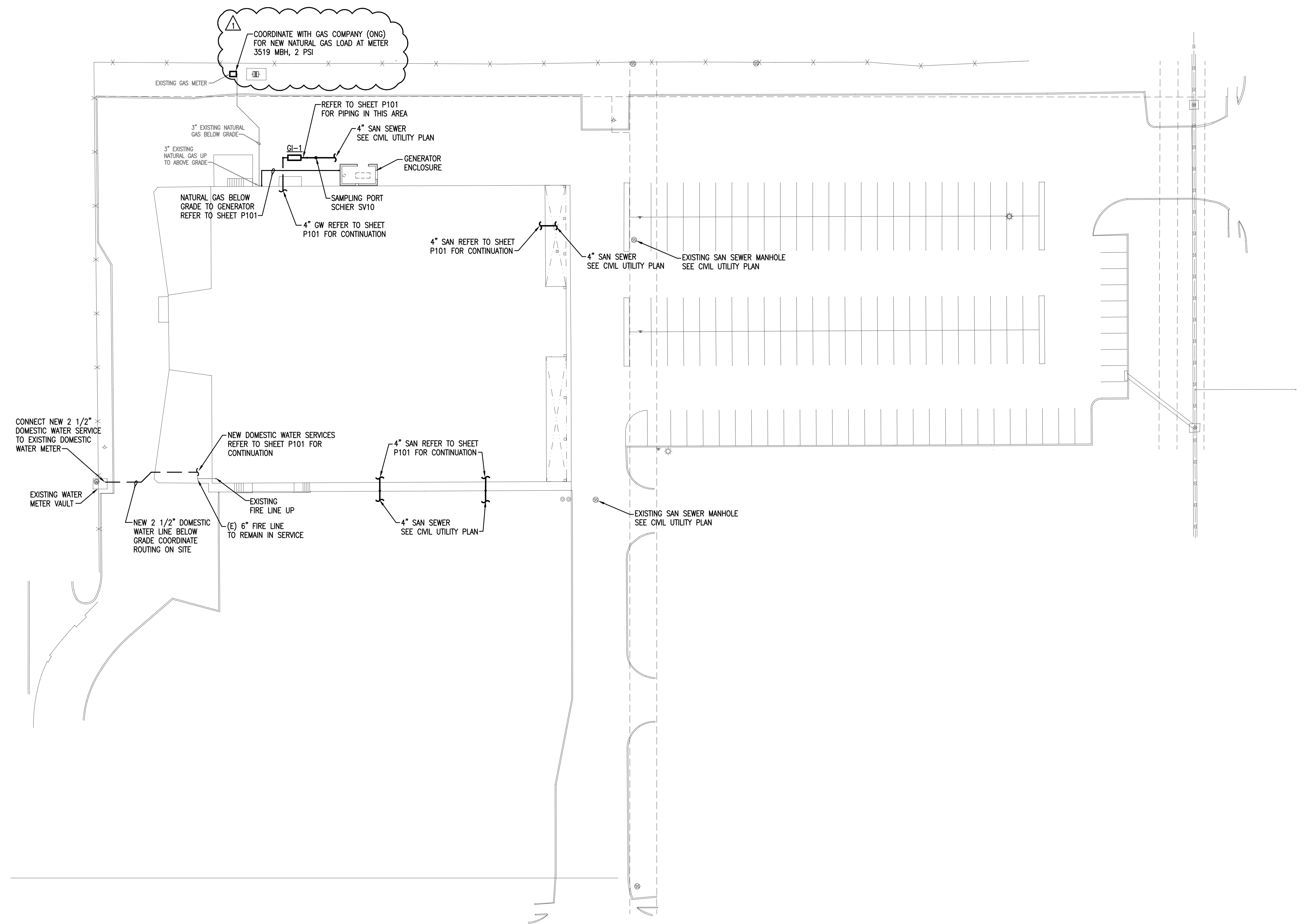


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1 PLUMBING SITE PLAN
SCALE: 1/32" = 1'-0"



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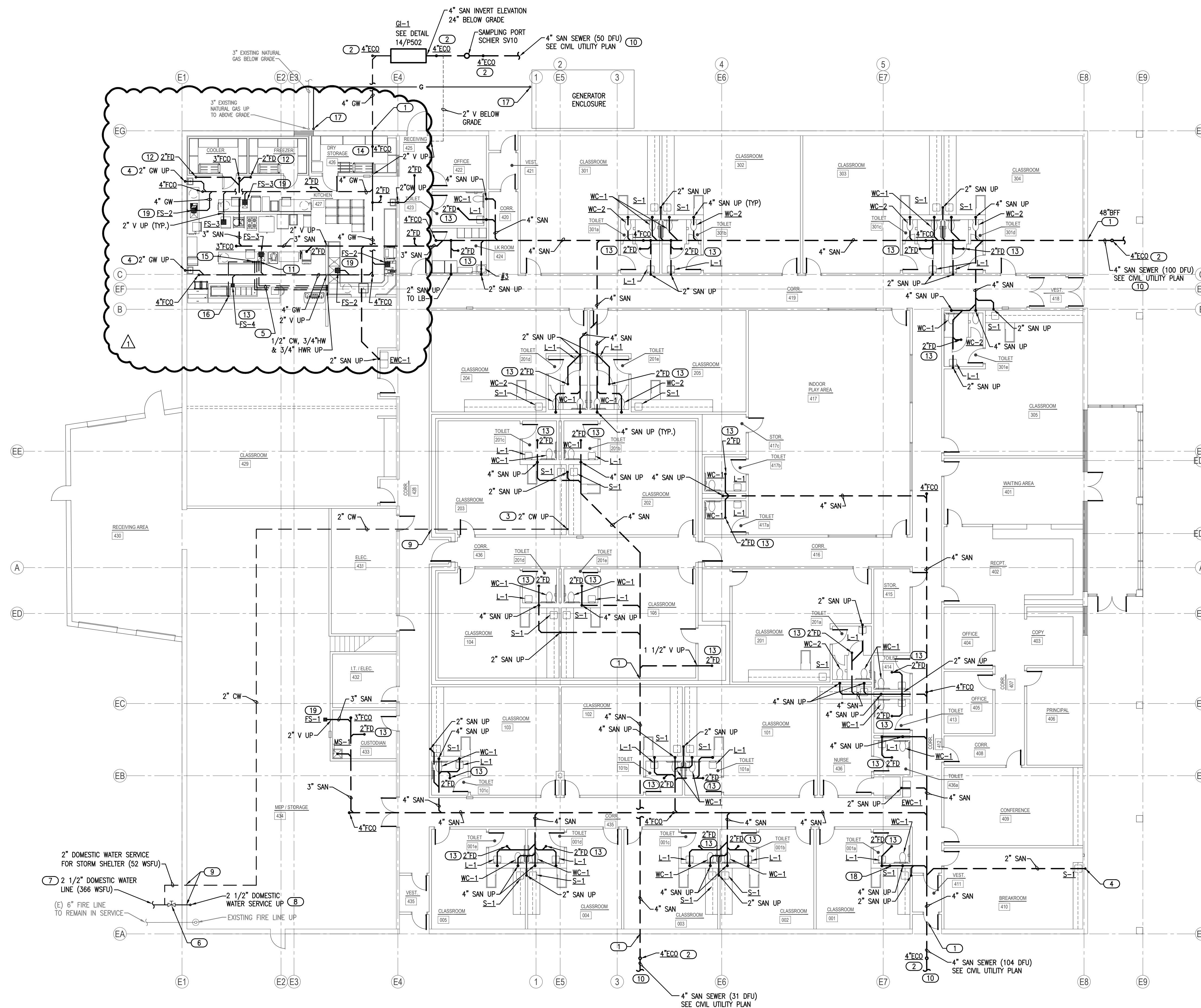
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GENERAL NOTES

- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
- COORDINATE ALL BELOW GRADE PIPE ROUTING WITH STRUCTURAL FOUNDATIONS AND REQUIRED PIPE SLEEVES THRU FOUNDATION PENETRATIONS.
- FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
- PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
- REFER TO PLUMBING FIXTURE SCHEDULE ON SHEET P601 FOR FIXTURE ROUGH-IN PIPE SIZES. REFER TO ISOMETRIC SHEETS P301 AND P302 FOR ADDITIONAL PIPE SIZES.
- PIPE TRENCHES SHALL HAVE SAND BEDDING TO A MINIMUM POINT 6" ABOVE THE TOP OF PIPE. REFER TO SPECIFICATIONS.
- TRAP PRIMER LINES SHALL BE COPPER TYPE "K" OR PEX-g TUBING WITH CONTINUOUS SLOPE TOWARDS DRAIN CONNECTION.
- COORDINATE WITH GENERAL CONTRACTOR FOR ALL REQUIRED FLOOR CUTTING AND PATCHING TO INSTALL NEW BELOW GRADE/FLOOR PIPING.
- INSTALL TRAP PRIMER LINES TO ALL FLOOR DRAINS AND FLOOR SINKS. SEE DETAIL 1/P501.

KEYED NOTES

- PROVIDE CAST IRON PIPE SLEEVE FOR SANITARY OR GREASE WASTE PIPE BELOW OR THRU FOUNDATION WALL OR GRADE BEAM. INSTALL FOAM SPACER BLOCKS TO MAINTAIN PIPE IN CENTER OF SLEEVE. COORDINATE PIPE SLEEVE INSTALLATION WITH STRUCTURAL.
- INSTALL 4" EXTERIOR CLEANOUT IN CONCRETE PAD AT GRADE. COORDINATE INVERT ELEVATION WITH CIVIL. SEE DETAIL 4/P501.
- INSTALL PVC PIPE SLEEVE THRU CONCRETE FLOOR AND STUB UP 2" AFF FOR WATER LINE. INSTALL FOAM PIPE INSULATION ON WATER LINE IN SLEEVE. SEAL SLEEVE OPENINGS WATERTIGHT.
- ROUTE 2" SANITARY OR GREASE WASTE UP INTO FUR OUT OF EXISTING CMU WALL. COORDINATE PIPE ROUTING WITH EXISTING WALL FOOTING.
- ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR (PEX-g TUBING) BELOW FLOOR TO COOK'S TABLE PREP SINK.
- INSTALL DOMESTIC WATER CURB STOP IN NEW WATER SERVICE WITH ACCESS COVER AT GRADE.
- REMOVE EXISTING BELOW GRADE 1 1/2" DOMESTIC WATER SERVICE PIPE FROM BUILDING OUT TO WATER METER CONNECTION. REPLACE WITH 2 1/2" PIPE. COORDINATE WORK WITH SITE CONTRACTOR AND CITY WATER UTILITY DEPARTMENT. SEE SHEET P001 FOR CONTINUATION.
- REMOVE EXISTING 1 1/2" DOMESTIC WATER SERVICE PIPE AND REPLACE WITH 2 1/2" PIPE. INSTALL PIPE IN PVC PIPE SLEEVE THRU CONCRETE FLOOR. INSULATE PIPE IN SLEEVE WITH CELLULAR FOAM INSULATION.
- COORDINATE WITH STRUCTURAL FOR ROUTING WATER LINE IN PIPE SLEEVE THRU FOOTING OR FOUNDATION WALL IN THIS AREA.
- COORDINATE 4" SANITARY SEWER CONNECTION TO EXISTING SEWER MANHOLE WITH SITE CONTRACTOR.
- ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR (PEX-g TUBING) FROM BELOW FLOOR UP TO SERVE COOK'S TABLE PREP SINK. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINES WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
- INSTALL FUNNEL FASTENED TO STRAINER FOR CONDENSATE DRAIN LINES FROM FREEZER AND COOLER. MINIMUM FUNNEL HEIGHT 3" AND TOP DIAMETER 4". PROVIDE TRAP PRIMER LINE TO FLOOR DRAIN.
- INSTALL TRAP PRIMER LINE TO FLOOR DRAIN. SEE DETAIL 1/P501.
- INSTALL 4" FLOOR CLEANOUT AND ROUTE 4" GREASE WASTE DOWN AND THRU EXISTING WALL FOOTING. COORDINATE WITH STRUCTURAL.
- ROUTE 1/2" HW (PEX-g TUBING) FROM BELOW FLOOR UP TO HW LINE SERVING SINK. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINE WITH FOAM INSULATION IN SLEEVE.
- ROUTE 1/2" HW (PEX-g TUBING) FROM BELOW FLOOR UP SERVING FOOD WELL FAUCET. INSTALL PIPE SLEEVE AT FLOOR PENETRATION FOR WATER LINES. INSULATE WATER LINE WITH FOAM INSULATION IN SLEEVE. SEE SHEET P110 FOR CONTINUATION.
- INSTALL 1" NATURAL GAS (2 PSI) ANODELESS GAS RISER FOR TRANSITION FROM BELOW GRADE MOPE TUBING TO ABOVE GRADE BLACK IRON PIPE. COORDINATE LOCATION ON SITE.
- ROUTE 3" SANITARY UP TO OPEN SITE DRAIN IN CHASE FOR CONDENSATE DRAIN LINES.
- ROUTE TRAP PRIMER LINE ABOVE FLOOR AND OVER FLOOR SINK WITH AIR GAP. SEE DETAIL 1/P501.



1 PLUMBING PLAN - BELOW GRADE
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- KEYED NOTES**
- 36 INSTALL 100 POUND PROPANE TANK WITH SUPPORT STRAP FASTENED TO WALL. INSTALL 2-STAGE PRESSURE REGULATOR WITH VENT PIPED TO ROOF WITH GOOSENECK. ROUTE 1" PROPANE GAS LINE TO GENERATOR. (355 MBH, 10" W.C. PRESSURE). COORDINATE CONNECTION WITH GENERATOR SUPPLIER ON SITE.
 - 37 DUAL FUEL GENERATOR WITH AUTOMATIC SWITCH OVER TO PROPANE WHEN UNIT SENSES LOSS OF NATURAL GAS PRESSURE IN FUEL INLET 1.
 - 38 INSTALL 2" OPEN SITE DRAIN IN CHASE FOR CONDENSATE DRAIN LINES FROM RTU'S. CONNECT TO SANITARY SERVING LAVATORY. COORDINATE ROUTING WITH MC. COORDINATE WALL ACCESS PANEL WITH GC.
 - 39 INSTALL 1 1/2" OPEN SITE DRAIN IN SINK CABINET FOR CONDENSATE DRAIN LINES FROM RTU'S. CONNECT TO SANITARY SERVING SINK. COORDINATE ROUTING WITH MC.

- KEYED NOTES**
- 32 ROUTE 1/2" CW AND 1/2" HW DOWN IN FUR OUT OF EXISTING CMU WALL TO SERVE PREP SINK #24 PROVIDED BY FSC. COORDINATE PIPE ROUTING WITH GC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 33 3/4" CW AND 3/4" HW DROPS IN WALL TO SERVE FAUCET AND HOSE REEL #13 PROVIDED BY FSC. ROUTE DRAIN LINE TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 34 CONNECT NEW 1" NATURAL GAS LINE (2 PSI) WITH LOCKABLE SHUT-OFF VALVE TO EXISTING 3" NATURAL GAS RISER AND ROUTE DOWN TO BELOW GRADE TO SERVE GENERATOR.
 - 35 INSTALL 1" NATURAL GAS (2 PSI) BALL VALVE, DRIP LEG, PRESSURE REGULATOR, UNION AND FINAL 1" CONNECTION (10" W.C. PRESSURE) TO GENERATOR. COORDINATE CONNECTION WITH GENERATOR SUPPLIER ON SITE.

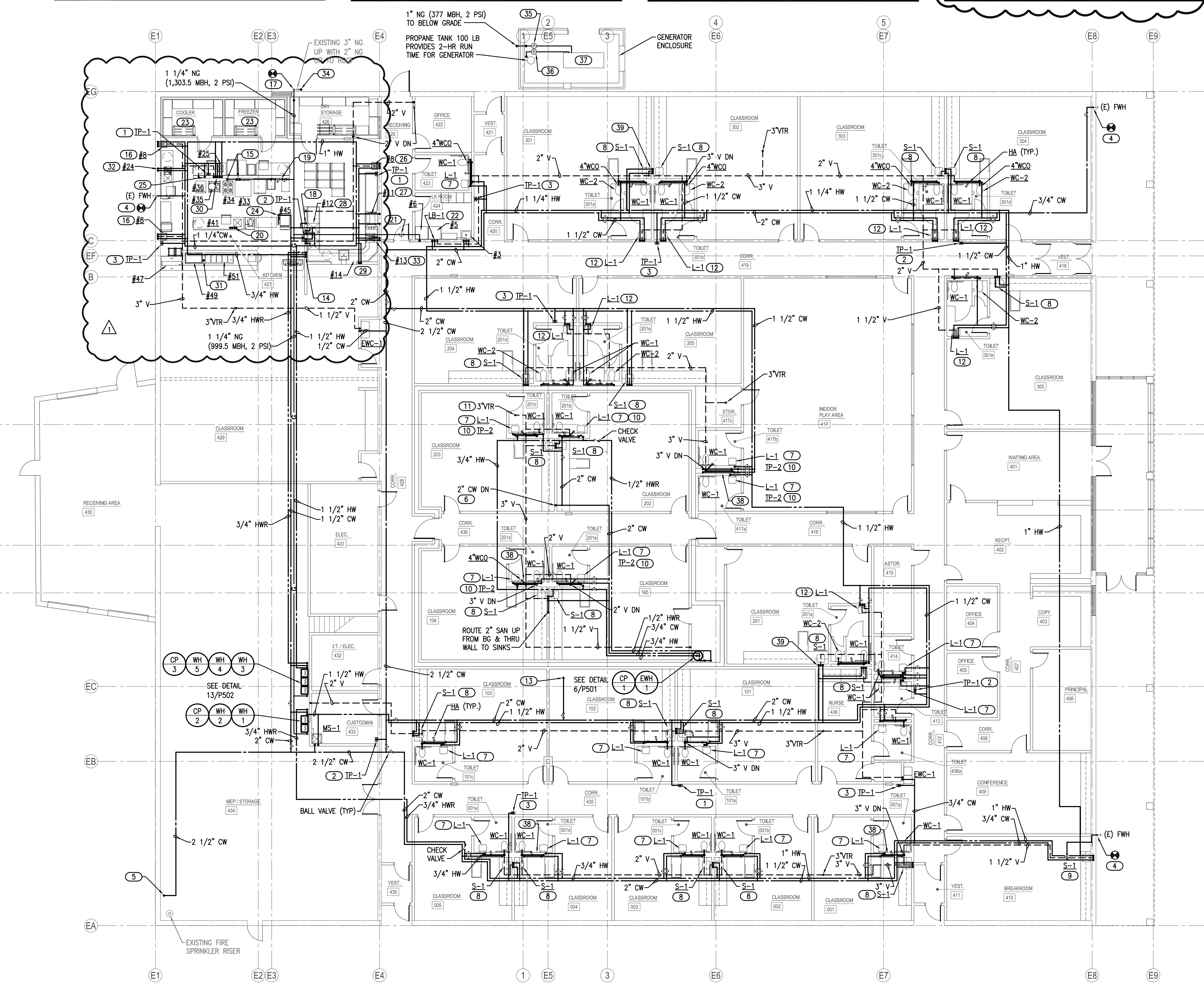
- KEYED NOTES**
- 28 3/4" CW AND 3/4" HW DROPS IN WALL TO SERVE 2 FAUCETS AT #12 3-COMPARTMENT SINK PROVIDED BY FSC. ROUTE DRAIN LINES TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. SEE DETAIL 15/P502.
 - 29 ROUTE 3/4" CW AND 3/4" HW DOWN IN WALL TO BELOW COUNTERTOP. STUB OUT. INSTALL BALL VALVES AND CONNECT TO WATER TROUGH MIXING VALVE FURNISHED BY FSC. SEE FSC SHEET FS301.
 - 30 1/2" CW AND 1/2" HW DOWN IN WALL TO SERVE KETTLE #35 FAUCET PROVIDED BY FSC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 31 CONNECT 1/2" HW TO FAUCET AT SERVING COUNTER FOOD WELL. ROUTE 1/2" HW LINE DOWN WITH TRANSITION TO PEX TUBING TO BELOW FLOOR. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTIONS.

- KEYED NOTES**
- 24 ROUTE 1/2" CW DOWN TO WATER FILTER AND CONNECT TO ICE MAKER #45. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. ICE MAKER PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR DRAIN.
 - 25 INSTALL 3/4" CW DROP IN WALL TO SERVE CONVENTION STEAMER PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 26 ROUTE 1/2" CW, 1/2" HW AND 2" VENT DOWN IN WALL TO SERVE HAND SINK PROVIDED BY KEC. PROVIDE THERMOSTATIC MIXING VALVE TMV-1 AND PIPE WRAP UNDER FIXTURE. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 27 1/2" CW AND 3/4" HW DROPS IN WALL TO SERVE DISHWASHER #11 PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. PROVIDE WATER ARRESTORS, PRVs AND BALL VALVES ON WATER LINES IN ACCESSIBLE LOCATION. ROUTE DRAIN LINE TO FLOOR SINK.

- GENERAL NOTES**
- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
 - PROVIDE WATER HAMMER ARRESTORS (HA) ON WATER LINES TO FLUSH VALVES, AND QUICK CLOSING VALVES. LOCATE UNITS IN ACCESSIBLE LOCATIONS.
 - SINK AND LAVATORY WATER SUPPLY STUB OUTS SHALL BE COPPER PIPE WITH SUPPORT BRACKET FASTENED IN WALL CAVITY.
 - FIRE SEAL ALL PENETRATIONS THRU RATED STRUCTURES TO MAINTAIN FIRE RATING.
 - REFER TO PLUMBING FIXTURE SCHEDULE ON SHEET P601 FOR FIXTURE ROUGH-IN PIPE SIZES. REFER TO ISOMETRIC SHEETS P301 AND P302 FOR ADDITIONAL PIPE SIZES.
 - PROVIDE ACCESS PANELS FOR ALL VALVES/DEVICES ABOVE HARD CEILINGS AND BEHIND WALLS.
 - ALL GAS PIPE SHALL COMPLY WITH IFCC. BRANCH LINES SHALL TAP OFF TOP OF GAS MAINS AND INSTALL SHUT-OFF VALVE ON BRANCH LINE.
 - TRAP PRIMER LINES SHALL BE COPPER TYPE "K" OR PEX-a TUBING WITH CONTINUOUS SLOPE TOWARDS DRAIN CONNECTION.
 - FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.

- KEYED NOTES**
- INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (4) 1/2" DISCHARGE LINES TO FLOOR DRAINS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (3) 1/2" DISCHARGE LINES TO FLOOR DRAINS OR FLOOR SINKS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (2) 1/2" DISCHARGE LINES TO FLOOR DRAINS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - FIELD VERIFY LOCATION OF EXISTING WALL HYDRANT AND CONNECT NEW 3/4" CW TO EXISTING PIPE SERVING WALL HYDRANT.
 - ROUTE INSULATED 2 1/2" CW PIPE DOWN WITH BALL VALVE AT 24" AFF. AND CONNECT TO NEW WATER SERVICE.
 - ROUTE 2" CW PIPE DOWN TO BELOW FLOOR. INSTALL ACCESS PANEL IN BACK OF CABINET FOR BALL VALVE. SEE SHEET P101 FOR CONTINUATION.
 - ROUTE 1/2" CW, 1/2" HW AND 1 1/2" VENT IN CHASE TO SERVE LAVATORY. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE SINK. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN INTO FUR OUT OF EXISTING CMU WALL TO SERVE SINK. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501. COORDINATE PIPE ROUTING WITH ARCHITECT AND GC.
 - INSTALL TRAP PRIMER (TP-2) UNDER LAVATORY. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SEE DETAIL 11/P501.
 - COORDINATE WITH STRUCTURAL FOR DEBRIS GUARD BELOW SHELTER ROOF FOR PLUMBING VENT ROOF PENETRATION.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE LAVATORY. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 3/4" CW UP TO ROOF HYDRANT. SEE SHEET P201 FOR CONTINUATION.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR DOWN IN WALL WITH PEX TUBING TO BELOW FLOOR TO SERVE ISLAND PREP SINK.
 - ROUTE 1" NG (LOW PRESS) BEHIND EQUIPMENT AND PROVIDE 3/4" GAS TO KITCHEN EQUIPMENT (33 & 34) PROVIDED BY KEC. PROVIDE SHUT-OFF VALVE AND FINAL UNIT CONNECTION. SEE DETAIL 9/P501.

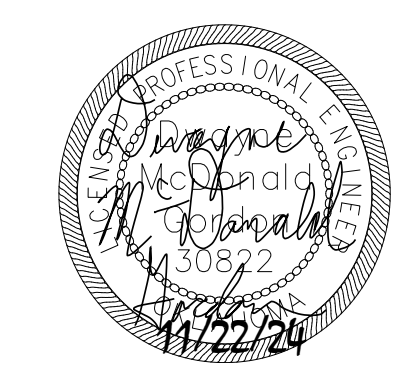
- KEYED NOTES**
- ROUTE 1/2" CW, 1/2" HW AND 2" VENT IN FUR OUT OF EXISTING CMU WALL TO SERVE HAND SINK (#8) PROVIDED BY KEC. PROVIDE THERMOSTATIC MIXING VALVE TMV-1 AND PIPE WRAP UNDER FIXTURE. COORDINATE PIPE ROUTING WITH GC.
 - CONNECT NEW 1 1/4" NATURAL GAS LINE (2 PSI) TO EXISTING 3" NATURAL GAS RISER AND ROUTE NEW LINE INTO BUILDING.
 - ROUTE 3/4" CW DOWN IN WALL WITH TRANSITION TO PEX TUBING TO BELOW FLOOR TO SERVE ICE MAKER PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - INSTALL 3/4" NATURAL GAS (2 PSI) BALL VALVE AND PRESSURE REGULATOR (KITCHEN EQUIP). INSTALL GAS SOLENOID VALVE FURNISHED BY KITCHEN EQUIPMENT SUPPLIER AND COORDINATE POWER WITH EC TO INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION SYSTEM. ROUTE 1" NG (LOW PRESS) TO KITCHEN EQUIPMENT.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR UP FROM BELOW FLOOR, TRANSITION TO COPPER PIPE AND CONNECT TO COOK'S TABLE SINK PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - INSTALL 1/2" BALL VALVE AND PRESSURE REGULATOR IN NATURAL GAS LINE SUPPLYING DRYER #6. PROVIDE 1/2" LOW PRESSURE GAS DOWN IN WALL TO GAS VALVE BOX (GVB-1) AND FLEXIBLE CONNECTION TO UNIT.
 - CLOTHES WASHER FURNISHED BY OTHERS. ROUGH-IN AND MAKE FINAL CONNECTION. PROVIDE 1/2" CW AND 1/2" HW LINES DOWN IN WALL TO LAUNDRY BOX. CONNECT FLEXIBLE SUPPLY LINES TO WASHER. ROUTE WASHER DRAIN LINE INTO WALL BOX DRAIN FITTING AND SECURE. COORDINATE WITH EQUIPMENT SUPPLIER.
 - COORDINATE WITH FOOD SERVICE CONTRACTOR FOR ROUTING CONDENSATE DRAIN LINES TO FLOOR DRAIN FROM FREEZER OR COOLER. SEE SHEET FS301.



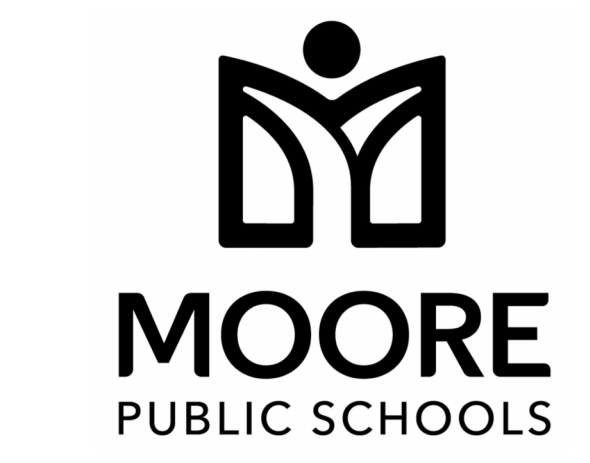
1 PLUMBING PLAN - ABOVE GRADE
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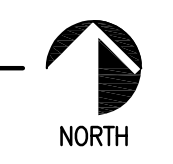


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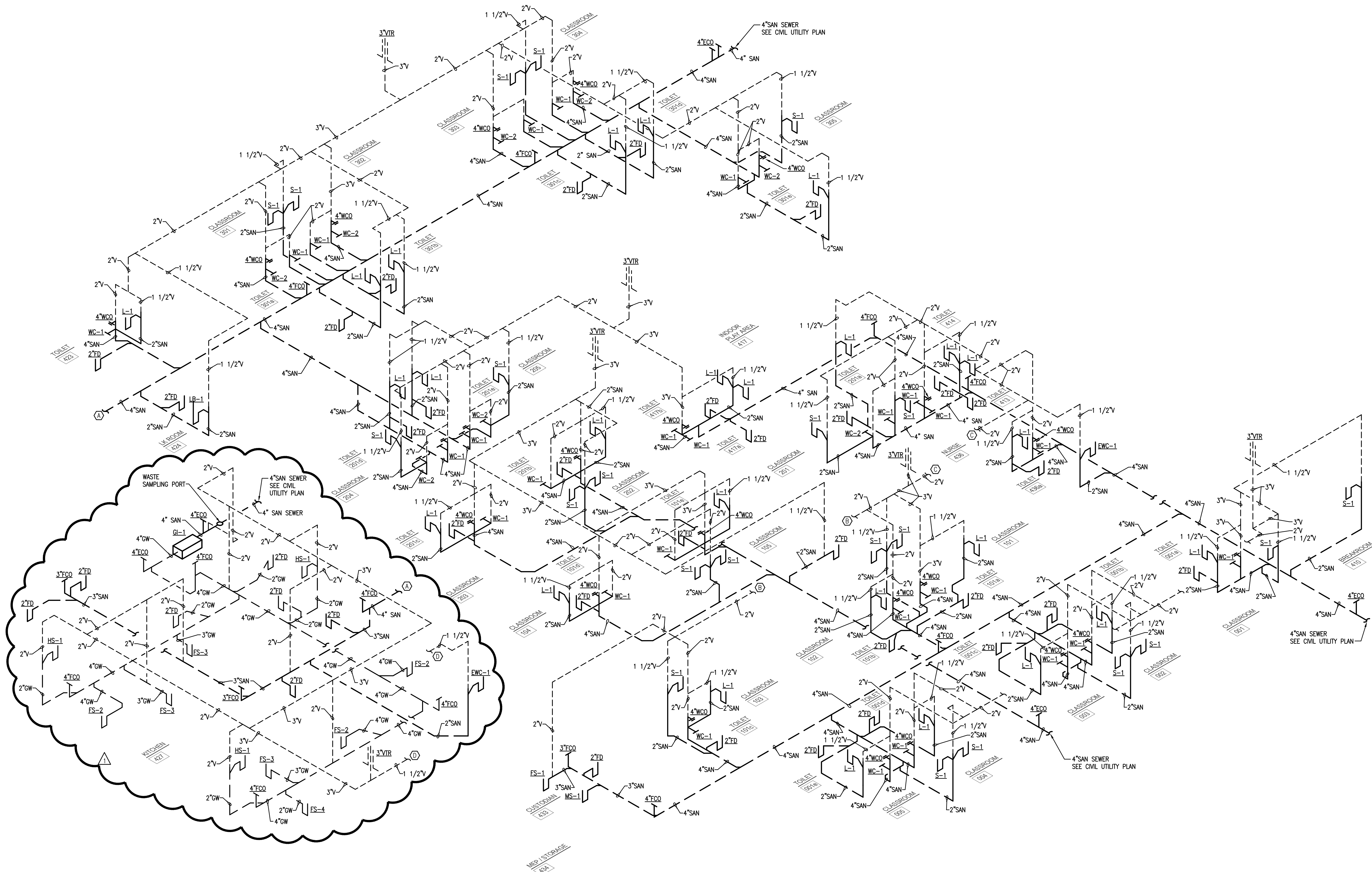
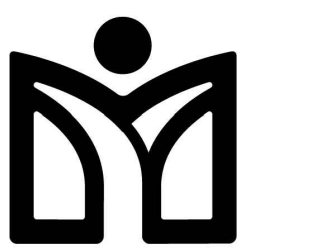
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1 PLUMBING ISOMETRIC - WASTE & VENT NO SCALE

Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



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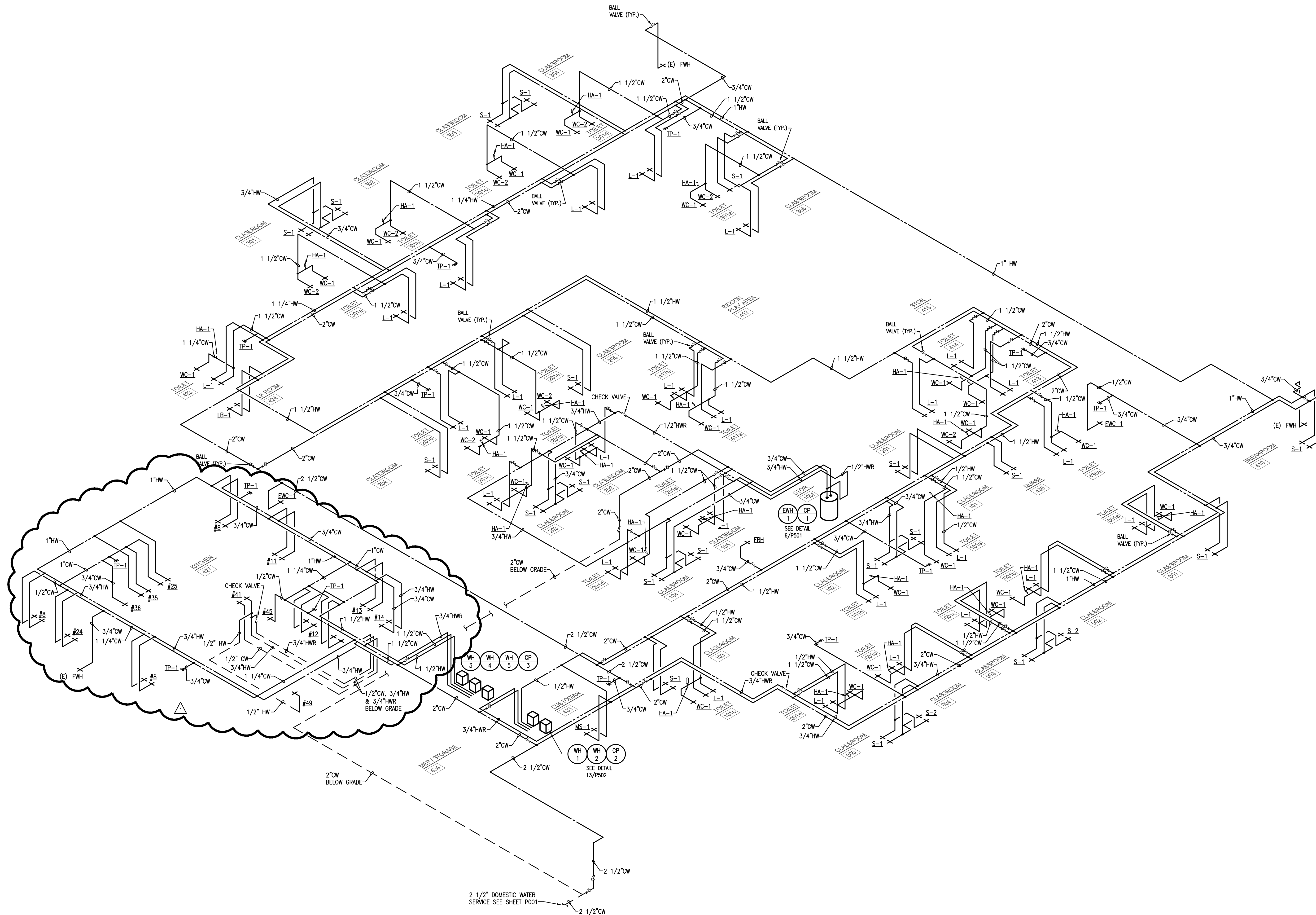


CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

P302

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1 PLUMBING ISOMETRIC - WATER SUPPLY

NO SCALE



2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

GAS LOAD TABLE					
MARK	INPUT (MBH)	REQUIRED PRESSURE	REQUIRED REGULATOR	SYSTEM PRESSURE	NOTES
RTU-1	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-2	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-3	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-4	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-5	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-6	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-7	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-8	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-9	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-10	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-11	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-12	108	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-13	180	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
RTU-14	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-15	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
RTU-16	65	7"	MAXITROL 325-3LB	2 PSI	1,3,4,5
DOAS-1	208	7"	MAXITROL 325-5LB	2 PSI	1,3,4,5
WH-1	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-2	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-3	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
WH-4	199.9	7"	MAXITROL 325-5L	2 PSI	1,2,5
KITCHEN	254	10"	MAXITROL 325-5L	2 PSI	1,2,5
DRYER	50	7"	MAXITROL 325-3L	2 PSI	1,2,5
GEN SET	377	10"	MAXITROL 325-5L	2 PSI	1,2,5
TOTAL LOAD	3519 MBH				

NOTES:

- INSTALL AND VENT REGULATOR PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE VENT LIMITING DEVICE FOR INDOOR REGULATORS EQUIPPED WITH INTEGRAL VENT LIMITING GRIPICE MODEL 12A09 OR 12A39.
- COORDINATE WITH MECHANICAL CONTRACTOR FOR EQUIPMENT LOCATIONS AND REQUIRED CONNECTION.
- PROVIDE VENT PROTECTOR DEVICE FOR OUTDOOR REGULATORS MODEL 13A15 OR 13A15-5.
- GAS SYSTEM DESIGN FOR INITIAL METER OUTLET PRESSURE OF 2 PSIG WITH PRESSURE DROP OF 1 PSIG AND TOTAL LENGTH OF 450 FEET.

PLUMBING KITCHEN EQUIPMENT SCHEDULE							
ITEM	DESCRIPTION	INDIRECT DRAIN	DIRECT DRAIN	VENT	CW	HW	GAS
3	MOP SINK	-	2"	1 1/2"	1/2"	1/2"	-
5	WASHER BY OWNER	-	2"	1 1/2"	1/2"	1/2"	-
6	DRYER BY OWNER	-	-	-	-	-	1/2" 50 MBH
8	HAND SINK	-	2"	1 1/2"	1/2"	1/2"	-
11	DISHWASHER	2"	-	-	1/2"	1/2"	-
12	SOILED DISHTABLE	(3) 2"	-	-	(2) 3/4"	(2) 3/4"	-
13	HOSE REEL	-	-	-	1/2"	1/2"	-
14	WATER TROUGH	2"	-	-	3/4"	3/4"	-
24	PREP TABLE	2"	-	-	1/2"	1/2"	-
25	FOOD ALLERGY WORKTABLE	2"	-	-	1/2"	1/2"	-
33	CONVECTION OVEN	-	-	-	-	-	(2) 3/4" 55 MBH
34	RANGE	-	-	-	-	-	3/4" 144 MBH
35	KETTLE	-	-	-	1/2"	1/2"	-
36	CONVECTION STEAMER	(2) 3/4"	-	-	3/4"	-	-
41	COOKS TABLE SINK	2"	-	-	1/2"	1/2"	-
45	ICEMAKER	3/4"	-	-	1/2"	-	-
47	MILK COOLER	3/4"	-	-	-	-	-
48	SERVING COUNTER	-	-	-	1/2"	-	-
49	COLD FOOD WELL	3/4"	-	-	-	-	-
51	HOT FOOD WELL	3/4"	-	-	-	1/2"	-

EQUIPMENT LISTED PROVIDED BY FOOD SERVICE CONTRACTOR (FSC). COORDINATE WITH FSC FOR REQUIRED CONNECTIONS.

GAS WATER HEATER SCHEDULE									
MARK	LOCATION	TEMPERATURE RISE	FLOW RATE GAL/MIN	CAPACITY (GALLONS)	MBH INPUT MAX	AIR INTAKE	FLUE EXHAUST	MANUFACTURER & MODEL NO.	NOTES
WH 1	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 2	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 3	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 4	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL
WH 5	MEP/STORAGE RM 434	(50F - 120F) 70F	5	TANKLESS	199.9	2"	2"	NAVIEN NPE-240A	ALL

NOTES:

- INSTALL AND VENT PER MANUFACTURER'S RECOMMENDATIONS.
- COORDINATE POWER SUPPLY WITH ELECTRICAL CONTRACTOR. POWER SUPPLY TO UNIT 120V, 2 AMP (GFCI) OUTLET.
- PROVIDE AMTROL ST-12 THERMAL EXPANSION TANK ON COLD WATER LINE. REFER TO DETAILS SHEET P501.
- PROVIDE CLEAR WATER ENVIRO TECHNOLOGIES SCALEBLASTER MODEL SB-250 ELECTRONIC DESCALER. COORDINATE 120 VOLT OUTLETS WITH EC.
- PROVIDE CIRCULATION PUMP WIRING FROM WATER HEATERS. COORDINATE POWER CONNECTIONS WITH EC.
- PROVIDE NAVIEN CONDENSATE NEUTRALIZER KIT AND OVERFLOW BY-PASS PIPING TO FLOOR SINK PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE ONE COMMUNICATION CABLE FOR WH-1 / WH-2 AND TWO CABLES FOR WH-3, WH-4 & WH-5.
- PROVIDE NAVIEN READY-LINK WALL MOUNT PIPING MANIFOLD SYSTEM FOR WATER HEATERS.
- PROVIDE NAVIEN EXHAUST/INTAKE CONCENTRIC VENT KIT THRU ROOF.
- SEE DETAIL 13/P502 FOR MORE INFORMATION.

ELECTRIC WATER HEATER SCHEDULE									
MARK	LOCATION	TEMPERATURE RISE	CAPACITY GALLONS	AMPS	ELEMENT KW	VOLTAGE	PHASE	MANUFACTURER & MODEL NO.	NOTES
EW 1	ELEC RM IN SAFEROOM	70 DEG @ 25 GPH	20	22	4.5	208	1	A.O. SMITH DEL-20	ALL

NOTES:

- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- WATER HEATER OUTLET TEMPERATURE SET TO 120°F. VERIFY TEMPERATURE WITH OWNER.
- PROVIDE AMTROL ST-5 THERMAL EXPANSION TANK ON COLD WATER LINE TO WATER HEATER.
- PROVIDE HOLD RITE WALL SUPPORT PLATFORM MODEL 50-SWHP-W & RESTRAINT STRAP FOR WATER HEATER.
- COORDINATE WIRING WITH E.C.
- SEE DETAIL 6/P501 FOR MORE INFORMATION.

CIRCULATION PUMP SCHEDULE										
MARK	MAXIMUM WORKING PRESSURE	MAXIMUM OPERATING TEMP (°F)	MOTOR				FLANGE SIZE (INCHES)	MATERIAL	MANUFACTURER & MODEL NO.	NOTES
			ELECTRICAL CHAR	F.L. AMPS	HP	RPM				
CP 1	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	
CP 2	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	
CP 3	150 PSI	225	115/60/1	3.5	1/6	VARIES	3/4"	S.S.	BELL & GOSSETT EDCOIRC+ 20-18	

NOTES:

- PROVIDE GRUNDFOS BRONZE 3/4" FLANGE SET.
- DATA: CP-1: 0.5 GPM AT 10 FEET HEAD.
- DATA: CP-2: 1.5 GPM AT 8 FEET HEAD.
- DATA: CP-3: 1 GPM AT 10 FEET HEAD.
- PROVIDE 24 HOUR TIMER AND AQUASTAT - SET TIMER PER OWNER'S REQUIREMENTS.
- COORDINATE WIRING WITH E.C.
- SEE DETAIL 7/P501 FOR MORE INFORMATION.

GREASE INTERCEPTOR SCHEDULE											
MARK	LOCATION	FLOW RATE (GPM)	LIQUID CAP. (GAL)	GREASE CAP. (LBS)	STANDARD CONNECTION LENGTH	DIMENSIONS (INCHES)			MANUFACTURER & MODEL NO.	NOTES	
						WIDTH	HEIGHT	WEIGHT (LBS)			
GI 1	EXTERIOR BELOW GRADE	100	277	1,865	4"	87	33	44	376	SCHIER GB-250	ALL

NOTES:

- INSTALL AND VENT PER MANUFACTURER'S RECOMMENDATION AND LOCAL PLUMBING CODE.
- INSTALL EXTERIOR BELOW GRADE GREASE INTERCEPTOR SO COVERS ARE FLUSH WITH FINISHED CONCRETE. PROVIDE EXTENSION RISER ASSEMBLY AS REQUIRED.
- INSTALL GREASE INTERCEPTOR WITH REQUIRED CLEARANCES FOR ACCESS AND CLEANING.
- PROVIDE SAMPLING PORT SCHIER SV10 WITH EXTENSION RISER DOWNSTREAM OF INTERCEPTOR PER MANUFACTURER'S RECOMMENDATIONS.
- SEE DETAIL 14/P502 FOR ADDITIONAL INFORMATION.

GREASE INTERCEPTOR SIZING
GREASE INTERCEPTOR SIZED TO COMPLY WITH INTERNATIONAL PLUMBING CODE 2018 AND PDI-G101. FIXTURES DRAINING TO GREASE INTERCEPTOR:
3-COMPARTMENT SINK: 20" x 20" x 14" x 3 = 16,800 CU INCHES / 231 = 58 GAL x 75% = 54.5 GALLONS
HANDSINKS: 3 FIXTURES x 1.5 GPM = 4.5 GPM
COOKS TABLE SINK #41: 18" x 18" x 12" = 3,888 CU INCHES / 231 x 75% = 13 GALLONS
PREP TABLE SINK #25: 12" x 15" x 10" = 1,800 CU INCHES / 231 x 75% = 6 GALLONS
DISHWASHER: 36 GALLONS
PREP DOUBLE SINK: 18" x 18" x 14" = 4,536 CU INCHES x 2 / 231 x 75% = 30 GALLONS
FLOOR SINKS WITH 2" OUTLET: 2 FIXTURES: 2 GPM x 2 = 4 GPM
PRE-RINSE SINK: 18" x 18" x 10" = 3,240 CU INCHES / 231 x 75% = 10.5 GALLONS
TOTAL DRAIN FLOW PER 2 MINUTES = 158.5 GALLONS / 2 MIN = 80 GALLONS
USE INTERCEPTOR SIZED FOR FLOW RATE OF 100 GPM.

PLUMBING FIXTURE SCHEDULE									
MARK	FIXTURE	MANUFACTURER	MODEL	MOUNT	ROUGH-IN SCHEDULE				FITTINGS AND REMARKS
					COLD	HOT	WASTE	VENT	
L-1	LAVATORY ADA	AMERICAN STANDARD	0355.012	WALL	1/2"	1/2"	1 1/2"	1 1/2"	COLOR WHITE. PROVIDE CHICAGO FAUCET 420-ABCP. MCGUIRE HD155A GRID STRAINER, 8902C P-TRAP, LFBV2165SC 1/4 TURN SUPPLY STOPS. TRUEBRO LAV GUARD2 PIPE COVERS. ZURN WALL FIXTURE CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE. INSTALL THERMOSTATIC MIXING VALVE TMV-1 UNDER FIXTURE. SEE DETAIL 5/P501.
WC-1	WATER CLOSET ADA	AMERICAN STANDARD	2257.101	WALL	1 1/4"	-	4"	-	COLOR WHITE. PROVIDE SLOAN ROYAL 111-1.6 SFSM BATTERY OPERATED FLUSH VALVE. PROVIDE BEIMS 1655SCT OPEN FRONT ELONGATED SEAT. EXTERNAL CHECK HINGE, COLOR WHITE. ZURN NARROW WALL CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE. ADA INSTALLATION.
WC-2	WATER CLOSET	AMERICAN STANDARD	2257.101	WALL	1 1/4"	-	4"	-	COLOR WHITE. PROVIDE SLOAN ROYAL 111-1.6 SFSM BATTERY OPERATED FLUSH VALVE. PROVIDE BEIMS 1655SCT OPEN FRONT ELONGATED SEAT. EXTERNAL CHECK HINGE, COLOR WHITE. ZURN NARROW WALL CARRIER. REFER TO ARCHITECT'S PLANS FOR HEIGHT AND WALL TYPE.
S-1	SINK	ELKAY	LRAD1919602	COUNTERTOP	1/2"	1/2"	1 1/2"	1 1/2"	SINGLE BOWL, 6" DEEP, 2 FAUCET HOLES, REAR CENTER DRAIN. PROVIDE ELKAY LK305 DRAIN & ELKAY LK4060Q814 FAUCET. MCGUIRE 8912 P-TRAP & LFBV2165 SUPPLY STOPS. INSTALL MIXING VALVE TMV-1 UNDER SINK.
MS-1	MOP SINK	FIAT	TSB-3000 24x24x12	FLOOR	1/2"	1/2"	3"	1 1/2"	MOLDED STONE, 6" DROP FRONT, SS THRESHOLD. PROVIDE FIAT 832AA HOSE & WALL BRACKET, 889-CC MOP BRACKET, MCG2424 SS WALL GUARDS, PROVIDE T&S BRASS FAUCET B-0665-BSTR. PROVIDE ASSE 1011 APPROVED HOSE CONNECTION VACUUM BREAKER.
EW-1	ELECTRIC WATER COOLER	ELKAY	LZSTLBWSSK	WALL	1/2"	-	1 1/2"	1 1/2"	DUAL LEVEL WITH SENSOR WATER BOTTLE FILLING STATION ON LOWER UNIT. VANDAL-RESISTANT, FILTERED, PUSH BUTTON ACTIVATION, 120 VOLT. PVC P-TRAP AND 1/4 TURN SUPPLY STOP. REFER TO ARCHITECT'S PLANS FOR MOUNTING HEIGHT. ADA INSTALLATION.
FD	FLOOR DRAIN	ZURN	ZN415-BZ1-P -VP	FLOOR	-	-	SEE PLANS	-	6" ROUND NICKEL BRONZE STRAINER, CAST IRON BODY ANCHOR FLANGE, CLAMP COLLAR, ADJUSTABLE COLLAR, ADJUSTABLE STRAINER HEIGHT, VANDAL-PROOF SECURED TOP, 1/2" TRAP PRIMER CONNECTION. SEE DETAIL 1/P501.
FS-1	FLOOR SINK	ZURN	ZN1910-K-2 -23	FLOOR	-	-	3"	-	8"x8" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, 1/2" GRATE WITH NICKEL BRONZE FINISH & SEDIMENT BUCKET.
FS-2	FLOOR SINK	ZURN	ZS1901-K-2 -23	FLOOR	-	-	4"	-	12"x12" TOP, 8" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, STAINLESS STEEL FRAME, 1/2" GRATE, & SEDIMENT BUCKET.
FS-3	FLOOR SINK	ZURN	ZS1900-K-2 -23	FLOOR	-	-	2"	-	12"x12" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, STAINLESS STEEL FRAME WITH 1/2" GRATE & SEDIMENT BUCKET.
FS-4	FLOOR SINK	ZURN	ZS1910-K-P -2-23	FLOOR	-	-	2"	-	8"x8" TOP, 6" DEEP. CAST IRON BODY WITH WHITE A.R.E INTERIOR, ANCHOR FLANGE, 1/2" TRAP PRIMER CONNECTION, STAINLESS STEEL FRAME WITH 1/2" GRATE & SEDIMENT BUCKET.
FCO	FLOOR CLEANOUT	ZURN	ZN1400-K-VP	FLOOR	-	-	SEE PLANS	-	ADJUSTABLE, CAST IRON BODY, ANCHOR FLANGE, ABS THREAD PLUG, ROUND SCORRIED TOP WITH NICKEL BRONZE FINISH, VANDAL RESISTANT COVER SCREWS.
WCO	WALL CLEANOUT	ZURN	Z1446-VP	WALL	-	-	SEE PLANS	-	CAST IRON CLEANOUT TEE, THREAD ABS PLUG, STAINLESS STEEL ROUND ACCESS COVER WITH VANDAL RESISTANT SECURING SCREW.
ECO	EXTERIOR CLEANOUT	ZURN	Z1474-N-VP	GRADE	-	-	SEE PLANS	-	CAST IRON CLEANOUT ACCESS HOUSING, ANCHOR FLANGE, SECURED GASKETED COVER WITH CLEANOUT FERRULE WITH ABS PLUG. VANDAL PROOF COVER SCREWS.
HA-1	HAMMER ARRESTOR	WATTS	LF15M2	PIPE	VARIES	-	-	-	LEAD-FREE DESIGN, PDI WH201 LISTED, MAINTENANCE FREE, INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
TP-1	TRAP PRIMER (ELECTRIC)	PRECISION PLUMBING PRODUCTS	PTS-4	PIPE	3/4"	-	-	-	ELECTRONIC UNIT ENCLOSED IN METAL CABINET WITH 24 HOUR TIMER, SOLENOID VALVE, VACUUM BREAKER, 3/4" CW INLET, HAMMER ARRESTOR & 1/2" OUTLETS, WATER, 120V POWER HARDWIRED. PROVIDE STRAINER PRIOR TO UNIT. COORDINATE 120 VOLT POWER OUTLET WITH EC. SEE DETAIL 1/P501.
TP-2	TRAP PRIMER	PRECISION PLUMBING PRODUCTS	PRO1-ULP500	PIPE	1/2"	-	-	-	UNDER FIXTURE TRAP PRIMER VALVE, CHROME PLATED, 1/2" CW INLET WITH ANGLE STOP, 3/8" OUTLET TO FAUCET, AIR GAP WITH 1/2" OUTLET TO FLOOR DRAIN. WALL ESCUTCHEON. MOUNT MINIMUM 12" ABOVE FLOOR. SEE DETAIL 11/P501.
TMV-1	THERMOSTATIC MIXING VALVE	WATTS	LFMMV-M1	BELOW FIXTURE	1/2"	1/2"	-	-	LEAD FREE MIXING VALVE WITH ADJUSTABLE TEMPERATURE SET-POINT & LOCKABLE, INTEGRAL CHECK STOPS & STRAINERS, 1/2" INLETS & OUTLET. SET OUTLET TEMP AT 105 DEGREES F. ASSE 1070 LISTED.
AP-1	ACCESS PANEL	ACUDOR	UF-5000 14x14 CLSS	WALL	-	-	-	-	14"x14" STEEL, 16 GAGE DOOR & FRAME, 18 GAGE MOUNTING FRAME. CONCEALED HINGE, CYLINDER LOCK & KEY, STAINLESS STEEL FINISH. CONCEALED FASTENING POINTS.
CD-1	CLOTHES DRYER	PROVIDED BY OTHERS	-	FLOOR	-	-	-	-	DRYER INSTALLED BY OTHERS. PC SHALL ROUGH-IN & MAKE FINAL CONNECTIONS. PROVIDE 1/2" DORMANT NATURAL GAS FLEXIBLE GAS LINE WITH BALL VALVE, SWIVEL CONNECTIONS & 36" LENGTH. LOW PRESSURE GAS. COORDINATE WITH UNIT SUPPLIER. 20 MBH GAS LOAD.
WM-1	WASHING MACHINE	PROVIDED BY OTHERS	-	FLOOR	3/4"	3/4"	3"	-	MACHINE INSTALLED BY OTHERS. PC SHALL ROUGH-IN & MAKE FINAL CONNECTIONS. ROUTE DRAIN HOSE TO LAUNDRY BOX DRAIN. CONNECT FLEXIBLE WATER HOSES TO WALL BOX & MACHINE. COORDINATE WITH UNIT SUPPLIER.
LB-1	LAUNDRY BOX	SIOUX CHIEF	696R2313WF	WALL	1/2"	1/2"	2"	1 1/2"	FIRE RATED RECESSED WALL MOUNTED BOX WITH FLANGE, 1/4 TURN BALL VALVES WITH HAMMER ARRESTORS, 3/4" THREADED OUTLETS, DRAIN CONNECTION. COORDINATE INSTALL HEIGHT FOR CLOTHES WASHER.
GVB-1	GAS VALVE BOX	SIOUX CHIEF	696R1020GF	WALL	-	-	-	-	FIRE RATED RECESSED WALL MOUNTED BOX WITH FLANGE, NATURAL GAS 1/4 TURN BALL VALVE, 1/2" THREADED OUTLET. PROVIDE DORMANT FLEXIBLE GAS LINE. COORDINATE INSTALL HEIGHT FOR CLOTHES DRYER GAS CONNECTION.



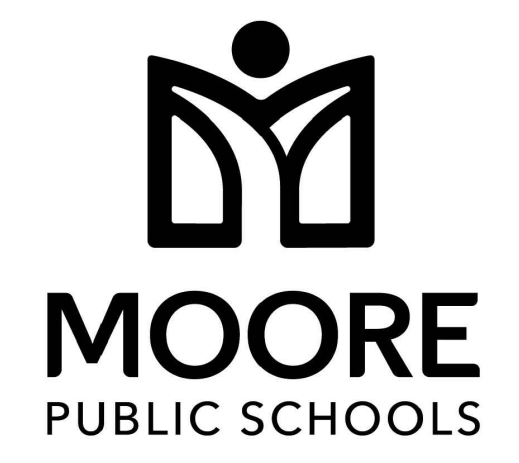
201 N. BROADWAY SUITE 210 MOORE, OK. 73160 405.735.3477 AGP@theAGP.net www.theAGP.net

KFC ENGINEERING STRUCTURAL SALAS O'BRIEN MECHANICAL / ELECTRICAL



KS drawn by KP checked by OCTOBER 2024 date

revisions 11/22/2024 AD 02



CHILD CARE FACILITY 201 N. EASTERN AVE.

sheet no: P601

Salas O'Brien
 2900 S. Telephone Road, Suite 120
 Moore, OK 73160
 Salas O'Brien Registration: CA# 7058
 Expiration Date: 6/30/2025
 Salas O'Brien Project Number: 2450-70304-00

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LIGHT FIXTURE SCHEDULE				
TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	REFERENCE CATALOG #
A1		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A1E		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2E		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3E		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A4		2X2 LED FLAT PANEL. 35W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X2 AL07 80CRI SSW7 SWL MVOLT
C		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING.	LITHONIA	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
CE		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITON	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
EX		LED EXIT SIGN, STAINLESS STEEL FACE WITH RED LETTERS, UNIVERSAL FACE AND MOUNTING. PROVIDE WITH UL924 DEVICE.	LIFE SAFETY LIGHTING	LSXDC 3 R A A EM SDT
L		2" X 4" LED EXTERIOR FIXTURE 1028 LUMENS/FT, 4000K CCT. SURFACE MOUNT	A-LIGHT	LIN 3 SP M4 LH 40 U HE F X D
LE		2" X 4" LED EXTERIOR FIXTURE 1028 LUMENS/FT, 4000K CCT. SURFACE MOUNT. PROVIDE WITH UL924 DEVICE.	A-LIGHT	LIN 3 SP M4 LH 40 U HE F X D EC
P2		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING.	DELRAY	UCCD6 W35 SR D
P2E		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	DELRAY	UCCD6 W35 SR D
S		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
SE		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
T		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
TE		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
V		2" LED VANITY FIXTURE. 9W, 300 LUMENS/FT DIRECT AND INDIRECT, 3500K CCT. 0-10V DIMMING.	MARK LIGHTING	S2WID LLP 2FT MSL2 80CRI 35K 300LMF I80 I35K I300LMF AS SCT MIN10 FL MVOLT WHTT ZT
W1E		2400 LUMEN, 4000K CT, LED WALL PACK PROVIDE WITH UL924 DEVICE.	LITHONIA	WPX1 LED P2 40K MVOLT DBLXD

GENERAL NOTES:
EQUIVALENT ALTERNATE LIGHT FIXTURES MAY BE PROVIDED FOR BIDDING PURPOSES. THE ENGINEER DOES NOT TAKE RESPONSIBILITY FOR ENSURING ALTERNATE LIGHT FIXTURES USED FOR BIDDING ARE EQUAL; THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALTERNATE FIXTURES ARE EQUIVALENT TO THOSE SPECIFIED PRIOR TO BID. THE WINNING BID PACKAGE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH THE SPECIFICATIONS.

ELECTRICAL ABBREVIATIONS			
AC	ABOVE COUNTERTOP	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCA	MINIMUM CIRCUIT AMPS
AFG	ABOVE FINISH GRADE	MCB	MAIN CIRCUIT BREAKER
ANNC	ANNUNCIATOR	MDP	MAIN DISTRIBUTION PANEL
CC	CONTROLS CONTRACTOR	MLO	MAIN LUG ONLY
DF	DRINKING FOUNTAIN	MTD	MOUNTED
EC	ELECTRICAL CONTRACTOR	NIC	NOT IN CONTRACT
EF	EXHAUST FAN	OCC	OCCUPANCY
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH	PC	PLUMBING CONTRACTOR
EX	EXISTING	PNL	PANEL
EXR	EXISTING RELOCATED	SPST	SINGLE POLE SINGLE THROW
GC	GENERAL CONTRACTOR	TIB	TELEPHONE TERMINAL BOARD
GFI	GROUND FAULT INTERRUPT	TYP	TYPICAL
HP	HORSEPOWER	WG	WIRE GUARD
IBC	INTERNATIONAL BUILDING CODE	WP	WEATHER PROOF
IG	ISOLATED GROUND	20A	20 AMP
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, AND GROUND	Ø	PHASE
LV	LOW VOLTAGE	3W	3 WIRE
LVPR	LV RELAY PANEL	1P20A	SINGLE POLE 20 AMP

GENERAL ELECTRICAL NOTES	
1.	CONTRACTOR TO VERIFY EXISTING ELECTRICAL CONDITIONS AND NOTIFY ARCHITECT/ENGINEER OF ANY ELECTRICAL OR CODE ISSUES PRIOR TO BID. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE AND OPERATIONAL CODE COMPLIANT SYSTEM.
2.	ALL WORK SHALL BE IN CONFORMANCE WITH NATIONAL, STATE, AND LOCAL CODES AND/OR ORDINANCES.
3.	ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER CONTRACTORS & LOCAL UTILITY. E.G. SHALL CONTACT LOCAL UTILITY FOR EXACT SERVICE REQUIREMENTS TO INCLUDE BUT NOT LIMITED TO TRANSFORMER, METERING AND CABLING. LOCAL UTILITY REQUIREMENTS SUPERSEDE DRAWINGS AND SPECIFICATIONS.
4.	SEE ARCHITECTURAL, MECHANICAL, & PLUMBING DRAWINGS FOR ADDITIONAL REQUIREMENTS.
5.	ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. THEY ARE INTENDED TO GIVE APPROXIMATE LOCATIONS AND OVERALL DESIGN INTENT. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCTS, MATERIALS, AND ELECTRICAL METHODS WHICH HAVE NOT BEEN SHOWN OR INDICATED BUT ARE REQUIRED FOR A COMPLETE SYSTEM TO THE STANDARDS OF THE INDUSTRY.
6.	INSTALL LIGHTING FIXTURES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE SUPPORTING DEVICES FOR ADEQUATE SUPPORT OF FIXTURES FROM STRUCTURE.
7.	UPON COMPLETION OF THE ELECTRICAL WORK, THE INSTALLATION SHALL BE TESTED FOR CONTINUITY, GROUNDS, AND SHORT CIRCUITS. THE ELECTRICAL CONTRACTOR SHALL DEMONSTRATE PROPER PERFORMANCE OF ALL SYSTEMS. ALL DEFECTIVE WORK OR MATERIALS SHALL BE REPLACED OR REPAIRED AS NECESSARY AND RETESTED.
8.	ELECTRICAL RACEWAYS THAT PENETRATE FIRE RATED ASSEMBLIES SHALL BE SLEEVED AND SEALED AS PER THE LOCAL BUILDING CODE.
9.	THE ELECTRICAL CONTRACTOR SHALL PROVIDE A TEMPORARY ELECTRICAL SYSTEM FOR THE PROJECT. AT LEAST ONE 120 VOLT SINGLE PHASE RECEPTACLE SHALL BE PROVIDED FOR EACH 500 SQUARE FEET OF FLOOR SPACE. SUFFICIENT TEMPORARY LIGHTING SHALL BE PROVIDED TO ALLOW ALL CONTRACTORS TO COMPLETE THEIR WORK. TEMPORARY ELECTRICAL CIRCUITS SHALL BE EQUIPPED WITH COMBINATION GROUND FAULT INTERRUPTER AND CIRCUIT BREAKER PER NEC. TEMPORARY ELECTRICAL SYSTEM SHALL BE INCLUDED IN THIS BID. USAGE CHARGES SHALL BE PAID FOR BY THE GENERAL CONTRACTOR.

SWITCH LEGEND	
SYMBOL	DESCRIPTION
\$	20A, SPST SWITCH
\$o	20A, LETTER INDICATES GROUP
\$3	20A, 3-WAY
\$4	20A, 4-WAY
\$D	DIMMER SWITCH
\$K	KEY OPERATED SWITCH
\$oc	OCCUPANCY SENSOR SWITCH

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

RECEPTACLE SCHEDULE	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE
	20A, 120V, 2P, 3W GROUNDING DUPLEX RECEPTACLE
	RECEPTACLE MTD. 6" ABOVE COUNTER OR HGT SHOWN
	GFCI RECEPTACLE
	GFCI RECEPTACLE, MTD. 6" ABOVE COUNTER OR HGT SHOWN
	20A, 120V, 2P, 3W GROUNDING DUPLEX GFCI RECEPTACLE - WEATHER PROOF (IN USE COVER)
	JUNCTION BOX, AS NOTED
	QUADPLEX RECEPTACLE

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

ELECTRICAL LEGEND	
	PANEL BOARD
	DISTRIBUTION PANEL BOARD
	TRANSFORMER
	UTILITY METER
	SEPARATE CIRCUIT BREAKER
	DISCONNECT
	FUSED DISCONNECT SWITCH
	EMERGENCY FUSED DISCONNECT SWITCH
	MOTOR STARTER/CONTRACTOR
	COMBINATION MOTOR STARTER
	PUSH BUTTON STATION AS NOTED
	PULL BOX, SIZE AS REQUIRED BY CODE
	ELECTRICAL CONNECTION
	MOTOR CONNECTION
	HOME RUN TO PANEL BOARD

ELECTRICAL SHEET INDEX	
E000	ELECTRICAL TITLE SHEET
E100	ELECTRICAL SITE PLAN
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL POWER PLAN
E202	ELECTRICAL ROOF PLAN
E203	ELECTRICAL KITCHEN PLAN
E401	ELECTRICAL ONE-LINE DIAGRAM
E501	ELECTRICAL DETAILS SHEET
E502	ELECTRICAL DETAILS SHEET
E601	ELECTRICAL SCHEDULES
E602	ELECTRICAL SCHEDULES

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KFC ENGINEERING
STRUCTURAL
SALAS O'BRIEN
MECHANICAL / ELECTRICAL



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CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

E000

Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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GENERAL NOTES

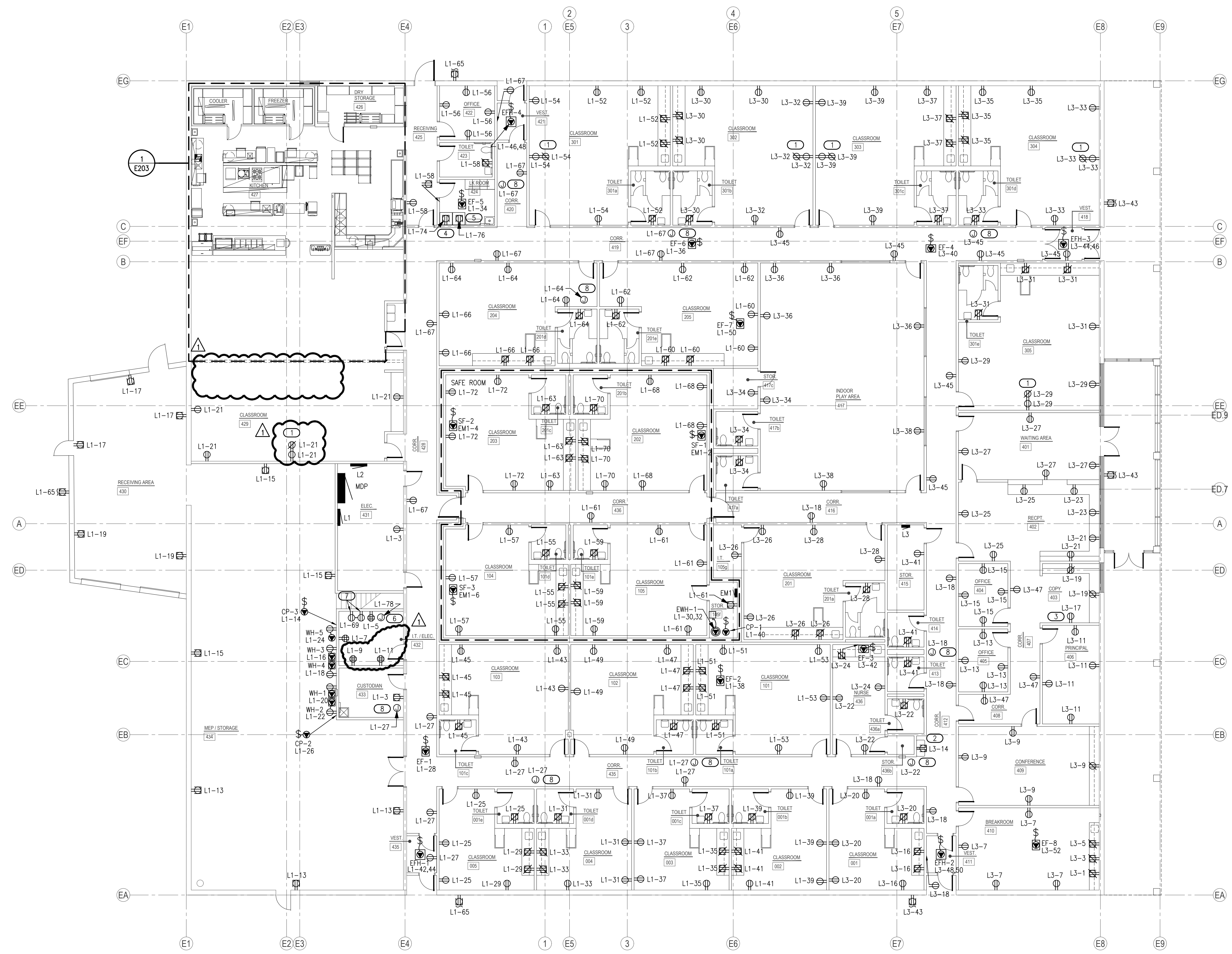
- COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT. COORDINATE EXACT LOCATION OF CEILING MOUNTED DEVICES WITH LIGHTS, HVAC EQUIPMENT, AND OTHER DEVICES.
- COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER CONTROL DEVICES.
- COORDINATE EXACT LOCATION OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR. REFER TO MECHANICAL PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- COORDINATE EXACT LOCATION OF PLUMBING EQUIPMENT WITH PLUMBING CONTRACTOR. REFER TO PLUMBING PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- ALL RECEPTACLES LOCATED AT COUNTERTOP HEIGHT SHALL BE ORIENTED HORIZONTALLY.
- FIRE STOP ALL PENETRATIONS IN FIRE AND SMOKE RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND ADDITIONAL INFORMATION

SAFEROOM GENERAL NOTES

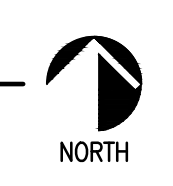
- PER ICC 500-2014, 309.1:
PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
1. 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
2. 2 1/16" IN DIAMETER
SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- PROVIDE 120V CONNECTION FOR SMARTBOARD. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH IN. REFER TO DETAIL '9/ES01' FOR ADDITIONAL INFORMATION.
- PROVIDE 120V WATER COOLER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V COPY MACHINE DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V GAS DRYER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V WASHER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V FIRE ALARM CONTROL PANEL. DEDICATED CONNECTION. COORDINATE RECEPTACLE TYPE AND LOCATION WITH FIRE ALARM CONTRACTOR.
- PROVIDE 120V TELECOM EQUIPMENT CONNECTION. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.



1 ELECTRICAL POWER PLAN
SCALE: 3/32" = 1'-0"



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GENERAL NOTES

1. COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT.
2. COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER DEVICES.
3. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR.
4. FIRMLY MOUNT WEATHERPROOF 120V CONVENIENCE OUTLET ON UNISTRUT/KINDORF. COORDINATE WITH OTHER TRADES PRIOR TO ROUGH-IN. REDUNDANT RECEPTACLES WHETHER STAND-ALONE OR INTEGRAL TO A UNIT, MAY BE OMITTED SO LONG AS ALL OF THE REQUIREMENTS OF NEC 210.63 ARE SATISFIED.

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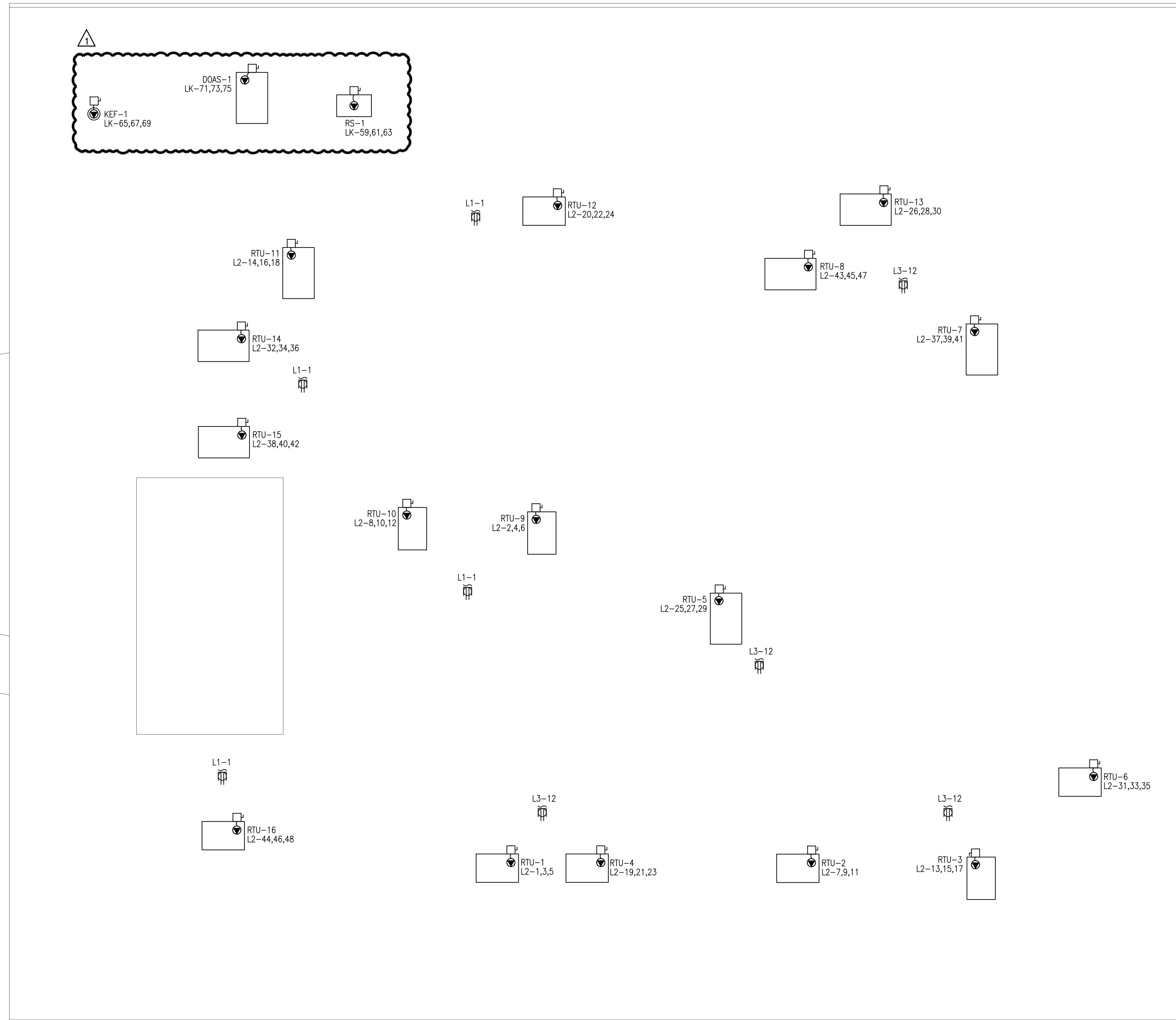
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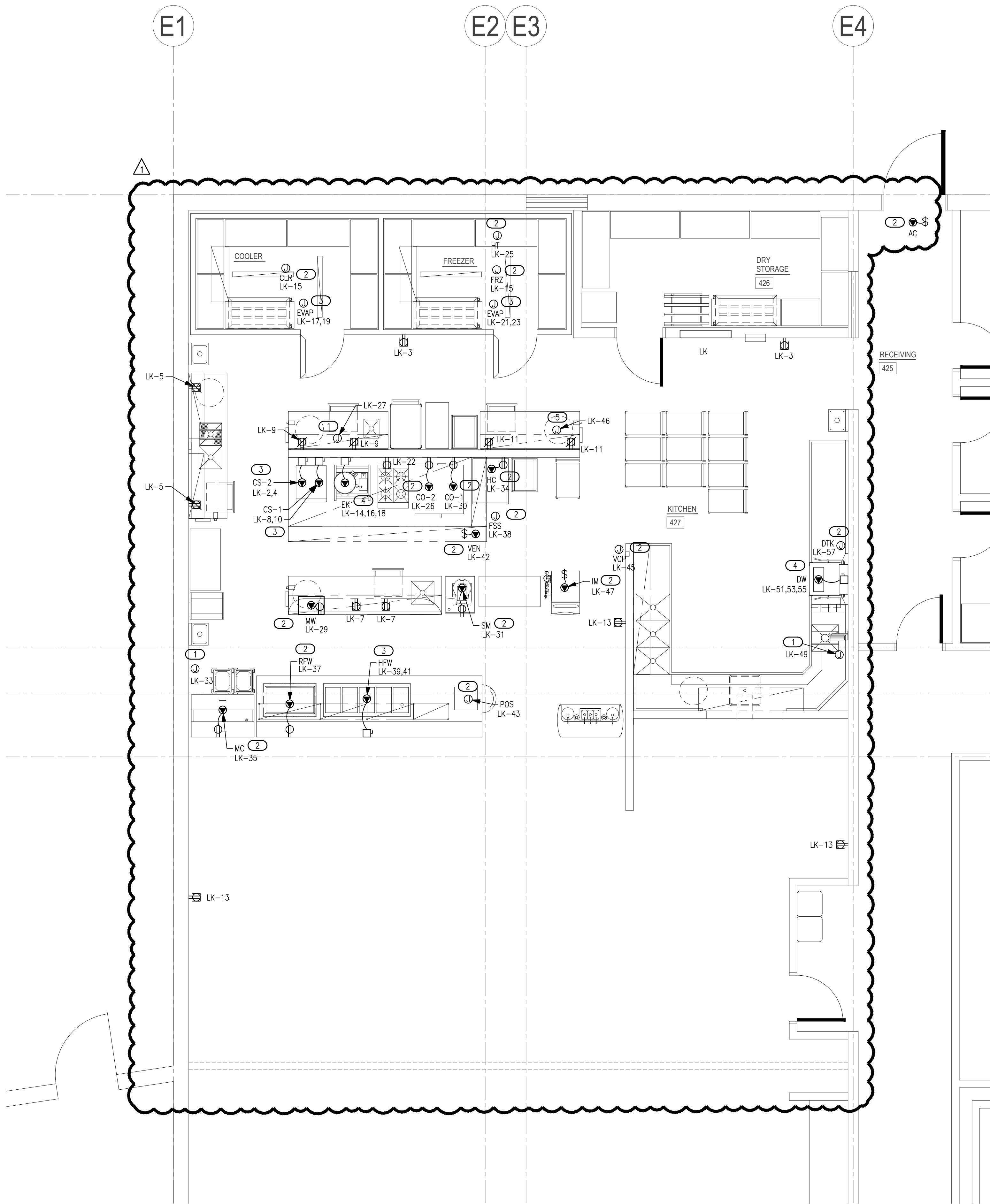
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1 ELECTRICAL ROOF PLAN

SCALE: 3/32" = 1'-0"





- ### KITCHEN GENERAL NOTES
- COORDINATE KITCHEN/FOODSERVICE EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MANUFACTURER, AND FOOD SERVICE CONTRACTOR PRIOR TO BEGINNING WORK. REFER TO FOOD SERVICE PLANS FOR ADDITIONAL INFORMATION.
 - COORDINATE KITCHEN HVAC EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MECHANICAL CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO MECHANICAL PLANS FOR ADDITIONAL INFORMATION.
 - COORDINATE KITCHEN PLUMBING EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION.
 - E.C. SHALL COORDINATE WITH OWNER, KITCHEN EQUIPMENT PROVIDER, AND OTHER TRADES PRIOR TO ROUGH IN TO ENSURE ALL ROUGH IN LOCATIONS ARE CONCEALED IN THE WALL AND STUBBED OUT IN THE PROPER LOCATIONS.
 - GFCI PROTECTION REQUIRED FOR ALL 120V 15 AND 20A RECEPTACLES, BY GFCI FUNCTION ON BREAKER OR RECEPTACLE, PER NEC 210.8 (B) (2).
 - HOOD STAND ALONE FIRE SUPPRESSION SYSTEM SHALL HAVE INPUT TO BUILDING FIRE ALARM SYSTEM.
 - PROVIDE A 20 A MP, 1 HP, 120V POWER SUPPLY FOR KITCHEN EXHAUST FAN ANSUL SYSTEM. THE ACTIVATION OF THE FIRE SUPPRESSION SYSTEM SHALL AUTOMATICALLY SHUT DOWN THE FUEL AND ELECTRICAL POWER SUPPLY TO THE COOKING EQUIPMENT UNDER THE KITCHEN HOOD. THE FUEL AND ELECTRICAL POWER SUPPLY RESET SHALL BE MANUAL. SHUNT TRIP CIRCUIT BREAKERS SHALL BE USED FOR ELECTRICALLY SUPPLIED APPLIANCES LOCATED UNDER THE HOOD.

- ### KEYED NOTES
- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
 - PROVIDE 120V CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
 - PROVIDE 208V SINGLE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
 - PROVIDE 208V THREE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
 - PROVIDE 120V CONNECTION FOR GAS SOLENOID VALVE ON SHUNT TRIP BREAKER. INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION.



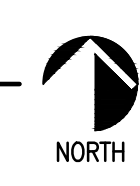
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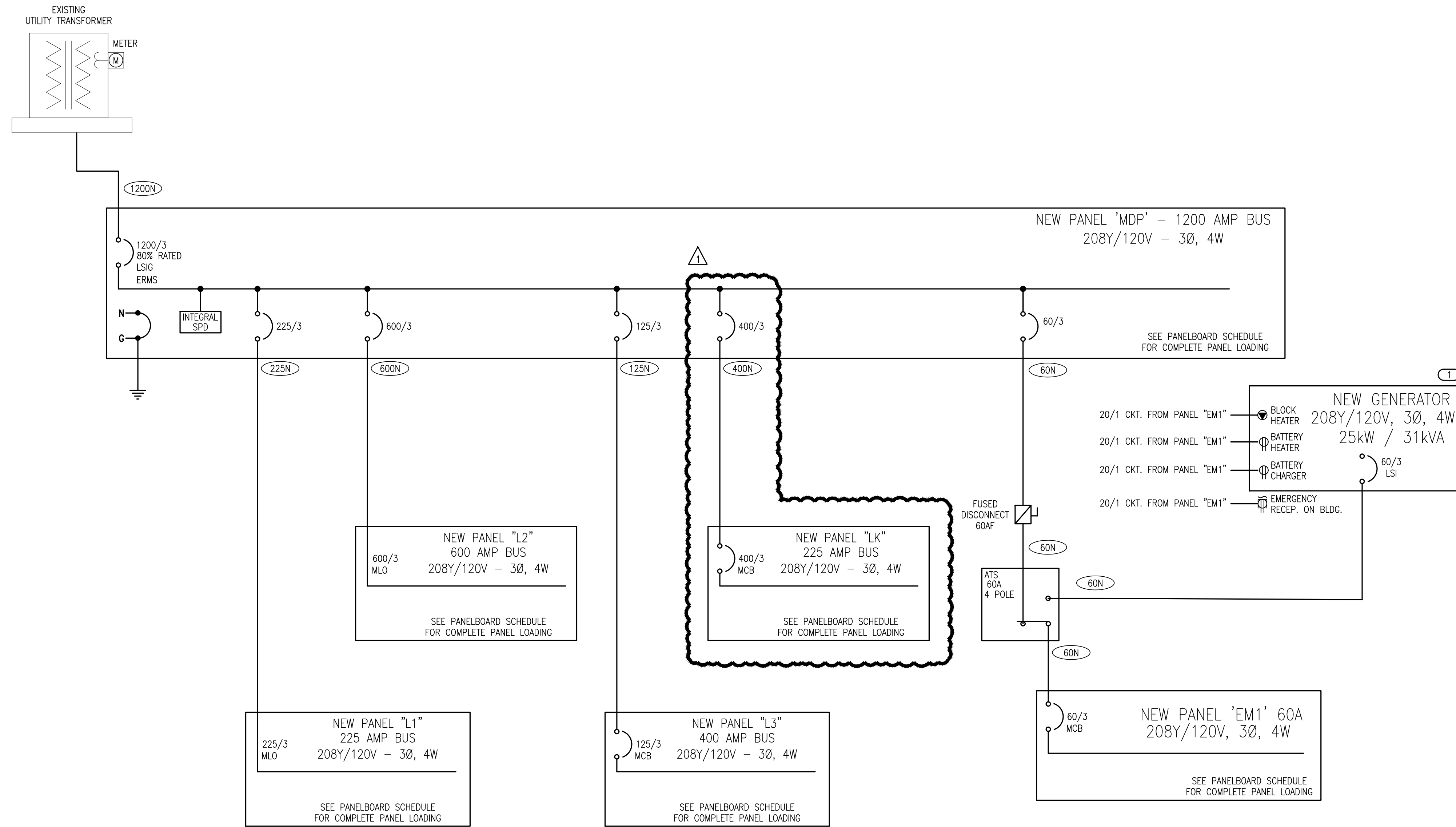
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1 ENLARGED ELECTRICAL KITCHEN PLAN
SCALE: 1/4" = 1'-0"



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1 ONE-LINE DIAGRAM
NO SCALE

FEEDER SCHEDULE				
AMPS	CONDUIT SIZE 4W	CONDUIT SIZE 3W	PHASE CONDUCTORS	EQUIPMENT GROUND CONDUCTOR
20	3/4"	3/4"	#12	#12
25	3/4"	3/4"	#10	#10
30	3/4"	3/4"	#10	#10
35	1"	3/4"	#8	#10
40	1"	3/4"	#8	#10
45	1"	1"	#6	#10
50	1"	1"	#6	#10
60	1 1/4"	1 1/4"	#4	#10
70	1 1/4"	1 1/4"	#4	#8
80	1 1/4"	1 1/4"	#3	#8
90	1 1/2"	1 1/4"	#2	#8
100	1 1/2"	1 1/4"	#2	#8
110	2"	1 1/2"	#1	#6
125	2"	1 1/2"	#1	#6
150	2"	1 1/2"	#1/0	#6
175	2"	2"	#2/0	#6
200	2"	2"	#3/0	#6
225	2 1/2"	2"	#4/0	#4
250	3"	2 1/2"	250 kcmil	#4
300	3"	3"	350 kcmil	#4
350	3 1/2"	3"	500 kcmil	#3
400	(2) 2"	(2) 2"	2 SETS OF #3/0	#3
450	(2) 2 1/2"	(2) 2"	2 SETS OF #4/0	#2
500	(2) 2 1/2"	(2) 2 1/2"	2 SETS OF 250 kcmil	#2
600	(2) 3"	(2) 3"	2 SETS OF 350 kcmil	#1
700	(2) 3 1/2"	(2) 3"	2 SETS OF 500 kcmil	#1/0
800	(3) 3"	(3) 2 1/2"	3 SETS OF 300 kcmil	#1/0
900	(3) 3 1/2"	(3) 3"	3 SETS OF 400 kcmil	#2/0
1000	(3) 3 1/2"	(3) 3"	3 SETS OF 500 kcmil	#2/0
1200	(4) 3"	(4) 3"	4 SETS OF 350 kcmil	#3/0
1600	(5) 3 1/2"	(5) 3"	5 SETS OF 500 kcmil	#4/0
1800	(6) 3 1/2"	(6) 3"	6 SETS OF 400 kcmil	250 kcmil
2000	(6) 3 1/2"	(6) 3"	6 SETS OF 500 kcmil	250 kcmil
2500	(7) 3 1/2"	(7) 3"	7 SETS OF 500 kcmil	350 kcmil

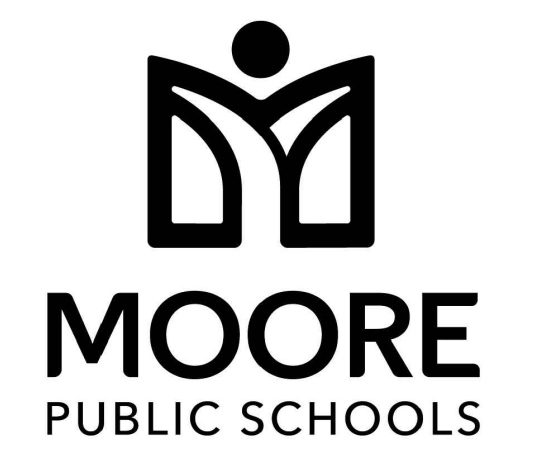
NOTES:
1. FEEDER SIZES ARE ON THE PLAN WHERE 60 REFERS TO A 60A FEEDER WITHOUT NEUTRAL AND 60N REFERS TO A 60A FEEDER WITH NEUTRAL.
2. SOME FEEDER SIZES DO NOT MATCH BREAKER SIZE DUE TO UP-SIZING OF THE FEEDER FOR VOLTAGE DROP.
3. CONDUITS ARE SIZED PER NEC TABLES FOR THHN/THWN AND MAY BE UPSIZED FOR EASE OF PULLING OR DOWNSIZED AS ALLOWED PER NEC FOR CONDUIT TYPE(S) BEING INSTALLED.
4. ALL CONDUCTORS 100A AND LESS ARE SIZED PER 60 DEGREE LUGS, EC MAY SIZE CONDUCTORS FOR ACTUAL RATING OF LUGS PER NEC.

GENERAL NOTES

1. AIC RATINGS ARE ESTIMATED BASED ON AVAILABLE DATA DURING DESIGN. CONTRACTOR TO VERIFY AVAILABLE FAULT CURRENT WITH UTILITY.

KEYED NOTES

(1) GENERATOR SHALL BE DUAL FUEL - NATURAL GAS AND PROPANE. GENERATOR SHALL HAVE FUEL TYPE AUTOMATIC SWITCHOVER CAPABILITY. BASIS OF DESIGN - KOHLER MODEL 250CL 25/31 KW/KVA.





Panel L2		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 600	MAIN BKR MLO LUGS STANDARD				
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	25/3	5.48	RTU-1	a	2	35/3	7.21	RTU-9
3				b	4			
5				c	6			
7	40/3	7.49	RTU-2	a	8	40/3	7.49	RTU-10
9				b	10			
11				c	12			
13	25/3	5.48	RTU-3	a	14	50/3	13.3	RTU-11
15				b	16			
17				c	18			
19	40/3	7.49	RTU-4	a	20	35/3	7.21	RTU-12
21				b	22			
23				c	24			
25	50/3	13.3	RTU-5	a	26	50/3	13.3	RTU-13
27				b	28			
29				c	30			
31	25/3	5.48	RTU-6	a	32	25/3	7.21	RTU-14
33				b	34			
35				c	36			
37	50/3	13.3	RTU-7	a	38	25/3	5.48	RTU-15
39				b	40			
41				c	42			
43	50/3	13.8	RTU-8	a	44	25/3	5.48	RTU-16
45				b	46			
47				c	48			
49	20/1	0	SPACE	a	50	20/1	0	SPACE
51	20/1	0	SPACE	b	52	20/1	0	SPACE
53	20/1	0	SPACE	c	54	20/1	0	SPACE
55	20/1	0	SPACE	a	56	20/1	0	SPACE
57	20/1	0	SPACE	b	58	20/1	0	SPACE
59	20/1	0	SPACE	c	60	20/1	0	SPACE

CONN KVA	CALC KVA	(%)	TOTAL LOAD	CALC KVA
LARGEST MOTOR	13.8	3.46 (25%)	142	142
MOTORS	138	138 (100%)	BALANCED 3-PHASE LOAD	394 A
			PHASE A	100%
			PHASE B	100%
			PHASE C	100%

Panel EM1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 60	MAIN BKR 60 LUGS STANDARD				
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.432	LIGHTING	a	2	15/1	1.18	SF-1
3	20/1	0.441	LIGHTING	b	4	15/1	0.696	SF-2
5	20/1	1	LIGHTING	c	6	15/1	0.696	SF-3
7	20/1	0.981	LIGHTING	a	8	20/1	0.5	BLOCK HEATER
9	20/1	0.55	LIGHTING	b	10	20/1	0.5	BATTERY HEATER
11	20/1	0.647	LIGHTING	c	12	20/1	0.5	BATTERY CHARGER
13	20/1	0.572	LIGHTING	a	14	20/1	0.18	RECEPTACLE
15	20/1	0.477	LIGHTING	b	16	20/1	0	SPACE
17	20/1	0	SPACE	c	18	20/1	0	SPACE
19	20/1	0	SPACE	a	20	20/1	0	SPACE
21	20/1	0	SPACE	b	22	20/1	0	SPACE
23	20/1	0	SPACE	c	24	20/1	0	SPACE
25	20/1	0	SPACE	a	26	20/1	0	SPACE
27	20/1	0	SPACE	b	28	20/1	0	SPACE
29	20/1	0	SPACE	c	30	20/1	0	SPACE

CONN KVA	CALC KVA	(%)	TOTAL LOAD	CALC KVA
LIGHTING	5.1	6.38 (125%)	2.57	2.57 (100%)
LARGEST MOTOR	1.18	0.294 (25%)	RECEPTACLES	1.68
			BALANCED 3-PHASE LOAD	30.3 A
			PHASE A	123%
			PHASE B	85.5%
			PHASE C	91.3%

Panel L1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 225	MAIN BKR MLO LUGS STANDARD				
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.72	ROOFTOP RECEPTACLE	a	2	20/1	1.28	LIGHTING
3	20/1	0.36	RM 431 RECEPTACLE, RM 433 RECEPTACLE	b	4	20/1	0.793	LIGHTING
5	20/1	0.36	I.T. RECEPTACLE	c	6	20/1	0.706	LIGHTING
7	20/1	0.36	I.T. RECEPTACLE	a	8	20/1	0.48	LIGHTING
9	20/1	0.36	I.T. RECEPTACLE	b	10	20/1	0.636	LIGHTING
11	20/1	0.36	I.T. RECEPTACLE	c	12	20/1	1.06	LIGHTING
13	20/1	0.54	RM 434 RECEPTACLE	a	14	20/1	0.528	CP-3
15	20/1	0.54	RM 434 RECEPTACLE	b	16	20/1	0.1	WH-3
17	20/1	0.54	RM 430 RECEPTACLE	c	18	20/1	0.1	WH-4
19	20/1	0.36	RM 430 RECEPTACLE	a	20	20/1	0.1	WH-1
21	20/1	0.9	RM 429 RECEPTACLE, SMARTBOARD	b	22	20/1	0.1	WH-2
23	20/1	0	SPACE	c	24	20/1	0.1	WH-5
25	20/1	0.72	RM 1E RECEPTACLE, RM 5 RECEPTACLE	a	26	20/1	0.528	CP-2
27	20/1	0.93	CORRIDOR 428 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 435 RECEPTACLE, TRAP PRIMER	b	28	15/1	0.696	EF-1
29	20/1	0.54	RM 5 RECEPTACLE	c	30	30/2	4.5	EW-1
31	20/1	0.72	RM 1D RECEPTACLE, RM 4 RECEPTACLE	a	32			
33	20/1	0.54	RM 4 RECEPTACLE	b	34	15/1	0.696	EF-5
35	20/1	0.54	RM 3 RECEPTACLE	c	36	15/1	0.696	EF-6
37	20/1	0.72	RM 1C RECEPTACLE, RM 3 RECEPTACLE	a	38	15/1	0.696	EF-2
39	20/1	0.72	RM 1B RECEPTACLE, RM 2 RECEPTACLE	b	40	20/1	0.528	CP-1
41	20/1	0.54	RM 2 RECEPTACLE	c	42	20/2	2	EFH-1
43	20/1	0.54	RM 103 RECEPTACLE	a	44			
45	20/1	0.72	RM 101C RECEPTACLE, RM 103 RECEPTACLE	b	46	20/2	2	EFH-4
47	20/1	0.72	RM 101B RECEPTACLE, RM 102 RECEPTACLE	c	48			
49	20/1	0.54	RM 102 RECEPTACLE	a	50	15/1	0.696	EF-7
51	20/1	0.72	RM 101A RECEPTACLE, RM 101 RECEPTACLE	b	52	20/1	0.9	RM 301A RECEPTACLE, RM 301 RECEPTACLE, RM 303 RECEPTACLE
53	20/1	0.54	RM 101 RECEPTACLE	c	54	20/1	0.72	RM 301 RECEPTACLE, SMARTBOARD
55	20/1	0.72	RM 101D RECEPTACLE, RM 104 RECEPTACLE	a	56	20/1	0.72	RM 422 RECEPTACLE
57	20/1	0.54	RM 104 RECEPTACLE	b	58	20/1	0.54	RM 423 RECEPTACLE, RM 424 RECEPTACLE, RM 425 RECEPTACLE
59	20/1	0.72	RM 101E RECEPTACLE, RM 105 RECEPTACLE	c	60	20/1	0.72	RM 205 RECEPTACLE
61	20/1	0.9	CORRIDOR 436 RECEPTACLE, RM 105F RECEPTACLE, RM 105 RECEPTACLE	a	62	20/1	0.72	RM 201E RECEPTACLE, RM 205 RECEPTACLE
63	20/1	0.72	RM 201C RECEPTACLE, RM 203 RECEPTACLE	b	64	20/1	0.73	RM 201D RECEPTACLE, RM 204 RECEPTACLE, TRAP PRIMER
65	20/1	0.54	EXTERIOR RECEPTACLE	c	66	20/1	0.72	RM 204 RECEPTACLE
67	20/1	1.1	CORRIDOR 419 RECEPTACLE, CORRIDOR 420 RECEPTACLE, CORRIDOR 428 RECEPTACLE, RM 421 RECEPTACLE, TRAP PRIMER	a	68	20/1	0.72	RM 202 RECEPTACLE
69	20/1	0.36	TELECOM EQ	b	70	20/1	0.72	RM 201B RECEPTACLE, RM 202 RECEPTACLE
71	20/1	0	SPACE	c	72	20/1	0.72	RM 203 RECEPTACLE
73	20/1	0	SPACE	a	74	20/1	0.35	DRYER
75	20/1	0	SPACE	b	76	20/1	0.84	WASHER
77	20/1	0	SPACE	c	78	20/1	0.18	FACP
79	20/1	0	SPACE	a	80	20/1	0	SPACE
81	20/1	0	SPACE	b	82	20/1	0	SPACE
83	20/1	0	SPACE	c	84	20/1	0	SPACE

CONN KVA	CALC KVA	(%)	TOTAL LOAD	CALC KVA
LIGHTING	4.96	6.2 (125%)	5.56	5.56 (100%)
LARGEST MOTOR	0.696	0.174 (25%)	RECEPTACLES	30
			HEATING	8.5
			BALANCED 3-PHASE LOAD	40.5
			PHASE A	112 A
			PHASE B	110%
			PHASE C	95.7%
				94%

Panel MDP		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM UTILITY		NEUTRAL 100%	BUS AMPS 1200	MAIN BKR 1200 LUGS STANDARD				
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	225/3	49.1	PANEL L1	a	2	600/3	138	PANEL L2
3				b	4			
5				c	6			
7	125/3	35	PANEL L3	a	8	400/3	93.3	PANEL LK
9				b	10			
11				c	12			
13	20/1	0	SPACE	a	14	60/3	9.35	TRANSFER SWITCH ATS
15	20/1	0	SPACE	b	16			
17	20/1	0	SPACE	c	18			
19	20/1	0	SPACE	a	20	20/1	0	SPACE
21	20/1	0	SPACE	b	22	20/1	0	SPACE
23	20/1	0	SPACE	c	24	20/1	0	SPACE
25	20/1	0	SPACE	a	26	20/1	0	SPACE
27	20/1	0	SPACE	b	28	20/1	0	SPACE
29	20/1	0	SPACE	c	30	20/1	0	SPACE

CONN KVA	CALC KVA	(%)	TOTAL LOAD	CALC KVA
LIGHTING	15.4	19.2 (125%)	236	236 (100%)
LARGEST MOTOR	18	4.5 (25%)	RECEPTACLES	58.7
			HEATING	15.3
			BALANCED 3-PHASE LOAD	309
			PHASE A	858 A
			PHASE B	104%
			PHASE C	100%
				95.6%

Panel L3		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000				
FED FROM MDP		NEUTRAL 100%	BUS AMPS 125	MAIN BKR 125 LUGS STANDARD				
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	20/1	0.18	RM 410 RECEPTACLE	a	2	20/1	0.73	LIGHTING
3	20/1	0.18	RM 410 RECEPTACLE	b	4	20/1	0.619	LIGHTING
5	20/1	0.18	RM 410 RECEPTACLE	c	6	20/1	0.838	LIGHTING
7	20/1	0.72	RM 410 RECEPTACLE	a	8	20/1	0.931	LIGHTING
9	20/1	0.72	RM 409 RECEPTACLE	b	10	20/1	0.99	LIGHTING
11	20/1	0.72	RM 406 RECEPTACLE	c	12	20/1	0.72	ROOFTOP RECEPTACLE
13	20/1	0.72	RM 405 RECEPTACLE	a	14	20/1	0.37	WATER COOLER RECEPTACLE
15	20/1	0.72	RM 404 RECEPTACLE	b	16	20/1	0.54	RM 1 RECEPTACLE
17	20/1	1.2	COPY MACHINE	c	18	20/1	1.09	CORRIDOR 412 RECEPTACLE, CORRIDOR 416 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 411 RECEPTACLE, TRAP PRIMER
19	20/1	0.36	RM 403 RECEPTACLE	a	20	20/1	0.72	RM 1A RECEPTACLE, RM 1 RECEPTACLE
21	20/1	0.36	RM 402 RECEPTACLE	b	22	20/1	0.55	RM 436A RECEPTACLE, RM 436 RECEPTACLE, TRAP PRIMER
23	20/1	0.36	RM 402 RECEPTACLE	c	24	20/1	0.36	RM 436 RECEPTACLE
25	20/1	0.54	RM 402 RECEPTACLE	a	26			

MECHANICAL EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
CP-1	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-40	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
CP-2	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-26	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
CP-3	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-14	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-1	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-28	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-38	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-42	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-4	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-40	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
EF-5	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-34	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-6	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-36	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-7	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-50	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-8	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-52	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EFH-1	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-42,44	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-2	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-48,50	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-3	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-44,46	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-4	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-46,48	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EWH-1	ELECTRIC WATER HEATER	208V 2P 2W		4.5			L1-30,32	3/4"C,2#10,1#10G	NON-FUSED	EC	EC
RTU-1	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-1,3,5	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-2	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-7,9,11	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-3	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-13,15,17	3/4"C,3#8,1#10G	NON-FUSED	MFR	EC
RTU-4	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-19,21,23	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-5	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-25,27,29	3/4"C,3#6,1#10G	NON-FUSED	MFR	EC
RTU-6	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-31,33,35	3/4"C,3#8,1#10G	NON-FUSED	MFR	EC
RTU-7	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-37,39,41	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-8	ROOF TOP UNIT	208V 3P 3W		13.83	48	50	L2-43,45,47	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-9	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-2,4,6	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-10	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-8,10,12	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-11	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-14,16,18	3/4"C,3#6,1#10G	NON-FUSED	MFR	EC
RTU-12	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-20,22,24	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-13	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-26,28,30	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-14	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-32,34,36	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-15	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-38,40,42	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-16	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-44,46,48	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
SF-1	EXHAUST FAN	120V 1P 2W	1/2 HP	1.18	2	15	EM1-2	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
SF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-4	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
SF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-6	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
WH-1	WATER HEATER	120V 1P 2W	F HP	0.1			L1-20	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-2	WATER HEATER	120V 1P 2W	F HP	0.1			L1-22	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-3	WATER HEATER	120V 1P 2W	F HP	0.1			L1-16	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-4	WATER HEATER	120V 1P 2W	F HP	0.1			L1-18	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
WH-5	WATER HEATER	120V 1P 2W	F HP	0.1			L1-24	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC

KITCHEN EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
AC	AIR CURTAIN	120V 1P 2W	1 HP	1.92					TOGGLE SWITCH	EC	EC
CLR	COOLER	120V 1P 2W		0.3			LK-15	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
CO-1	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-30	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
CO-2	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-26	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
CS-1	CONVECTION STEAMER	208V 2P 2W		6			LK-8,10	3/4"C,2#8,1#10G	NON-FUSED	EC	EC
CS-2	CONVECTION STEAMER	208V 2P 2W		8			LK-2,4	3/4"C,2#6,1#10G	NON-FUSED	EC	EC
DOAS-1	ROOF TOP UNIT	208V 3P 3W		16.43	57.1	60	LK-71,73,75	1"C,3#4,1#10G	NON-FUSED	MFR	EC
DTK	DRAIN WATER TEMPERING KIT	120V 1P 2W		0.6			LK-57	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
DW	DISHWASHER	208V 3P 3W		18			LK-51,53,55	1"C,3#4,1#8G	NON-FUSED	EC	EC
EK	ELECTRIC KETTLE	208V 3P 3W		10.8			LK-14,16,18	3/4"C,3#8,1#10G	NON-FUSED	EC	EC
EVAP	EVAPORATOR	208V 2P 2W		0.21			LK-17,19	3/4"C,2#12,1#12G	JUNCTION BOX	EC	EC
EVAP	EVAPORATOR	208V 2P 2W		0.21			LK-21,23	3/4"C,2#12,1#12G	JUNCTION BOX	EC	EC
FRZ	FREEZER	120V 1P 2W		0.3			LK-15	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
FSS	FIRE SUPPRESSION SYSTEM	120V 1P 2W		0.12			LK-38	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
HC	HOT CABINET	120V 1P 2W		1.92			LK-34	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
HPW	HOT FOOD WELL	208V 2P 2W		2.81			LK-39,41	3/4"C,2#12,1#12G	NON-FUSED	EC	EC
HT	HEAT TAPE	120V 1P 2W		1.92			LK-25	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
IM	ICE MAKER	120V 1P 2W		1.62			LK-47	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC
KEF-1	KITCHEN EXHAUST FAN	208V 3P 3W		2.63			LK-65,67,69	3/4"C,3#10,1#10G	NON-FUSED	EC	EC
MC	MILK COOLER	120V 1P 2W		0.33			LK-35	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
MW	MICROWAVE	120V 1P 2W		1.5			LK-29	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
POS	POINT OF SALE SYSTEM	120V 1P 2W		0.12			LK-43	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
RFW	REFRIGERATED FOOD WELL	120V 1P 2W		0.84			LK-37	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
RS-1	REFRIGERATION SYSTEM	208V 3P 3W		9.73	29	40	LK-59,61,63	3/4"C,3#10,1#10G	NON-FUSED	EC	EC
SM	STAND MIXER	120V 1P 2W	1/2 HP	1.18			LK-31	3/4"C,1#12,1#12G	DUPLEX RECEPTACLE	EC	EC
VCP	VENTILATOR CONTROL PANEL	120V 1P 2W		0.12			LK-45	3/4"C,1#12,1#12G	JUNCTION BOX	EC	EC
VEN	VENTILATOR	120V 1P 2W		1.8			LK-42	3/4"C,1#12,1#12G	TOGGLE SWITCH	EC	EC

Panel		ROOM	MOUNTING	RECESSED	FED FROM	MDP	VOLTS	208Y/120V 3P 4W	AIC	65,000	
LK							BUS AMPS	400	MAIN BKR	400	
		NOTE		[DOUBLE TUB]		NEUTRAL		100%		LUGS STANDARD	
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION				
1	20/1	0.752	LIGHTING	2	50/2	8	CS-2				
3	20/1	0.36	RECEPTACLE	4		0	SHUNT TRIP				
5	20/1	0.36	RECEPTACLE	6	-/1	0	SHUNT TRIP				
7	20/1	0.36	RECEPTACLE	8	40/2	6	CS-1				
9	20/1	0.36	RECEPTACLE	10		0	SHUNT TRIP				
11	20/1	0.36	RECEPTACLE	12	-/1	0	SHUNT TRIP				
13	20/1	0.54	RECEPTACLE	14	40/3	10.8	EK				
15	20/1	0.6	CLR, FRZ	16		0					
17	20/2	0.208	EVAP	18		0					
19				20	-/1	0	SHUNT TRIP				
21	20/2	0.208	EVAP	22	20/1	0.18	RECEPTACLE				
23				24	-/1	0	SHUNT TRIP				
25	20/1	1.92	HT	26	20/1	1.18	CO-2				
27	20/1	0.01	TRAP PRIMER	28	-/1	0	SHUNT TRIP				
29	20/1	1.5	MW	30	20/1	1.18	CO-1				
31	20/1	1.18	SM	32	-/1	0	SHUNT TRIP				
33	20/1	0.01	TRAP PRIMER	34	20/1	1.92	HC				
35	20/1	0.325	MC	36	-/1	0	SHUNT TRIP				
37	20/1	0.84	RFW	38	20/1	0.12	FSS				
39	20/2	2.81	HPW	40	-/1	0	SHUNT TRIP				
41				42	20/1	1.8	VEN				
43	20/1	0.12	POS	44	-/1	0	SHUNT TRIP				
45	20/1	0.12	VCP	46	20/1	0.18	GAS VALVE				
47	20/1	1.62	IM	48	-/1	0	SHUNT TRIP				
49	20/1	0.01	TRAP PRIMER	50	20/1	0	SPACE				
51	70/3	18	DW	52	20/1	0	SPACE				
53				54	20/1	0	SPACE				
55				56	20/1	0	SPACE				
57	20/1	0.6	DTK	58	20/1	0	SPACE				
59	40/3	9.73	RS-1	60	20/1	0	SPACE				
61				62	20/1	0	SPACE				
63				64	20/1	0	SPACE				
65	20/3	2.63	KEF-1	66	20/1	0	SPACE				
67				68	20/1	0	SPACE				
69				70	20/1	0	SPACE				
71	60/3	16.4	DOAS-1	72	20/1	0	SPACE				
73				74	20/1	0	SPACE				
75				76	20/1	0	SPACE				
77	20/1	0	SPACE	78	20/1	0	SPACE				
79	20/1	0	SPACE	80	20/1	0	SPACE				
81	20/1	0	SPACE	82	20/1	0	SPACE				
83	20/1	0	SPACE	84	20/1	0	SPACE				

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	0.752	0.94	(125%)	MOTORS	87
LARGEST MOTOR	18	4.5	(25%)	RECEPTABLES	2.73
				HEATING	2.81
				TOTAL LOAD	98
				BALANCED 3-PHASE LOAD	272 A
				PHASE A	107%
				PHASE B	103%
				PHASE C	89.5%

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KFC ENGINEERING
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OCTOBER 2024
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11/22/2024 AD 02



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
E602

Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas

TEXT	DESCRIPTION
WP	DEVICE SHALL BE WEATHER PROOF AND RATED FOR EXTERIOR CONDITIONS
•	FIELD COORDINATE ELEVATION.
AFF	ABOVE FINISHED FLOOR
UC	DEVICE IS TO BE MOUNTED ON THE UNDERSIDE OF THE ELEVATED CANOPY.
WM	DEVICE IS TO BE WALL MOUNTED.
WG	WIRE GUARD TO BE PROVIDED AND INSTALLED TO PROTECT ASSOCIATED DEVICE.

TEXT	DESCRIPTION
E	EXISTING TO REMAIN.
D	DEVICE IS EXISTING AND IS TO BE REMOVED. CONTRACTOR TO REMOVE THE DEVICE AND RETURN TO OWNER.
R	REMOVE EXISTING DEVICE AND RELOCATE TO A LOCATION INDICATED ON THE DRAWINGS.

NOTES TO CONTRACTOR	
1.	EVERY SYMBOL SHOWN ON LEGEND MAY NOT APPEAR ON DRAWINGS.
2.	SYSTEM INSTALLERS SHALL COORDINATE LOCATIONS AND CONNECTIONS WITH THE PROJECTS ELECTRICAL CONTRACTOR.
3.	CONTRACTOR TO PROVIDE PROPERLY GROUNDED LIGHTING PROTECTION ON ALL CABLING ENTERING AND EXITING THE BUILDING.

SCOPE ITEM	RESPONSIBILITY	NOTES
COMMUNICATIONS - DIVISION 27	OFI CFI OFCI	
CATEGORY 6 STRUCTURED CABELLING SYSTEM		X
BUILDING INTERCOMPA, BELL, AND CLOCK SYSTEM		X
NETWORK EQUIPMENT		
→ MDF/IDF NETWORK EQUIPMENT		X
→ VOIP TELEPHONES		X
→ WIRELESS ACCESS POINTS		X
→ UNINTERRUPTABLE POWER SUPPLIES (UPS)		X
RACEWAY, CONDUIT, BACK BOXES, SLEEVES, ETC.		X SEE NOTE 1.
ELECTRICAL POWER		X SEE NOTE 1.
LIFE SAFETY AND SECURITY - DIVISION 28	OFI CFI OFCI	
ACCESS CONTROL SYSTEM(ACS)		X
INTRUSION DETECTION SYSTEM		X
VIDEO SURVEILLANCE SYSTEM (VSS)		
→ VSS SERVERS		X
→ VSS CAMERAS		X
→ VSS PROGRAMMING		X
→ VSS CABLING		X SEE NOTE 2.
FIRE ALARM SMOKE DETECTION WITH VOICE EVACUATION		X SEE NOTE 1.
RACEWAY, CONDUIT, BACK BOXES, SLEEVES, ETC.		X SEE NOTE 1.
ELECTRICAL POWER		X SEE NOTE 1.
OFI - OWNER FURNISHED AND OWNER INSTALLED CFI - CONTRACTOR FURNISHED AND CONTRACTOR INSTALLED OFCI - OWNER FURNISHED AND CONTRACTOR INSTALLED		
RESPONSIBILITY MATRIX NOTES:		
1. BY DIVISION 26.		
2. BY DIVISION 27.		

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
ACP	ACCESS CONTROL SYSTEM, CONTROL PANEL.	+60" AFF TO CENTER	AS REQUIRED	COORDINATE POWER, NOTE #4.
CR	ACCESS CONTROL PROXIMITY CARD READER. DEFAULT SYMBOL INDICATES WALL MOUNTED "M" - INDICATES MULLION MOUNTED READER	+42" A.F.F.	1-G, 3/4" C	
CR	DOOR MOUNTED ACCESS CONTROL PROXIMITY CARD READER THAT IS INTEGRATED INTO THE DOOR HARDWARE.	+42" AFF	N/A	
ES	2-WAY AUDIO/VIDEO INTERCOM DOOR STATION. *DEFAULT INDICATES WALL MOUNTED "M" - INDICATES MULLION MOUNTED DEVICE	+42" AFF	"W: 1-G, 3/4" C "M: 3/4" C	COORDINATE POWER, NOTE #4 & #5.
ES	DOOR MOUNTED, 2-WAY AUDIO/VIDEO INTERCOM DOOR STATION.	+42" AFF, FIELD COORDINATE		COORDINATE POWER, NOTE #4 & #5
MS	2-WAY AUDIO/VIDEO INTERCOM MASTER STATION.	DESK MOUNTED UNO		COORDINATE POWER, NOTE #4
DR	DOOR RELEASE BUTTON	COORDINATE WITH GC	1-G, 3/4" C	
DH	PIR MOTION REQUEST TO EXIT DEVICE, DOOR CONTACT AND ELECTRIC STRIKE.			ACCESS CONTROL ONLY DOOR SHALL BE SPST. DOOR WITH BOTH ACCESS CONTROL AND INTRUSION SHALL BE DPDT. ONLY 1 DOOR CONTACT PER DOOR IF DH AND DC SYMBOL ARE SHOWN

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK
5. AVIGLON PART # 3.0C-HAV-RD1-R.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
W	WALL/CORNER MOUNT 4-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5 AND 6
W	CEILING MOUNTED 4-SENSOR CAMERA	CEILING		NOTE #5
W	3-SENSOR CAMERA	CEILING UNO		NOTE #5 AND 6
W	2-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5
W	1-SENSOR CAMERA	REFERENCE FLOOR PLANS	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
+	SYMBOL ADDED TO CAMERA TO INDICATE WALL MOUNT.	+9" AFF UNO		NOTE #6
VRS	VIDEO RECORDING SERVER			
HMU	VIDEO SURVEILLANCE MAIN UNIT	ABOVE CEILING		NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK
6. EXTERIOR WALL MOUNT SPEAKERS SHALL BE MOUNTED +10" AFF.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
IDP	INTRUSION DETECTION SYSTEM CONTROL PANEL	+60" AFF	TWO(2) - 1" C TO CONTRACTOR PROVIDED BACK BOX	COORDINATE POWER WITH EC, NOTE #5
KP	INTRUSION DETECTION SYSTEM KEYPAD	+60" AFF TO TOP	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
W	WALL MOUNTED MOTION DETECTOR *# = LR IF LONG RANGE	REFERENCE FLOOR PLAN	N/A	
W	CEILING MOUNTED GLASS BREAK DETECTOR	CEILING	N/A	
DC	DOOR CONTACT	FLUSH MOUNTED IN DOOR FRAME	N/A	INTRUSION ONLY DOOR SHALL BE DPDT. DOOR WITH BOTH ACCESS CONTROL AND INTRUSION SHALL BE (1) DPDT FOR INTRUSION AND (1) SPST FOR ACCESS CONTROL. SPACE CONTACTS AT LEAST 2" APART.
DDC	OVERHEAD DOOR MOUNT MAGNETIC DOOR CONTACT.	SURFACE MOUNTED ON DOOR FRAME	N/A	
HU	DMP WIRELESS HOLDUP BUTTON	UNDER DESK UNO	N/A	
SS	SECURITY SIREN	+9" AFF	SINGLE GANG BACKBOX	

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. REFERENCE DIVISION 28 SPECIFICATION FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

FIRE ALARM	
*PROJECT SCOPE INCLUDES REPLACING EXISTING FIRE ALARM SYSTEM IN ITS ENTIRETY WITH NEW VOICE EVACUATION FIRE ALARM SYSTEM. FIRE ALARM SYSTEM SHALL BE FULLY OPERATIONAL THROUGHOUT ALL PHASES OF CONSTRUCTION. DEMOUSH EXISTING SYSTEM ONCE NEW SYSTEM IS INSTALLED, TESTED, AND ACCEPTED BY THE AHJ.	
LEGEND	
ACP	FIRE ALARM CONTROL. PROVIDE AND INSTALL 1 CATEGORY CABLE TO CONNECT PANEL TO NETWORK.
FAA	FIRE ALARM ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE
NOTES:	
1.	REFERENCE SHEET SPECIFICATIONS
2.	A LICENSED FIRE ALARM PLANNING SUPERINTENDENT CERTIFIED TO A MINIMUM LEVEL 3, IN THE SUBFIELD OF FIRE ALARM SYSTEMS THROUGH THE NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET), SHALL PROVIDE PLANS AND CALCULATIONS FOR A MANUAL AND AUTOMATIC FIRE DETECTION AND ALARM SYSTEM TO COMPLY WITH THE BUILDING SPACE LAYOUT, BUILDING OCCUPANCY, CURRENT NFPA 72, LOCAL AND STATE CODE REQUIREMENTS, AND THE FIRE ALARM AND DETECTION SYSTEM SPECIFICATIONS.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
W	WALL MOUNTED NETWORK OUTLET D#: NUMBER OF DATA DROPS IN OUTLET AP: WIRELESS ACCESS POINT	+18" AFF, UNLESS OTHERWISE NOTED	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
W	COMMUNICATIONS OUTLET	FIELD COORDINATE	FIELD COORDINATE	
W	WALL MOUNTED NETWORK OUTLET	+44" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
B	WALL MOUNTED BOX FOR FUTURE USE.	+18" AFF UNO	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
D#	FLOOR MOUNTED NETWORK OUTLET	N/A	COORDINATE WITH ELECTRICAL CONTRACTOR	FINISHED HARDWARE PROVIDED BY DIV 27
D#	CEILING MOUNTED NETWORK OUTLET	ABOVE CEILING	CEILING BRACKET WITH BISCUIT BLOCK	
D#	CEILING MOUNTED NETWORK OUTLET FOR ACCESS POINT D#: NETWORK DROP QUANTITY	ABOVE CEILING	CEILING BRACKET WITH BISCUIT BLOCK	

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. CONDUIT STUB UP AND SLEEVES SHALL HAVE A SOLID UNCOATED PLASTIC PROTECTIVE BUSHING.
5. NO CONDUITS SHALL EXCEED FOR 40% MAXIMUM FILL RATIO. CONTRACTOR TO PROVIDE ADDITIONAL CONDUITS REQUIRED.

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
WMP	WALL MOUNTED PROJECTOR AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLANS.	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
CMP	CEILING MOUNTED PROJECTOR AUDIOVISUAL OUTPUT OUTLET	CEILING MOUNTED	N/A	NOTE #5
AV-1	WALL MOUNTED AUDIO/VIDEO INPUT OUTLET	+18" AFF UNO	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	
FSD-1	WALL MOUNTED FLAT SCREEN DISPLAY AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLAN	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	NOTE #5
FSD-2	WALL MOUNTED FLAT SCREEN DISPLAY AUDIOVISUAL OUTPUT OUTLET ASSOCIATED WITH AV-1 INPUT OUTLET	REFERENCE FLOOR PLAN	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
IVD	INTERACTIVE VIDEO DISPLAY AUDIOVISUAL OUTPUT OUTLET	REFERENCE FLOOR PLAN	4 11/16"X4 11/16"X2-1/8" BACK BOX WITH DOUBLE GANG RING, TWO(2) 1.25" C	NOTE #5
CP	AV CONTROL PANEL	+48" AFF TO TOP	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
ES	LOCAL INSTRUCTIONAL SPACE PRESENTATION SPEAKER	CEILING	CONTRACTOR PROVIDED CEILING BOX	COORDINATE POWER WITH EC
SC	STREAMING CAMERA	CEILING UNO	N/A	NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

SYMBOL	DESCRIPTION	ELEVATION	BACK BOX/RACEWAY	NOTES
ICS	INTERCOM COMMUNICATIONS SYSTEM HEAD END UNIT.	FLOOR MOUNTED	COORDINATE WITH EC	COORDINATE POWER WITH EC
S	CEILING MOUNT INTERCOM SPEAKER, LAY-IN CEILING	CEILING	CONTRACTOR PROVIDED	
S	CEILING MOUNT INTERCOM SPEAKER, HARD CEILING.	CEILING	CONTRACTOR PROVIDED	
S	WALL MOUNT INTERIOR INTERCOM SPEAKER	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
S	WALL MOUNT EXTERIOR INTERCOM SPEAKER	+10" AFF UNO	CONTRACTOR PROVIDED	
S	PENDANT MOUNT INTERCOM SPEAKER	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
S	SURFACE MOUNT INTERCOM SPEAKER, MOUNT TO STRUCTURE	CEILING	CONTRACTOR PROVIDED	
S	CEILING MOUNTED EXTERIOR INTERCOM SPEAKER.	CEILING	CONTRACTOR PROVIDED	
IP	IP BASED SPEAKER. # TO BE REPLACED WITH S, S2, S3, S4 INDICATING THE SPECIFIC TYPE OF SPEAKER.	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	NOTE #5
IP	SPEAKER CONNECTED TO IP MODULE AND AMPLIFIER. # TO BE REPLACED WITH S, S2, S3, S4 INDICATING THE SPECIFIC TYPE OF SPEAKER.	REFERENCE FLOOR PLANS	CONTRACTOR PROVIDED	
VC	WALL MOUNTED VOLUME CONTROL.	+48" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
CB	INTERCOM CALL BUTTON	+48" AFF	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
C	SINGLE FACE CLOCK	90" AFF UNO.	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
C	DOUBLE FACE CLOCK	90" AFF UNO.	4"X4"X2 1/8" BACK BOX WITH 1-G MUD RING, 1" C	
RPS	REMOTE PROGRAM SOURCE	DESK TOP	COORDINATE WITH EC	NOTE #5
ACS	ADMINISTRATIVE CALL STATION.	DESK TOP	N/A	NOTE #5

NOTES:
1. #G INDICATES BACK BOX SIZE.
2. #C INDICATES CONDUIT SIZE.
3. UNO, UNLESS NOTED OTHERWISE
4. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
5. PROVIDE AND INSTALL ONE (1) CATEGORY CABLE TO CONNECT DEVICE TO NETWORK

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OCTOBER 2024	date
11/22/2024 AD 02	revisions



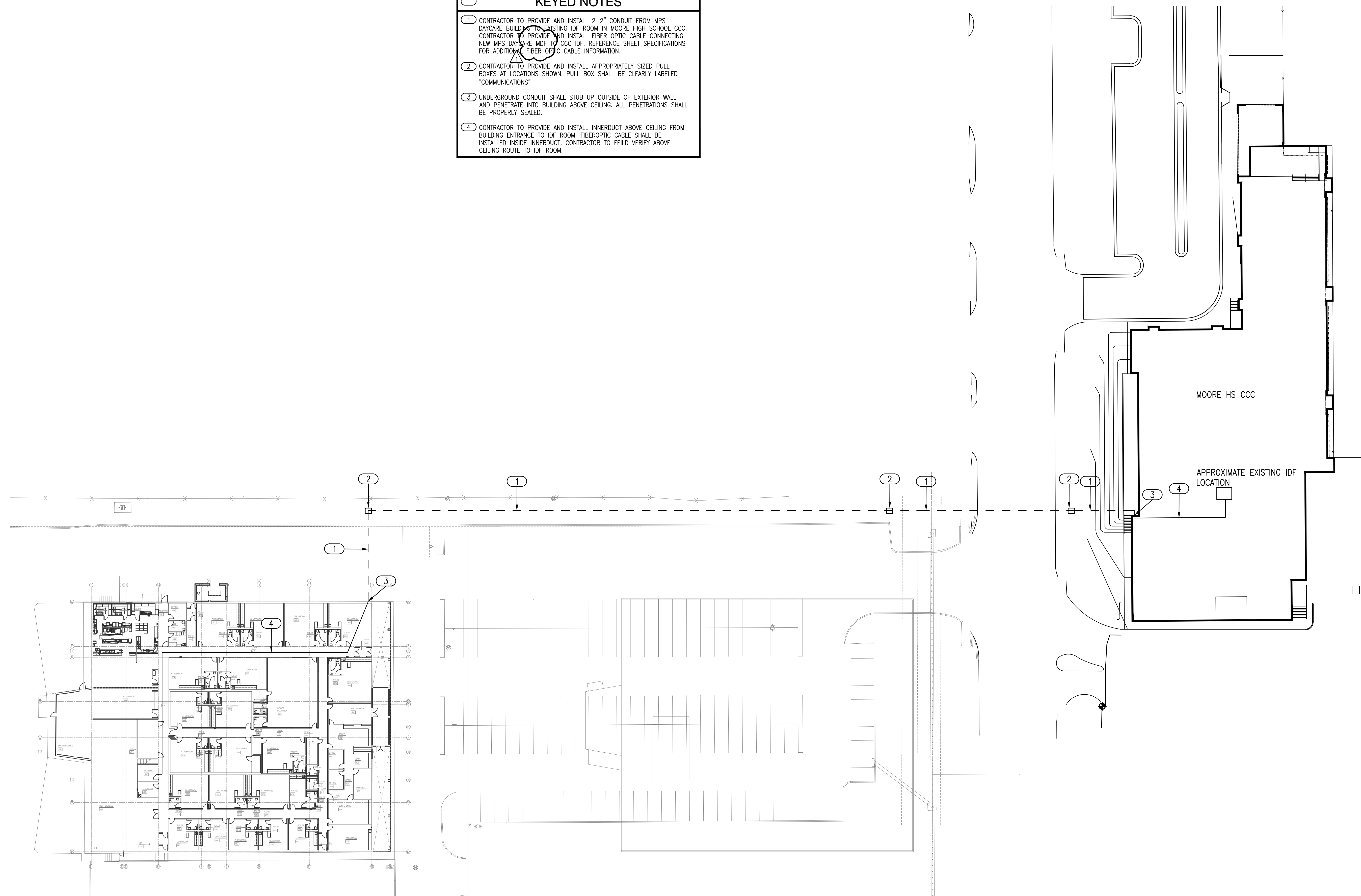
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KEYED NOTES	
1	CONTRACTOR TO PROVIDE AND INSTALL 2-2" CONDUIT FROM MPS DAYCARE BUILDING TO EXISTING IDF ROOM IN MOORE HIGH SCHOOL CCC. CONTRACTOR TO PROVIDE AND INSTALL FIBER OPTIC CABLE CONNECTING NEW MPS DAYCARE MDF TO CCC IDF. REFERENCE SHEET SPECIFICATIONS FOR ADDITIONAL FIBER OPTIC CABLE INFORMATION.
2	CONTRACTOR TO PROVIDE AND INSTALL APPROPRIATELY SIZED PULL BOXES AT LOCATIONS SHOWN. PULL BOX SHALL BE CLEARLY LABELED "COMMUNICATIONS"
3	UNDERGROUND CONDUIT SHALL STUB UP OUTSIDE OF EXTERIOR WALL AND PENETRATE INTO BUILDING ABOVE CEILING. ALL PENETRATIONS SHALL BE PROPERLY SEALED.
4	CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING FROM BUILDING ENTRANCE TO IDF ROOM. FIBEROPTIC CABLE SHALL BE INSTALLED INSIDE INNERDUCT. CONTRACTOR TO FIELD VERIFY ABOVE CEILING ROUTE TO IDF ROOM.



1 TECHNOLOGY SITE PLAN
SCALE: 1/32" = 1'-0"



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Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

SAFEROOM NOTE

PER ICC 500-2014, 309.1:

PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:

- 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
- 2 1/16" IN DIAMETER

SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

GENERAL NOTES

- FIRE ALARM: CONNECT NEW FIRE ALARM DEVICES TO NEW SILENT KNIGHT 6820XL SUPPLY 6820XL PANEL AND ALL NAC PANELS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE AN CODE COMPLIANT SYSTEM. SYSTEM SHALL USE SK PROTOCOL DEVICES ONLY. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- SECURITY ALARM: CONNECT ALL NEW SECURITY ALARM DEVICES TO NEW DMP SECURITY ALARM PANEL. SUPPLY DMP PANEL AND ALL ZONE EXPANDERS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. SYSTEM SHALL BE WIRED WITH 2 ZONES PER SINGLE DOOR OR DOUBLE DOOR. ONE ZONE FOR SECURITY ALARM AND ONE ZONE FOR DOOR HOLD OPEN ALERTS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- INTERCOM: INTERCOM DEVICES SHALL BE RAULAND. CONNECT ALL NEW INTERCOM DEVICES TO EXISTING RAULAND TELECENTER U.I.P. SUPPLY ALL MASTER CONSOLES, AMPLIFIERS, POWER SUPPLIES, MODULES, CALL BUTTONS, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. ROOM SPEAKERS AND RESTROOM SPEAKERS SHALL BE TIED TOGETHER ON ONE TALK ZONE PER ROOM CALL BUTTON. EACH ROOM WITH A CALL BUTTON SHALL HAVE A STATUS LIGHT INSTALLED ABOVE ROOM DOOR ON HALLWAY SIDES. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- CLOCKS: CLOCKS SHALL BE RAULAND. SEE SHEET SPECIFICATIONS FOR APPROVED PART NUMBERS.
- ACCESS CONTROL: CONNECT ALL NEW ACCESS CONTROL DEVICES TO NEW KEYSCAN CONTROLLERS. SUPPLY KEYSCAN CONTROLLERS AND ALL POWER SUPPLIES, READERS, STRIKES, ETC. NEEDED TO FURNISH A COMPLETE SYSTEM. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- CAMERA: CONNECT ALL NEW CAMERAS TO NEW MDF. CAMERA SYSTEM IS AVIGILON. CONTRACTOR TO PROVIDE DELL AVIGILON SERVER IN MDF ROOM LOCATED ON 2 POST RACK. CONTACT JACK PHILLIPS WITH MOORE PUBLIC SCHOOLS @ 405-473-5225 FOR EXACT CAMERA MOUNTING LOCATIONS AND SPECIFICATIONS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- DATA: CONNECT NEW DATA, WIFI AND CAMERA NETWORK DROPS TO NEW MDF. CONNECT NEW DATA, WIFI TO EXISTING IDF LOCATED IN MOORE HIGH SCHOOL CCC VIA FIBER AND CAT 6 CABLE. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.

KEYED NOTES

- CONTRACTOR TO EXTEND ENTRANCE CONDUIT ABOVE CEILING. CONTRACTOR TO MATCH NEW CONDUIT SIZE WITH EXISTING CONDUIT SIZE.
- CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING AT THE INDICATED ROUTE TO THE NEW IT ROOM. PENETRATE AND SEAL WALLS AS NEEDED.
- INDICATES NEW DEMARC LOCATION. PLYWOOD IS RESERVED FOR SERVICE PROVIDER EQUIPMENT.
- INDICATES THE LOCATION OF A 8" TALL, 3/4" FIRE RATED PLYWOOD CONTRACTOR TO PROVIDE AND INSTALL PLYWOOD AND ALL REQUIRED MOUNTING HARDWARE. PLYWOOD SHALL BE PAINTED WHITE WITH FIRE RATED PAINT. TYPICAL FOR ALL SHOWN ON DRAWING.
- INDICATES THE LOCATION OF A NEW WALL MOUNTED TELECOMMUNICATION GROUND BUS BAR (TGBB). CABLING CONTRACTOR TO PROVIDE BUS BAR AND ALL REQUIRED MATERIAL TO MOUNT AT THE LOCATION SHOWN. TGBB TO BE MOUNTED AT +93" A.F.F.
- PROVIDE AND INSTALL A 12" WIDE, UNIVERSAL LADDER TRAY AND ALL REQUIRED MOUNTING HARDWARE. LADDER TRAY SHALL BE BLACK IN COLOR. TYPICAL FOR ALL SHOWN ON ENTIRE PROJECT.
- PROVIDE AND INSTALL ONE (1) 2-POST, FLOOR MOUNTED, 7' RELAY RACK (BLACK IN COLOR). PROVIDE BONDING WASHERS, BOLTS, AND NUTS AT ALL MECHANICALLY CONNECTED LOCATIONS OF THE RACK TO ENSURE THAT ALL PIECES OF THE RACK ARE COMPLETELY BONDED. SCRAPING PAINT FROM RACKS TO MAKE A BOND WILL NOT BE ACCEPTED. ALL RACK MOUNTED COMPONENTS SHALL BE MOUNTED WITH BONDING SCREWS AND THE CONTRACTOR SHALL PROVIDE THE OWNER WITH (50) ADDITIONAL BONDING SCREWS FOR THE INSTALLATION OF OWNER EQUIPMENT. NO DANGEROUS CHANGING GROUNDS FROM RACK TO CABLE TRAY OR TO OTHER RACKS WILL BE ACCEPTED. ALL GROUNDS SHALL BE HOME RUN TO THE TELECOMMUNICATIONS GROUND BUS BAR (TGBB). TYPICAL FOR ALL SHOWN ON THE ENTIRE PROJECT.
- PROVIDE AND INSTALL ONE (1) 7'X6", FRONT AND REAR MANAGED, VERTICAL CABLE MANAGER (BLACK IN COLOR). CABLE MANAGERS SHALL BE INSTALLED ON EACH END OF THE RACK SYSTEMS AND BETWEEN EACH RACK. CABLE MANAGERS SHALL HAVE A SINGLE, SOLID, FULL HEIGHT HINGED DOOR IN THE FRONT AND WIDE SPACED CABLE RINGS WITH SPIN-OPEN LATCHES IN THE REAR. TYPICAL FOR ALL SHOWN IN THE ENTIRE PROJECT.
- DOOR HARDWARE SPECIFIED FOR INDICATED DOORS SHOULD HAVE KEY ACCESS FROM BOTH SIDES ALLOWING EACH SIDE TO BE LOCKED AND UNLOCKED INDEPENDENTLY.
- CONTRACTOR TO PROVIDE AND INSTALL A DMP WIRELESS HOLD UP BUTTON AT EACH LOCATION INDICATED.

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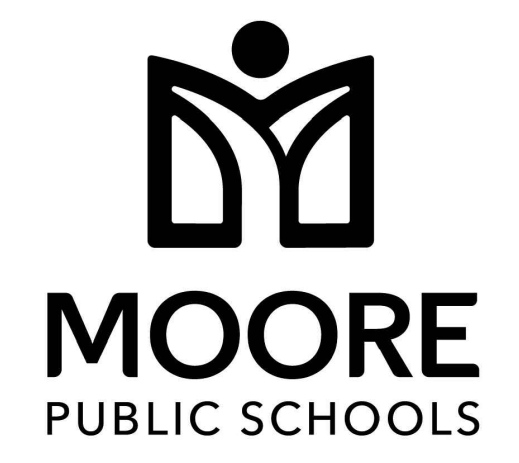
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11/22/2024 AD 02

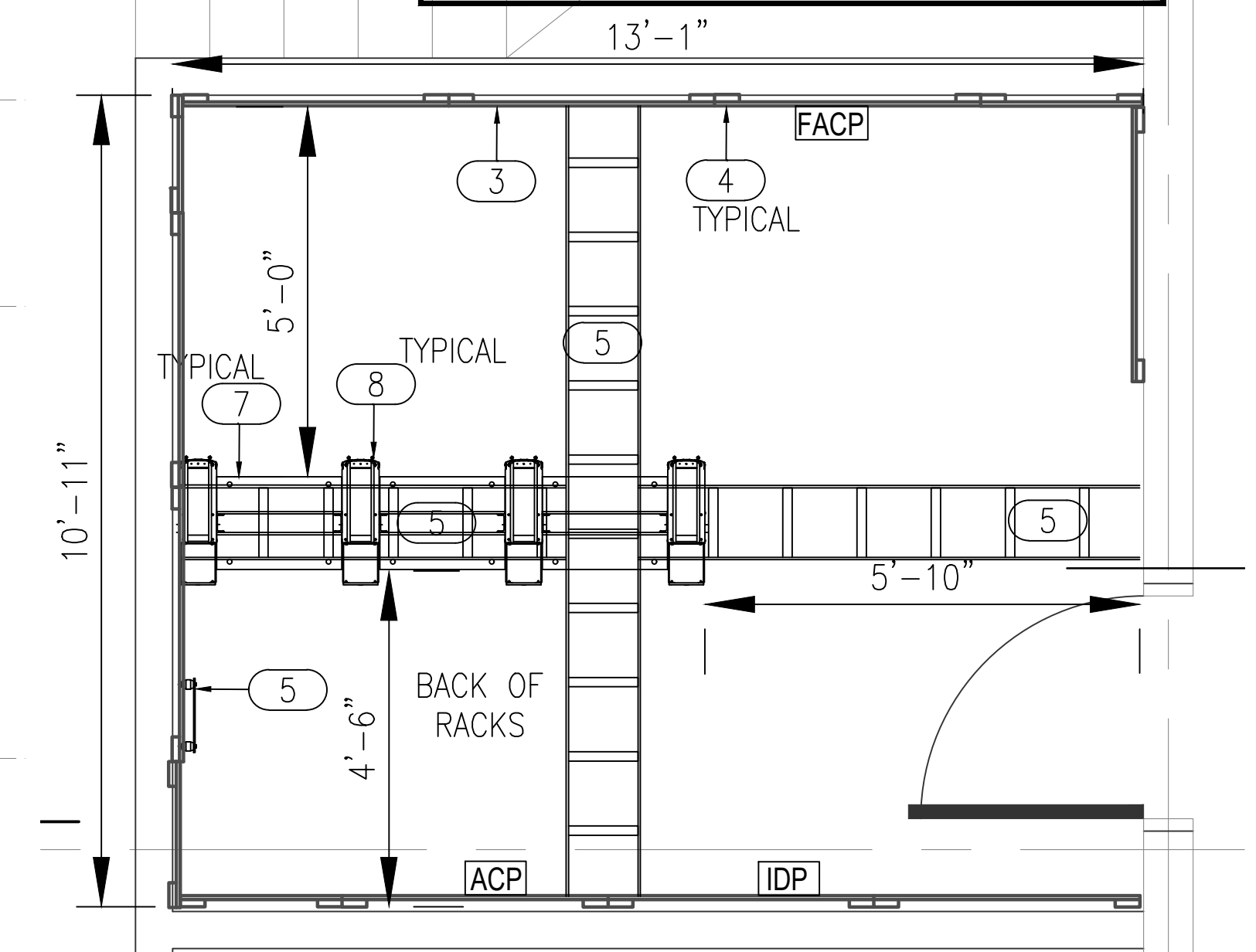


CHILD CARE FACILITY
201 N. EASTERN AVE.

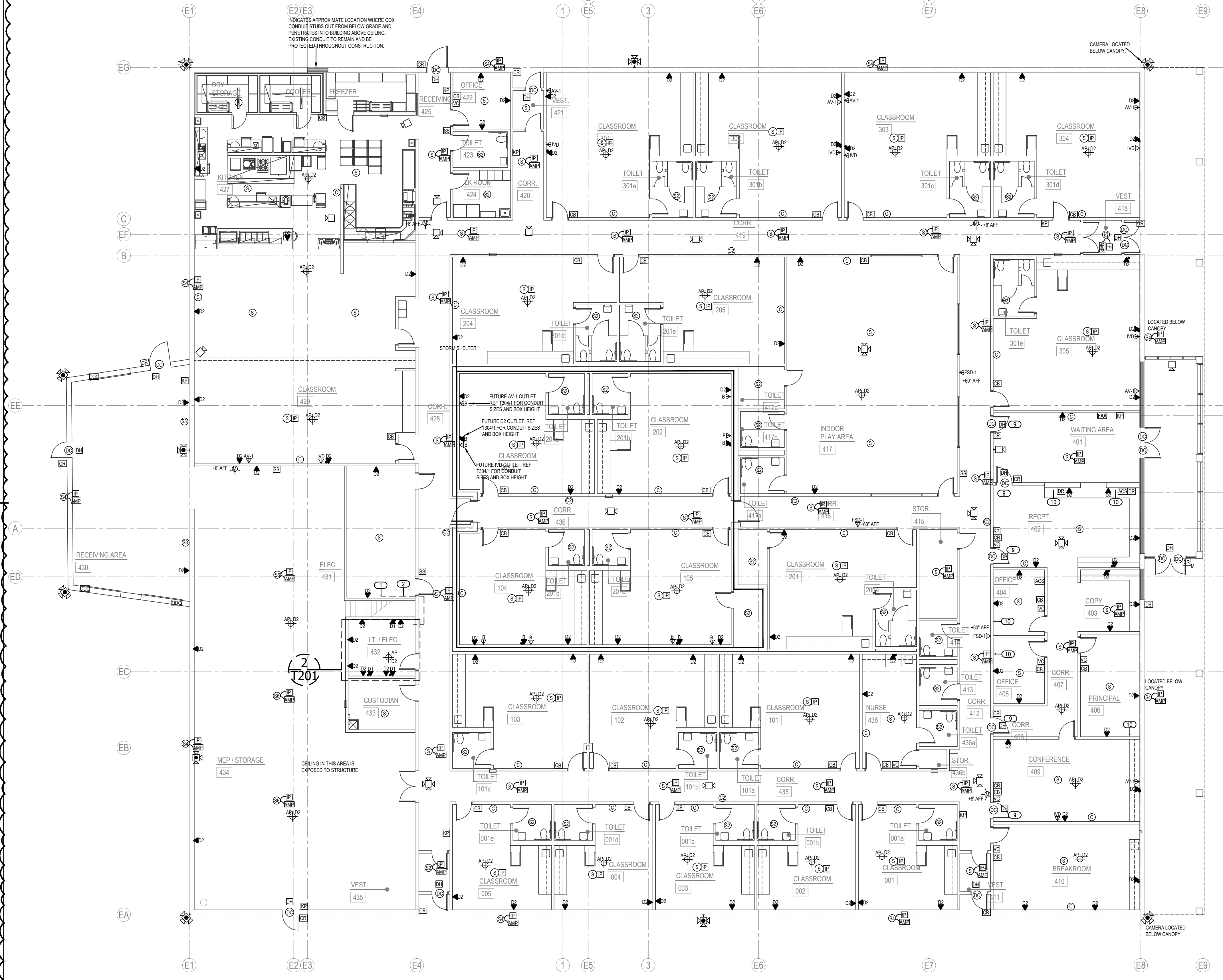
sheet no:
T201

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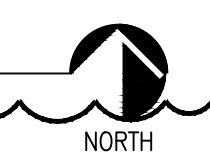
Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

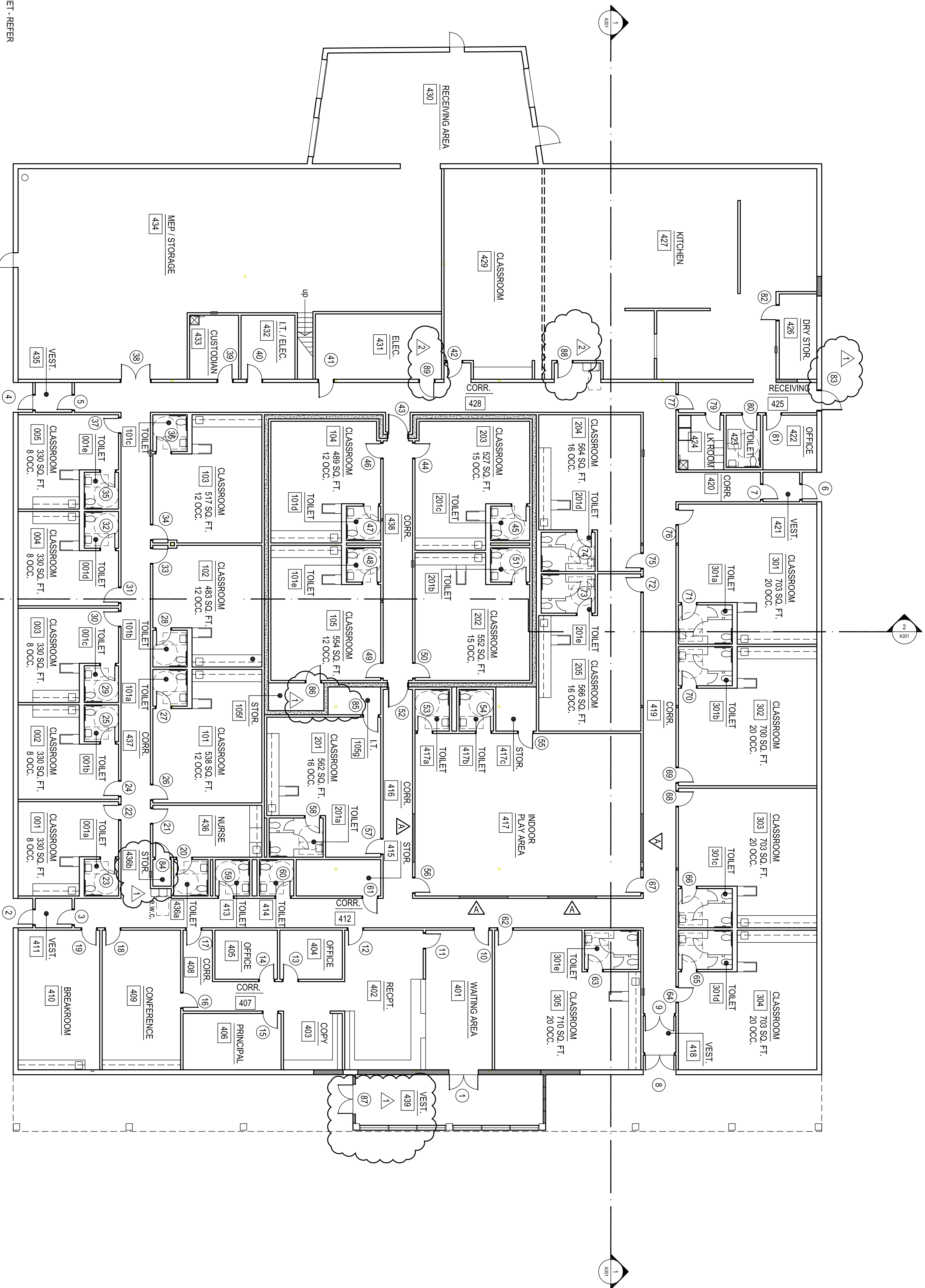


2 TECHNOLOGY ENLARGED PLAN - I.T./ELEC. 432
SCALE: 1/2" = 1'-0"

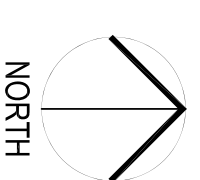


1 TECHNOLOGY FLOOR PLANS
SCALE: 3/32" = 1'-0"

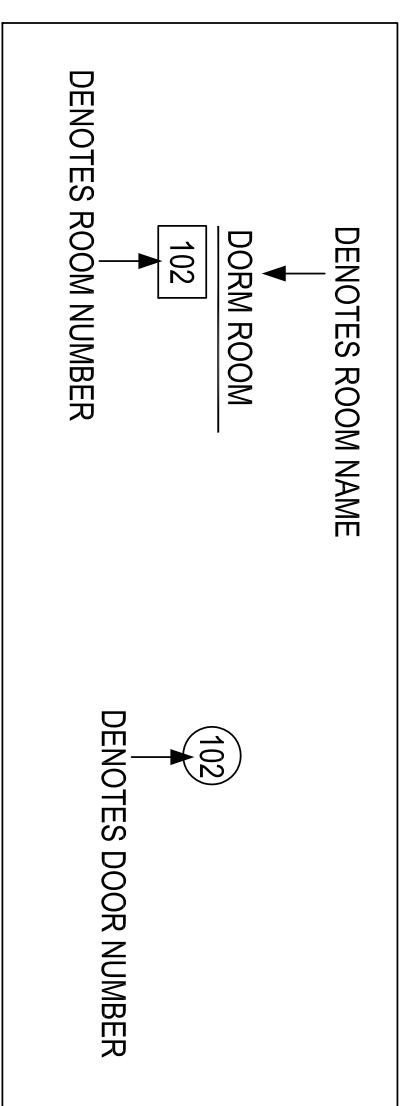




- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. REFER SHEETS A100a FOR DIMENSION PLAN
 5. NUMBER OF CLASSROOM STUDENT OCCUPANTS ARE BASED ON DEPARTMENT OF HUMAN SERVICES' 2022 LIMITS



OVERALL FLOOR PLAN
3/82" = 1'-0"



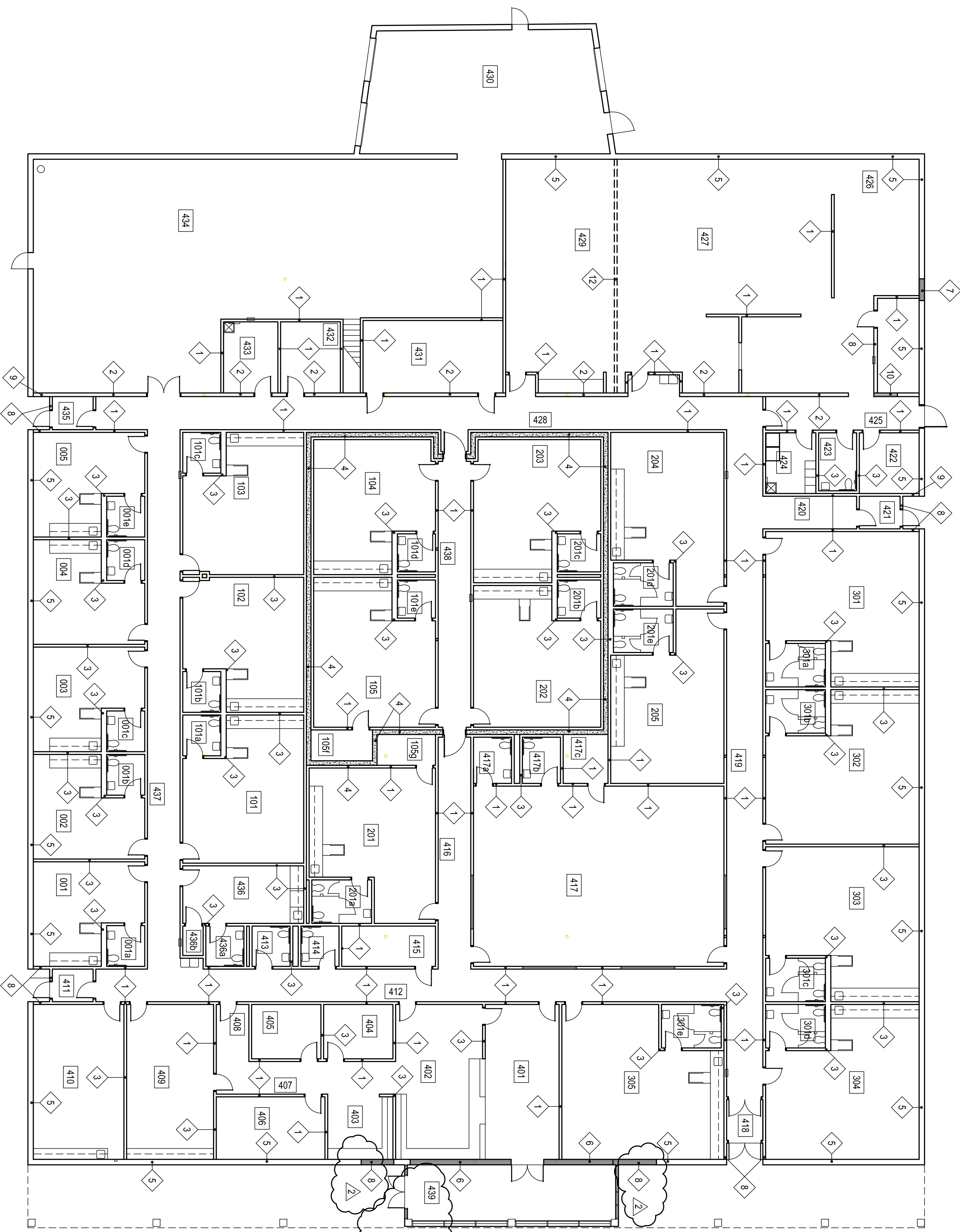


WALL / PARTITION LEGEND

- 1 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 2 EXISTING LOAD BRNG, 6" CMU WALL
1 LAYER FIRE RATED GYP. BD. EA.SIDE ON 7/8" FURRING STRIPS
HEIGHT: 6" ABOVE CEILING
PROVIDE FIRE STOPPING AS REQUIRED AT TOP OF EXISTING CMU WALL
- 3 STUD WALL / CHASE WALL (12" CLEAR)
1 LAYERS GYPSUM BOARD EACH SIDE, 3.58" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
- 4 SHELTER WALL
1 LAYER GYP. BD. EA. SIDE ON 3/8" METAL STUDS
HEIGHT: SLAB TO 6" ABOVE CEILING
10" CONC. WALL TO SLAB ABOVE - 12'-6", RE. STRUCT.
- 5 EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. ON 2" FURRING STRIPS W/ 2" BATT INSULATION
HEIGHT: SLAB TO 6" ABOVE CEILING
- 6 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO MATCH
EXISTING CMU WIDTH
HEIGHT: SLAB TO DECK ABOVE
- 7 NEW STUD IN-FILL AT EXISTING EXTERIOR 12" CMU
1 LAYER GYP. BD. AND EXTERIOR SHEATHING ON METAL STUDS TO
MATCH EXISTING CMU WIDTH. MATCH EXISTING E.F.I.S. THICKNESS
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 8 STUD WALL / METAL WALL PANEL
1 LAYERS GYPSUM BOARD, 6" METAL STUDS, EXTERIOR SHEATHING W/
METAL WALL PANELS
HEIGHT: 6" STUDS AND GYP. BD. SLAB TO DECK ABOVE. SHEATHING
AND METAL WALL PANEL TO SOFFIT ABOVE
- 9 EXISTING CMU WALL / METAL WALL PANEL
7/8" FURRING STRIPS, EXTERIOR SHEATHING W/ METAL WALL PANELS
HEIGHT: SHEATHING AND METAL WALL PANEL TO SOFFIT ABOVE
- 10 NEW STUD IN-FILL AT EXISTING 8" CMU
1 LAYER GYP. BD. EACH SIDE ON METAL STUDS TO
MATCH EXISTING CMU WIDTH.
HEIGHT: SLAB TO OPENING HEIGHT / DECK ABOVE
- 11 STUD WALL
1 LAYERS FIRE RATED GYPSUM BOARD EACH SIDE, 6" METAL STUDS
HEIGHT: SLAB TO DECK
- 12 MOVABLE PARTITION
REFER SPECIFICATIONS

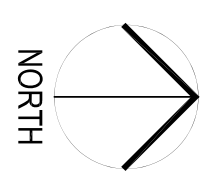
REFER ROOM FINISH SCHEDULE, COLOR SCHEDULE,
INTERIOR ELEVATIONS & SPECIFICATIONS FOR ADDITIONAL
WALL FINISH INFORMATION

CONSTRUCTION MANAGER & SUBCONTRACTORS SHALL
COORDINATE FINAL CONSTRUCTION OF ALL WALLS
PRIOR TO BEGINNING WORK



WALL TYPE PLAN

3/32" = 1'-0"



NORTH

CONSTRUCTION DATA (TABLE 603):

OCCUPANCY -	E & I-4
CONSTRUCTION TYPE -	TYPE II - B
BASIC ALLOWABLE AREA -	E - 58,000 S.F. / I-4 - 52,000 S.F. PER FLOOR
ALLOWABLE STORIES -	3 / 3
ACTUAL STORIES -	1 / 1
ACTUAL HEIGHT -	23'-4"

BUILDING SIZES:
BUILDING : 1 STORY @ 32,200 S.F.

STRUCTURAL FIRE PROTECTION (TABLE 601):	0 HOUR
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
EXTERIOR BEARING WALLS	NONCOMBUSTIBLE
COLUMNS	0 HOUR
BEAMS	0 HOUR
PERMANENT PARTITIONS	NONCOMBUSTIBLE
FLOOR ASSEMBLIES	0 HOUR
ROOF ASSEMBLIES	0 HOUR
EXTERIOR OPENINGS	N/A

PASSIVE FIRE SAFETY SYSTEM:
PORTABLE FIRE EXTINGUISHERS (REF: SHEETS A104)
TRAVEL DISTANCE = 250'-0" MAX.
ACTUAL MAX. TRAVEL DISTANCE = 170'-0"
DEADEND - 50'-0" MAX.
ACTUAL DEADEND - NONE

ACTIVE FIRE SAFETY SYSTEMS (EXISTING & NEW ADDITION):
FIRE SPRINKLER SYSTEM THROUGHOUT
FIRE ALARM SYSTEM
SMOKE DETECTION
AUTOMATIC AIR HANDLING EQUIP. SHUTDOWN
EXIT LIGHTS/EMERGENCY LIGHTS BATTERY

CODES/REGULATIONS USED: (CITY OF MOORE):
2018 IBC - INTERNATIONAL BUILDING CODE
AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE
2009 ENERGY CONSERVATION CODE
ASSOCIATED SUPPLEMENTS TO EACH CODE

OCCUPANT LOAD (TABLE 1004.1.1.1):

BUILDING RENOVATION: 278 CHILDREN
12 ADMIN / STAFF
40 TEACHERS
330 TOTAL OCCUPANTS

EGRESS WIDTH:

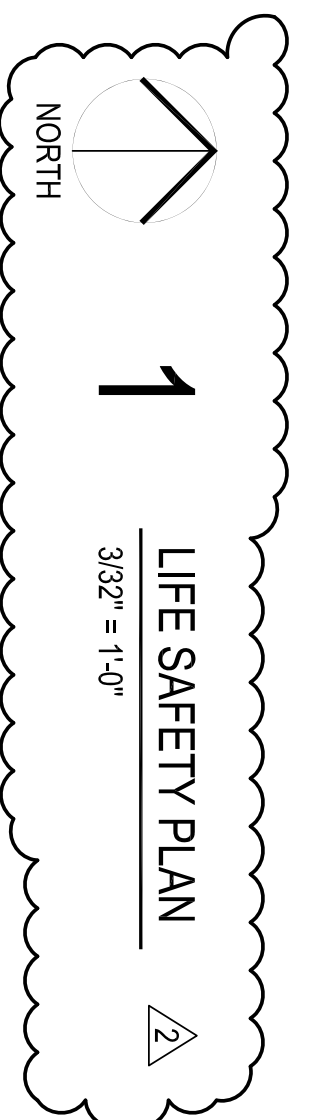
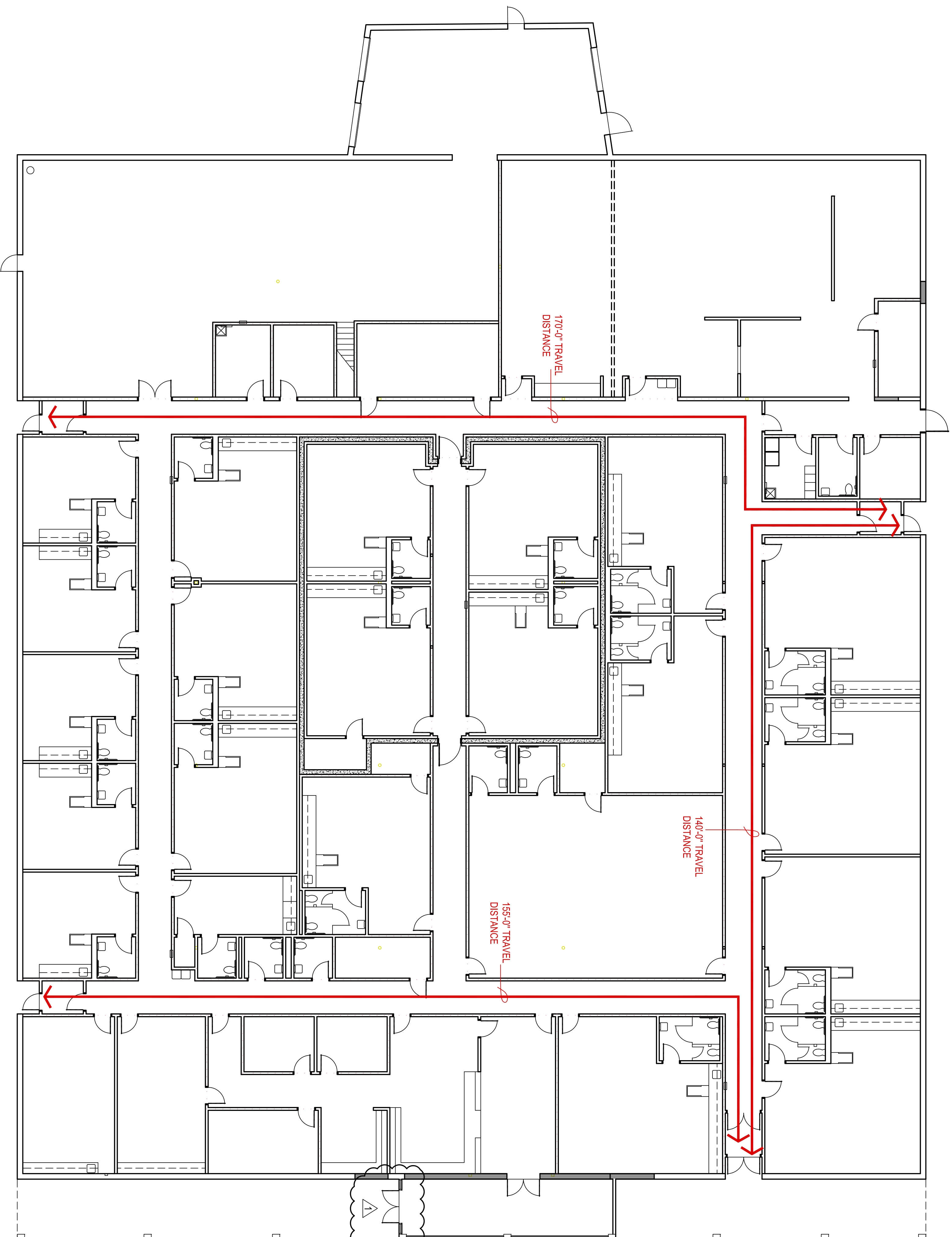
BUILDING RENOVATION: REQUIRED 66"
BUILDING RENOVATION: PROVIDED 432"

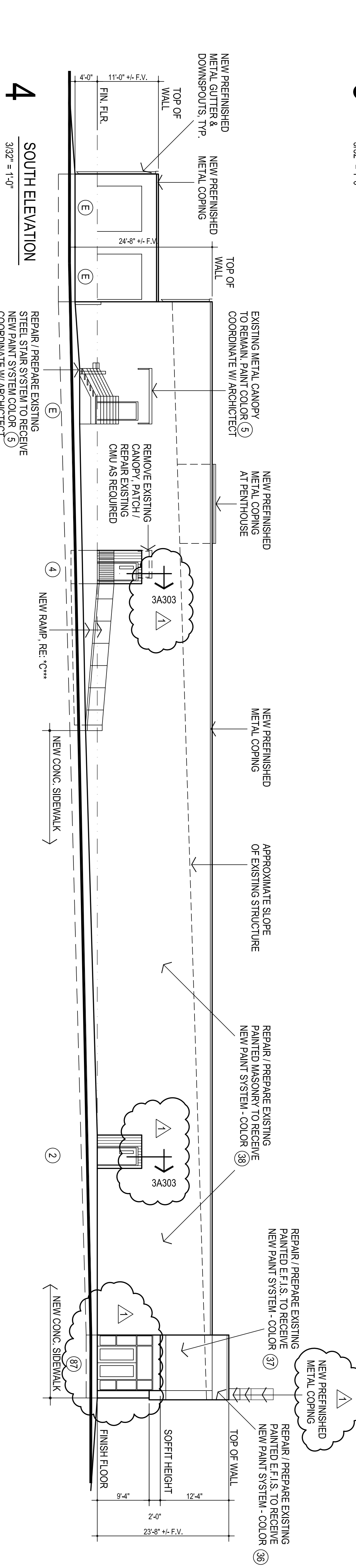
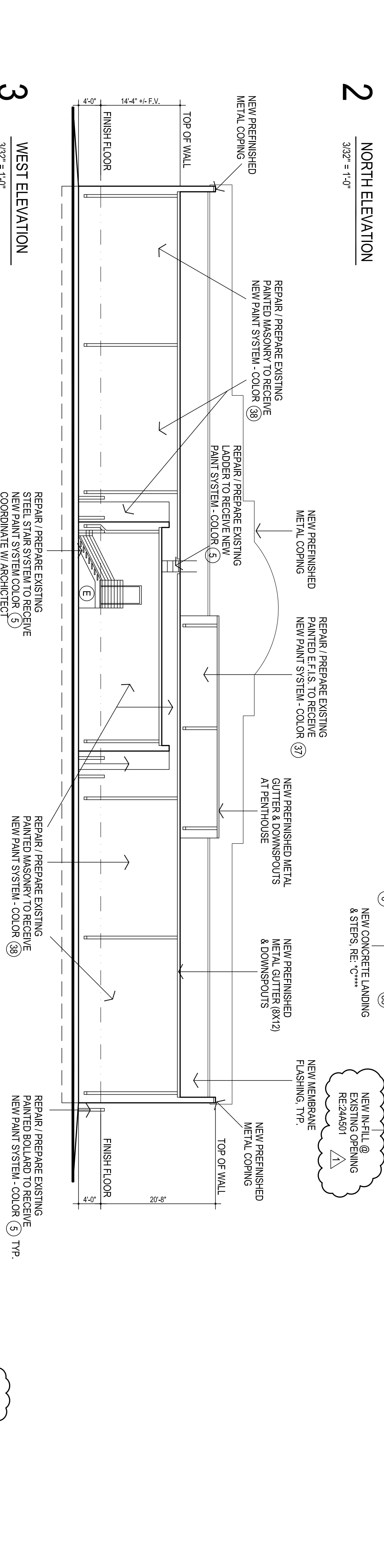
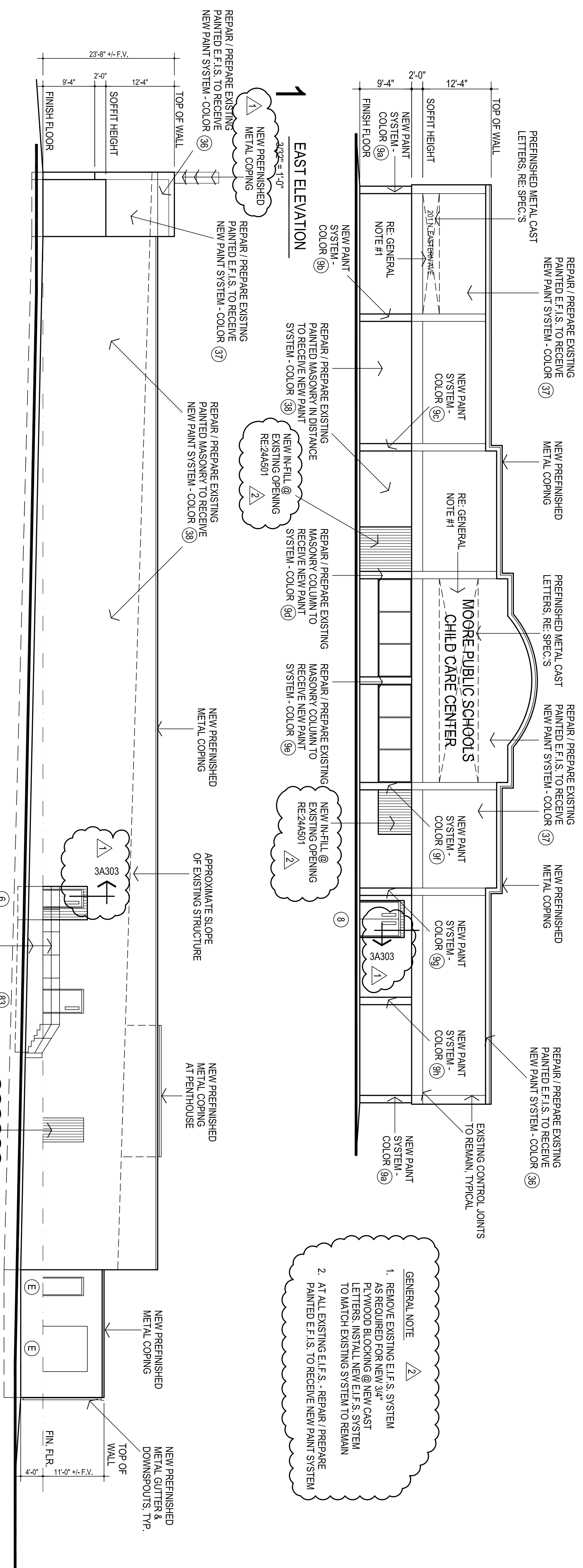
PLUMBING FIXTURES (TABLE 2902.1):

TOTAL OCCUPANT LOAD (INSTITUTIONAL) = 330

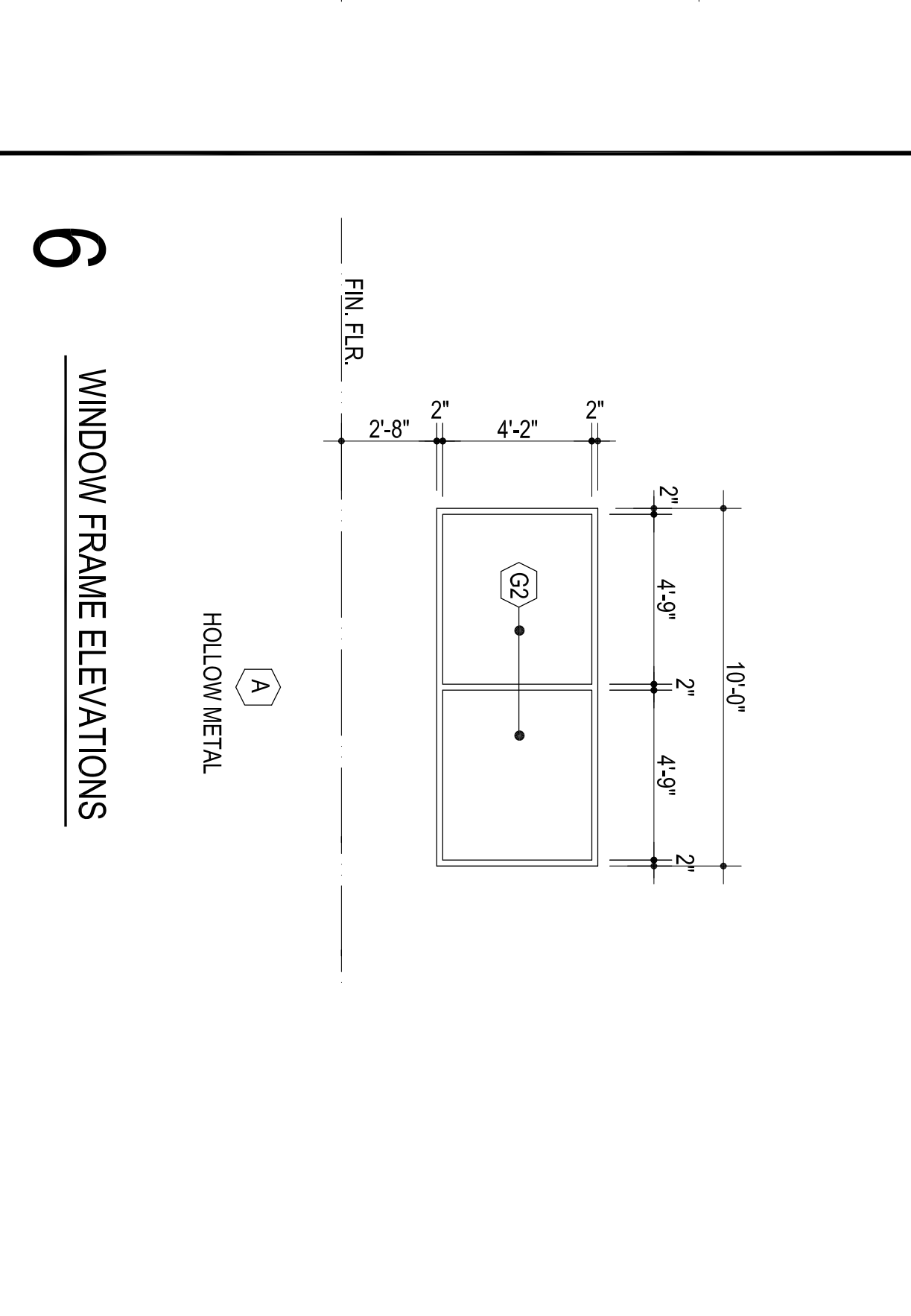
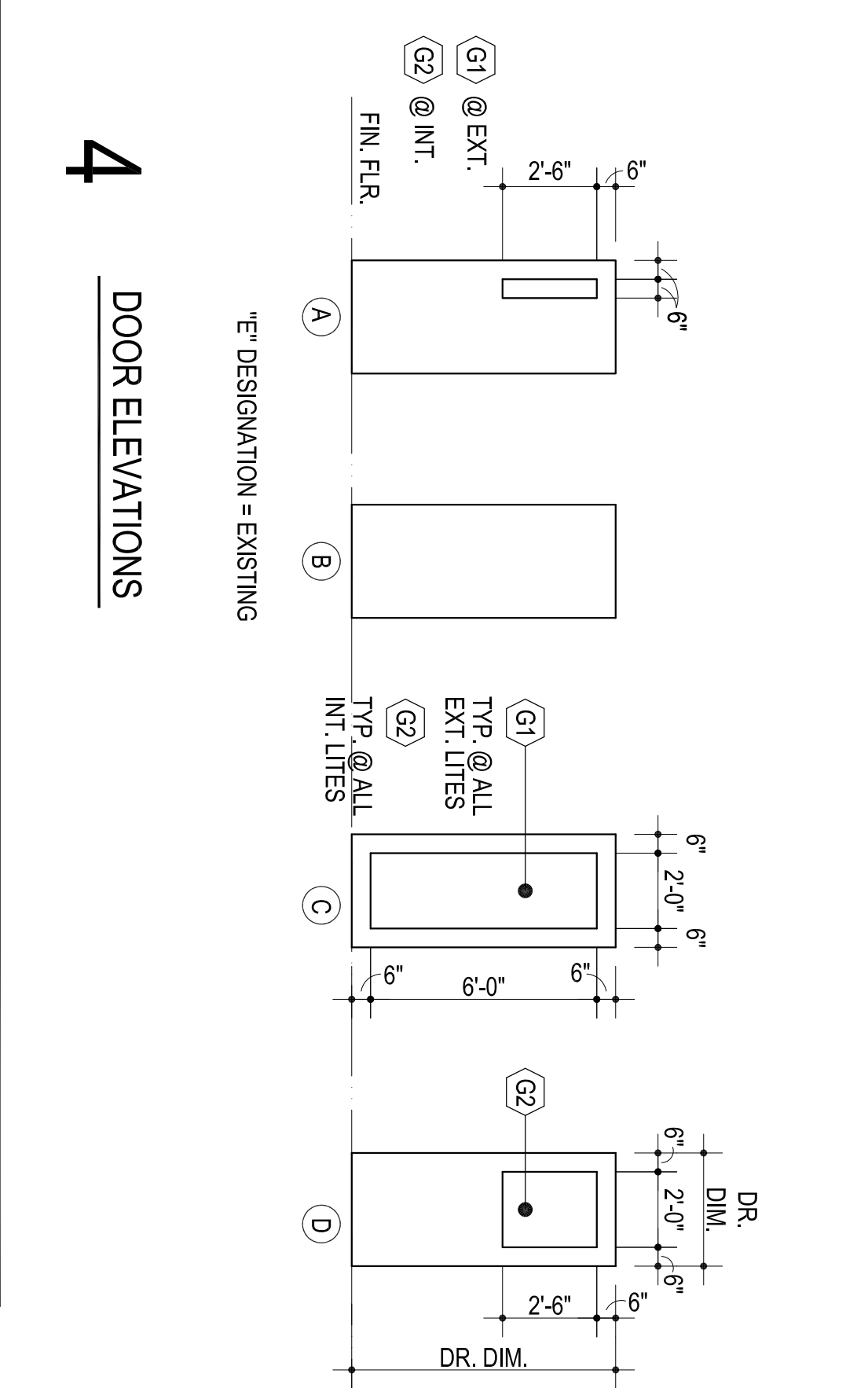
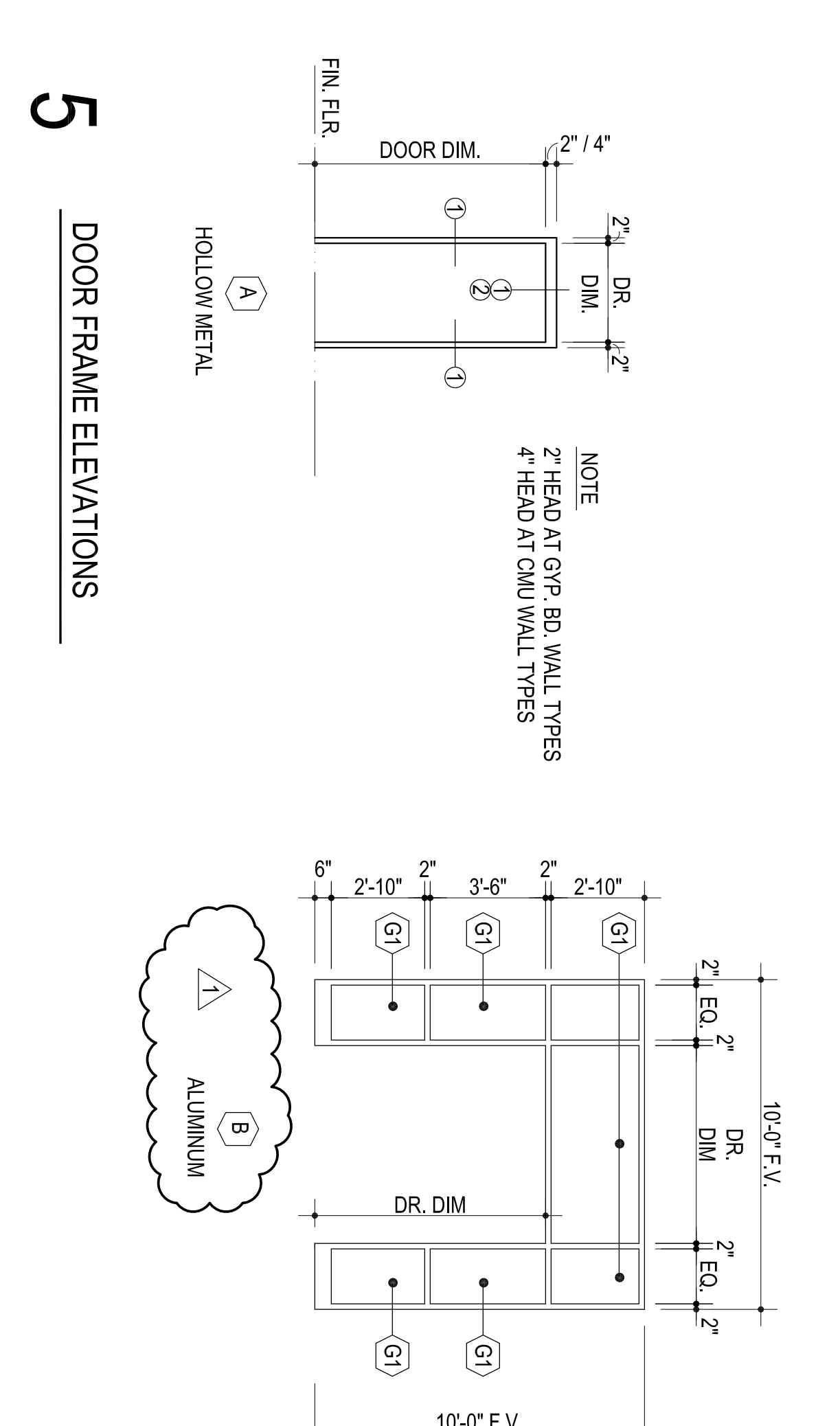
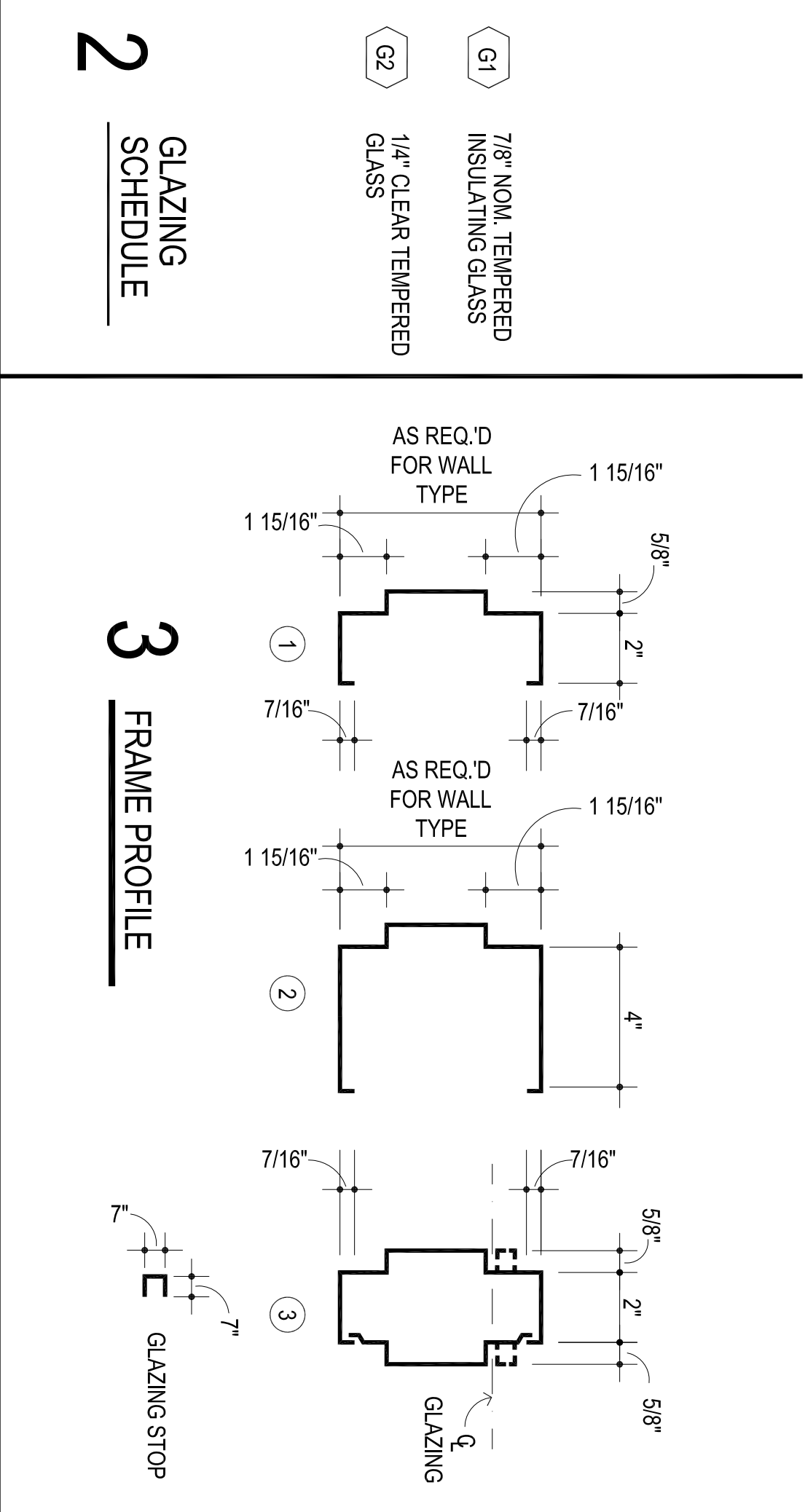
TOTAL REQUIRED:	TOTAL PROVIDED
WATER CLOSETS = 22	WATER CLOSETS = 34
LAVATORIES = 22	URINALS = 0
DRINKING FOUNTAINS = 4	LAVATORIES = 49
SERVICE SINKS = 1	DRINKING FOUNTAINS = 4
	SERVICE SINKS = 2

DEVOTES 1 HR. RATED PARTITIONS CLOSE-OUT TO
BOTTOM OF DECKING - CLOSE-OUT PARTITIONS TO
BE CMU WHERE INDICATED ON STRUCTURAL FOR
LOAD BEARING CONDITIONS. ALL OTHER INDICATED
LOCATIONS TO BE CONSTRUCTED OF 1 LAYER
OF 5/8" FIRE RATED GYP. BOARD EACH SIDE
ON 6" METAL STUDS @ 16" O.C. STAGGER ALL
JOINTS & PROVIDE FIRE TAPE SEAL ALL PENETRATIONS
W/ CONTINUOUS FIRE STOPPING INSULATION
& OR SEALANT.



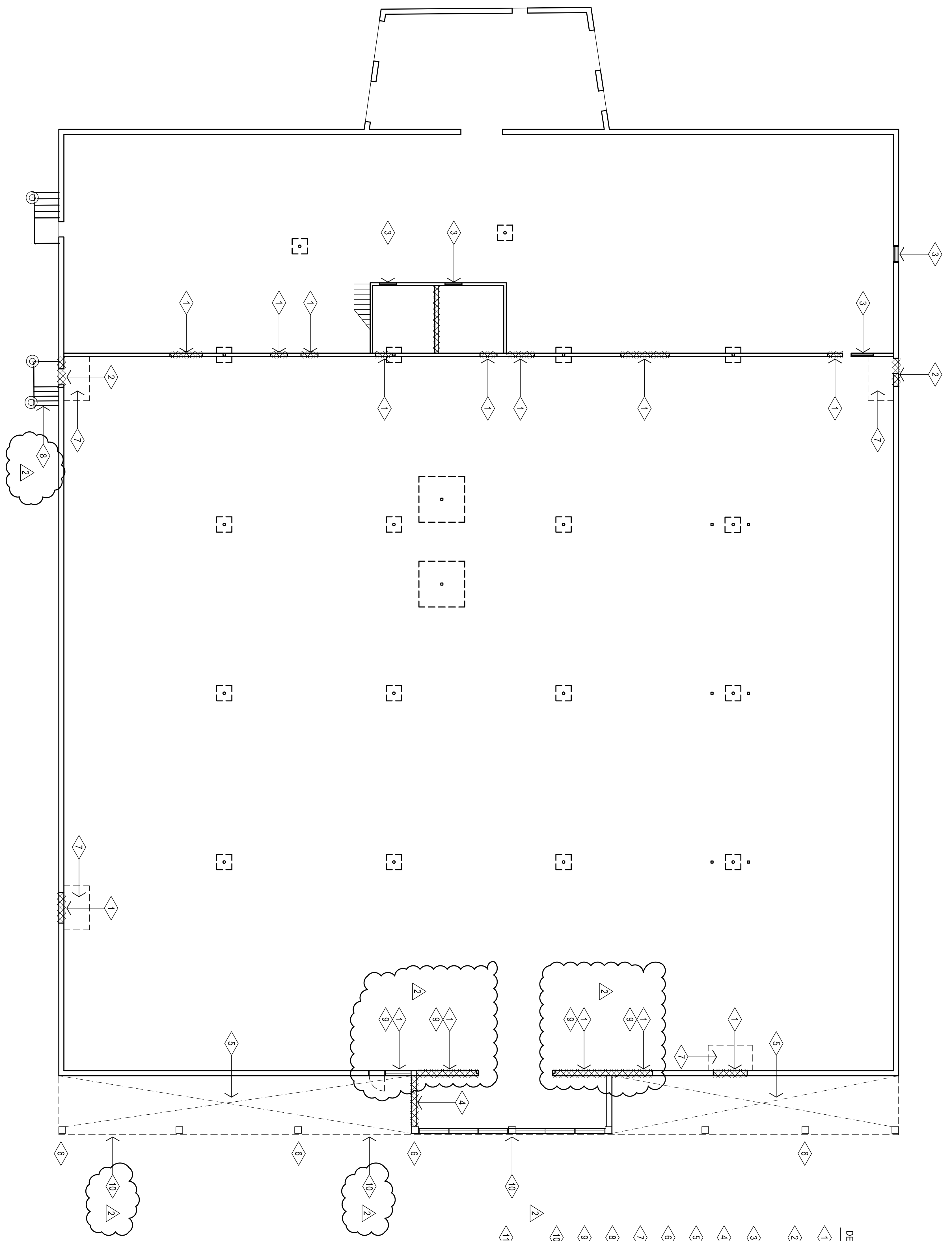



DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.		
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB				
1	401	EXT. C	HM.	3'-0"	7'-0"	1 3/4"	A	16A501	16A501	11A501	29A501	29A501	20 MIN. DR & FRAME	5
2	411	EXT. A	<	<	<	<	<	22A501	15A501	11A501	11A501	11A501		7
3	412	411	<	<	<	<	<	4A501	16A501	11A501	11A501	11A501		10
4	435	EXT.						22A501	16A501	29A501	29A501	29A501		5
5	428	435						4A501	16A501	11A501	11A501	11A501		10
6	421	EXT.						22A501	15A501	29A501	29A501	29A501		5
7	420	421	<	<	<	<	<	4A501	16A501	11A501	11A501	11A501		10
8	418	EXT.	<	<	<	<	<	22A501	15A501	29A501	29A501	29A501		13
9	419	418	HM.	PR. 3'-0"				4A501	16A501	11A501	11A501	11A501		15
10	412	401	WD.	3'-0"				4A501	16A501	11A501	11A501	11A501		16
11	402	401	<	<	<	<	<	3A501	10A501	10A501	10A501	10A501		16
12	412	402						4A501	11A501	11A501	11A501	11A501		5
13	407	404						4A501	11A501	11A501	11A501	11A501		11
14	407	405						4A501	11A501	11A501	11A501	11A501		11
15	407	406						4A501	11A501	11A501	11A501	11A501		11
16	409	407						4A501	11A501	11A501	11A501	11A501		12
17	412	408	<	<	<	<	<	4A501	11A501	11A501	11A501	11A501		8
18	412	410	<	<	<	<	<	4A501	11A501	11A501	11A501	11A501		14
19	412	410	A					4A501	11A501	11A501	11A501	11A501		14
20	436	436a	B					3A501	10A501	10A501	10A501	10A501		2
21	435	436	A					4A501	11A501	11A501	11A501	11A501		14
22	435	001	D					4A501	11A501	11A501	11A501	11A501		9
23	001	001a	B					3A501	10A501	10A501	10A501	10A501		12
24	435	002	D					4A501	11A501	11A501	11A501	11A501		9
25	002	001b	D					3A501	10A501	10A501	10A501	10A501		12
26	435	101	D					4A501	11A501	11A501	11A501	11A501		9
27	101	101a	B					3A501	10A501	10A501	10A501	10A501		12
28	102	101b	B					3A501	10A501	10A501	10A501	10A501		12
29	003	101c	B					3A501	10A501	10A501	10A501	10A501		12
30	435	003	D					4A501	11A501	11A501	11A501	11A501		9
31	435	004	D					4A501	11A501	11A501	11A501	11A501		9
32	004	001d	B					3A501	10A501	10A501	10A501	10A501		12
33	435	102	D					4A501	11A501	11A501	11A501	11A501		9
34	435	103	D					4A501	11A501	11A501	11A501	11A501		9
35	005	001e	B					3A501	10A501	10A501	10A501	10A501		12
36	103	101c	B					3A501	10A501	10A501	10A501	10A501		12
37	435	005	D					4A501	11A501	11A501	11A501	11A501		9
38	428	434	B	PR. 3'-0"				2A501	9A501	9A501	9A501	9A501	20 MIN. DR & FRAME	3
39	428	433	B					2A501	9A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
40	428	432	B					2A501	9A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
41	428	431	B	<	<	<	<	2A501	9A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
42	429	428	A					4A501	11A501	11A501	11A501	11A501		9
43	428	436	B					19A501	20A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
44	436	203	D					4A501	11A501	11A501	11A501	11A501		9
45	203	201c	B	<	<	<	<	3A501	10A501	10A501	10A501	10A501		12
46	436	104	D					4A501	11A501	11A501	11A501	11A501		9
47	104	201d	B					3A501	10A501	10A501	10A501	10A501		12
48	105	201e	B					3A501	10A501	10A501	10A501	10A501		12
49	436	105	D					4A501	11A501	11A501	11A501	11A501		9
50	436	202	D	<	<	<	<	4A501	11A501	11A501	11A501	11A501		9
51	202	201b	B					3A501	10A501	10A501	10A501	10A501		12
52	436	416	B					19A501	20A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
53	417	417a	B					4A501	11A501	11A501	11A501	11A501		12
54	417	417b	B	<	<	<	<	4A501	11A501	11A501	11A501	11A501		12
55	417	417c	B					4A501	11A501	11A501	11A501	11A501		12
56	416	417	A					4A501	11A501	11A501	11A501	11A501		9
57	416	201	D					4A501	11A501	11A501	11A501	11A501		9
58	201	201a	B					3A501	10A501	10A501	10A501	10A501		12
59	412	413	B					4A501	11A501	11A501	11A501	11A501		2
60	412	414	B					4A501	11A501	11A501	11A501	11A501		2
61	415	412	B					4A501	11A501	11A501	11A501	11A501		4
62	412	305	D					4A501	11A501	11A501	11A501	11A501		9
63	305	301e	B					3A501	10A501	10A501	10A501	10A501		12
64	419	304	D					4A501	11A501	11A501	11A501	11A501		9
65	304	301d	B					3A501	10A501	10A501	10A501	10A501		12
66	303	301c	B					3A501	10A501	10A501	10A501	10A501		12
67	419	417	A					4A501	11A501	11A501	11A501	11A501		9
68	419	303	D					4A501	11A501	11A501	11A501	11A501		9
69	419	302	D					4A501	11A501	11A501	11A501	11A501		9
70	302	301b	B					3A501	10A501	10A501	10A501	10A501		12
71	301	301a	B					3A501	10A501	10A501	10A501	10A501		12
72	419	205	D					4A501	11A501	11A501	11A501	11A501		9
73	205	201e	B					3A501	10A501	10A501	10A501	10A501		12
74	204	201d	B					3A501	10A501	10A501	10A501	10A501		12
75	419	204	D					4A501	11A501	11A501	11A501	11A501		9
76	419	301	D	<	<	<	<	4A501	11A501	11A501	11A501	11A501		9
77	419	425	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		9
78	NUMBER NOT USED							NUMBER NOT USED						
79	425	424	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		2
80	425	423	B	<	<	<	<	4A501	16A501	11A501	11A501	11A501		2
81	425	422	A	<	<	<	<	4A501	16A501	11A501	11A501	11A501		11
82	427	426	B	WD.	3'-0"			4A501	16A501	11A501	11A501	11A501	8" GRP. BD. WALL ADJUST FRAME AS REQUIRED	6
83	425	EXT.	B	HM.	4'-0"			1A501	15A501	8A501	8A501		5	
84	436	436	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		12
85	105g	201	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6



1 DOOR SCHEDULE

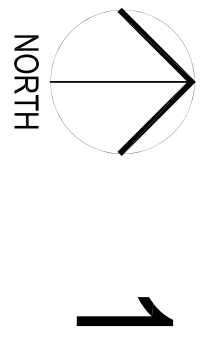
DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.		
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB				
86	105f	105	B	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6
87	439	EXT.	C	ALUM.	PR. 3'-0"	7'-0"	1 3/4"	A	17A501	15A501				1
88	427	428	A	WD.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		9
89	431	428	B	WD.	3'-0"	7'-0"	1 3/4"	A	2A501	16A501	9A501	9A501		4



- DEMOLITION NOTES:**
- 1  INDICATES EXISTING WALLS TO BE DEMOLISH TO LIMITS INDICATED. RE: A1014 FOR LOCATIONS
 - 2 REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND EXISTING WALL SYSTEM. PREPARE OPENING TO RECEIVE NEW WALL INFILL AND NEW HM. DOOR FRAME
 - 3 REMOVE EXISTING HOLLOW METAL DOOR & FRAME AND PREPARE OPENING TO RECEIVE NEW WALL INFILL
 - 4 REMOVE EXISTING TEMPORARY WALL SYSTEM AND PREPARE OPENING TO RECEIVE NEW STOREFRONT
 - 5 REMOVE EXISTING SOFFIT SYSTEM AND ASSOCIATED FRAMING AS REQUIRED FOR NEW FRAMING AND PREFINISHED METAL SOFFIT PANEL
 - 6 REMOVE EXISTING "NO PARKING" SIGN & REINSTALL AFTER EXTERIOR WORK IS COMPLETE
 - 7 REMOVE EXISTING SLAB AT NEW DOOR LOCATIONS RE: A1008 & a100b. PREPARE AREA TO RECEIVE NEW CONCRETE SLAB AND STOOP. RE: 3A4303
 - 8 REMOVE EXISTING STEEL STEPS AND ALL ASSOCIATED FOOTINGS, BOLLARDS, ETC. AND PREPARE AREA TO RECEIVE NEW CONC. STOOP AND RAMP. RE: SHEET C300
 - 9 REMOVE EXISTING STOREFRONT SYSTEM AS REQUIRED FOR NEW WALL INFILL SYSTEM.
 - 10 REMOVE EXISTING EXTERIOR SIGNAGE & ASSOCIATED BRACKETS AS REQUIRED. REMOVE EXISTING E.L.F.S. SYSTEM AS REQUIRED FOR NEW PLYWOOD BLOCKING FOR NEW SIGNAGE. REPAIR / PROVIDE NEW E.L.F.S. SYSTEM AS REQUIRED - MATCH EXISTING SYSTEM. RE: SHEET A201 FOR LOCATIONS
 - 11 REMOVE EXISTING CONCRETE SIDEWALK TO LIMITS INDICATED AND PREPARE AREA TO RECEIVE NEW CONCRETE SIDEWALK. RE: SHEET C300

 ENTIRE SHEET

DEMOLITION FLOOR PLAN
3/32" = 1'-0"



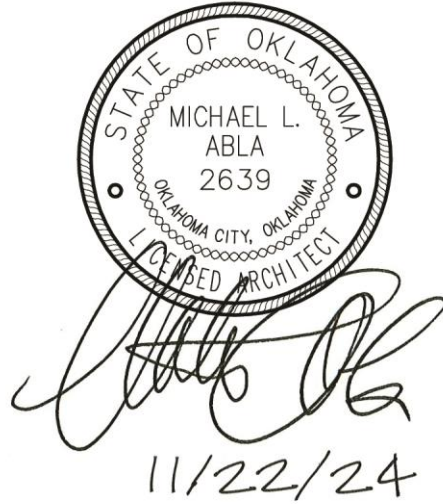
- GENERAL NOTES:**
1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT PROVIDED TO THESE DOCUMENTS SHOULD BE BROUGHT TO THE ARCHITECT'S ATTENTION OF THE ARCHITECT AND INCLUDED IN THE BASE BID.
 2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS INSTRUCTIONS.
 3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
 4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED. PROTECT EXISTING CMU WALL TO REMAIN AS REQUIRED. PROTECT EXISTING EXTERIOR WALL TO REMAIN.

**MOORE PUBLIC SCHOOLS -
CHILD CARE CENTER**

Moore Public Schools - Moore, Oklahoma
AGP - Moore, Oklahoma

ADDENDUM NO. 2

November 22, 2024



This addendum applicable to work designated herein, shall be understood to be an Addendum, and as such shall be included in the Contract Agreement.

Receipt of this Addendum shall be acknowledged by the Construction Management Firm notifying this office in writing, and by any applicable subcontractor to the CM.

This addendum consists of two (2) pages with attachments of three (3) 8.5"x11" pages and forty (40) 24"x36" sheets.

A. Drawings:

Replaced Cover Sheet "C". Refer to attachment.

General

No changes.

Civil

1. Sheet C200, Demolition Site Plan and Notes: revised / demolition notes at front entry overhangs. Refer to attachment.
2. Sheet C300, Site Plan – Parking Requirements: added sheet in its entirety. Refer to attachment.
3. Sheet C900, Site Details: added sheet in its entirety. Refer to attachment.

Architectural Demolition

1. Sheet AD100, Demolition Floor Plan and Notes: revised / demolition notes at front entry overhangs. Refer to attachment.

Structural

Replace Sheet S602 in its entirety. Refer to attachment.

Architectural

1. Sheet A100, Detail 1, Overall Floor Plan: revised duplicate door number by adding Doors 88 & 89. Added "E" designation to indicate existing doors – no work.
2. Sheet A101, Detail 1, Wall Type Plan: provided infill information at demolished storefronts at sides of entry vestibule. Refer to attachment.
3. Sheet A102, Detail 1, Life Safety Plan: updated plan at infill / demolished storefronts at sides of entry vestibule. Refer to attachment.
4. Sheet A201, Detail 1, East Elevation: provided infill information at demolished storefronts at sides of entry vestibule. Refer to attachment.
5. Sheet A602, Detail 1, Door Schedule: revised duplicate door number by adding Doors 88 & 89.

Mechanical, Electrical, and Plumbing

Refer to attachments.

Food Service Documents

No changes.

B. Specifications:

No changes.

END OF ADDENDUM NO. 2



CJC	drawn by
BWB	checked by
OCTOBER 2024	date
ADDDENDUM 2	11/22/2024

MOORE PUBLIC SCHOOLS
BOARD OF EDUCATION
MOORE, OKLAHOMA



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

S602

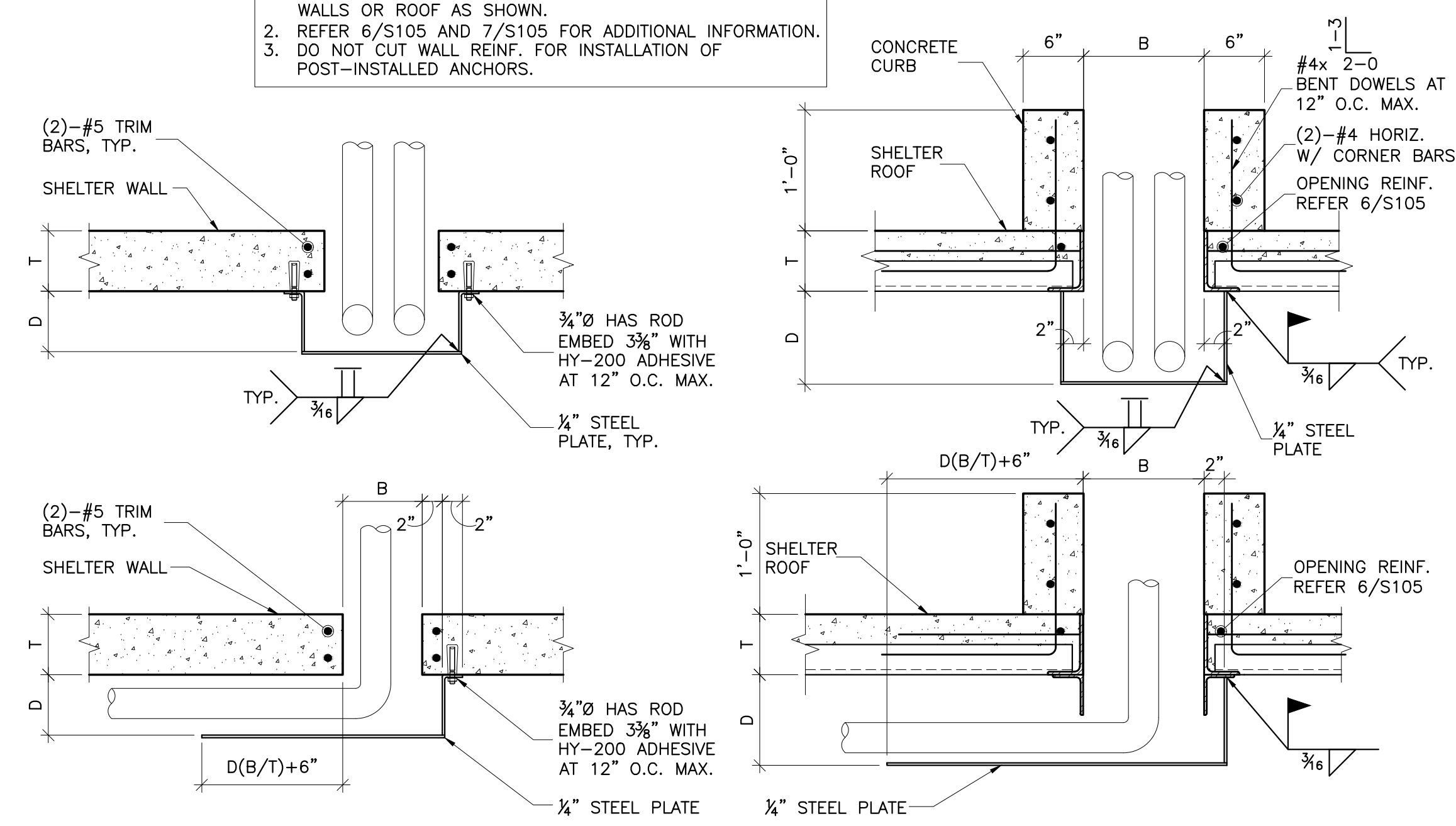
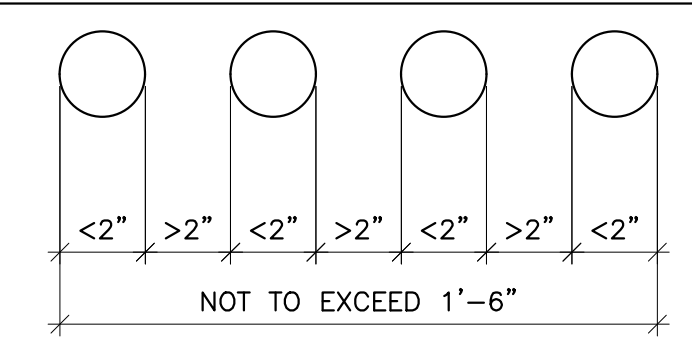
KFC engineering
Kirkpatrick Forest Curtis PC
Structural Engineering
OK CA #3888, EXP. 06/30/25
525 Central Park Drive, Suite 202
Oklahoma City, OK 73105
405.528.4596 | kfcengr.com

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CONSENT OF AGP.

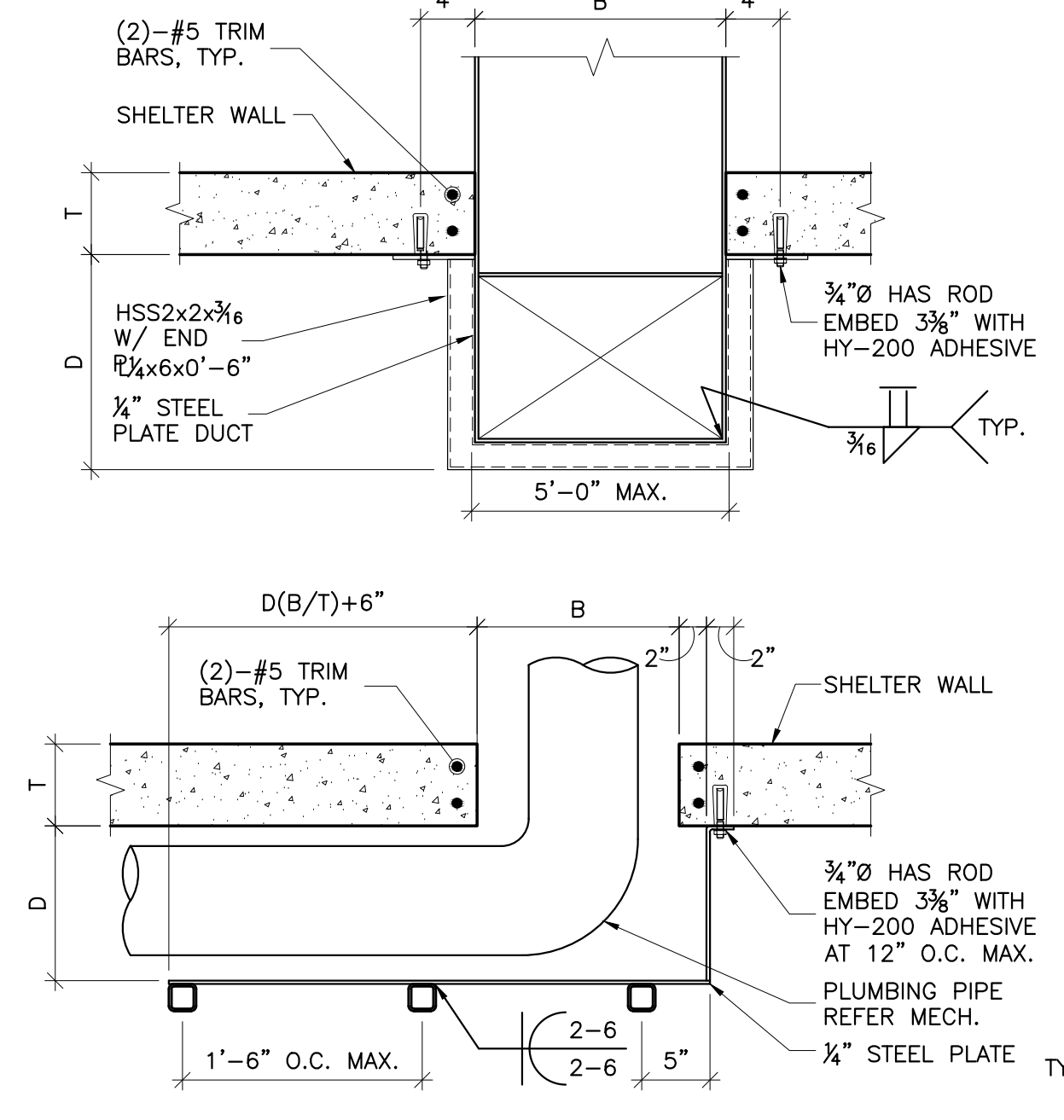
NOTES:
1. WE ARE NOT AWARE OF ANY OPENINGS LARGER THAN 5'-0", IF AN OPENING LARGER THAN 5'-0" IS REQUIRED, CONTACT ENGINEER IMMEDIATELY FOR EVALUATION AND FURTHER INSTRUCTIONS.
2. REFER 6/S105 AND 7/S105 FOR ADDITIONAL INFORMATION.
3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

NOTES:
1. OPENINGS 18" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF AS SHOWN.
2. REFER 6/S105 AND 7/S105 FOR ADDITIONAL INFORMATION.
3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

NOTE:
OPENINGS 2" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF WITHOUT PROTECTION OR REGARD TO THE TYPICAL REINFORCING (SPECIAL REINFORCING AROUND OPENINGS SHALL NOT BE CUT). GROUPS OF UP TO 4 OPENINGS 2" OR LESS MAY BE MADE PROVIDED THE CLEAR SPACE BETWEEN OPENINGS EXCEEDS 2" AND THE TOTAL LENGTH OF THE GROUP DOES NOT EXCEED 18". OPENINGS CAN BE HORIZONTAL (AS SHOWN) OR VERTICAL.



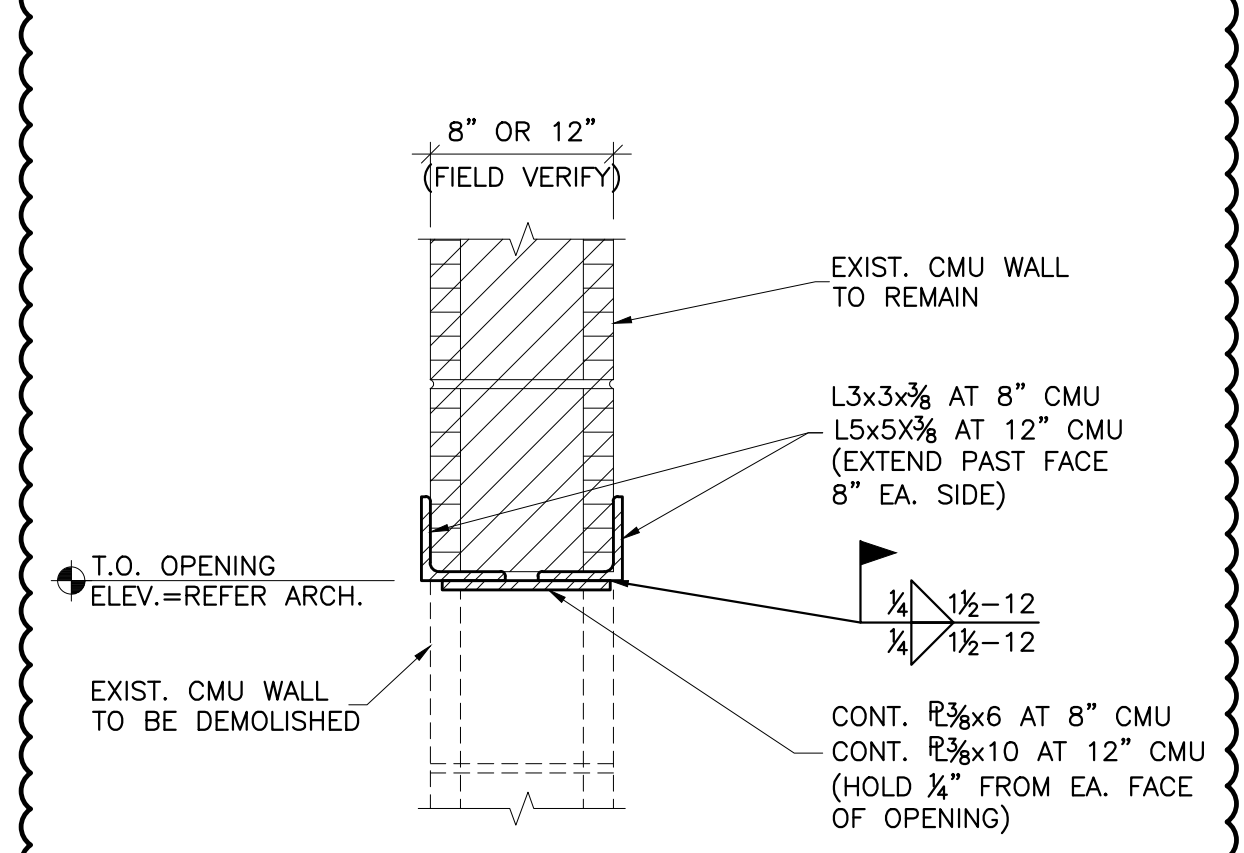
2 OPENINGS IN SHELTER 2" TO 1'-6"
SCALE: 1"=1'-0"



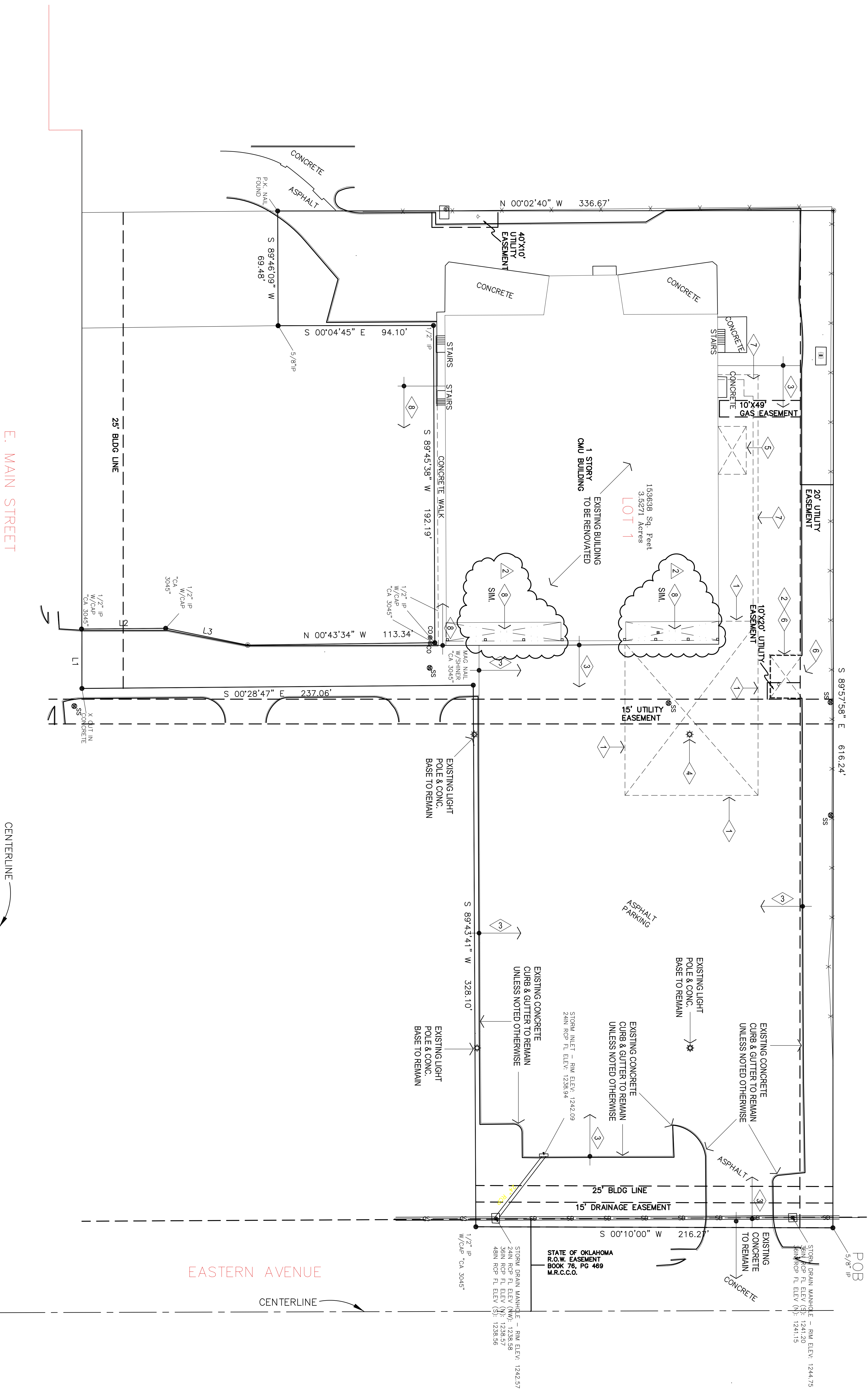
3 OPENINGS IN SHELTER TO 1'-6" TO 5'-0"
SCALE: 1"=1'-0"

1 OPENINGS IN SHELTER 2" OR LESS
SCALE: 1"=1'-0"

- SEQUENCING NOTES:**
1. IDENTIFY 8" OR 12" CMU WALL AND USE PROPER ANGLE AND PLATE WIDTH ACCORDING TO EXIST. WALL WIDTH.
 2. SAW-CUT HORIZONTAL SLOT INTO ONE SIDE OF EXISTING WALL FOR PLACEMENT OF NEW ANGLE. SAW-CUT SHALL EXTEND A MINIMUM OF 8" BEYOND NEW OPENING.
 3. INSTALL NEW ANGLE TIGHT INTO SLOT. ANGLES SHALL EXTEND A MINIMUM OF 8" BEYOND OPENING.
 4. REPEAT STEPS 1 AND 2 ON OPPOSITE SIDE OF WALL.
 5. DEMOLISH MASONRY TO EXTENTS SPECIFIED BY ARCH., FOR NEW OPENING.
 6. INSTALL BOTTOM PL TO WITHIN 1/4" OF EACH JAMB OF NEW OPENING.
 7. PAINT ANY EXPOSED PORTIONS OF LINTEL, REFER ARCH FOR COLOR.



4 SECTION
SCALE: 1 1/2"=1'-0"



DEMOLITION SITE PLAN



1" = 30'-0"

GENERAL NOTES:

1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT INCLUDED IN THESE DOCUMENTS SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT AND INCLUDED IN THE BASE BID.
2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS INSTRUCTIONS.
3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED.

DEMOLITION NOTES:

1. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW POURED-IN-PLACE RUBBER PLAYGROUND SURFACE.
2. DEMOLISH EXISTING CONCRETE CURB & GUTTER AROUND EXISTING FIRE HYDRANT TO BE RELOCATED. RE: CIVIL.
3. DEMOLISH / REMOVE TOP 2" OF ASPHALT WEARING COURSE W/IN LIMITS INDICATED & REPAIR / PREPARE EXISTING ASPHALT BASE COURSE TO REMAIN TO RECEIVE NEW 2" WEARING COURSE.
4. DEMOLISH / REMOVE EXISTING LIGHT POLE & CONCRETE BASE. LOCATE EXISTING ELECTRICAL CONDUIT & PROVIDE ALL MATERIALS REQUIRED FOR REMAINING LIGHT POLES TO WORKING ORDER.
5. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED. PREPARE EXISTING SUBGRADE TO RECEIVE NEW GENERATOR BUILDING.
6. REMOVE EXISTING SUBGRADE AND PREPARE AREA TO RECEIVE NEW ASPHALT PAVING. MATCH EXISTING THICKNESS. PROVIDE NEW CURB & GUTTER AS REQUIRED. MATCH EXISTING.
7. DEMOLISH / REMOVE TOTAL THICKNESS OF ASPHALT W/IN BOUNDARIES INDICATED FOR NEW GREASE INTERCEPTOR AND ASSOCIATED PIPING. RE: PLUMBING.
8. DEMOLISH / REMOVE EXISTING SIDEWALK TO LIMITS INDICATED. PREPARE SUBSTRATE FOR NEW RAMPS & SIDEWALK.



ENTIRE SHEET



MOORE PUBLIC SCHOOLS DISTRICT NO. 1-2
CLEVELAND COUNTY MOORE, OKLAHOMA

CHILD CARE CENTER

201 NORTH EASTERN AVE.
MOORE, OK. 73160

AGP | the Abila Griffin
Partnership

313 SE. 5TH ST. MOORE, OK. 73160
405.735.3477 AGP@theAGP.net www.theAGP.net



CONSTRUCTION MANAGER



1909 S. EASTERN AVE.
MOORE, OK 73160

STRUCTURAL
KFC ENGINEERING

205 NW 63rd, SUITE 390
OKLAHOMA CITY, OK 73116

MECHANICAL/ELECTRICAL/PLUMBING

SALAS O'BRIEN

2900 S. TELEPHONE RD., SUITE 120
MOORE, OKLAHOMA 73160

CIVIL

CEDAR CREEK

11912 N. PENNSYLVANIA AVE., SUITE D4
OKLAHOMA CITY, OK 73120

KITCHEN CONSULTANT

STURM CONSULTING, INC.

6838 S. HUDSON PL.
TULSA, OK. 74135

INDEX TO DRAWINGS

SHEET NUMBER	DESCRIPTION	SHEET NUMBER	DESCRIPTION
C	COVER SHEET	F101	FIRE PROTECTION PLAN - SITE
--	TOPOGRAPHIC SURVEY - FOR INFORMATION ONLY	P000	GENERAL NOTES
G100	LEGENDS / MAPS / ETC.	P001	PLUMBING SITE PLAN
G101	SHELTER CALCULATION PLAN / SHELTER LOCATION PLAN	P002	PLUMBING PLAN - BELOW GRADE
GEN-101	GENERATOR BUILDING FLOOR PLAN / ELEVATIONS / SECTIONS / DETAILS	P110	PLUMBING PLAN - ABOVE GRADE
C200	DEMOLITION SITE PLAN	P201	PLUMBING PLAN - ROOF
C300	SITE PLAN - PARKING REQUIREMENTS	P301	PLUMBING ISOMETRIC WASTE & VENT
C300	ENLARGED SITE PLAN / DETAILS	P302	PLUMBING ISOMETRIC WATER SUPPLY
C300	ENLARGED SITE PLAN / DETAILS	P501	DETAILS
C0.00	COVER SHEET	P502	DETAILS
C1.00	UTILITY PLAN	P801	SCHEDULES
C2.00	WATERLINE 1 PLAN AND PROFILE	M000	MECHANICAL NOTES
C2.01	WATERLINE DETAILS	M101	MECHANICAL PLAN
C3.00	EROSION CONTROL PLAN	M201	MECHANICAL ROOF PLAN
C3.01	EROSION CONTROL DETAILS	M501	DETAILS
S100	GENERAL NOTES	M801	SCHEDULES
S101	GENERAL NOTES	T000	TECHNOLOGY LEGENDS / NOTES
S102	GENERAL NOTES	T101	TECHNOLOGY SITE PLAN
S103	SHELTER INFORMATION / SHELTER LOAD PLAN	T201	TECHNOLOGY PLAN
S104	DETAILS	T301	DETAILS
S105	DETAILS	T302	DETAILS
S106	SPECIAL INSPECTIONS	T303	DETAILS
S200	OVERALL FOUNDATION PLAN	T304	DETAILS
S201	OVERALL FOUNDATION PLAN	T401	SYSTEM SPECIFICATIONS
S202	PARTIAL FOUNDATION PLAN	T402	SYSTEM SPECIFICATIONS
S300	OVERALL FRAMING PLAN	T403	SYSTEM SPECIFICATIONS
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S501	FOUNDATION SECTIONS	E100	ELECTRICAL SITE PLAN
S601	FRAMING SECTIONS	E101	ELECTRICAL LIGHTING PLAN
S602	FRAMING SECTIONS	E201	ELECTRICAL POWER PLAN
S701	GENERAL FOUNDATION PLAN / FRAMING PLAN / SECTIONS	E202	ELECTRICAL ROOF PLAN
AD100	DEMOLITION PLAN	E401	ELECTRICAL KITCHEN PLAN
AD100a	OVERALL FOUNDATION PLAN	E501	ELECTRICAL ONE-LINE DIAGRAM / SCHEDULE
A100a	DIMENSION PLAN	E801	DETAILS
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A107a	ROOF DETAILS		
A109	EQUIPMENT FLOOR PLAN		
A301	BUILDING SECTION		
A302	WALL SECTIONS		
A303	WALL SECTIONS		
A401	INTERIOR ELEVATIONS		
A402	INTERIOR ELEVATIONS		
A501	DETAILS		
A601	ROOM FINISH SCHEDULE / COLOR SCHEDULE		
A602	DOOR SCHEDULE / DOOR ELEVATIONS / FRAME ELEVATIONS		
A701	MILLWORK DETAILS		
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FS301	FOODSERVICE EQUIPMENT PLUMBING CONNECTIONS PLAN / SCHEDULE / DETAILS		
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FS801	FOODSERVICE EQUIPMENT SNEEZE GUARD PLAN		

CHILD CARE CENTER
SET NO.

Revisions:

- △ ADDENDUM #1
- △ ADDENDUM #2

Sheet no:

C

date:

OCTOBER 2024



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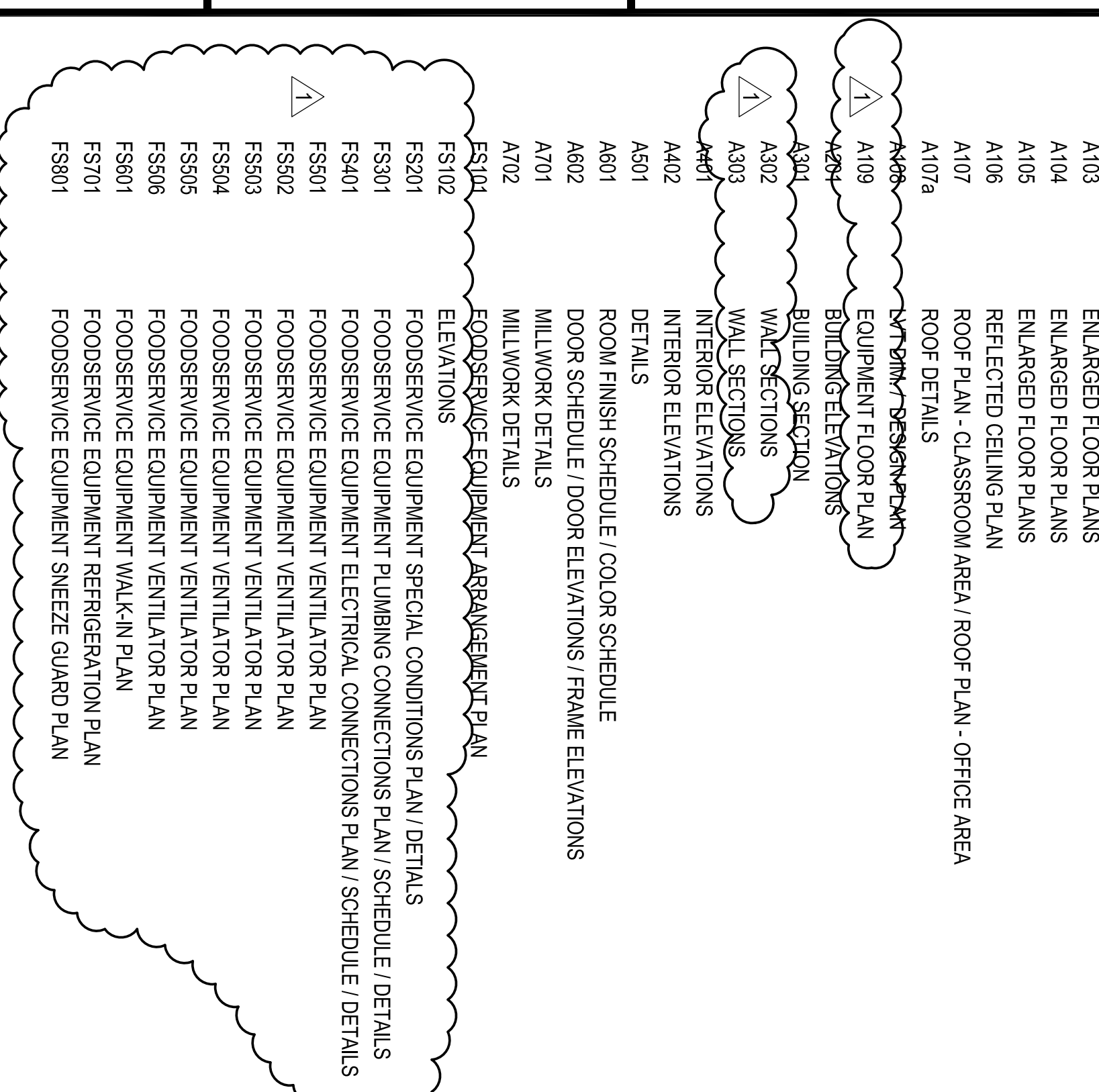
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Revisions:

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Sheet no:

C

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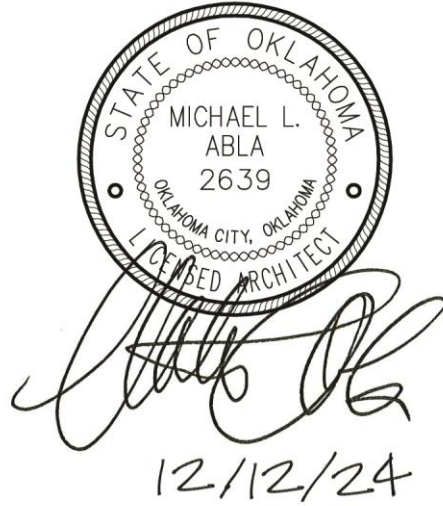
CHILD CARE CENTER
SET NO.

**MOORE PUBLIC SCHOOLS -
CHILD CARE CENTER**

Moore Public Schools - Moore, Oklahoma
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ADDENDUM NO. 3

December 12, 2024



This addendum applicable to work designated herein, shall be understood to be an Addendum, and as such shall be included in the Contract Agreement.

Receipt of this Addendum shall be acknowledged by the Construction Management Firm notifying this office in writing, and by any applicable subcontractor to the CM.

This addendum consists of two (2) pages with attachments of five (5) 8.5"x11" pages and twenty-five (25) 24"x36" sheets.

A. Drawings:

General

1. Added Final Plat sheet for the Food Lion 5 Addition and current project building site.

Civil

1. Sheet C300, Site Plan – Parking Requirements: various revisions – replace sheet in its entirety. Refer to attachment.
2. Sheet C900, Site Details: added details, etc. – replace sheet in its entirety. Refer to attachment.

Structural

No changes.

Architectural

1. Sheet A100c, Detail 1, Existing Mezzanine Floor Plan: added sheet in its entirety. Refer to attachment.

2. Sheet A102, Life Safety Plan: revised Corridor Width Requirements. Refer to attachment.
3. Sheet A201, Details 1 thru 4, Exterior Elevations: revised details, cast letters at east elevation, and notes. Refer to attachment.

Mechanical, Electrical, and Plumbing

Refer to attachments.

Food Service Documents

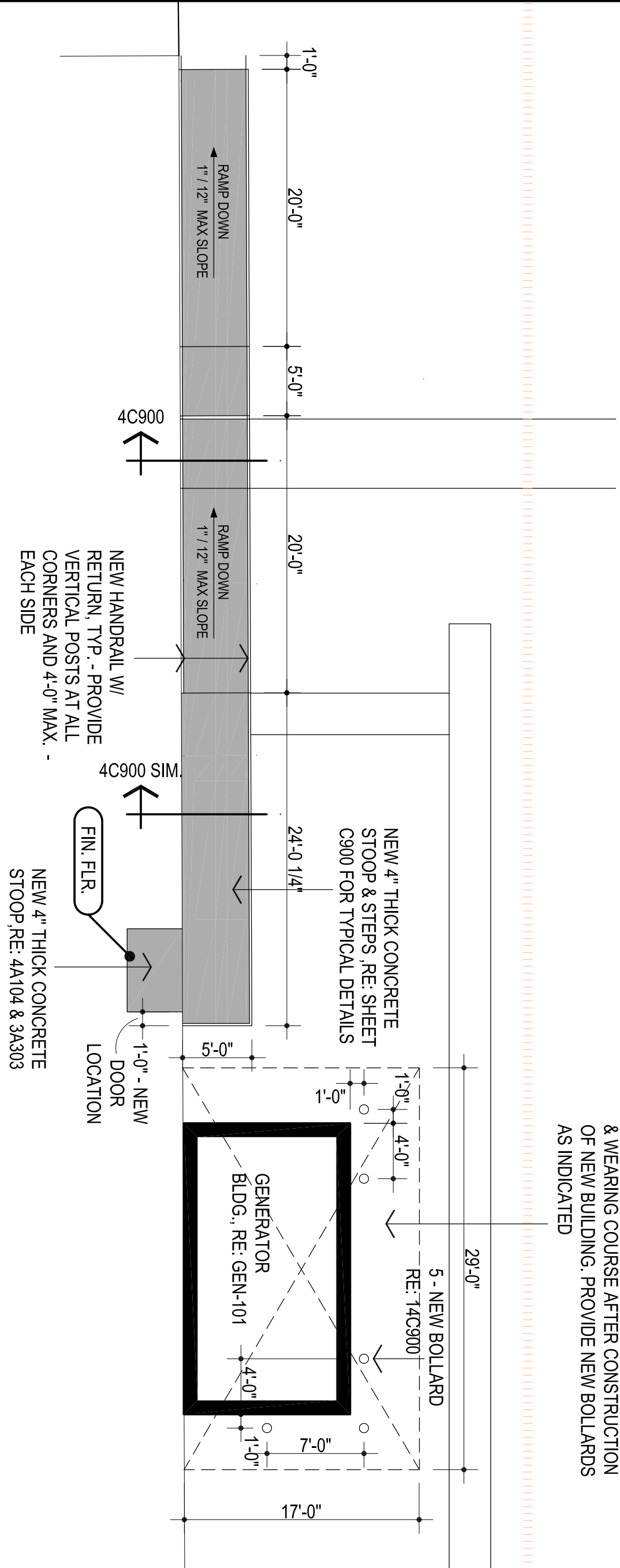
No changes.

B. Specifications:

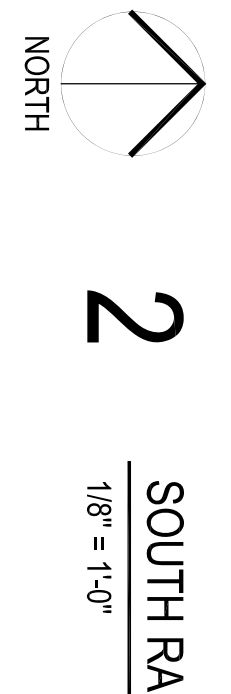
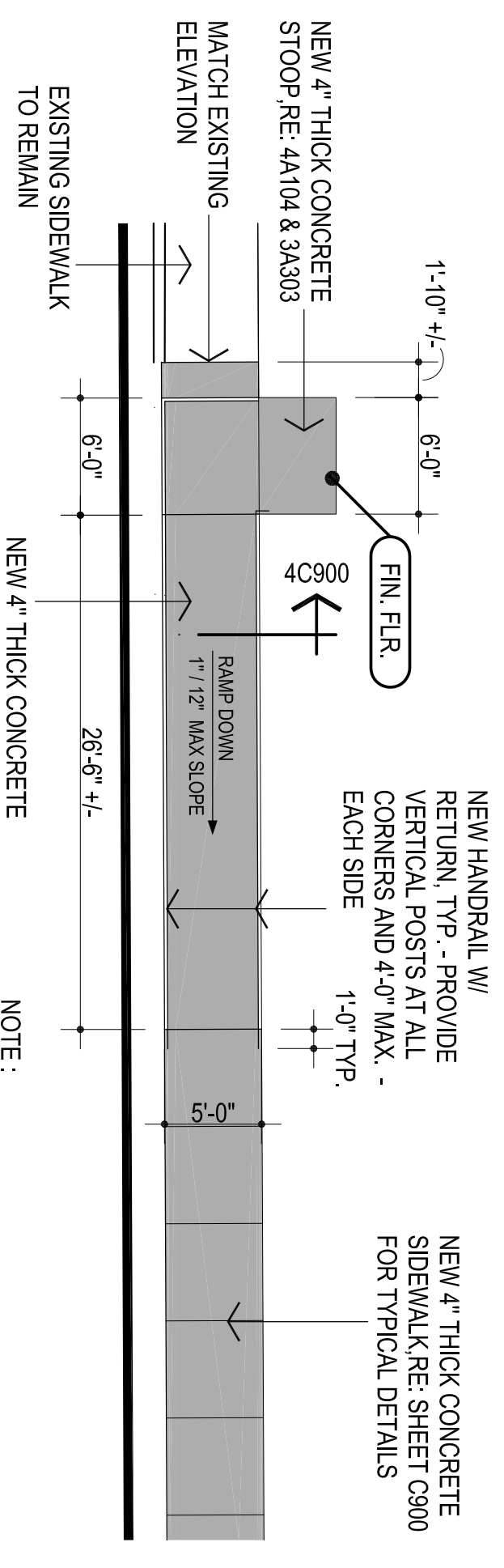
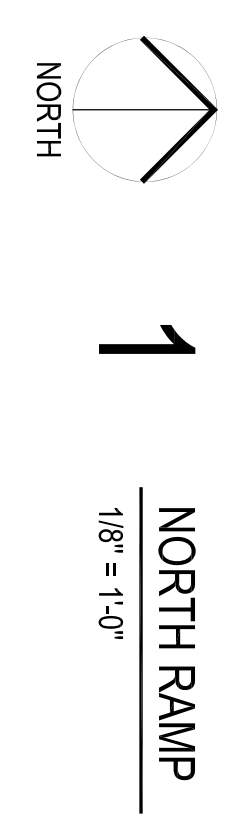
1. Section 10420-2.02-F.2 Cast Letters at Exterior: signage shall read **MOORE PUBLIC SCHOOLS – CHILD DEVELOPMENT CENTER** in lieu of MOORE PUBLIC SCHOOLS – CHILD CARE CENTER. Also, refer to Detail 1A201.

END OF ADDENDUM NO. 3

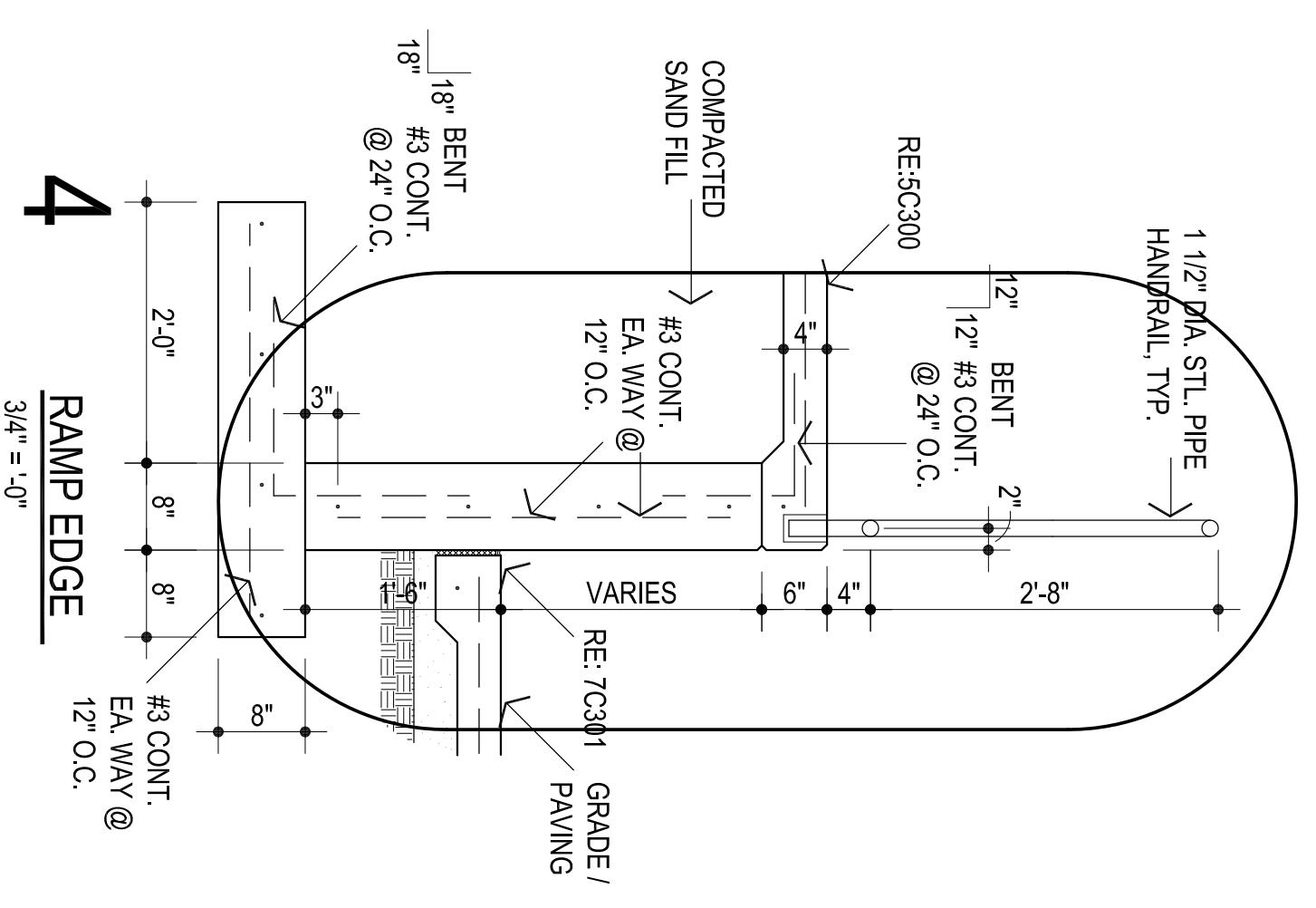
FILL IN AREA W/ NEW COMPACTED
SUBGRADE NEW ASPHALT BASE COURSE
& WEARING COURSE AFTER CONSTRUCTION
OF NEW BUILDING. PROVIDE NEW BOLLARDS
AS INDICATED



NOTE:
CONTRACTOR SHALL COORDINATE ALL
FINAL ELEVATIONS W/ ARCHITECT



3 NUMBER NOT USED



NOTE:
1. CONTRACTOR SHALL COORDINATE ALL
FINAL ELEVATIONS W/ ARCHITECT
2. SIDEWALK SHALL NOT EXCEED 2% CROSS SLOPE

- 1 NEW 2" WEARING COURSE ON EXISTING BASE COURSE
- 2 PATCH REPAIR EXISTING CONC. / ASPHALT
- 3 PROVIDE DETECTABLE & WARNING SYSTEMS / TACTILE PANELS W/ RAISED INDICATED DOMES TO MEET ADA. FINISH INTO CONCRETE. PROVIDE CLEAN INSTALLATION W/ TOOLED EDGES AROUND PANEL. PANEL EDGES TO BE FLUSH W/ CONCRETE PERimeter INSTALL AS PER MFR'S RECOMMENDATIONS. COLOR TO BE BLACK.
- 4 NEW 4" THICK CONCRETE STOOP & RAMP RE: SHEET C900 FOR TYPICAL DETAILS
- 5 NEW 4" THICK CONCRETE SIDEWALK RE: SHEET C900 FOR TYPICAL DETAILS
- 6 NEW HANDRAIL W/ RETURN. TYP. - PROVIDE VERTICAL POSTS AT ALL CORNERS AND 4'-0" MAX. EACH SIDE
- 7 NEW 4" THICK CONCRETE SIDEWALK EXP. JOINT
- 8 PROVIDE @ 24"-0" O.C. EXPANSION JOINT MATL. FILL TOP W/ 1/2" SEALANT
- 9 PROVIDE @ 6'-0" O.C. MAX. SAW CUT JOINT FILL W/ SEALANT
- 10 EXISTING / NEW CONCRETE SIDEWALK
- 11 NEW EXPANSION JOINT MATL. FILL TOP W/ 1" SEALANT
- 12 EXISTING CONCRETE SIDEWALK
- 13 EXISTING / NEW CONCRETE SIDEWALK
- 14 EXISTING CONT. CONCRETE CURB TO REMAIN - REPAIR / REPLACE ANY DAMAGED CONCRETE CURBS W/ NEW TO MATCH EXISTING

- 1 SIDEWALK @ VERT. SURF.
- 2 TOOLED EDGE
- 3 H.C. RAMP @ CURB
- 4 SIDEWALK EXP. JOINT
- 5 SIDEWALK CONTROL JT.
- 6 SIDEWALK / CONC. CURB
- 7 CONC. CURB / ASPHALT PAVING
- 8 BOLLARD

CG
drawn by
MA
checked by
OCTOBER 2024
date

revisions
ADDENDUM #2
ADDENDUM #3

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CDAR CREEK
CIVIL
KFC ENGINEERING
STRUCTURAL
SALAS OBIEN
MECHANICAL / ELECTRICAL

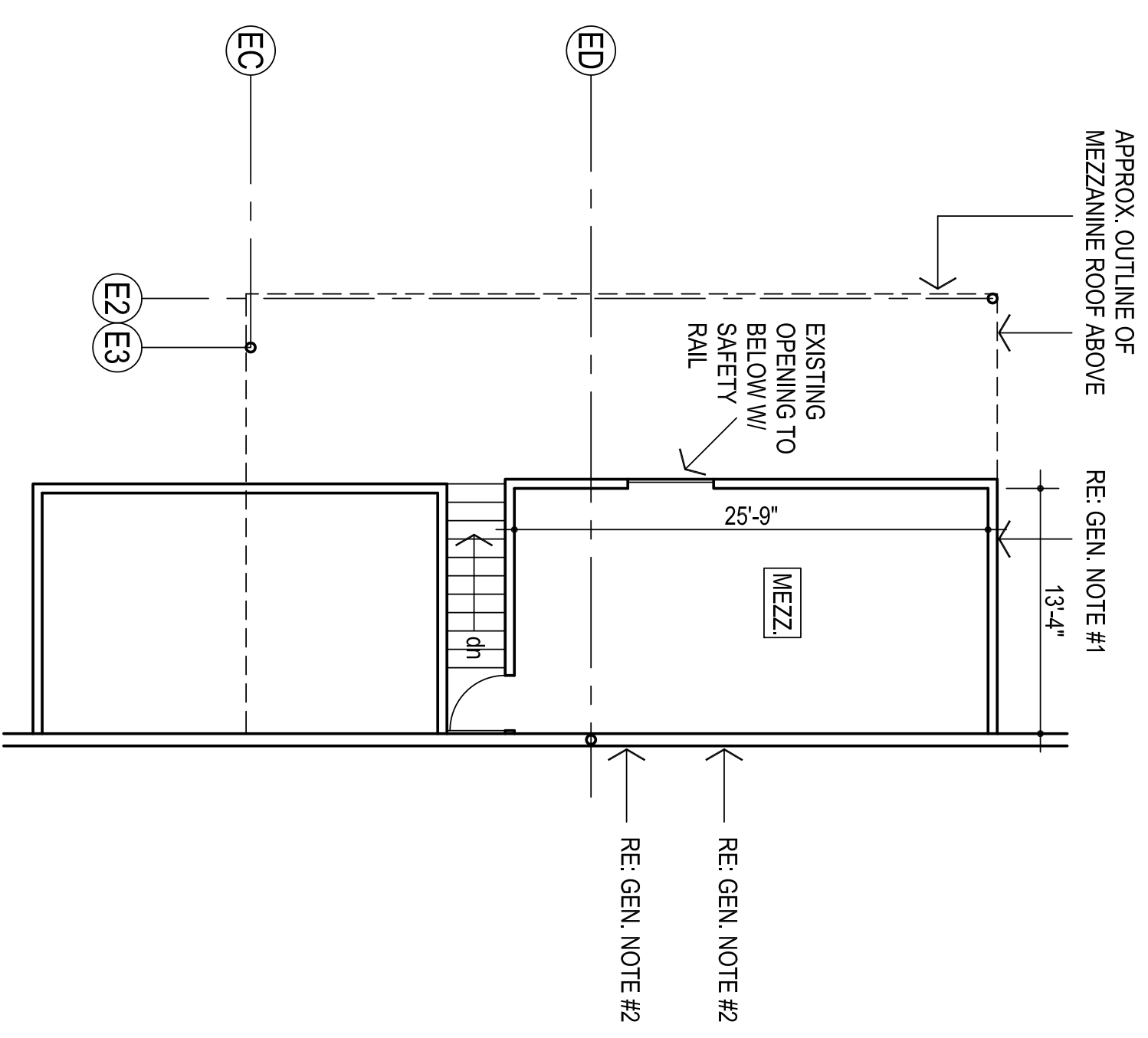
313 S. E. 5th Street
MOORE, OK. 73160
405.735.3477
ACP@theACP.net
www.theACP.net

the Abia Griffin
Partnership L.L.C.

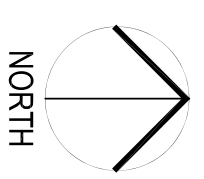
AGP

CHILD CARE FACILITY
201 N. EASTERN AVE.
C900

MOORE
PUBLIC SCHOOLS



- GENERAL NOTES:**
1. REMOVE EXISTING MECH. HOOD AND ASSOCIATED ASSOCIATED EQUIPMENT. PREPARE OPENING TO RECEIVE NEW IN-FILL FRAMING.
 2. REMOVE EXISTING MECH. LOUVER AND ASSOCIATED ASSOCIATED EQUIPMENT. PREPARE OPENING TO RECEIVE NEW IN-FILL FRAMING.
 3. AT ALL EXTERIOR WALLS ABOVE EXISTING ROOF DECK PROVIDE NEW 6" BATT INSULATION AND 5/8" GYP. BD. COORDINATE WITH ARCHITECT



1 EXISTING MEZZANINE
1/8" = 1'-0"

AGP
the Abia Griffin
Partnership L.L.C.

313 S. E. 5th Street
MOORE, OK, 73160
405.735.3477
AGP@theACP.net
www.theACP.net

CEDAR CREEK
CIVIL

KFC ENGINEERING
STRUCTURAL

SALAS OBIEN
MECHANICAL / ELECTRICAL


Michael L. Moore
10/22/24

CG
drawn by _____
MA
checked by _____
OCTOBER 2024
date

revisions
 ADDENDUM #3

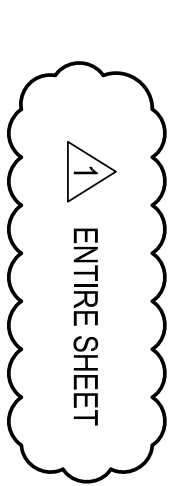


MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
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Sheet No.:

A100C



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CONSTRUCTION DATA (TABLE 603):

OCCUPANCY -	E & I-4
CONSTRUCTION TYPE -	TYPE II - B
BASIC ALLOWABLE AREA -	E - 58,000 S.F. / I-4 - 82,000 S.F. PER FLOOR
ALLOWABLE STORIES -	3 / 3
ACTUAL STORIES -	1 / 1
ACTUAL HEIGHT -	23'-4"

BUILDING SIZES:

BUILDING : 1 STORY @ 32,200 S.F.

STRUCTURAL FIRE PROTECTION (TABLE 601):

EXTERIOR BEARING WALLS	0 HOUR
EXTERIOR NONBEARING WALLS	NONCOMBUSTIBLE
COLUMNS	NONCOMBUSTIBLE
BEAMS	0 HOUR
PERMANENT PARTITIONS	0 HOUR
FLOOR ASSEMBLIES	NONCOMBUSTIBLE
ROOF ASSEMBLIES	0 HOUR
EXTERIOR OPENINGS	N/A

PASSIVE FIRE SAFETY SYSTEM:

PORTABLE FIRE EXTINGUISHERS (REF: SHEETS A104)
TRAVEL DISTANCE = 250'-0" MAX.
ACTUAL MAX. TRAVEL DISTANCE = 170'-0"
DEADEND - 50'-0" MAX.
ACTUAL DEADEND - NONE

ACTIVE FIRE SAFETY SYSTEMS (EXISTING & NEW ADDITION):

FIRE SPRINKLER SYSTEM THROUGHOUT
FIRE ALARM SYSTEM
SMOKE DETECTION
AUTOMATIC AIR HANDLING EQUIP. SHUTDOWN
EXIT LIGHTS/EMERGENCY LIGHTS BATTERY

CODES/REGULATIONS USED (CITY OF MOORE):

2018 IBC - INTERNATIONAL BUILDING CODE
AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE
2009 ENERGY CONSERVATION CODE
ASSOCIATED SUPPLEMENTS TO EACH CODE

OCCUPANT LOAD (TABLE 1004.1.1.1):

BUILDING RENOVATION: 278 CHILDREN
12 ADMIN / STAFF
40 TEACHERS
330 TOTAL OCCUPANTS

EGRESS WIDTH:

BUILDING RENOVATION: REQUIRED 66"
BUILDING RENOVATION: PROVIDED 432"

PLUMBING FIXTURES (TABLE 2902.1):

TOTAL OCCUPANT LOAD (INSTITUTIONAL) = 330	TOTAL PROVIDED
TOTAL REQUIRED:	WATER CLOSETS = 34
WATER CLOSETS = 22	URINALS = 0
LAVATORIES = 22	LAVATORIES = 49
DRINKING FOUNTAINS = 4	DRINKING FOUNTAINS = 4
SERVICE SINKS = 1	SERVICE SINKS = 2

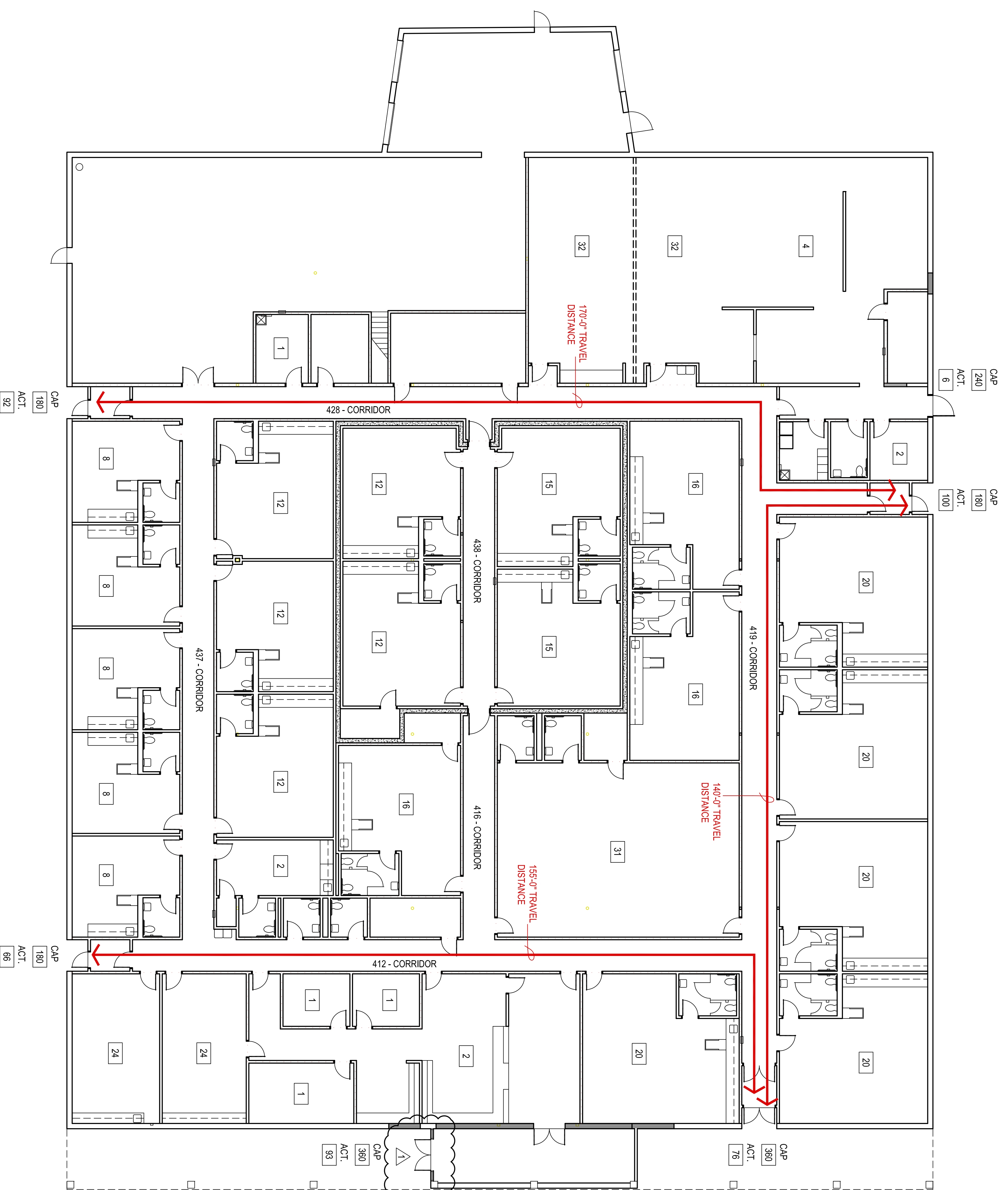
DEVOTES 1-HR. RATED PARTITIONS CLOSE-OUT TO BOTTOM OF DECKING - CLOSE-OUT PARTITIONS TO BE CMU WHERE INDICATED ON STRUCTURAL FOR LOAD BEARING CONDITIONS. ALL OTHER INDICATED LOCATIONS TO BE CONSTRUCTED OF 1 LAYER OF 5/8" FIRE RATED GYP. BOARD EACH SIDE ON 6" METAL STUDS @ 16" O.C. STAGGER ALL JOINTS & PROVIDE FIRE TAPE SEAL ALL PENETRATIONS W/ CONTINUOUS FIRE STOPPING INSULATION & OR SEALANT.

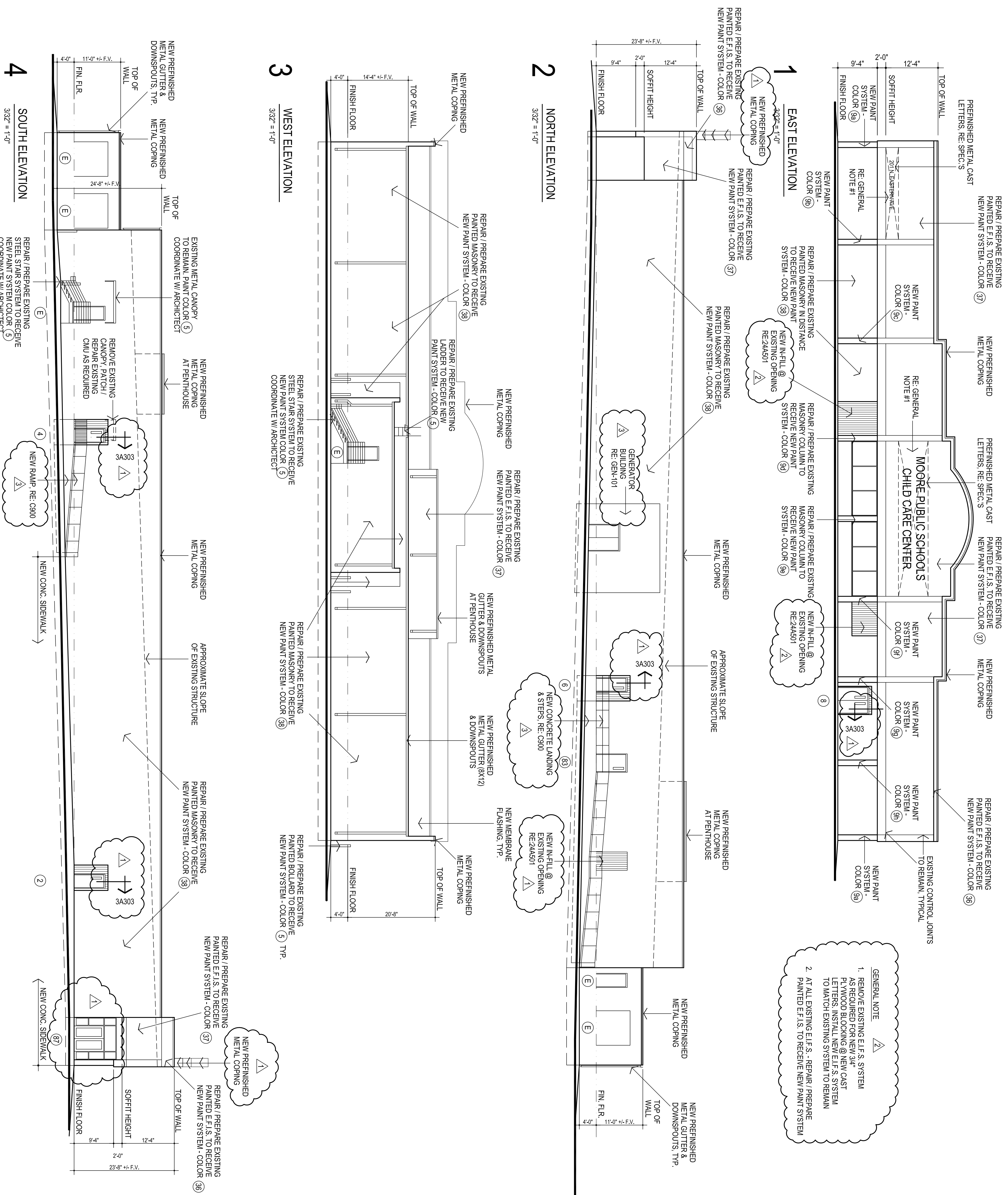
CORRIDOR WIDTH REQUIREMENTS:

*** DEVOTES NUMBER OF OCCUPANTS PER ROOM

- 412 - CORRIDOR : 78 MAX. OCCUPANTS X 0.20 = 16' REQD. / 72" PROVIDED
- 416 - CORRIDOR : 58 MAX. OCCUPANTS X 0.20 = 12' REQD. / 72" PROVIDED
- 419 - CORRIDOR : 100 MAX. OCCUPANTS X 0.20 = 20' REQD. / 60" PROVIDED
- 428 - CORRIDOR : 92 MAX. OCCUPANTS X 0.20 = 19' REQD. / 73" PROVIDED
- 437 - CORRIDOR : 46 MAX. OCCUPANTS X 0.20 = 10' REQD. / 72" PROVIDED

ALL CORRIDORS & EXIT DOORS EXCEED MINIMUM CLEARANCES AS REQUIRED BY IBC & ADA





ADDENDUM 03

Issue Date: December 12, 2024

Project Information

Client: Abla Griffin Partnership
 Project Name: MPS Daycare
 Project Location: Moore, OK
 Owner: Moore Public Schools
 Engineer: Salas O'Brien, LLC

Project No. 2450-70304-00



To Prospective Bidders

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated November 12, 2024, (and previous addenda), with amendments and additions noted below.

This Addendum consists of (3) pages and (20) attachments.

- Index of Attachments
 - Earthsmart Controls Proposal
 - M101 T403 E201 E602
 - M201 P001 E202
 - M501 P110 E203
 - M601 E000 E401
 - F101 E100 E502
 - T201 E101 E601

Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may disqualify Bidder.

CHANGES TO BIDDING REQUIREMENTS

The attached Earthsmart Temperature Control proposal shall be included as part of the mechanical bid for this project.



CHANGES TO THE DRAWINGS

Revisions have been made to the following drawings and are issued in the form of full-size plans. Edits are indicated by a revision delta and a cloud surrounding the affected portion of the drawing.

M101 – MECHANICAL FLOOR PLAN

- Refer to clouds and deltas on plan.

M201 – MECHANICAL ROOF PLAN

- Refer to clouds and deltas on plan.

M501 – MECHANICAL DETAILS

- Refer to clouds and deltas on plan.

M601 – MECHANICAL SCHEDULES

- Refer to clouds and deltas on plan.

F101 – Fire Protection Plan

- Refer to clouds and deltas on plan.

T201 – TECHNOLOGY FLOOR PLANS

- Refer to clouds and deltas on plan.

T403 – TECHNOLOGY SHEET SPECIFICATIONS

- Refer to clouds and deltas on plan.

P001 – PLUMBING SITE PLAN

- Refer to clouds and deltas on plan.

P110 – PLUMBING PLAN – ABOVE GRADE

- Refer to clouds and deltas on plan.

E000 – ELECTRICAL TITLE SHEET

- Refer to clouds and deltas on plan.

E100 – ELECTRICAL SITE PLAN

- Refer to clouds and deltas on plan.

E101 – ELECTRICAL LIGHTING PLAN

- Refer to clouds and deltas on plan.

E201 – ELECTRICAL POWER PLAN

- Refer to clouds and deltas on plan.

E202 – ELECTRICAL ROOF PLAN

- Refer to clouds and deltas on plan.



E203 – ELECTRICAL KITCHEN PLAN

- Refer to clouds and deltas on plan.

E401 – ELECTRICAL ONE-LINE DIAGRAM

- Refer to clouds and deltas on plan.

E502 – ELECTRICAL DETAILS SHEET

- Refer to clouds and deltas on plan.

E601 – ELECTRICAL SCHEDULES

- Refer to clouds and deltas on plan.

E602 – ELECTRICAL SCHEDULES

- Refer to clouds and deltas on plan.

END OF ADDENDUM [03]

EARTHSMART CONTROLS

5305 N Santa Fe Avenue
Oklahoma City, OK 73118

www.earthsmartcontrols.com

Phone: (405) 778-8008
Fax: (866) 676-5602

To: Moore Houchin Elementary Bidders
Attn: Estimator

November 26, 2024

This is a proposal to provide controls for the Moore Schools Childcare Facility project.

RTUs (16)

- Provide and install Honeywell controls.
- Install communication, controller, supply air sensor, fan status, compressor statuses, digital space temperature/humidity/ CO2 sensor to control outside air damper (damper actuator by others).
- Commission the units to ensure proper operation.

GPS Ionizers (16)

- Provide and install 16 new GPS-FC48-AC ionizers.
- Commission the unit to ensure proper operation.

Honeywell WEBS N4 Frontend

- Tie to existing WEB-8000 onsite and integrate N4 supervisor station (graphical user interface).
- Provide a 25 Device JACE to allow for future expansion.
- Provide 4 hours of user training.
- ***Provide 1-year parts and labor warranty.***
- Provide graphical representations of equipment listed above.
- Provide custom trending and alarming.
- Provide scheduling capabilities and remote access.

We thank you for the opportunity to bid and look forward to working with you soon.

If you have any questions, please feel free to contact us at (405) 778-8008.

Exclusions for total job: Any wiring above 24V, EF Controls, Kitchen equipment control, carbon monoxide sensors, smoke detectors, RTU damper actuators and anything not mentioned in this proposal.

Continued on next page...

CEARTHSMART CONTROLS

5305 N Santa Fe Avenue
Oklahoma City, OK 73118

www.earthsmartcontrols.com

Phone: (405) 778-8008
Fax: (866) 676-5602

The total price for the control work above is: \$72,710.00
Seventy-Two Thousand Seven Hundred and Ten Dollars



Erin Bevill
Controls Manager
EarthSmart Controls, LLC

Company: _____

Signature: _____

Date: _____

Printed Name: _____

Title: _____

PO #: _____



GENERAL NOTES

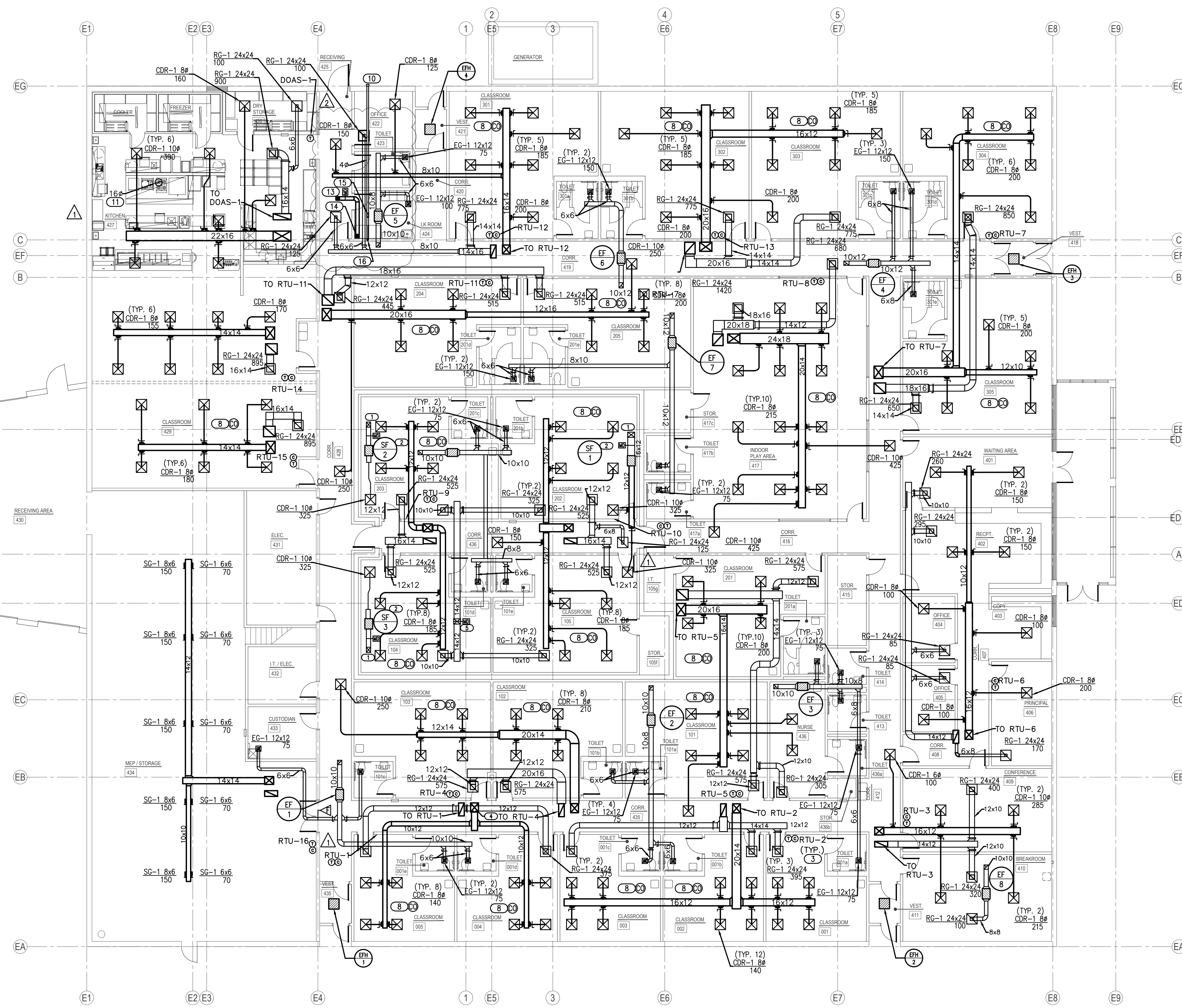
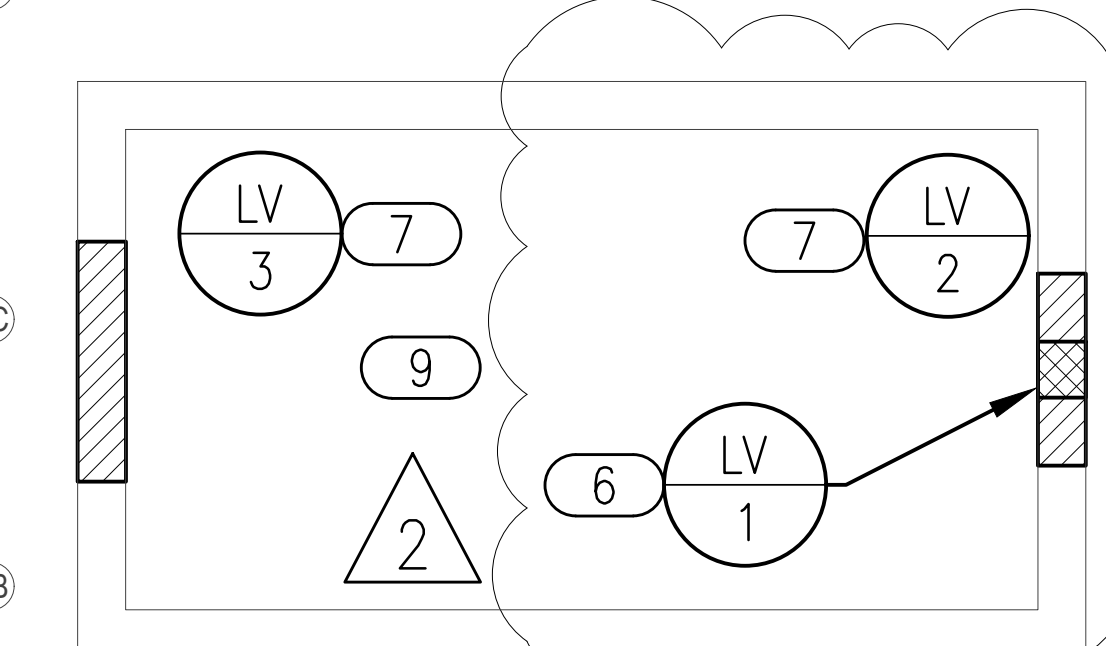
- COORDINATE INSTALLATION OF EQUIPMENT AND DUCTWORK WITH ALL TRADES.
- COORDINATE LOCATION OF THERMOSTATS WITH E.C. ROUGH-IN BY E.C.
- ALL PENETRATIONS OVER 3 1/2 SQUARE INCHES OR 2 1/16 INCHES IN DIAMETER IN/OUT OF SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
- M.C. IS RESPONSIBLE TO ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
- E.C. TO PROVIDE, LOCATE, AND INSTALL SWITCH FOR EMERGENCY VENTILATION FAN. M.C. SHALL PROVIDE CALL OUT LETTERING "EMERGENCY VENTILATION" ON PLACARD ABOVE SWITCH WITH 3/4" LETTERING FOR INSTALLATION BY GC. COORDINATE WITH GC AND EC.

KEYED NOTES

- ROOF HOOD IS PART OF EMERGENCY VENTILATION SYSTEM. DUCT UP 16X12 TO TRANSITION INTO ROOF HOOD OPENING 18X16.
- MOTORIZED DAMPER TO BE 120V CONNECTED TO EMERGENCY POWER. DAMPER SHALL OPEN WHEN SUPPLY FAN TURNS ON.
- PROVIDE LOCKABLE COVER FOR THERMOSTAT.
- DUCT 18X20 SUPPLY AND 12X28 RETURN UP TO RTU.
- ROOF HOOD PART OF THE EMERGENCY VENTILATION SYSTEM TO PROVIDE RELIEF AIR. MOTORIZED DAMPER SHALL OPERATE ON INVERTER. INTERLOCK WITH SF-1. DUCT DOWN TO 16X12.
- MOUNT BOTTOM OF LOUVER MINIMUM 60" ABOVE LV-2. LOUVER CONNECTION FOR ENGINE EXHAUST.
- MOUNT BOTTOM OF LOUVER MINIMUM 18" AFF. LOUVER CONNECTION FOR RADIATOR EXHAUST.
- CARBON MONOXIDE DETECTOR TO BE INSTALLED ACCORDING TO ALL APPLICABLE CODES. DETECTOR SHALL BE INSTALLED CENTRALLY ON CEILING. ALSO INCLUDE BATTERY BACKUP IN EVENT PRIMARY POWER IS INTERRUPTED. ALARM SIGNAL SHALL BE ROUTED TO ADMINISTRATION OFFICE. COORDINATE WITH E.C. WITH PRIMARY POWER CONNECTION AND SYSTEM CONNECTION.
- PROVIDE EXHAUST DUCT TO GENERATOR RADIATOR CONNECTION. COORDINATE DUCT SIZE WITH GENERATOR MANUFACTURER DRAWINGS.
- PROVIDE DRYER VENT EXHAUST HOOD TERMINATION AT EXTERIOR WALL IN ACCORDANCE WITH DRYER MANUFACTURER'S REQUIREMENTS. PROVIDE WALL CAP WITH BIRD FILTER.
- DUCT 14" DIA. UP TO ROOF EXHAUST FAN OPENING. TRANSITION TO HOOD COLLAR PER KITCHEN SPECIFICATIONS.
- DOAS UNIT SHALL CYCLE DOWN TO TEMPER KITCHEN WHILE HOODS ARE OFF.
- DUCT 8"x8" MAKEUP AIR DUCT TO ROOF HOOD. INTERLOCK MOTORIZED DAMPER WITH POWER OF DRYER.
- MAKEUP AIR DUCT TO BE DUCTED DOWN BEHIND DRYERS TO 20" AFF. COVER DUCT OPENING WITH 1/4" WIRE MESH.
- PROVIDE UL-705 LISTED DRYER BOOSTER FAN OF FANTECH DBF 110 OR APPROVED EQUIVALENT. FAN SHALL PROVIDE MINIMUM OF 160 CFM. INTERLOCK FAN WITH POWER OF DRYER.
- PROVIDE EXTERNAL LINT TRAP OF FANTECH DBLT 4W OR EQUIVALENT AT DRYER EXHAUST CONNECTION.

2 MECHANICAL GENERATOR PLAN
SCALE: 1/4" = 1'-0"

SCALE: 1/4" = 1'-0"

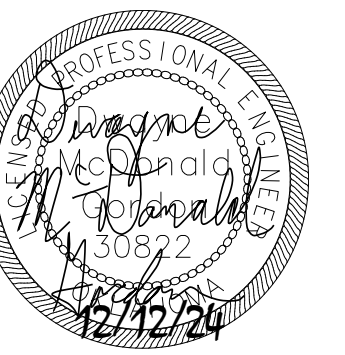


1 MECHANICAL FLOOR PLAN
SCALE: 3/32" = 1'-0"

SCALE: 3/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



KF
drawn by
DG
checked by
OCTOBER 2024
date

revisions
1 11/22/2024 AD 02
2 12/12/2024 AD 03



CHILD CARE FACILITY
201 N. EASTERN AVE.

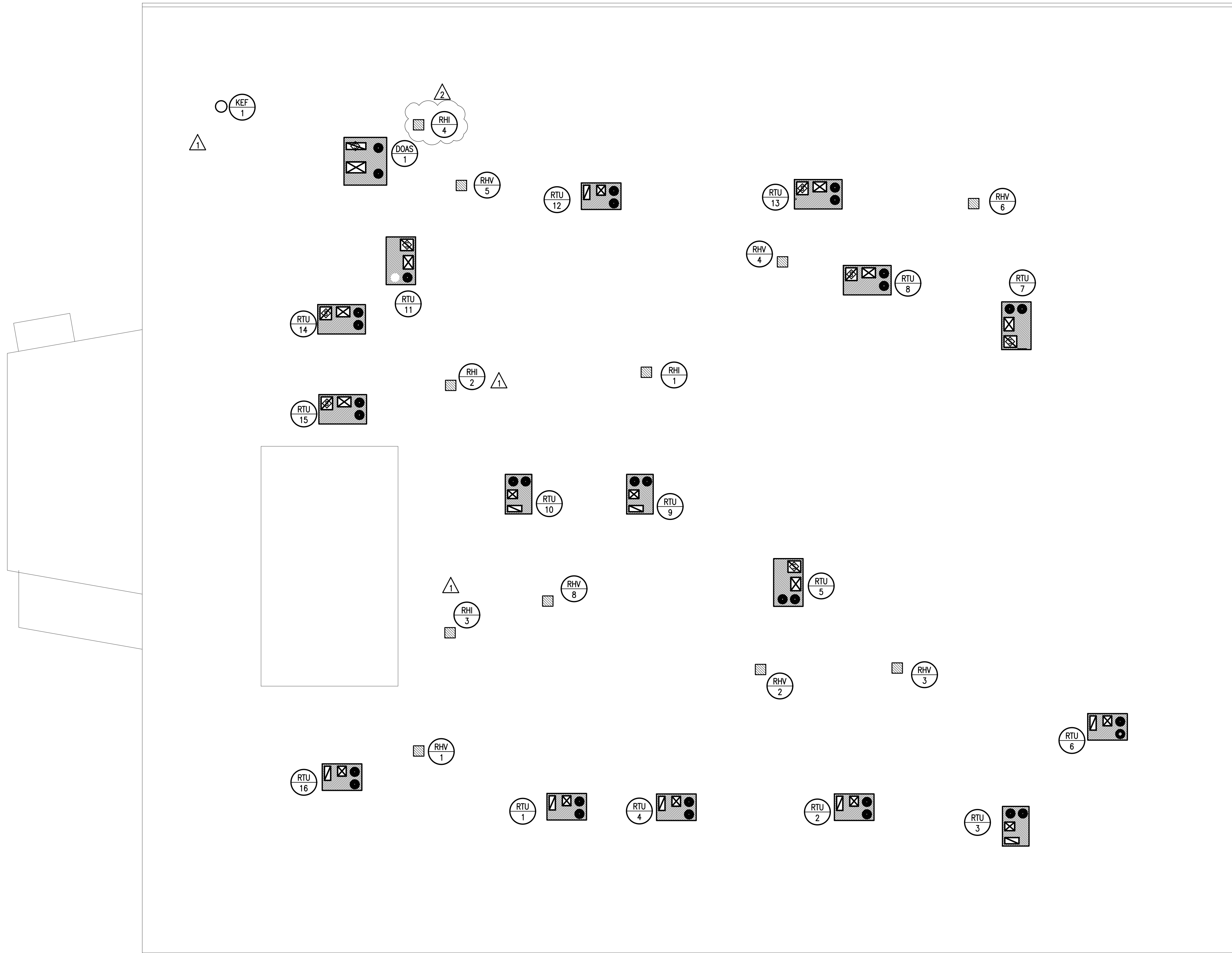
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GENERAL NOTES

1. ALL ROOF TOP EQUIPMENT TO BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ROOF EDGE.
2. MAINTAIN A MINIMUM OF 10'-0" HORIZONTAL CLEARANCE BETWEEN ALL EXHAUST OUTLETS AND ANY FRESH AIR INTAKES.
3. MOUNT ROOF CURBS LEVEL ON PITCHED ROOF.
4. ALL ROOF SUPPORT SYSTEMS ARE TO BE MANUFACTURED FOR THE ROOF MATERIAL/SYSTEM TO BE INSTALLED. REFER TO ARCH PLANS FOR THE ROOF SYSTEM. CURB INSTALLATION TO BE WARRANTED BY ROOFING CONTRACTOR.
5. ALL PENETRATIONS OVER 3 1/2 SQUARE INCHES OR 2 1/16 INCHES IN DIAMETER IN/OUT OF THE SHELTER REQUIRE SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
6. MC IS RESPONSIBLE FOR ALL STRUCTURAL REQUIRED PENETRATION PROTECTION ITEMS FOR ALL MECHANICAL SYSTEMS PENETRATING THE SHELTER.
7. ROUTE ALL CONDENSATE TO NEAREST OPEN SITE DRAIN.



1 MECHANICAL ROOF PLAN
SCALE: 3/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
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drawn by	KF
checked by	DG
date	OCTOBER 2024
revisions	
	12/12/2024 AD 03



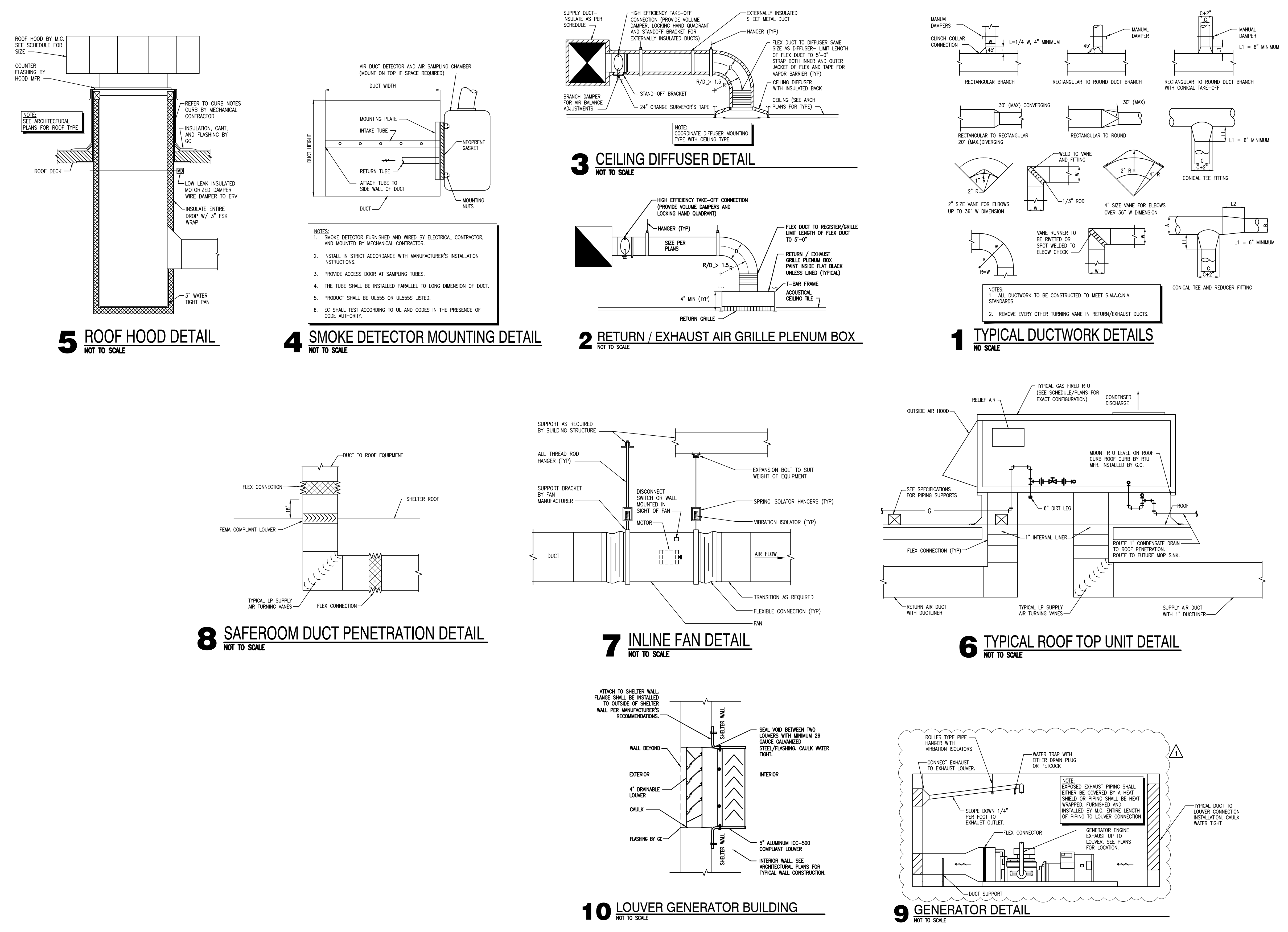
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201 N. EASTERN AVE.

sheet no:

M501

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Moore, OK 73160
Salas O'Brien Registration: CA# 7058
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Salas O'Brien Project Number: 2450-70304-00



ROOF HOOD SCHEDULE							
THROW SIZE DIMENSION (N)	THROW AREA (FP)	DAMPER ROD OR MOD	CONSTRUCTION	MANUFACTURER & MODEL NO.	COMMENTS	NOTES	
RHI-1	14X14	1.36	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHI-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHI-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHI-4	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-1	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-2	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-3	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-4	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-5	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-6	10X10	0.69	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3
RHV-7	14X14	1.36	MOD	ALUMINUM	GREENHECK FG	COLOR BY ARCHITECT	1-3

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
1. M.C. TO PROVIDE ROOF HOOD WITH ALUMINUM BIRDSCREEN.
2. M.C. SHALL PROVIDE ROOF CURB CURB INSTALLATION BY C.C.
3. M.C. SHALL PROVIDE LOW VOLTAGE MOTORIZED DAMPER.

LOUVER SCHEDULE									
CONNECTED TO	SIZE (N) W/OI	MINIMUM FREE AREA (FP)	FLANGE	CONSTRUCTION	INCLUDE MOD	MANUFACTURER AND MODEL NUMBER	COMMENTS	NOTES	
1	GEN ENCLOSURE	18X18	0.71	YES	ALUMINUM	--	GREENHECK AFL-501	5" FEMA RATED LOUVER-- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
2	GEN ENCLOSURE	48X30	4.33	YES	ALUMINUM	--	GREENHECK AFL-501	5" FEMA RATED LOUVER-- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2
3	GEN ENCLOSURE	60X72	14.98	YES	ALUMINUM	--	GREENHECK AFL-501	5" FEMA RATED LOUVER-- PROVIDE ADDITIONAL DRAINABLE LOUVER (GREENHECK ESD-403)	1-2

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSION, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
1. PROVIDE PAINTED KYNAR FINISH COLOR BY ARCHITECT.
2. PROVIDE BIRD SCREEN.

AIR BALANCE SCHEDULE			
EXHAUST		OUTDOOR AIR	
SOURCE	CFM	SOURCE	CFM
KEF-1	2500	DOAS-1	2400
EF-1	225	RTU-1	350
EF-2	300	RTU-2	520
EF-3	375	RTU-3	280
EF-4	450	RTU-4	535
EF-5	300	RTU-5	645
EF-6	175	RTU-6	205
EF-7	300	RTU-7	700
EF-8	100	RTU-8	900
DRYER	160	RTU-9	450
--	--	RTU-10	535
--	--	RTU-11	625
--	--	RTU-12	400
--	--	RTU-13	710
--	--	RTU-14	205
--	--	RTU-15	205
--	--	RTU-16	205
TOTAL:	4885		9870

PACKAGED ROOFTOP GAS/ELECTRIC UNIT SCHEDULE																
LOCATION	INPUT MBH	OUTPUT MBH	COOLING NOMINAL TONS	AMBIENT TEMP. DB/MB	WALL EER	CAPACITY STAGES	TOTAL CFM	MIN F.A. CFM	ELEC. CHAR	MCA	MOCP	ESP (N)	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES	
1	ROOF-SEE PLANS	65	52	3	104 / 74	14.3	2(H)/1(C)	1100	350	208 / 3	19	25	1.0	900	LENNOX LGM036USE	1,2,4-12
2	ROOF-SEE PLANS	108	87	5	104 / 74	12.5	2(H)/1(C)	1880	520	208 / 3	26	40	1.0	905	LENNOX LGM060USE	1,2,4-12
3	ROOF-SEE PLANS	65	52	3	104 / 74	14.3	2(H)/1(C)	1100	280	208 / 3	19	25	1.0	900	LENNOX LGM036USE	1,2,4-12
4	ROOF-SEE PLANS	108	87	5	104 / 74	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM060USE	1,2,4-12
5	ROOF-SEE PLANS	180	144	7.5	104 / 74	12.5	2(H)/1(C)	2100	645	208 / 3	46	50	1.0	1500	LENNOX LGM092USE	1-12
6	ROOF-SEE PLANS	65	52	3	104 / 74	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM036USE	1,2,4-12
7	ROOF-SEE PLANS	180	144	7.5	104 / 74	12.5	2(H)/1(C)	2200	700	208 / 3	46	50	1.0	1500	LENNOX LGM092USE	1-12
8	ROOF-SEE PLANS	180	144	8.5	104 / 74	12.5	2(H)/1(C)	3000	900	208 / 3	48	50	1.0	1500	LENNOX LGM102USE	1-12
9	ROOF-SEE PLANS	108	87	4	104 / 74	13.2	2(H)/1(C)	1500	450	208 / 3	25	35	1.0	905	LENNOX LGM048USE	1,2,4-12
10	ROOF-SEE PLANS	108	87	5	104 / 74	12.5	2(H)/1(C)	1700	535	208 / 3	26	40	1.0	905	LENNOX LGM060USE	1,2,4-12
11	ROOF-SEE PLANS	180	144	7.5	104 / 74	12.5	2(H)/1(C)	2100	625	208 / 3	46	50	1.0	1500	LENNOX LGM092USE	1-12
12	ROOF-SEE PLANS	108	87	4	104 / 74	13.2	2(H)/1(C)	1400	400	208 / 3	25	35	1.0	905	LENNOX LGM048USE	1,2,4-12
13	ROOF-SEE PLANS	180	144	7.5	104 / 74	12.5	2(H)/1(C)	2200	710	208 / 3	46	50	1.0	1500	LENNOX LGM092USE	1-12
14	ROOF-SEE PLANS	65	52	3	104 / 74	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM036USE	1,2,4-12
15	ROOF-SEE PLANS	65	52	3	104 / 74	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM036USE	1,2,4-12
16	ROOF-SEE PLANS	65	52	3	104 / 74	14.3	2(H)/1(C)	1100	205	208 / 3	19	25	1.0	900	LENNOX LGM036USE	1,2,4-12

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
1. PROVIDE CONDENSER COIL HALL GUARD.
2. PROVIDE FACTORY-INSTALLED UNIT DISCONNECT SWITCH.
3. PROVIDE FACTORY-INSTALLED RETURN DUCT SMOKE DETECTOR WITH REMOTE TEST STATION TO BE LOCATED IN OCCUPIED SPACE. INSTALLATION OF REMOTE TEST STATION AND CONNECTION TO FIRE ALARM SYSTEM BY E.C.
4. PROVIDE FACTORY-INSTALLED 120V GFCI CONVENIENCE OUTLET. GFCI POWERED FROM UNIT. RECEPTACLE SHALL BE COMPLIANT WITH NEC 210.63.
5. PROVIDE ANTI-SHORT CYCLE TIMER AND LOW AMBIENT CONTROLS.
6. PROVIDE FACTORY ROOF CURB SO THAT THE BOTTOM OF THE ROOFTOP UNIT IS A MINIMUM OF 14" ABOVE FINISHED ROOF. MINIMUM LEVEL ON SLOPED ROOF.
7. PROVIDE HINGED AND TOOL-LESS ACCESS DOORS.
8. PROVIDE PHASE MONITOR.
9. PROVIDE FULL ENTHALPHY ECONOMIZER WITH POWERED EXHAUST.
10. PROVIDE DIGITAL, W-FI ACCESSIBLE 7-DAY PROGRAMMABLE THERMOSTAT WITH OCCUPIED/UNOCCUPIED SETTINGS CAPABLE OF CONTROLLING THE H/C STAGES OF SPECIFIED UNIT.
11. PROVIDE UNIT WITH HGRN.
12. MODULATE OUTSIDE AIR BASED ON DEMAND REPORTED BY CO2 SENSOR.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE					
PLAN SYMBOL	DESCRIPTION	MANUFACTURER & MODEL NO.	MATERIAL	FINISH	NOISE CRITERIA
GR-1	SQUARE FACE, ROUND NECK, 4-WAY DEFLECTION CEILING DIFFUSER, SPRING LOCK INNER CORE, FOR LAY-IN CEILING INSTALLATION.	PRICE SCD (4C)	STEEL	WHITE	--
SG-1	DOUBLE DEFLECTION SIDEWALL GRILLE, ADJUSTABLE DEFLECTION BLADES, 3/4" O.C. FLAT FRAME WITH 1 1/4" MARGIN, HORIZONTAL FRONT.	PRICE 520	STEEL	COLOR BY ARCHITECT	--
RG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	--
RG-2	SQUARE PATTERN GRILLE, ZERO DEGREE DEFLECTION, FLAT STEEL FRAME WITH 1 1/4" BORDER, FOR SURFACE MOUNT INSTALLATION.	PRICE 80	STEEL	WHITE	--
EG-1	SQUARE PATTERN GRILLE, FIXED CORE OF 1/2"x1/2"x1/2" FABRICATED ALUMINUM SQUARES, FLAT FRAME WITH 1 1/4" MARGIN, FOR LAY-IN CEILING INSTALLATION.	PRICE 80	ALUMINUM	WHITE	--

NOTES:
SEE PLANS FOR QUANTITY AND SIZES.
M.C. TO FIELD VERIFY CEILING TYPE FOR ALL GRD BEFORE PURCHASING EQUIPMENT. PROVIDE REQUIRED MOUNTING.

DUCTWORK/INSULATION SCHEDULE												
SYSTEM	LOW PRESSURE			MED. PRESS.			HIGH PRESS.			INSULATION		
	MAX. PRES.	A	B	C	SEAL	MAX. PRES.	SEAL A	MAX. PRES.	SEAL A	INTERNAL THICKNESS	EXTERNAL THICKNESS	NOTES
SUPPLY AIR WITHIN 10' OF UNIT	2"	X	--	--	--	--	--	--	YES	1"	NO	--
SUPPLY AIR BEYOND 10' OF UNIT	2"	X	--	--	--	--	--	--	NO	--	YES	2" FSK
RETURN AIR WITHIN 10' OF UNIT	2"	--	X	--	--	--	--	--	YES	1"	NO	--
RETURN AIR BEYOND 10' OF UNIT	2"	--	X	--	--	--	--	--	NO	--	YES	2" FSK
OUTSIDE AIR/MIXED AIR	2"	--	X	--	--	--	--	--	NO	--	YES	3" FSK
EXHAUST AIR	2"	--	X	--	--	--	--	--	NO	--	YES	2" FSK
GREASE AIR	2"	X	--	--	--	--	--	--	NO	--	YES	SEE NOTE 1

NOTES:
1. PROVIDE CODE-COMPLIANT FIRE WRAP.

FAN SCHEDULE															
CFM	SP	FAN RPM	ELECTRICAL				DAMPER BDD OR MOD	DRIVE	FAN TYPE	INTERLOCK/CONTROL	WEIGHT	MANUFACTURER & MODEL NUMBER	NOTES		
			VOLTAGE & PHASE	H.P.	FLA/AMPS	MCA								MOCP	
EF-1	225	0.5	1253	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-2	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-3	375	0.5	1435	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-4	450	0.5	1332	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-99-VG	1,2,3
EF-5	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-6	175	0.5	1489	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-97-VG	1,2,3
EF-7	300	0.5	1321	115/1	0.25	3.5	4	15	BDD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	1,2,3
EF-8	100	0.3	1670	115/1	0.07	1.3	2	15	BDD	DIRECT	INLINE	SWITCH	30	GREENHECK SO-60-VG	1,2,3
SF-1	750	0.5	1089	115/1	0.5	6.4	8	15	MOD	DIRECT	INLINE	SWITCH	65	GREENHECK SO-120-VG	4-7
SF-2	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	4-7
SF-3	325	0.5	1354	115/1	0.25	3.5	4	15	MOD	DIRECT	INLINE	SWITCH	50	GREENHECK SO-98-VG	4-7

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
1. PROVIDE ELECTRONIC SPEED CONTROL MOUNTED ABOVE ACCESSIBLE CEILING.
2. M.C. SHALL PROVIDE AND INSTALL LOW VOLTAGE MOTORIZED DAMPER.
3. OPERATION OF DEVICE ON OCCUPIED MODE OF RTU OR SWITCH WITH LIGHTS. SEE INTERLOCK/CONTROL COLUMN FOR TYPE.
4. PROVIDE UNIT MOUNTED DISCONNECT.
5. FAN AND MOTORIZED DAMPER ARE PART OF EMERGENCY POWER SYSTEM. COORDINATE ALL CIRCUITS WITH EC.
6. ALL WIRING TO FAN AND DAMPER SHALL BE BY EC.
7. PROVIDE 120 V DAMPER.

ELECTRIC FAN FORCED HEATER SCHEDULE												
ROOM NO.	CFM	WALL OR CEILING	KW	MOUNTING	ELECTRICAL CHAR	AMPS	SPEEDS	CONTROL	RPM	MANUFACTURER & MODEL NUMBER	NOTES	
1	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
2	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
3	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3
4	VEST	300	CEILING	2	RECESSED	208 / 1	9.6	1	INT STAT	1400	BERKO FFCH-548	1-3

NOTES: M.C. IS RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY DIMENSIONAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL ALTERATIONS NECESSITATED BY PROVIDING ALTERNATE EQUIPMENT.
1. PROVIDE INTERNAL THERMOSTAT.
2. RECESSED MOUNTED UNIT. PROVIDE RECESSED MOUNTING KIT.
3. PROVIDE BUILT-IN DISCONNECT.

FIRE PROTECTION ABBREVIATIONS			
AG	ABOVE GRADE	FT	FOOT (FEET)
ADD	ADDENDUM	GAL	GALLON
ADJL	ADDITIONAL	GC	GENERAL CONTRACTOR
ADJ	ADJUSTABLE	GPM	GALLONS PER MINUTE
AF	ABOVE FINISH FLOOR	MC	MECHANICAL CONTRACTOR
AFG	ABOVE FINISH GRADE	MECH	MECHANICAL
ALT	ALTERNATE	MIN	MINIMUM
BG	BELOW GRADE	NTS	NOT TO SCALE
CI	CAST IRON	PC	PLUMBING CONTRACTOR
COL	COLUMN	PLBC	PLUMBING
CW	COLD WATER	QTY	QUANTITY
DN	DOWN	SCH	SCHEDULE
EC	ELECTRICAL CONTRACTOR	SPEC	SPECIFICATIONS
FD	FLOOR DRAIN	SS	STAINLESS STEEL
FDC	FIRE DEPARTMENT CONNECTION	TEMP	TEMPERATURE
FLR	FLOOR	TYP	TYPICAL
FP	FIRE PROTECTION	W/	WITH

FIRE PROTECTION SYMBOL LEGEND	
	SHUTOFF VALVE
	CHECK VALVE
	DOUBLE CHECK VALVE
	END CAP
	FIRE DEPARTMENT CONNECTION (FDC)
	BELL

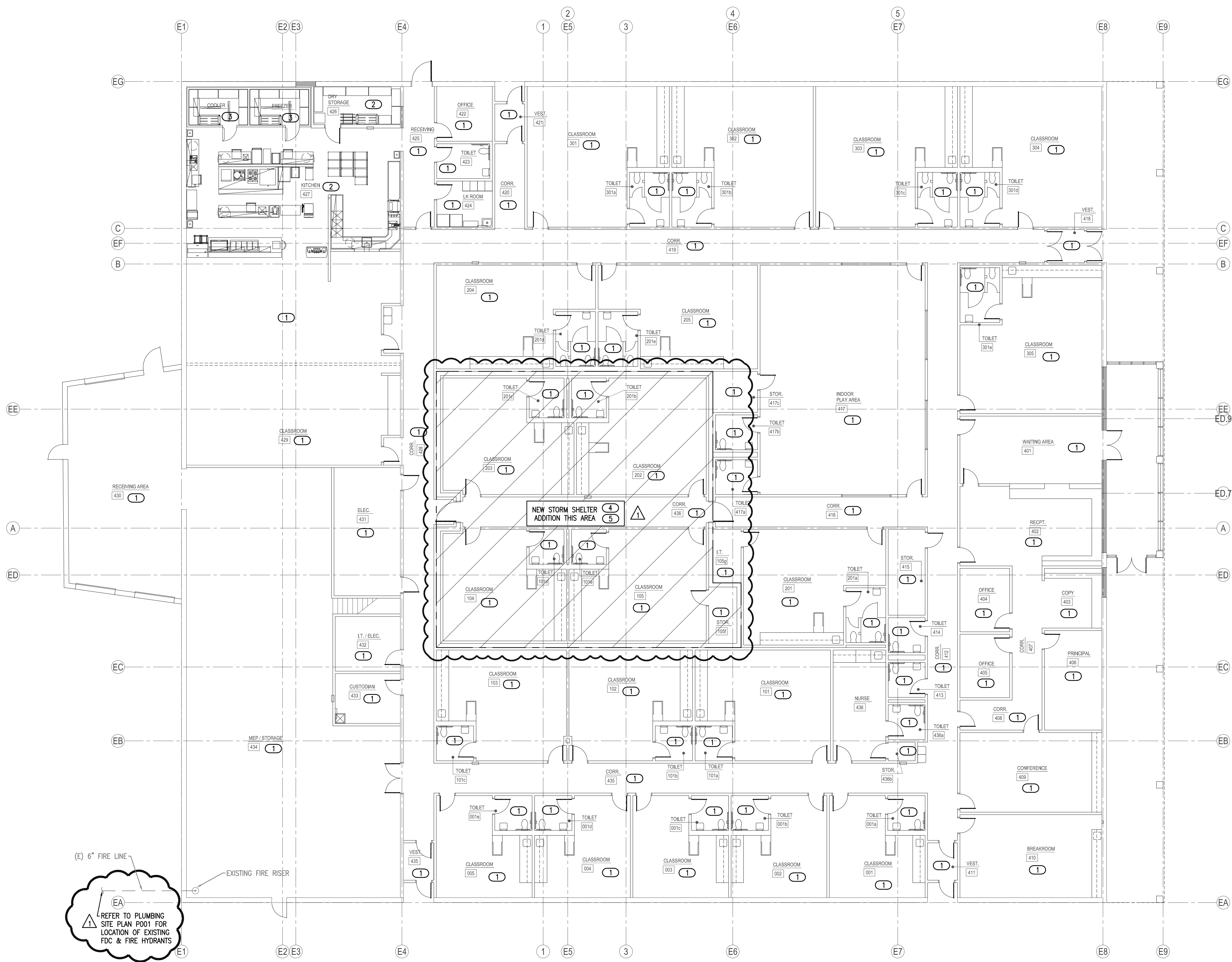
FIRE PROTECTION PIPING LINETYPES	
LINETYPE	DESCRIPTION
	NEW - ABOVE GRADE
	NEW - BELOW GRADE

- ### FIRE PROTECTION GENERAL NOTES
- CONTRACTOR SHALL PROVIDE DESIGN FOR SPRINKLER SYSTEM FOR REMODELED EXISTING SPACE.
 - COORDINATE INSTALLATION OF SPRINKLER PIPING AND ALL COMPONENTS WITH OTHER TRADES, OWNER, AND GENERAL CONTRACTOR.
 - FIRE PROTECTION SYSTEM TO COMPLY WITH NFPA 13, INSURANCE CARRIER AND ALL APPLICABLE STATE AND LOCAL CODES.
 - CUTTING OF STRUCTURAL AND/OR ARCHITECTURAL MEMBERS TO BE DONE ONLY WITH THE WRITTEN APPROVAL OF THE ARCHITECT AND STRUCTURAL ENGINEER.
 - PROVIDE MINIMUM 10 PSI SAFETY FACTOR.
 - WORK DRAWINGS INDICATING SPRINKLER HEAD LOCATIONS AND EXPOSED AND CONCEALED PIPING ROUTING SHALL BE PROVIDED TO THE ARCHITECT/ENGINEER PRIOR TO INSTALLATION FOR APPROVAL.
 - FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ORGANIZING A COORDINATION MEETING WITH OTHER TRADES AND OWNER PRIOR TO INSTALLATION.
 - SYSTEM PIPING LOCATION: WET SYSTEM PIPING SHALL BE INSTALLED AT HIGHEST ELEVATION POSSIBLE. PIPING SHALL BE INSTALLED ABOVE ALL MECHANICAL EQUIPMENT, DUCTWORK, AND ALL PLUMBING SYSTEM PIPING. PROVIDE ADEQUATE CLEARANCE TO MECHANICAL UNITS. FIRE PROTECTION CONTRACTOR SHALL COORDINATE FIRE PROTECTION PIPING PRIOR TO INSTALLATION.
 - PROPERLY TORQUE MECHANICAL TEES TO MANUFACTURER'S RECOMMENDATIONS.
 - FIRE PROTECTION PLANS ARE FOR REFERENCE ONLY. OCCUPANCIES AND AREAS OF PROTECTION NOTED ON THE PLANS SHALL BE CONFIRMED WITH NFPA 13 AND AUTHORITIES HAVING JURISDICTION. THIS CONTRACTOR SHALL COMPLY WITH ANY CODE REQUIREMENTS AS REQUIRED.
 - ALL AREA HORIZONTAL FOUR SQUARE FEET IN SIZE OR ABOVE NEED TO BE SPRINKLED.

FIRE PROTECTION SHEET INDEX

F101	FIRE PROTECTION PLAN
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- ### KEYED NOTES
- LIGHT HAZARD AREA - REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE AND HEIGHT.
 - ORDINARY HAZARD GROUP 1. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE AND HEIGHT.
 - ORDINARY HAZARD GROUP 1. COORDINATE WITH FREEZER/COOLER SUPPLIER OR MANUFACTURER FOR SPRINKLER HEAD INSTALLATION. PROVIDE DRY SPRINKLER HEADS IN FREEZER/COOLER.
 - STORM SHELTER - HATCHED AREA - SHELTER WALL PENETRATIONS OF PIPING SHALL HAVE AN OFFSET AND BE PROTECTED WITH DEBRIS GUARD. COORDINATE DEBRIS GUARDS WITH STRUCTURAL CONTRACTOR FOR STORM SHELTER WALL PENETRATIONS OF SPRINKLER PIPING. FIRESAL PENETRATIONS TO MAINTAIN FIRE RATING. ALL PENETRATIONS 2-1/16 INCH DIAMETER AND LARGER IN/OUT SHELTER REQUIRE FEMA SHROUD. REFER TO STRUCTURAL FOR ALL SHROUD DETAILS.
 - ALL SPRINKLER PIPING PENETRATING STORM SHELTER SHALL HAVE AUTOMATIC WATER SHUT-OFF VALVE TO PROTECT AGAINST LEAKAGE INTO SHELTER.



1 FIRE PROTECTION PLAN
SCALE: 3/32" = 1'-0"

KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL



KS
drawn by
KP
checked by
OCTOBER 2024
date
revisions
12/12/2024 AD 03



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:
F101

Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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SAFEROOM NOTE

PER ICC 500-2014, 309.1:

PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:

- 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
- 2 1/16" IN DIAMETER

SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

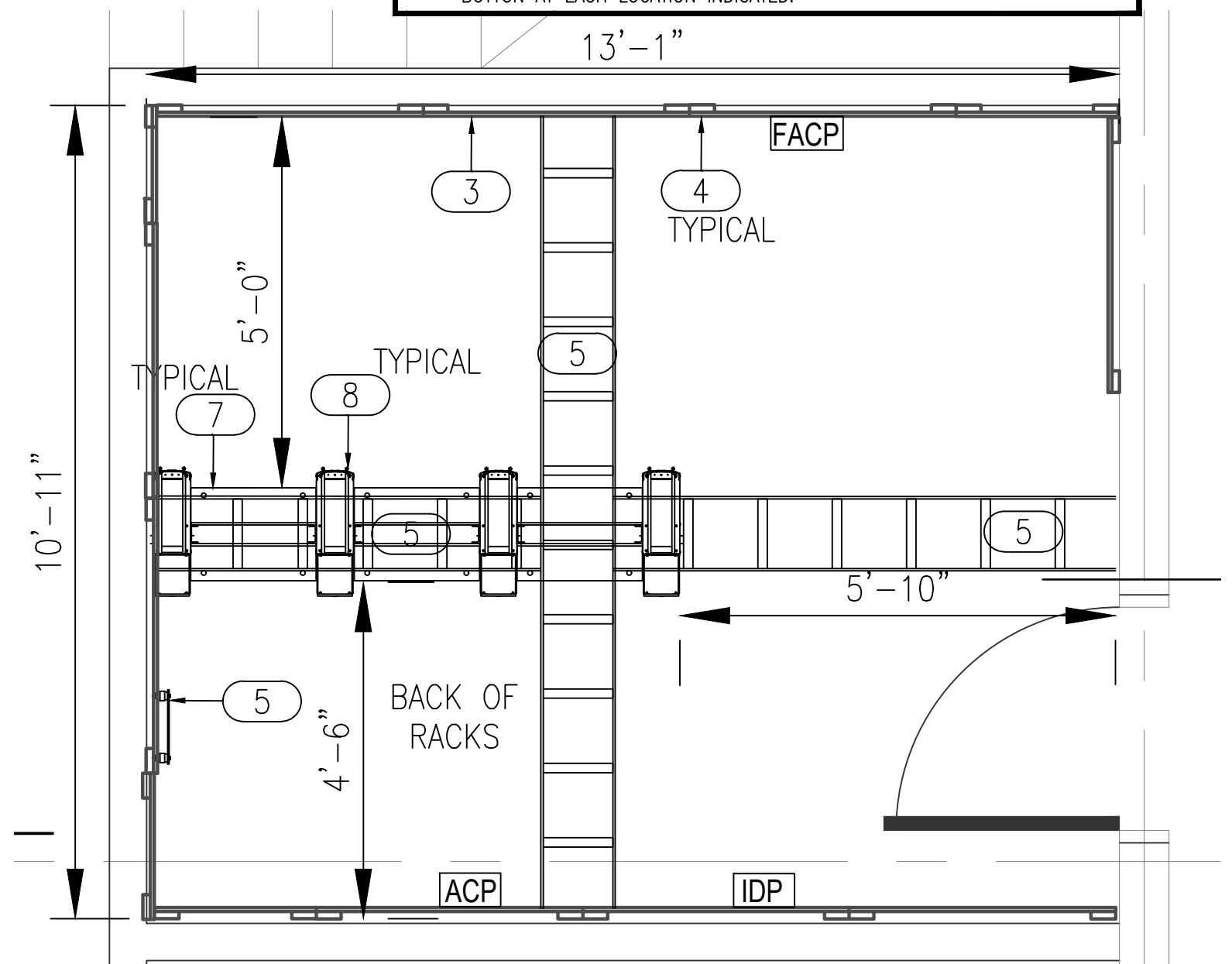
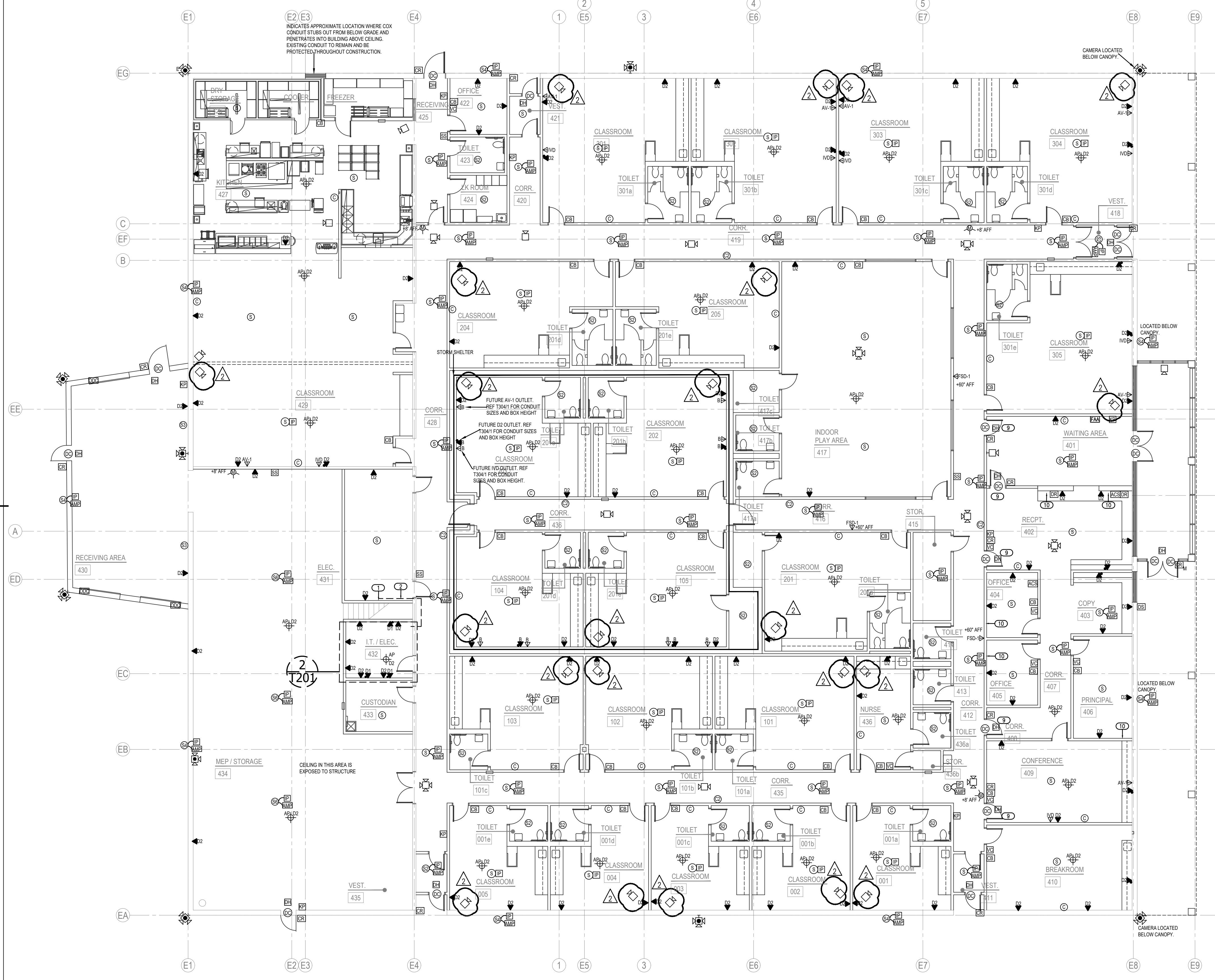
GENERAL NOTES

- FIRE ALARM: CONNECT NEW FIRE ALARM DEVICES TO NEW SILENT KNIGHT 6820XL SUPPLY 6820XL PANEL AND ALL NAC PANELS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE AN CODE COMPLIANT SYSTEM. SYSTEM SHALL USE SK PROTOCOL DEVICES ONLY. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- SECURITY ALARM: CONNECT ALL NEW SECURITY ALARM DEVICES TO NEW DMP SECURITY ALARM PANEL. SUPPLY DMP PANEL AND ALL ZONE EXPANDERS, POWER SUPPLIES, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. SYSTEM SHALL BE WIRED WITH 2 ZONES PER SINGLE DOOR OR DOUBLE DOOR. ONE ZONE FOR SECURITY ALARM AND ONE ZONE FOR DOOR HOLD OPEN ALERTS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- INTERCOM: INTERCOM DEVICES SHALL BE RAULAND. CONNECT ALL NEW INTERCOM DEVICES TO EXISTING RAULAND TELECENTER U IP. SUPPLY ALL MASTER CONSOLES, AMPLIFIERS, POWER SUPPLIES, MODULES, CALL BUTTONS, ETC. NEEDED TO MAKE A COMPLETE SYSTEM. ROOM SPEAKERS AND RESTROOM SPEAKERS SHALL BE TIED TOGETHER ON ONE TALK ZONE PER ROOM CALL BUTTON. EACH ROOM WITH A CALL BUTTON SHALL HAVE A STATUS LIGHT INSTALLED ABOVE ROOM DOOR ON HALLWAY SIDES. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- CLOCKS: CLOCKS SHALL BE RAULAND. SEE SHEET SPECIFICATIONS FOR APPROVED PART NUMBERS.
- ACCESS CONTROL: CONNECT ALL NEW ACCESS CONTROL DEVICES TO NEW KEYSCAN CONTROLLERS. SUPPLY KEYSCAN CONTROLLERS AND ALL POWER SUPPLIES, READERS, STRIKES, ETC. NEEDED TO FURNISH A COMPLETE SYSTEM. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- CAMERA: CONNECT ALL NEW CAMERAS TO NEW MDF. CAMERA SYSTEM IS AVIGILON. CONTRACTOR TO PROVIDE DELL AVIGILON SERVER IN MDF ROOM LOCATED ON 2 POST RACK. CONTACT JACK PHILLIPS WITH MOORE PUBLIC SCHOOLS @ 405-473-5225 FOR EXACT CAMERA MOUNTING LOCATIONS AND SPECIFICATIONS. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.
- DATA: CONNECT NEW DATA, WIFI AND CAMERA NETWORK DROPS TO NEW MDF. CONNECT NEW DATA/MDF TO EXISTING IDF LOCATED IN MOORE HIGH SCHOOL CCC VIA FIBER AND CAT 6 CABLE. SEE SPECIFICATIONS FOR APPROVED PART NUMBERS.

KEYED NOTES

- CONTRACTOR TO EXTEND ENTRANCE CONDUIT ABOVE CEILING. CONTRACTOR TO MATCH NEW CONDUIT SIZE WITH EXISTING CONDUIT SIZE.
- CONTRACTOR TO PROVIDE AND INSTALL INNERDUCT ABOVE CEILING AT THE INDICATED ROUTE TO THE NEW IT ROOM. PENETRATE AND SEAL WALLS AS NEEDED.
- INDICATES NEW DEMARC LOCATION. PLYWOOD IS RESERVED FOR SERVICE PROVIDER EQUIPMENT.
- INDICATES THE LOCATION OF A 8" TALL, 3/4" FIRE RATED PLYWOOD CONTRACTOR TO PROVIDE AND INSTALL PLYWOOD AND ALL REQUIRED MOUNTING HARDWARE. PLYWOOD SHALL BE PAINTED WHITE WITH FIRE RATED PAINT. TYPICAL FOR ALL SHOWN ON DRAWING.
- INDICATES THE LOCATION OF A NEW WALL MOUNTED TELECOMMUNICATION GROUND BUS BAR (TG8B). CABLING CONTRACTOR TO PROVIDE BUS BAR AND ALL REQUIRED MATERIAL TO MOUNT AT THE LOCATION SHOWN. TG8B TO BE MOUNTED AT +93" A.F.F.
- PROVIDE AND INSTALL A 12" WIDE, UNIVERSAL LADDER TRAY AND ALL REQUIRED MOUNTING HARDWARE. LADDER TRAY SHALL BE BLACK IN COLOR. TYPICAL FOR ALL SHOWN ON ENTIRE PROJECT.
- PROVIDE AND INSTALL ONE (1) 2-POST, FLOOR MOUNTED, 7' RELAY RACK (BLACK IN COLOR). PROVIDE BONDING WASHERS, BOLTS, AND NUTS AT ALL MECHANICALLY CONNECTED LOCATIONS OF THE RACK TO ENSURE THAT ALL PIECES OF THE RACK ARE COMPLETELY BONDED. SECURING PAINT FROM RACKS TO MAKE A BOND WILL NOT BE ACCEPTED. ALL RACK MOUNTED COMPONENTS SHALL BE MOUNTED WITH BONDING SCREWS AND THE CONTRACTOR SHALL PROVIDE THE OWNER WITH (50) ADDITIONAL BONDING SCREWS FOR THE INSTALLATION OF OWNER EQUIPMENT. NO DASHY CHAINING GROUNDS FROM RACK TO CABLE TRAY OR TO OTHER RACKS WILL BE ACCEPTED. ALL GROUNDS SHALL BE HOME RUN TO THE TELECOMMUNICATIONS GROUND BUS BAR (TG8B). TYPICAL FOR ALL SHOWN ON THE ENTIRE PROJECT.
- PROVIDE AND INSTALL ONE (1) 7'X6", FRONT AND REAR MANAGED, VERTICAL CABLE MANAGER (BLACK IN COLOR). CABLE MANAGERS SHALL BE INSTALLED ON EACH END OF THE RACK SYSTEMS AND BETWEEN EACH RACK. CABLE MANAGERS SHALL HAVE A SINGLE, SOLID, FULL HEIGHT HINGED DOOR IN THE FRONT AND WIDE SPACED CABLE RINGS WITH SPIN-OPEN LATCHES IN THE REAR. TYPICAL FOR ALL SHOWN IN THE ENTIRE PROJECT.
- DOOR HARDWARE SPECIFIED FOR INDICATED DOORS SHOULD HAVE KEY ACCESS FROM BOTH SIDES ALLOWING EACH SIDE TO BE LOCKED AND UNLOCKED INDEPENDENTLY.
- CONTRACTOR TO PROVIDE AND INSTALL A DMP WIRELESS HOLD UP BUTTON AT EACH LOCATION INDICATED.

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NY	checked by
OCTOBER 2024	date
revisions	
12/12/2024 AD 03	
11/22/2024 AD 02	



1 TECHNOLOGY FLOOR PLANS
SCALE: 3/32" = 1'-0"

2 TECHNOLOGY ENLARGED PLAN - I.T./ELEC. 432
SCALE: 1/2" = 1'-0"

 **Salas O'Brien**
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00



4.03 Products Installed but not Supplied Under This Section

- All conduit and EMT required for Fire cabling pathway in/out of closets and in/out of wall cavities at the work or Conduit for pathways shall have no more than two 90 degree sweeps and no continuous section over 100'.
- All core holes and poke through devices in the floor for the installation of cabling.
- All core holes and EMT sleeves between floors for the routing of cabling.
- Back boxes for the mounting of Devices.
- Drag line or pull string at the back boxes fished through EMT or conduit to the other end for installing Cabling.

4.04 References

- NFPA-70 National Electrical Code 2008 edition
- NFPA-72 National Fire Alarm Code
- UL 1666 - Standard for Safety of Flame Propagation Height
- NFPA 262 - Flame Travel and Smoke of Wires and Cables
- Local Authority Having Jurisdiction

4.05 Definitions

AWG - American Wire Gauge
 BICSI - Building Industry Consulting Service International
 EIA - Electronics Industry Alliance
 FCC - Federal Communications Commission
 NECA - National Electrical Contractors Association
 NFPA - National Fire Protection Agency
 UL - Underwriters Laboratory

4.06 Delivery, Storage, and Protection

- Contractor shall ensure that materials delivery to work area shall be coordinated with construction site manager responsible for materials distribution to all trades.
- Contractor is responsible for all materials, tools and vehicles left on the job site.
- Follow Manufacturer's recommendations for handling of materials.

4.07 Project Conditions

4.07.1 Environmental Requirements

- Contractor shall ensure that any pollutants produced during the Work are disposed off according to local, state or national regulations. Follow the most stringent guidelines.
- It is preferred that the Contractor recycle any used or un-used components during the course of the construction project.

4.07.2 Field Measurements

- Contractor shall coordinate with electrical engineer on project that the main electrical service ground has a resistance to earth of less than 5 ohms.
- Contractor shall ensure that all field testers have been calibrated from the Manufacturer within 1 year.
- All field test results will be documented and submitted to Moore Public Schools, Technology Department.

4.08 Sequencing

- Contractor shall coordinate with Owner's project manager on sequencing of various trades and construction items for the lifecycle of the project.

4.09 Scheduling

- Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager.

4.10 Warranty

- Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure. (1 year warranty shall begin at job completion)

4.11 Source Quality Control

- Materials shall be purchased from Distributors authorized by system Manufacturers to sell new and unused components.

Part 5 -

5.01 Field Quality Control

- Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative.
- Contractor shall replace all defective components.

5.02 Adjusting

- No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative.

5.03 Cleaning

- Contractor shall sweep and mop the floors of all equipment rooms or connection point closets prior to turnover to the Owner.

5.04 Protection

- It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials.
- Remove all protective covers and protective materials from equipment prior to turnover to Owner.

5.05 Schedules

- Coordinate work with Owner's project manager and follow scheduling sequence as established by Owner's project manager.
- It is recommended that the Contractor schedule closely with any other systems contractor to ensure turnover date is met.
- Contractor bidding will work closely with the electrical and/or masonry contractors to ensure conduit, back boxes, door frame access conduit, etc. are in the proper locations and accessible.

End of Section

Moore Public Schools Fire System Specifications SK & SD Protocol

Part 1 - General
2.01 Manufacturers

- Fire System Manufacturer shall be Silent Knight. (No Substitutions)
- Notification appliance Manufacturer shall be System Sensor. (No Substitutions)
- Device Manufacture shall be as specified in equipment description. (No Substitutions)
- Cable Manufacturer shall be Genesis. (Or Equivalent)

1.03 Fire Systems Equipment Description

- NOTE:** Contractor shall use SK Protocol devices on all new installations except when the existing system has SD protocol devices connected. In these instances, SD protocol devices shall be used. Contractor shall not combine SD & SK protocol devices to one system.
- Fire alarm control shall be Silent Knight Model # 5820 or 6820. (No Substitutions)
- Fire alarm distributed power module NAC Expansion shall be Silent Knight SK-PS6 / SK-PS10 or Fire-Lite Model #'s FL-PS6 / FL-PS10. (No Substitutions)
- Fire alarm intelligent power supply shall be Silent Knight Model # 5895XL. (No Substitutions)
 NOTE: The 5895XL NAC circuits will not sync with the main control panels NAC circuits. If new NAC circuit synchronization is required with existing NAC circuits, use the SK-PS6/FL-PS6 or SK-PS10/FL-PS10
- Fire alarm remote Annunciator shall be Silent Knight Model # 5860 (Grey) and surface mount trim ring 5860TG (Grey) shall be used if surface mounted. (No Substitutions)
- Fire Alarm signaling line circuit expander shall be Silent Knight Model # 5815XL for SD protocol devices & 6815 for SK protocol devices. (No Substitutions)

SK Protocol Devices Shall Be

- Fire alarm addressable manual pull station shall be Silent Knight Model # SK-PULL-DA. (No Substitutions)
- Fire alarm addressable photoelectric smoke detector shall be Silent Knight Model # SK-PHOTO-W. (No Substitutions)
- Fire alarm addressable heat detector shall be Silent Knight Model # SK-HEAT-W. (No Substitutions)
- Fire alarm base shall be Silent Knight Model # B300-6. (No Substitutions)
- Smoke Detectors in areas that require a CO Detector shall be SK-FIRE-CO-W. (No Substitutions)
- Fire alarm addressable input module shall be Silent Knight Model # SK-MONITOR or SK-MONITOR-2. (No Substitutions)
- Fire alarm addressable relay module shall be a Silent Knight Model # SK-RELAY. (No Substitutions)
- Fire alarm SLC line isolator shall be Silent Knight Model # SK-ISO. (No Substitutions)
- Fire alarm Duct detectors and Duct Detector Remote Test Stations shall be Silent Knight Model #'s SK-DUCT and RTS151KEY. If a Form-C relay is required, please add an SK-RELAY. (No Substitutions)

SD Protocol Devices Shall Be

- Fire alarm addressable manual pull station shall be Silent Knight Model # SD500-PSDA. (No Substitutions)
- Fire alarm addressable photoelectric smoke detector shall be Silent Knight Model # SD505-PHOTO. (No Substitutions)
- Fire alarm addressable heat detector shall be Silent Knight Model # SD505-HEAT. (No Substitutions)
- Fire alarm base for Silent Knight Model #'s SD505-PHOTO and SD505-HEAT shall be Silent Knight Model # SD505-6AB. (No Substitutions)
- CO Detector shall be System Sensor Model # CO1224T. (No Substitutions) An SD500-AIM shall be installed on each CO1224T and shall be accessible and visible from the finished floor.
- Fire alarm addressable input module shall be Silent Knight Model # SD500-AIM. (No Substitutions)
- Fire alarm addressable relay module shall be a Silent Knight Model # SD500-ARM. (No Substitutions)
- Fire alarm SLC line isolator shall be Silent Knight Model # SD500-LIM. (No Substitutions)
- Fire alarm Duct detectors and Duct Detector Remote Test Stations shall be Silent Knight Model #'s SD505-DUCTR and SD505-DTS-K. (No Substitutions) Remote test station shall be accessible and visible from the finished floor.
- Fire alarm Horn / Strobe signaling device shall be System Sensor Model # P2WL. (Model PC2WL can be substituted if mounted on non-stainable ceiling tile. No other Substitutions)
- Fire alarm Strobe signaling device shall be System Sensor Model # SWL. (Model SCWL can be substituted if mounted on non-stainable ceiling tile. No other Substitutions)
- Fire alarm strobe synch module shall be System Sensor Model # MDL3. (Not needed on version 9 panels or newer) (No Substitutions)
- Fire alarm Outdoor strobe signaling device shall be System Sensor Model # P2RK. (No Substitutions)
- Fire alarm Speaker / Strobe signaling device shall be System Sensor Model # SPSWL. (Model SPSCWL can be substituted if mounted on non-stainable ceiling tile. No other Substitutions)
- Fire alarm Speaker signaling device shall be System Sensor Model # SPWL. (No Substitutions)
- Fire alarm 50-watt Voice Evac system shall be as needed Silent Knight SKE-450 (Single Zone), SKE-450-ZN4 (4 Zone) or SKE-450-ZN6 (6 Zone). (No Substitutions)

1.01 Systems Installation

- All fire alarm junctions and/or splices shall be soldered and insulated.
- All Ceiling mounted devices shall be mounted on non-stainable ceiling tiles.
- All circuits and wiring shall be labeled at all terminating ends.
- All fire system wiring shall be RED in color and non-shielded.
- All devices shall be mounted according to the manufacture's specifications.
- All devices shall be properly adjusted and tested prior to job completion.
- All fire pulls shall be dual action.
- All Initiating Devices shall be labeled with their corresponding module and point number. Smoke detector label shall be on smoke detector and smoke detector base and be clearly visible from the finished floor.
- Each Initiating Device Circuits (IDC) shall have Line Isolator Modules installed at the SLC Head End.
- All Initiating Device Circuits (IDC) shall be wired Class B (NFPA Style B).
- All Initiating Device Circuits (IDC) shall be wired with minimum 18 AWG gauge red **NON-Shielded cable.**

- All duct detectors shall be connected to fire system and shall have remote test stations installed accessible and visible from the finished floor. They shall be labeled with their corresponding module and point number.
- All duct detector ARM / AIM shall be installed adjacent to the remote test stations and shall be accessible and visible from the finished floor. They shall be labeled with their corresponding module and point number. (ARM/AIM should not be needed when using SD505-DUCTR duct det.)
- Each CO 1224T detectors shall have an SD500 AIM installed (No doubling). All CO1224T & SD500 AIM shall be labeled with their corresponding module and point number and shall be accessible and visible from the finished floor.
- All modules shall have their corresponding module number.
- All notification devices shall be wall mounted where possible. Where wire is exposed decorative wire molding shall be installed from the ceiling to the device. If ceiling mount devices are used, they shall be mounted on a non-stainable ceiling tile.
- All notification devices shall be labeled with their corresponding module, circuit number and device number. Label shall be on the base and be clearly visible from the finished floor. EOL Device shall be labeled as such.
- All horn / strobes and strobes shall be synchronized.
- All Notification Appliance Circuits (NAC) shall be wired Class B (NFPA Style Y).
- All Notification Appliance Circuits (NAC) shall be wired with minimum 16 AWG gauge red **NON-Shielded cable.**
- Protective grommets shall be installed on all conduits to protect wire.
- All SBUS and SLC circuits shall be wired with red **NON-shielded cable.**
- All wire shall be run in J hooks above ceiling with a minimum space of 6" from ceiling deck. All wire shall be in separate pathways 6" from other system wiring. No wire ties allowed. No wire shall be run between the red iron and roof deck.
- Main control panel shall have a CAT 6 cable ran between the main control and the phone company DMARC for monitoring purposes.
- All wire ran between building shall be in conduit and shall be **Non-shielded** direct burial cable. It shall be a minimum of 4 conductor 16 AWG copper.
- Installer shall have a commercial fire technician on the job site at all times during the installation.
- Installer shall supply the electrical and/or masonry contractors with specialty back boxes such as remote annunciator recessed back boxes etc. and coordinate with them to ensure that all necessary conduits, back boxes, etc. are installed in the proper locations.
- Follow and adhere to installation practices specified by the applicable NFPA 72 standards.
- Follow and adhere to installation practices specified by NFPA-70 National Electric Code, Edition 2008.
- Follow and adhere to installation practices specified by the Manufacturers.

1.02 Products Installed but not Supplied Under This Section

- All conduit and EMT required for Fire cabling pathway in/out of closets and in/out of wall cavities at the work area. EMT or Conduit for pathways shall have no more than two 90-degree sweeps and no continuous section over 100'.
- All core holes and poke through devices in the floor for the installation of Fire cabling.
- All core holes and EMT sleeves between floors for the routing of Fire cabling.
- Back boxes for the mounting of Fire Devices.
- Drag line or pull string at the back boxes fished through EMT or conduit to the other end for installing Fire Cabling.

1.03 Quality Assurance

- 1.03.01 Qualifications**
 - Install all components as directed by Manufacturer's installation guidelines.
 - All products shall bear the mark of UL or ETL for performance level.
 - System installation shall meet all applicable Local/State codes and safety requirements where project is located.
 - All products shall be new and un-used in original packaging.
- 1.03.02 Bidder/Installer Qualifications**
 - Bidding contractor shall be a local licensed Commercial Fire Alarm Company with licensed Commercial Fire Alarm technician(s) on staff.
 - Bidding contractor shall have a minimum of one year experience installing Silent Knight Addressable fire panels.
 - Bidding contractor shall have a minimum of 5 years experience installing commercial fire alarms.
 - Bidding contractor shall be able to provide insurance at the request of the owner.
- Bidding contractor shall have a commercial fire technician on the job site at all times during the installation.

1.04 Sequencing

- Contractor shall coordinate with Owner's project manager on sequencing of various trades and construction teams for the lifecycle of the project.

1.05 Scheduling

- Contractor shall provide a detailed construction schedule with hard dates for completion of roughing in cables, terminations and testing once scheduling sequence has been determined to the Owner's Project Manager.

1.06 Warranty

- Contractor shall provide a 1-year parts and labor warranty against defective workmanship and/or system component failure. (1-year warranty shall begin at job completion)

Part 2 - Products
2.02 Source Quality Control

- Materials shall be purchased from Distributors authorized by system Manufacturers to sell new and unused components.

Part 3 -
3.01 Field Quality Control

- Contractor shall make available all ceiling and termination work for inspection by Manufacturer's representative or owner's representative.
- Contractor shall replace all defective components.

3.02 Adjusting

- No additional work outside of the contract scope of work shall be completed without the approval of the Owner or Owner's representative.

3.03 Protection

- It is the responsibility of the Contractor to ensure equipment is protected from dust and water during the project with appropriate materials.
 - Remove all protective covers and protective materials from equipment prior to turnover to Owner.
- End of Section**
- 1.04 Submittals**
- 1.04.01 Prior to installation**
- Show compete map of system design for approval by Owner.
- 1.04.02 Prior to final acceptance**
- Provide a soft CAD copy As-Built showing layout of panel, initiating devices, notification devices and all mounted equipment upon Substantial Completion.
 - Ensure all warranties specify that the Owner is entitled to all rights guaranteed by the warranty for various components.

Fire System Installation Completion Check List

- Part 1 - General**
1.01 Section Includes
- Fire System Completion Check List

1.02 Completion Check List

- A map of the entire system showing device numbers and wire routes has been left inside the main control panel and a copy has been given to Jack Phillips with MPS.
- All panel programming has been checked and is correct.
- Panel(s) has been tested for proper operation.
- All zones have been tested to verify proper description at keypad.
- All zones have been tested to verify proper reporting to the monitoring station.
- All points have been tested to verify proper description at the keypad.
- All horn/strobes and strobes have been tested for proper operation.
- All smoke detectors have been tested and dust covers removed.
- All devices have been tested for proper operation.
- All cabinets are labeled on the outside with module numbers and point numbers.
- All cabinets are labeled on the inside with module numbers by the corresponding module and point descriptions.
- The monitoring station has the correct account information such as call list, zone descriptions, etc.

End of Section

IP camera Specifications

Moore Public Schools
IP camera Specifications

IP CAMERA MANUFACTURE IS AVIGILON (NO SUBSTITUTIONS).

AVIGILON EQUIPMENT
INDOOR DOME SINGLE HEAD CAMERA REQUIRED EQUIPMENT LIST

- 4.0C-H5A-D1-IR
- ACC7-ENT LICENSE - 1 per camera
- INDOOR MULTI-HEAD 3 HEAD CAMERA REQUIRED EQUIPMENT LIST
- 9C-H4A-3MH-180 (3x3MP)
- POE-INJ2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-CEIL1
- H4AMH-DC-COVR1
- INDOOR MULTI-HEAD 4 HEAD CAMERA REQUIRED EQUIPMENT LIST
- 12C-H4A-3MH-360 (4x3MP)
- POE-INJ2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-CEIL1
- H4AMH-DC-COVR1

OUTDOOR DOME SINGLE HEAD CAMERA REQUIRED EQUIPMENT LIST

- 6.0C-H5A-DO1-IR
- ACC7-ENT LICENSE - 1 per camera
- OUTDOOR MULTI-HEAD 3 HEAD CAMERA CORNER MOUNT REQUIRED EQUIPMENT LIST
- 15C-H4A-3MH-270 (3x5MP)
- POE-INJ2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-PEND1
- H4AMH-DO-COVR1
- H4AMH-AD-IR1L1
- H4-MT-CRNR1
- OUTDOOR MULTI-HEAD 3 HEAD CAMERA WALL MOUNT REQUIRED EQUIPMENT LIST
- 15C-H4A-3MH-180 (3x5MP)
- POE-INJ2-60W-NA Power Injector
- ACC7-ENT LICENSE - 1 per camera
- H4AMH-AD-PEND1
- H4AMH-DO-COVR1
- H4AMH-AD-IR1L1

INDOOR CAMERA LOCATED IN CLASSROOMS REQUIRED EQUIPMENT LIST

- 3.0C-H6SL-D1-IR
- ACC7-ENT LICENSE - 1 per camera
- CAMERA SERVER INFORMATION, CONTRACTOR TO PROVIDE THE FOLLOWING
- 1 - Dell Server part# NVR6-PRM-FORM-D-72TB-S22
- 1 - SFP fiber connector, part# NVR6-AINVR2-FORM-D-SFPPLUS-SR

INSTALLATION

- Install cameras on adjacent walls were possible. If it must be mounted on ceiling, it shall be on a water-resistant non-stainable ceiling tile. **MPS to have final determination of camera location and field of view) (Call Jack Phillips for final location and view phone 473-5225)**
- Any cameras installed on ceiling shall be mounted on a water-resistant non-stainable ceiling tile. (BIDDING CONTRACTOR SHALL PROVIDE NON-STAINABLE TILE)
- Each installed camera needs a camera license.
- All network drops shall be connected with patch cords to a switch at each rack location.
- No Substitutions.

Horizontal Cabling Requirements

- See MPS Structured Cabling Specifications for camera network cabling installation, labelling and testing requirements.

Warranty

- Communications Contractor shall provide a 1 year parts and labor warranty against defective workmanship and/or system component failure.
- Communications Contractor shall execute a Lifetime Applications Assurance Warranty for parts and labor to support stated applications from the connectivity Manufacturer.

End of Section

Audio Visual Systems for Instructional Spaces Specifications

Part 1 - General

1.01 Instructional Spaces

- Reference technology drawings and detail sheet T504 for classroom configuration and part numbers.

1.02 Special Spaces

- Reference technology drawings and one line diagrams.

1.03 Flat Panel Displays

- All non interactive Flat Panel displays shall be 43" Samsung BE Series.
- Bio Lab 37 displays shall be ceiling mounted.
- Career Tech 12 and Career Tech 15 displays shall be wall mounted 55" AFF to center of display.

End of Section



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KFC ENGINEERING

STRUCTURAL

SALAS O'BRIEN

MECHANICAL / ELECTRICAL

NY

drawn by

NY

checked by

OCTOBER 2024

date

revisions

12/12/2024 AD 03



CHILD CARE FACILITY
 201 N. EASTERN AVE.

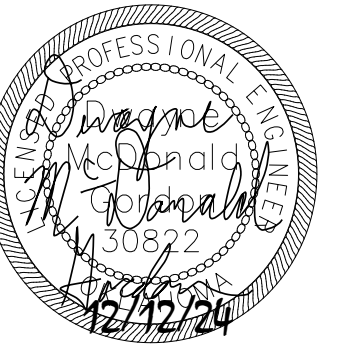
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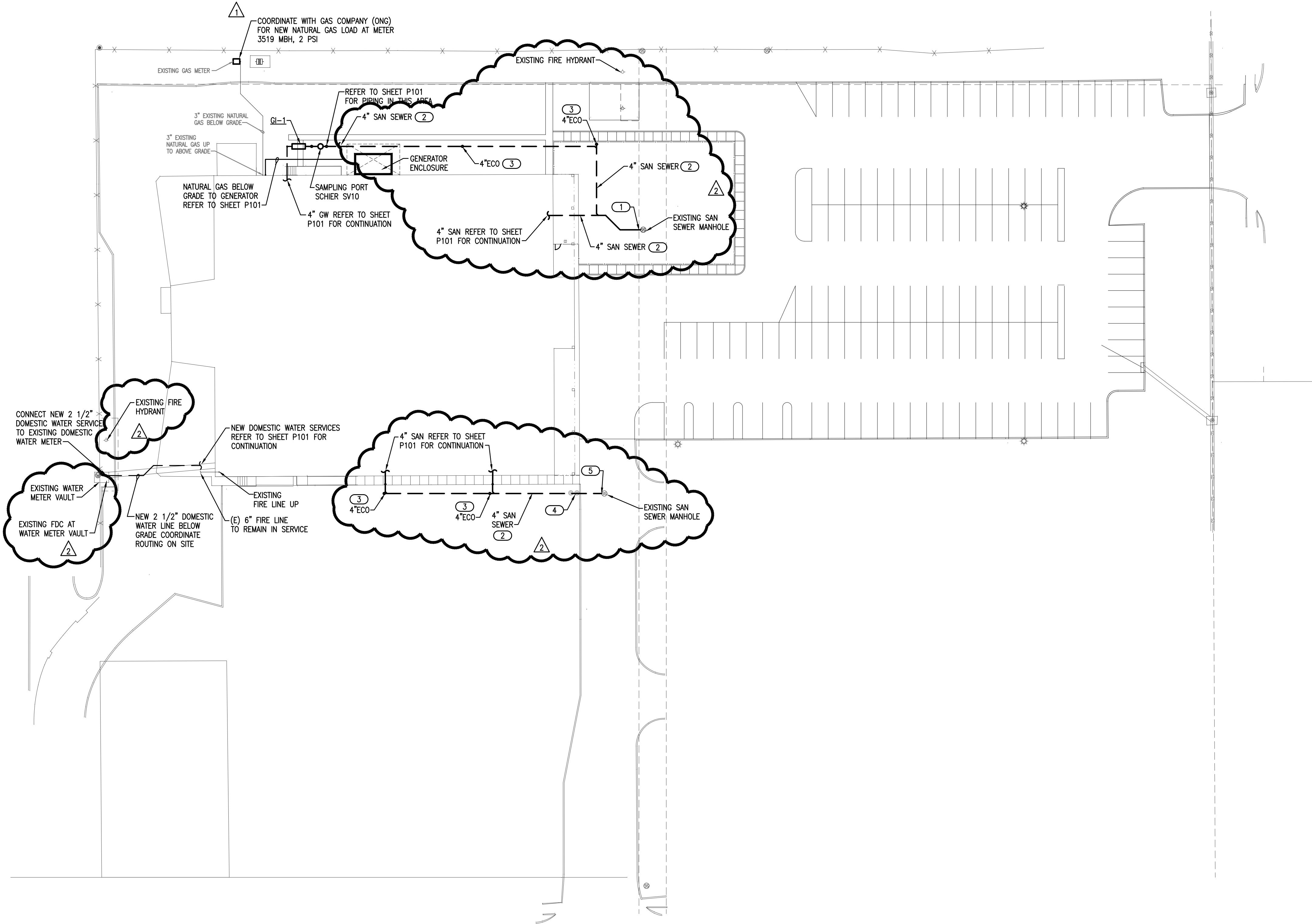
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Salas O'Brien
 2900 S. Telephone Road, Suite 120
 Moore, OK 73160
 Salas O'Brien Registration: CA# 7058
 Expiration Date: 6/30/2025
 Salas O'Brien Project Number: 2450-70304-00



- ### GENERAL NOTES
- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
 - FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
 - PRIOR TO COMMENCING WORK, COORDINATE WITH SITE CONTRACTOR FOR SANITARY SEWER AND WATER INVERT ELEVATIONS.
 - COORDINATE ALL BELOW GRADE NATURAL GAS PIPE ROUTING WITH EXISTING SITE CONDITIONS.

- ### KEYED NOTES
- SITE CONTRACTOR TO FIELD VERIFY AND CONNECT NEW 4" SANITARY SEWER TO EXISTING MANHOLE. APPROXIMATE INVERT ELEVATION OF 7.67 FEET.
 - PLUMBING CONTRACTOR TO COORDINATE WITH SITE CONTRACTOR FOR INSTALLING NEW BELOW GRADE SANITARY SEWER PIPING.
 - PLUMBING CONTRACTOR TO COORDINATE WITH SITE CONTRACTOR FOR INSTALLING NEW EXTERIOR SEWER CLEANOUT.
 - COORDINATE WITH SITE CONTRACTOR FOR REMOVAL OF EXISTING GREASE WASTE PIPING, GREASE INTERCEPTOR, CLEANOUTS AND SEWER PIPING TO MANHOLE.
 - SITE CONTRACTOR TO FIELD VERIFY AND CONNECT NEW 4" SANITARY SEWER TO EXISTING MANHOLE. APPROXIMATE INVERT ELEVATION OF 7.69 FEET.



KS	drawn by
KP	checked by
OCTOBER 2024	date
revisions	
11/22/2024 AD 02	
12/12/2024 AD 03	



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

P001

1 PLUMBING SITE PLAN

SCALE: 1/32" = 1'-0"



Salas O'Brien
2900 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
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- KEYED NOTES**
- 36 INSTALL 100 POUND PROPANE TANK WITH SUPPORT STRAP FASTENED TO WALL. INSTALL 2-STAGE PRESSURE REGULATOR WITH VENT PIPED TO ROOF WITH GOOSENECK. ROUTE 1" PROPANE GAS LINE WITH FLEXIBLE CONNECTION TO GENERATOR. (355 MBH, 10" W.C. PRESSURE). COORDINATE CONNECTION WITH GENERATOR SUPPLIER ON SITE. PRESSURE REGULATOR LOCATED 10'-0" FROM GENERATOR CONNECTION.
 - 37 DUAL FUEL GENERATOR WITH AUTOMATIC SWITCH OVER TO PROPANE WHEN UNIT SENSES LOSS OF NATURAL GAS PRESSURE IN FUEL INLET 1.
 - 38 INSTALL 2" OPEN SITE DRAIN IN CHASE FOR CONDENSATE DRAIN LINES FROM RTU'S. CONNECT TO SANITARY SERVING LAVATORY. COORDINATE ROUTING WITH MC. COORDINATE WALL ACCESS PANEL WITH GC.
 - 39 INSTALL 1 1/2" OPEN SITE DRAIN IN SINK CABINET FOR CONDENSATE DRAIN LINES FROM RTU'S. CONNECT TO SANITARY SERVING SINK. COORDINATE ROUTING WITH MC.

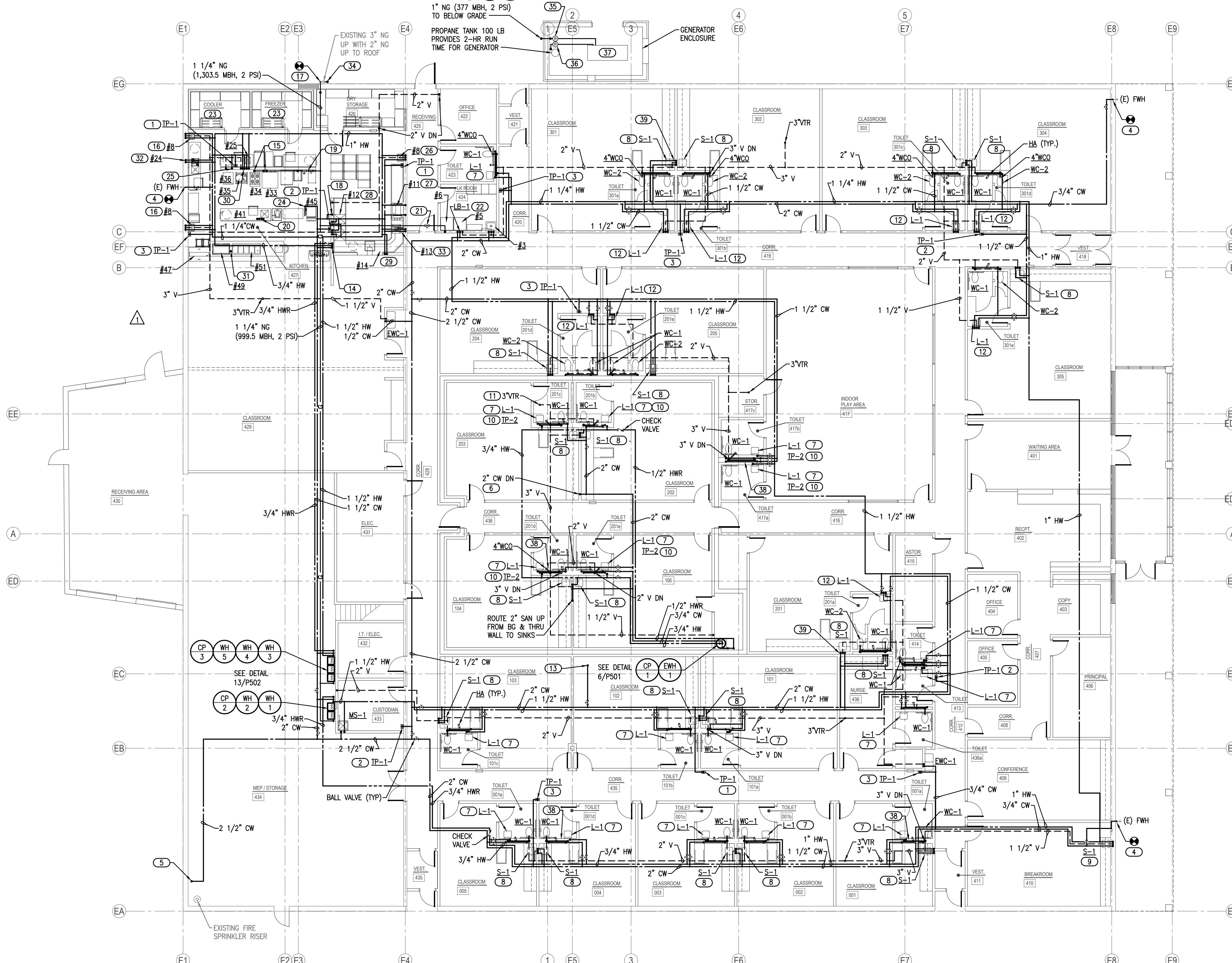
- KEYED NOTES**
- 32 ROUTE 1/2" CW AND 1/2" HW DOWN IN FUR OUT OF EXISTING CMU WALL TO SERVE PREP SINK #24 PROVIDED BY FSC. COORDINATE PIPE ROUTING WITH GC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 33 3/4" CW AND 3/4" HW DROPS IN WALL TO SERVE FAUCET AND HOSE REEL #13 PROVIDED BY FSC. ROUTE DRAIN LINE TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 34 CONNECT NEW 1" NATURAL GAS LINE (2 PSI) WITH LOCKABLE SHUT-OFF VALVE TO EXISTING 3" NATURAL GAS RISER AND ROUTE DOWN TO BELOW GRADE TO SERVE GENERATOR.
 - 35 INSTALL 1" NATURAL GAS (2 PSI) BALL VALVE, DRIP LEG, PRESSURE REGULATOR, UNION AND FINAL 1" CONNECTION (10" W.C. PRESSURE) WITH FLEXIBLE CONNECTION TO GENERATOR. COORDINATE CONNECTION WITH GENERATOR SUPPLIER ON SITE. PRESSURE REGULATOR LOCATED 10'-0" FROM GENERATOR CONNECTION.

- KEYED NOTES**
- 28 3/4" CW AND 3/4" HW DROPS IN WALL TO SERVE 2 FAUCETS AT #12 3-COMPARTMENT SINK PROVIDED BY FSC. ROUTE DRAIN LINES TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. SEE DETAIL 15/P502.
 - 29 ROUTE 3/4" CW AND 3/4" HW DOWN IN WALL TO BELOW COUNTERTOP. STUB OUT, INSTALL BALL VALVES AND CONNECT TO WATER TROUGH MIXING VALVE FURNISHED BY FSC. SEE FSC SHEET FS301.
 - 30 1/2" CW AND 1/2" HW DOWN IN WALL TO SERVE KETTLE #35 FAUCET PROVIDED BY FSC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 31 CONNECT 1/2" HW TO FAUCET AT SERVING COUNTER FOOD WELL. ROUTE 1/2" HW LINE DOWN WITH TRANSITION TO PEX TUBING TO BELOW FLOOR. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTIONS.

- KEYED NOTES**
- 24 ROUTE 1/2" CW DOWN TO WATER FILTER AND CONNECT TO ICE MAKER #45. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. ICE MAKER PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR DRAIN.
 - 25 INSTALL 3/4" CW DROP IN WALL TO SERVE CONVENTION STEAMER PROVIDED BY KEC. ROUTE DRAIN LINE TO FLOOR SINK WITH AIR GAP. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 26 ROUTE 1/2" CW, 1/2" HW AND 2" VENT DOWN IN WALL TO SERVE HAND SINK PROVIDED BY KEC. PROVIDE THERMOSTATIC MIXING VALVE TMV-1 AND PIPE WRAP UNDER FIXTURE. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - 27 1/2" CW AND 3/4" HW DROPS IN WALL TO SERVE DISHWASHER #11 PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION. PROVIDE WATER ARRESTORS, PRVs AND BALL VALVES ON WATER LINES IN ACCESSIBLE LOCATION. ROUTE DRAIN LINE TO FLOOR SINK.

- GENERAL NOTES**
- COORDINATE WORK WITH ALL OTHER TRADES ON SITE.
 - PROVIDE WATER HAMMER ARRESTORS (HA) ON WATER LINES TO FLUSH VALVES, AND QUICK CLOSING VALVES. LOCATE UNITS IN ACCESSIBLE LOCATIONS.
 - SINK AND LAVATORY WATER SUPPLY STUB OUTS SHALL BE COPPER PIPE WITH SUPPORT BRACKET FASTENED IN WALL CAVITY.
 - FIRE SEAL ALL PENETRATIONS THRU RATED STRUCTURES TO MAINTAIN FIRE RATING.
 - REFER TO PLUMBING FIXTURE SCHEDULE ON SHEET P601 FOR FIXTURE ROUGH-IN PIPE SIZES. REFER TO ISOMETRIC SHEETS P301 AND P302 FOR ADDITIONAL PIPE SIZES.
 - PROVIDE ACCESS PANELS FOR ALL VALVES/DEVICES ABOVE HARD CEILINGS AND BEHIND WALLS.
 - ALL GAS PIPE SHALL COMPLY WITH IFCC. BRANCH LINES SHALL TAP OFF TOP OF GAS MAINS AND INSTALL SHUT-OFF VALVE ON BRANCH LINE.
 - TRAP PRIMER LINES SHALL BE COPPER TYPE "K" OR PEX-a TUBING WITH CONTINUOUS SLOPE TOWARDS DRAIN CONNECTION.
 - FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.

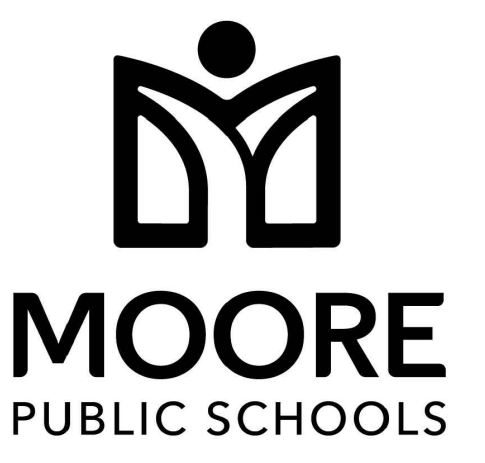
- KEYED NOTES**
- INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (4) 1/2" DISCHARGE LINES TO FLOOR DRAINS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (3) 1/2" DISCHARGE LINES TO FLOOR DRAINS OR FLOOR SINKS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - INSTALL ELECTRIC TRAP PRIMER ASSEMBLY (TP-1) ABOVE LAY-IN CEILING IN ACCESSIBLE LOCATION. ROUTE (2) 1/2" DISCHARGE LINES TO FLOOR DRAINS IN THIS AREA. COORDINATE POWER WITH EC. SEE DETAIL 1/P501.
 - FIELD VERIFY LOCATION OF EXISTING WALL HYDRANT AND CONNECT NEW 3/4" CW TO EXISTING PIPE SERVING WALL HYDRANT.
 - ROUTE INSULATED 2 1/2" CW PIPE DOWN WITH BALL VALVE AT 24" AFF. AND CONNECT TO NEW WATER SERVICE.
 - ROUTE 2" CW PIPE DOWN TO BELOW FLOOR. INSTALL ACCESS PANEL IN BACK OF CABINET FOR BALL VALVE. SEE SHEET P101 FOR CONTINUATION.
 - ROUTE 1/2" CW, 1/2" HW AND 1 1/2" VENT IN CHASE TO SERVE LAVATORY. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE SINK. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN INTO FUR OUT OF EXISTING CMU WALL TO SERVE SINK. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501. COORDINATE PIPE ROUTING WITH ARCHITECT AND GC.
 - INSTALL TRAP PRIMER (TP-2) UNDER LAVATORY. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SEE DETAIL 11/P501.
 - COORDINATE WITH STRUCTURAL FOR DEBRIS GUARD BELOW SHELTER ROOF FOR PLUMBING VENT ROOF PENETRATION.
 - 1/2" CW, 1/2" HW AND 1 1/2" VENT DOWN IN WALL TO SERVE LAVATORY. INSTALL THERMOSTATIC MIXING VALVE (TMV-1) BELOW FIXTURE. SEE DETAIL 5/P501.
 - 3/4" CW UP TO ROOF HYDRANT. SEE SHEET P201 FOR CONTINUATION.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR DOWN IN WALL WITH PEX TUBING TO BELOW FLOOR TO SERVE ISLAND PREP SINK.
 - ROUTE 1" NG (LOW PRESS) BEHIND EQUIPMENT AND PROVIDE 3/4" GAS TO KITCHEN EQUIPMENT (33 & 34) PROVIDED BY KEC. PROVIDE SHUT-OFF VALVE AND FINAL UNIT CONNECTION. SEE DETAIL 9/P501.
 - ROUTE 1/2" CW, 1/2" HW AND 2" VENT IN FUR OUT OF EXISTING CMU WALL TO SERVE HAND SINK (#8) PROVIDED BY KEC. PROVIDE THERMOSTATIC MIXING VALVE TMV-1 AND PIPE WRAP UNDER FIXTURE. COORDINATE PIPE ROUTING WITH GC.
 - CONNECT NEW 1 1/4" NATURAL GAS LINE (2 PSI) TO EXISTING 3" NATURAL GAS RISER AND ROUTE NEW LINE INTO BUILDING.
 - ROUTE 3/4" CW DOWN IN WALL WITH TRANSITION TO PEX TUBING TO BELOW FLOOR TO SERVE ICE MAKER PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - INSTALL 3/4" NATURAL GAS (2 PSI) BALL VALVE AND PRESSURE REGULATOR (KITCHEN EQUIP). INSTALL GAS SOLENOID VALVE FURNISHED BY KITCHEN EQUIPMENT SUPPLIER AND COORDINATE POWER WITH EC TO INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION SYSTEM. ROUTE 1" NG (LOW PRESS) TO KITCHEN EQUIPMENT.
 - ROUTE 1/2" CW, 3/4" HW AND 3/4" HWR UP FROM BELOW FLOOR, TRANSITION TO COPPER PIPE AND CONNECT TO COOK'S TABLE SINK PROVIDED BY KEC. ROUGH-IN AND PROVIDE FINAL UNIT CONNECTION.
 - INSTALL 1/2" BALL VALVE AND PRESSURE REGULATOR IN NATURAL GAS LINE SUPPLYING DRYER #6. PROVIDE 1/2" LOW PRESSURE GAS DOWN IN WALL TO GAS VALVE BOX (GVB-1) AND FLEXIBLE CONNECTION TO UNIT.
 - CLOTHES WASHER FURNISHED BY OTHERS. ROUGH-IN AND MAKE FINAL CONNECTION. PROVIDE 1/2" CW AND 1/2" HW LINES DOWN IN WALL TO LAUNDRY BOX. CONNECT FLEXIBLE SUPPLY LINES TO WASHER. ROUTE WASHER DRAIN LINE INTO WALL BOX DRAIN FITTING AND SECURE. COORDINATE WITH EQUIPMENT SUPPLIER.
 - COORDINATE WITH FOOD SERVICE CONTRACTOR FOR ROUTING CONDENSATE DRAIN LINES TO FLOOR DRAIN FROM FREEZER OR COOLER. SEE SHEET FS301.



1 PLUMBING PLAN - ABOVE GRADE
SCALE: 3/32" = 1'-0"



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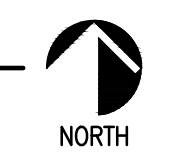
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P110

Salas O'Brien
2800 S. Telephone Road, Suite 120
Moore, OK 73160
Salas O'Brien Registration: CA# 7058
Expiration Date: 6/30/2025
Salas O'Brien Project Number: 2450-70304-00

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LIGHT FIXTURE SCHEDULE				
TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	REFERENCE CATALOG #
A1		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A1E		2X4 LED FLAT PANEL. 26W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A2E		2X4 LED FLAT PANEL. 36W, 5000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A3E		2X4 LED FLAT PANEL. 45W, 6000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CPX 2X4 AL08 80CRI SSW7 SWL MVOLT
A4		2X2 LED FLAT PANEL. 35W, 4000 LUMENS, 3500K CCT. 0-10V DIMMING.	LITHONIA	CPX 2X2 AL07 80CRI SSW7 SWL MVOLT
C		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING.	LITHONIA	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT UG2
CE		6" LED RECESSED LED DOWNLIGHT. 13W, 1000 LUMEN, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITON	LBR6 NCH AL02 SSW1 AR LSS WD MVOLT US2
EX		LED EXIT SIGN, STAINLESS STEEL FACE WITH RED LETTERS, UNIVERSAL FACE AND MOUNTING, PROVIDE WITH UL924 DEVICE.	LIFE SAFETY LIGHTING	LSXDC 3 R A A EM SDT
L		2" X 4" LED EXTERIOR FIXTURE 1028 LUMENS/FT, 4000K CCT. SURFACE MOUNT	A-LIGHT	LIN 3 SP M4 LH 40 U HE F X D
LE		2" X 4" LED EXTERIOR FIXTURE 1028 LUMENS/FT, 4000K CCT. SURFACE MOUNT PROVIDE WITH UL924 DEVICE.	A-LIGHT	LIN 3 SP M4 LH 40 U HE F X D EC
P2		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING.	DELRAY	UCDC6 W35 SR D
P2E		6" CIRCULAR LED PENDANT. 156W, 13,000 LUMENS, 3500K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	DELRAY	UCDC6 W35 SR D
R1		SINGLE HEAD PARKING LOT FIXTURE, 7-PIN RECEPTACLE CONTROL 187W, 25,000 LUMENS, 4000K CCT.	LITHONIA	RSX2-LED-P4-40K-R3-208V-RPA-PER7-DDBXD-DLL127F 1.5JU
R2		DOUBLE HEAD PARKING LOT FIXTURE, 7-PIN RECEPTACLE CONTROL (2) 187W, 25,000 LUMENS, 4000K CCT.	LITHONIA	RSX2-LED-P4-40K-R3-208V-RPA-PER7-DDBXD-DLL127F 1.5JU
R2-P		PARKING LOT POLE	LITHONIA	RTS-25'-7'-0F-DM28AS-DDBXD
S		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
SE		4" LED LENSED STRIP FIXTURE. 35W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSS L48 AL03 MVOLT SSW3 80CRI
T		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
TE		4" LED VAPOR TIGHT STRIP FIXTURE. 42W, 5000 LUMENS, 4000K CCT. 0-10V DIMMING. PROVIDE WITH UL924 DEVICE.	LITHONIA	CSVT L48 AL03 MVOLT SSW3 80CRI
V		2" LED VANITY FIXTURE. 9W, 300 LUMENS/FT DIRECT AND INDIRECT, 3500K CCT. 0-10V DIMMING.	MARK LIGHTING	S2WID LLP 2FT MSL2 80CRI 35K 300LMF 180 135K 1300LMF AS SCT MIN10 FL MVOLT WHTT ZT
W1E		2400 LUMEN, 4000K CT, LED WALL PACK PROVIDE WITH UL924 DEVICE.	LITHONIA	WPX1 LED P2 40K MVOLT DBLXD

GENERAL NOTES:
EQUIVALENT ALTERNATE LIGHT FIXTURES MAY BE PROVIDED FOR BIDDING PURPOSES. THE ENGINEER DOES NOT TAKE RESPONSIBILITY FOR ENSURING ALTERNATE LIGHT FIXTURES USED FOR BIDDING ARE EQUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALTERNATE FIXTURES ARE EQUIVALENT TO THOSE SPECIFIED PRIOR TO BID. THE WINNING BID PACKAGE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH THE SPECIFICATIONS.

ELECTRICAL ABBREVIATIONS			
AC	ABOVE COUNTERTOP	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCA	MINIMUM CIRCUIT AMPS
AFG	ABOVE FINISH GRADE	MCB	MAIN CIRCUIT BREAKER
ANNC	ANNUNCIATOR	MDP	MAIN DISTRIBUTION PANEL
CC	CONTROLS CONTRACTOR	MLO	MAIN LUG ONLY
DF	DRINKING FOUNTAIN	MTD	MOUNTED
EC	ELECTRICAL CONTRACTOR	NIC	NOT IN CONTRACT
EF	EXHAUST FAN	OCC	OCCUPANCY
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH	PC	PLUMBING CONTRACTOR
EX	EXISTING	PNL	PANEL
EXR	EXISTING RELOCATED	SPST	SINGLE POLE SINGLE THROW
GC	GENERAL CONTRACTOR	TIB	TELEPHONE TERMINAL BOARD
GFI	GROUND FAULT INTERRUPT	TYP	TYPICAL
HP	HORSEPOWER	WG	WIRE GUARD
IBC	INTERNATIONAL BUILDING CODE	WP	WEATHER PROOF
IG	ISOLATED GROUND	20A	20 AMP
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, AND GROUND	Ø	PHASE
LV	LOW VOLTAGE	3W	3 WIRE
LVPR	LV RELAY PANEL	1P20A	SINGLE POLE 20 AMP

SWITCH LEGEND	
SYMBOL	DESCRIPTION
\$	20A, SPST SWITCH
\$ _o	20A, LETTER INDICATES GROUP
\$ ₃	20A, 3-WAY
\$ ₄	20A, 4-WAY
\$ _D	DIMMER SWITCH
\$ _K	KEY OPERATED SWITCH
\$ _{OC}	OCCUPANCY SENSOR SWITCH

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

RECEPTACLE SCHEDULE	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE
	20A, 120V, 2P, 3W GROUNDING DUPLEX RECEPTACLE
	RECEPTACLE MTD. 6" ABOVE COUNTER OR HGT SHOWN
	GFCI RECEPTACLE
	GFCI RECEPTACLE, MTD. 6" ABOVE COUNTER OR HGT SHOWN
	20A, 120V, 2P, 3W GROUNDING DUPLEX GFCI RECEPTACLE - WEATHER PROOF (IN USE COVER)
	JUNCTION BOX, AS NOTED
	QUADPLEX RECEPTACLE

GENERAL NOTE:
SEE SPECIFICATIONS FOR MANUFACTURERS

GENERAL ELECTRICAL NOTES	
1.	CONTRACTOR TO VERIFY EXISTING ELECTRICAL CONDITIONS AND NOTIFY ARCHITECT/ENGINEER OF ANY ELECTRICAL OR CODE ISSUES PRIOR TO BID. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE AND OPERATIONAL CODE COMPLIANT SYSTEM.
2.	ALL WORK SHALL BE IN CONFORMANCE WITH NATIONAL, STATE, AND LOCAL CODES AND/OR ORDINANCES.
3.	ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER CONTRACTORS & LOCAL UTILITY. E.G. SHALL CONTACT LOCAL UTILITY FOR EXACT SERVICE REQUIREMENTS TO INCLUDE BUT NOT LIMITED TO TRANSFORMER, METERING AND CABLING. LOCAL UTILITY REQUIREMENTS SUPERSEDE DRAWINGS AND SPECIFICATIONS.
4.	SEE ARCHITECTURAL, MECHANICAL, & PLUMBING DRAWINGS FOR ADDITIONAL REQUIREMENTS.
5.	ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. THEY ARE INTENDED TO GIVE APPROXIMATE LOCATIONS AND OVERALL DESIGN INTENT. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCTS, MATERIALS, AND ELECTRICAL METHODS WHICH HAVE NOT BEEN SHOWN OR INDICATED BUT ARE REQUIRED FOR A COMPLETE SYSTEM TO THE STANDARDS OF THE INDUSTRY.
6.	INSTALL LIGHTING FIXTURES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE SUPPORTING DEVICES FOR ADEQUATE SUPPORT OF FIXTURES FROM STRUCTURE.
7.	UPON COMPLETION OF THE ELECTRICAL WORK, THE INSTALLATION SHALL BE TESTED FOR CONTINUITY, GROUNDS, AND SHORT CIRCUITS. THE ELECTRICAL CONTRACTOR SHALL DEMONSTRATE PROPER PERFORMANCE OF ALL SYSTEMS. ALL DEFECTIVE WORK OR MATERIALS SHALL BE REPLACED OR REPAIRED AS NECESSARY AND RETESTED.
8.	ELECTRICAL RACEWAYS THAT PENETRATE FIRE RATED ASSEMBLIES SHALL BE SLEEVED AND SEALED AS PER THE LOCAL BUILDING CODE.
9.	THE ELECTRICAL CONTRACTOR SHALL PROVIDE A TEMPORARY ELECTRICAL SYSTEM FOR THE PROJECT. AT LEAST ONE 120 VOLT SINGLE PHASE RECEPTACLE SHALL BE PROVIDED FOR EACH 500 SQUARE FEET OF FLOOR SPACE. SUFFICIENT TEMPORARY LIGHTING SHALL BE PROVIDED TO ALLOW ALL CONTRACTORS TO COMPLETE THEIR WORK. TEMPORARY ELECTRICAL CIRCUITS SHALL BE EQUIPPED WITH COMBINATION GROUND FAULT INTERRUPTER AND CIRCUIT BREAKER PER NEC. TEMPORARY ELECTRICAL SYSTEM SHALL BE INCLUDED IN THIS BID. USAGE CHARGES SHALL BE PAID FOR BY THE GENERAL CONTRACTOR.

ELECTRICAL LEGEND	
	PANEL BOARD
	DISTRIBUTION PANEL BOARD
	TRANSFORMER
	UTILITY METER
	SEPARATE CIRCUIT BREAKER
	DISCONNECT
	FUSED DISCONNECT SWITCH
	EMERGENCY FUSED DISCONNECT SWITCH
	MOTOR STARTER/CONTRACTOR
	COMBINATION MOTOR STARTER
	PUSH BUTTON STATION AS NOTED
	PULL BOX, SIZE AS REQUIRED BY CODE
	ELECTRICAL CONNECTION
	MOTOR CONNECTION
	HOME RUN TO PANEL BOARD

ELECTRICAL SHEET INDEX	
E000	ELECTRICAL TITLE SHEET
E100	ELECTRICAL SITE PLAN
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL POWER PLAN
E202	ELECTRICAL ROOF PLAN
E203	ELECTRICAL KITCHEN PLAN
E401	ELECTRICAL ONE-LINE DIAGRAM
ES01	ELECTRICAL DETAILS SHEET
ES02	ELECTRICAL DETAILS SHEET
E601	ELECTRICAL SCHEDULES
E602	ELECTRICAL SCHEDULES

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KFC ENGINEERING

STRUCTURAL

SALAS O'BRIEN

MECHANICAL / ELECTRICAL



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MOORE
PUBLIC SCHOOLS

CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

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Moore, OK 73160
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CHILD CARE FACILITY
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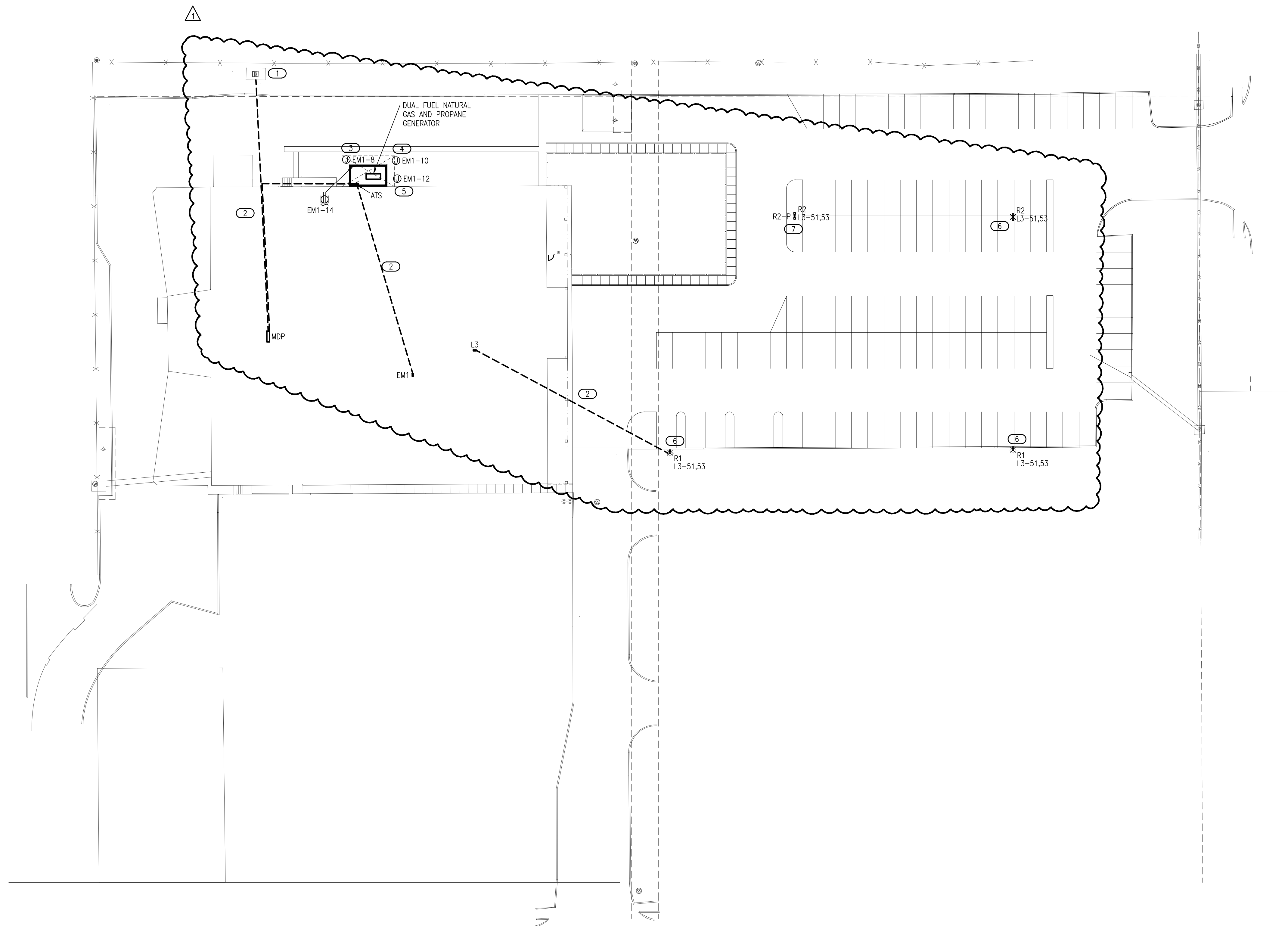
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SITE GENERAL NOTES

- COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT.
- PROVIDE (2) ELECTRONIC TIMERS WITH INTEGRAL ASTRONOMICAL TIMECLOCK AND PHOTOCELL INPUT. LOCATE PHOTOCELL WITH CLEAR VIEW OF NORTHERN SKY AND SHIELD FROM ARTIFICIAL LIGHT SOURCES. ONE TIMER SHALL CONTROL EXTERIOR WALL PACKS AND THE OTHER SHALL CONTROL THE PARKING LOT.
- THESE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC ONLY. CONSULT WITH GENERAL CONTRACTOR FOR DETAILS ON BIDDING; PROVIDE ALL PARTS AND LABOR FOR A COMPLETE AND CODE COMPLIANT FACILITY.
- ELECTRICAL CONTRACTOR TO SHOW ACTUAL ROUTING OF ALL BELOW-GRADE CONDUITS AND WIRING ON AS-BUILT DRAWINGS. ROUTES SHOWN ARE GENERAL IN NATURE AND ACTUAL ROUTE SHALL BE DETERMINED BY GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR ONSITE.
- PROVIDE GROUNDING AND BONDING AT EACH BUILDING IN ACCORDANCE WITH NEC 250.32.
- REFER TO SHEET "T-XXX" FOR ADDITIONAL CONDUIT LAYOUT INFORMATION.

KEYED NOTES

- EXISTING 208/120V 3P UTILITY TRANSFORMER.
- PROPOSED CONDUIT ROUTE. SAW CUT CONCRETE AS NECESSARY TO ENSURE CONDUIT IS ROUTED UNDER THE EXISTING CONCRETE FOUNDATION.
- PROVIDE 120V GENERATOR BLOCK HEATER CONNECTION.
- PROVIDE 120V GENERATOR BATTERY HEATER CONNECTION.
- PROVIDE 120V GENERATOR BATTERY CHARGER CONNECTION.
- MOUNT FIXTURE ON EXISTING POLE 28'-0" AFF TO BOTTOM OF LIGHT FIXTURE.
- INSTALL NEW LIGHT FIXTURE POLE AND POLE BASE. MOUNT FIXTURE 28'-0" AFF TO BOTTOM OF LIGHT FIXTURE.

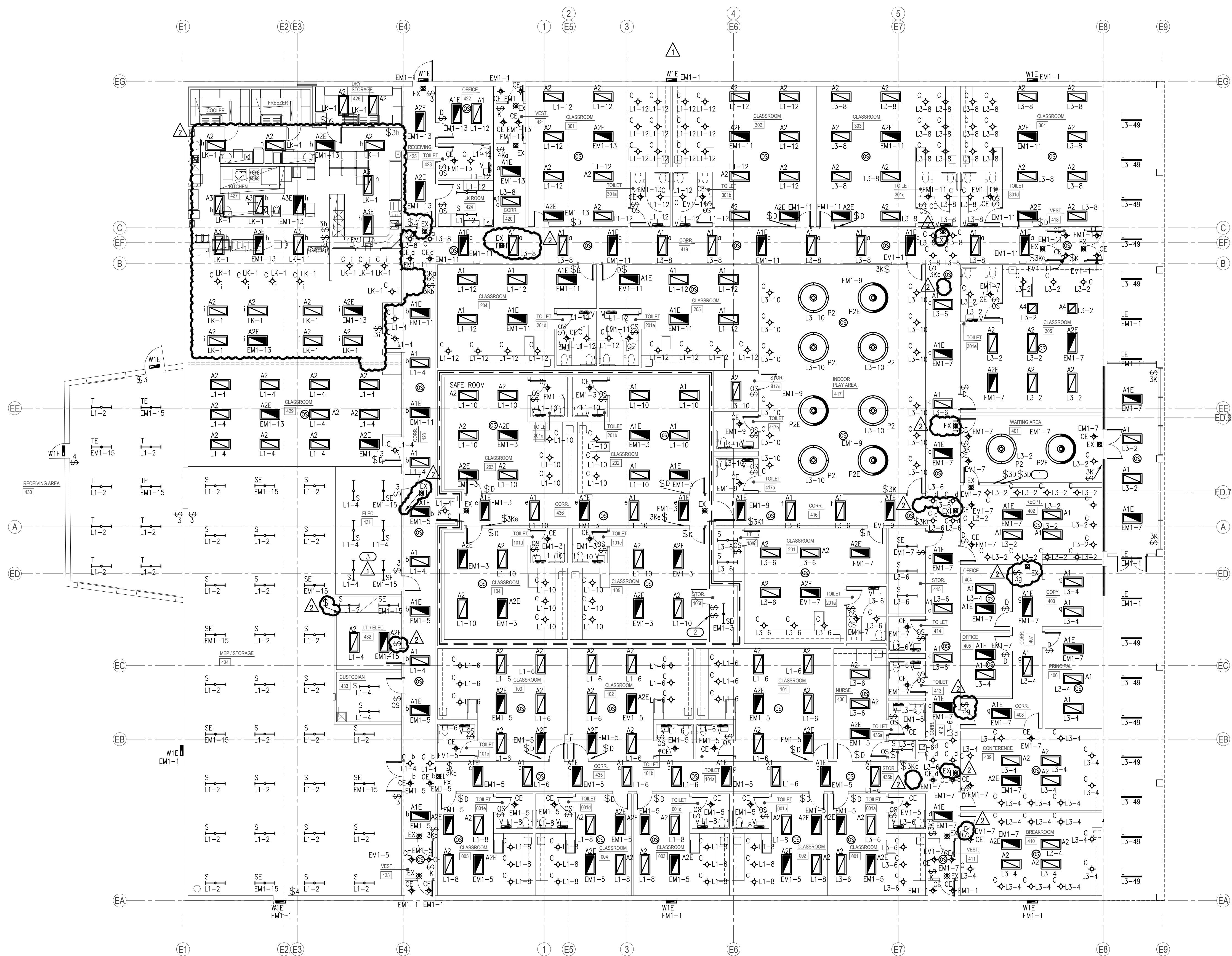


1 ELECTRICAL SITE PLAN

SCALE: 1/32" = 1'-0"



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GENERAL NOTES

- OCCUPANCY SENSOR LOCATIONS SHOWN ARE FOR DESIGN INTENT ONLY. LOCATE OCCUPANCY SENSORS PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- CONNECT BATTERY PACKS TO UNSWITCHED HOT OF LOCAL LIGHTING CIRCUIT.
- COORDINATE WITH ALL ASSOCIATED TRADES FOR THE EXACT LOCATIONS OF LIGHT FIXTURES WITH HVAC EQUIPMENT AND OTHER DEVICES/EQUIPMENT.
- COORDINATE WITH THE ARCHITECT, OWNER, AND ASSOCIATED TRADES FOR THE EXACT HEIGHT/LOCATION OF EXTERIOR MOUNTED LIGHTING FIXTURES PRIOR TO ROUGH-IN.
- LABEL SWITCH PLATES AND J-BOXES WITH CIRCUIT PER SPECS.
- COORDINATE LIGHT SWITCHES WITH THERMOSTATS AND OTHER WALL MOUNT DEVICES.



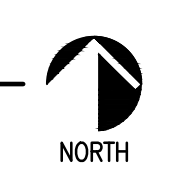
SAFEROOM GENERAL NOTES

- PER ICC 500-2014, 309.1:
- PENETRATIONS THROUGH THE STORM SHELTER ENVELOPE THAT ARE LARGER THAN:
- 3.5" SQUARE INCHES IN AREA FOR RECTANGULAR OPENINGS, OR
 - 2 1/16" IN DIAMETER
- SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- LIGHT SWITCH FOR 'WAITING AREA 401' LIGHT FIXTURES.
- SUPPLY VENTILATION FAN SWITCH. COORDINATE WITH MECHANICAL CONTRACTOR.
- DUPLICATE LIGHT FIXTURE PLACEMENT IN MEZZANINE AREA ABOVE. INSTALL LIGHT SWITCH IN MEZZANINE NEXT TO ENTRY WAY.

1 ELECTRICAL LIGHTING PLAN
SCALE: 3/32" = 1'-0"



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GENERAL NOTES

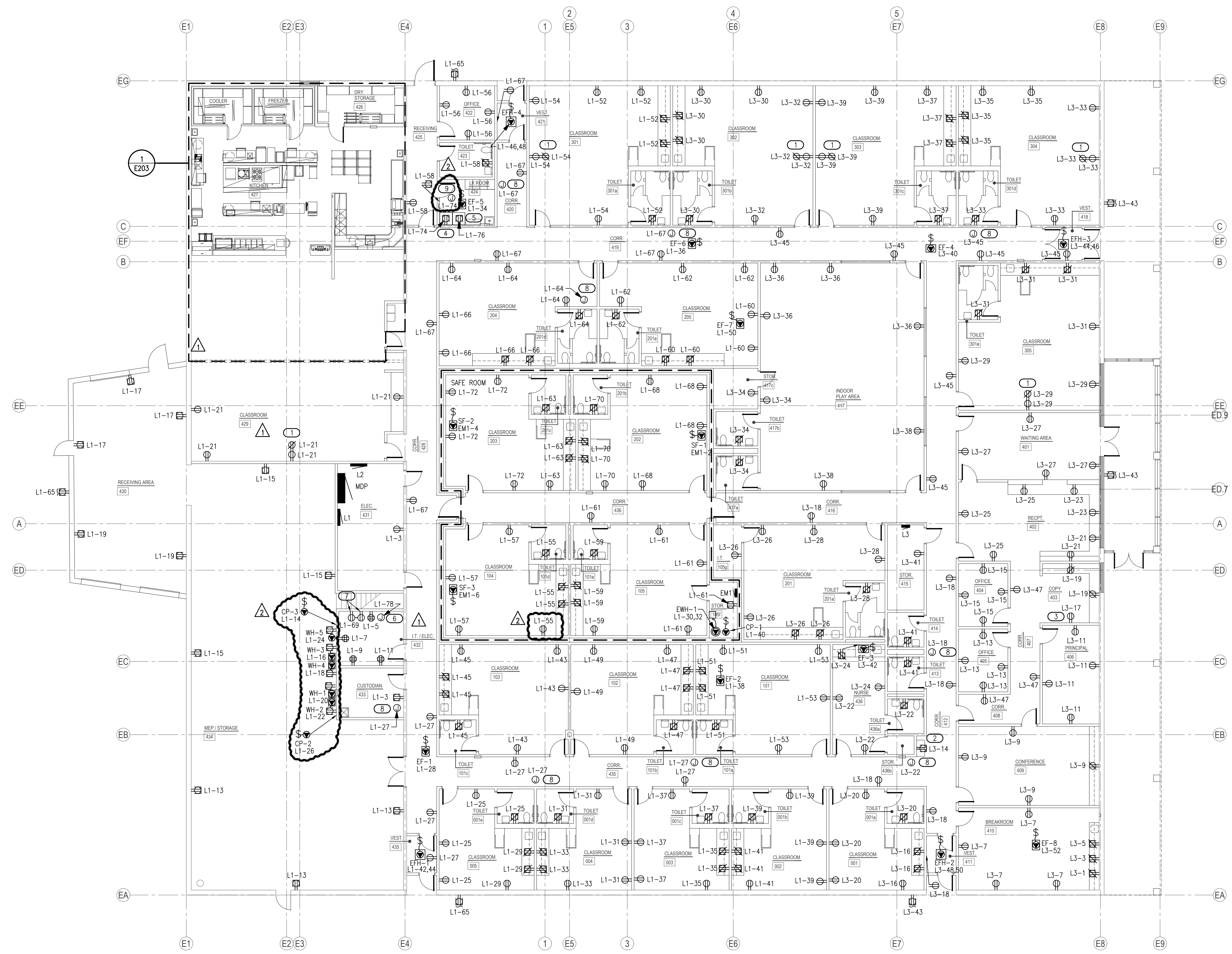
- COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT. COORDINATE EXACT LOCATION OF CEILING MOUNTED DEVICES WITH LIGHTS, HVAC EQUIPMENT, AND OTHER DEVICES.
- COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER CONTROL DEVICES.
- COORDINATE EXACT LOCATION OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR. REFER TO MECHANICAL PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- COORDINATE EXACT LOCATION OF PLUMBING EQUIPMENT WITH PLUMBING CONTRACTOR. REFER TO PLUMBING PLANS AND MANUFACTURER FOR ADDITIONAL INFORMATION.
- ALL RECEPTACLES LOCATED AT COUNTERTOP HEIGHT SHALL BE ORIENTED HORIZONTALLY.
- FIRE STOP ALL PENETRATIONS IN FIRE AND SMOKE RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND ADDITIONAL INFORMATION

SAFEROOM GENERAL NOTES

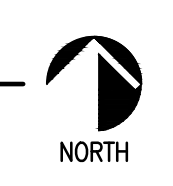
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SHALL BE CONSIDERED AN OPENING AND SHALL BE PROVIDED WITH AN OPENING PROTECTIVE DEVICE (SHROUD). REFERENCE STRUCTURAL DRAWINGS FOR A SAMPLE SHROUD DETAIL. THIS INCLUDES PENETRATIONS FOR BUNDLES OF CONDUIT.

KEYED NOTES

- PROVIDE 120V CONNECTION FOR SMARTBOARD. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN. REFER TO DETAIL '1/ES02' FOR ADDITIONAL INFORMATION.
- PROVIDE 120V WATER COOLER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V COPY MACHINE DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER, AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH-IN.
- PROVIDE 120V GAS DRYER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V WASHER DEDICATED CONNECTION. COORDINATE WITH THE ARCHITECT, OWNER AND MANUFACTURER FOR THE EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO ROUGH IN.
- PROVIDE 120V FIRE ALARM CONTROL PANEL. DEDICATED CONNECTION. COORDINATE RECEPTACLE TYPE AND LOCATION WITH FIRE ALARM CONTRACTOR.
- PROVIDE 120V TELECOM EQUIPMENT CONNECTION. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
- PROVIDE 120V CONNECTION FOR DRYER BOOSTER FAN. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR ON SITE.



1 ELECTRICAL POWER PLAN
SCALE: 3/32" = 1'-0"



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GENERAL NOTES

1. COORDINATE EXACT LOCATIONS OF DEVICES SHOWN WITH OTHER EQUIPMENT.
2. COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ALL RELAYS, CONNECTIONS, AND ALL DEVICES NECESSARY TO INTERLOCK EXHAUST FANS, DAMPERS, ETC WITH PROPER DEVICES.
3. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR.
4. FIRMLY MOUNT WEATHERPROOF 120V CONVENIENCE OUTLET ON UNISTRUT/KINDORF. COORDINATE WITH OTHER TRADES PRIOR TO ROUGH-IN. REDUNDANT RECEPTACLES WHETHER STAND-ALONE OR INTEGRAL TO A UNIT, MAY BE OMITTED SO LONG AS ALL OF THE REQUIREMENTS OF NEC 210.63 ARE SATISFIED.

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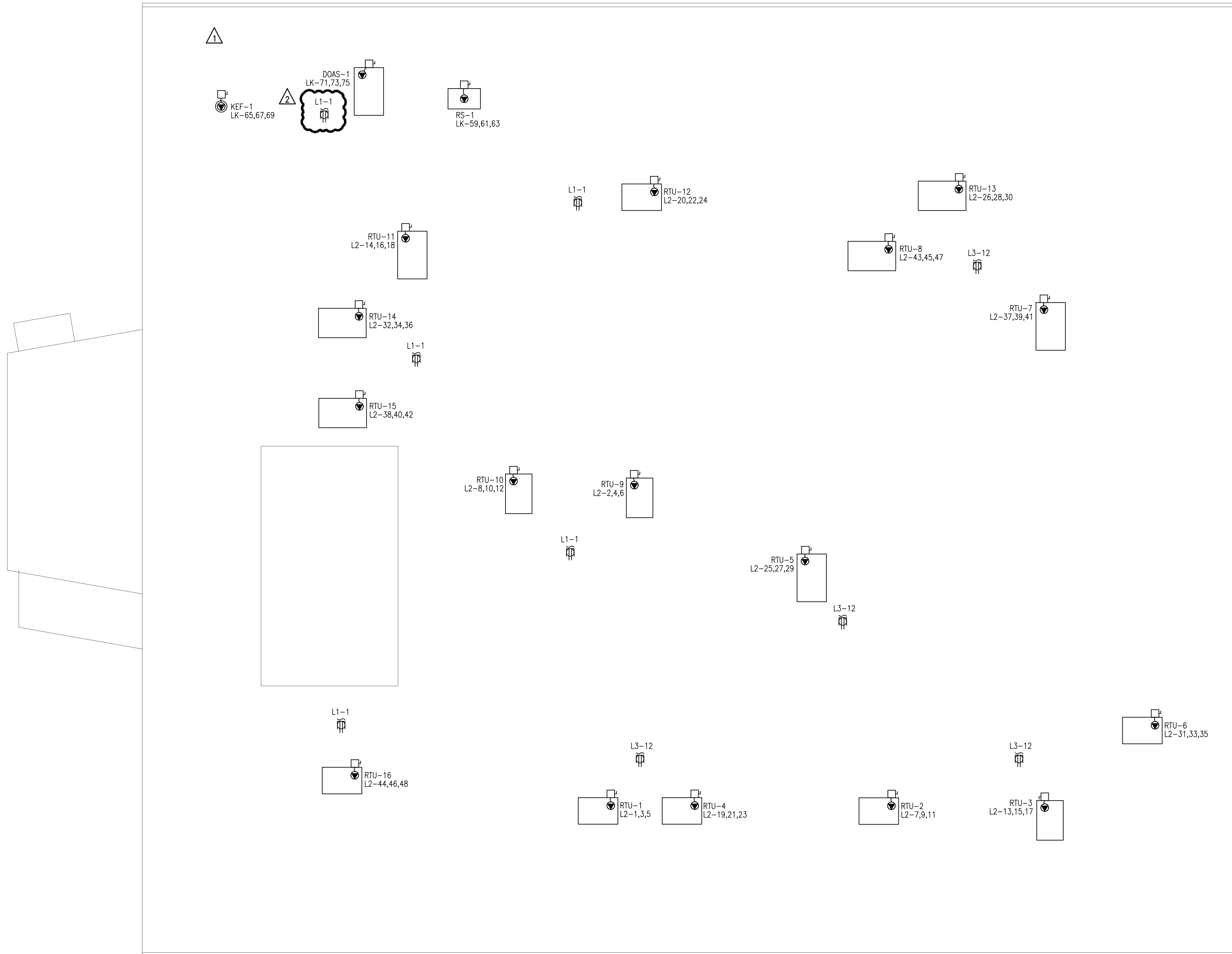
CHILD CARE FACILITY
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sheet no:

E202

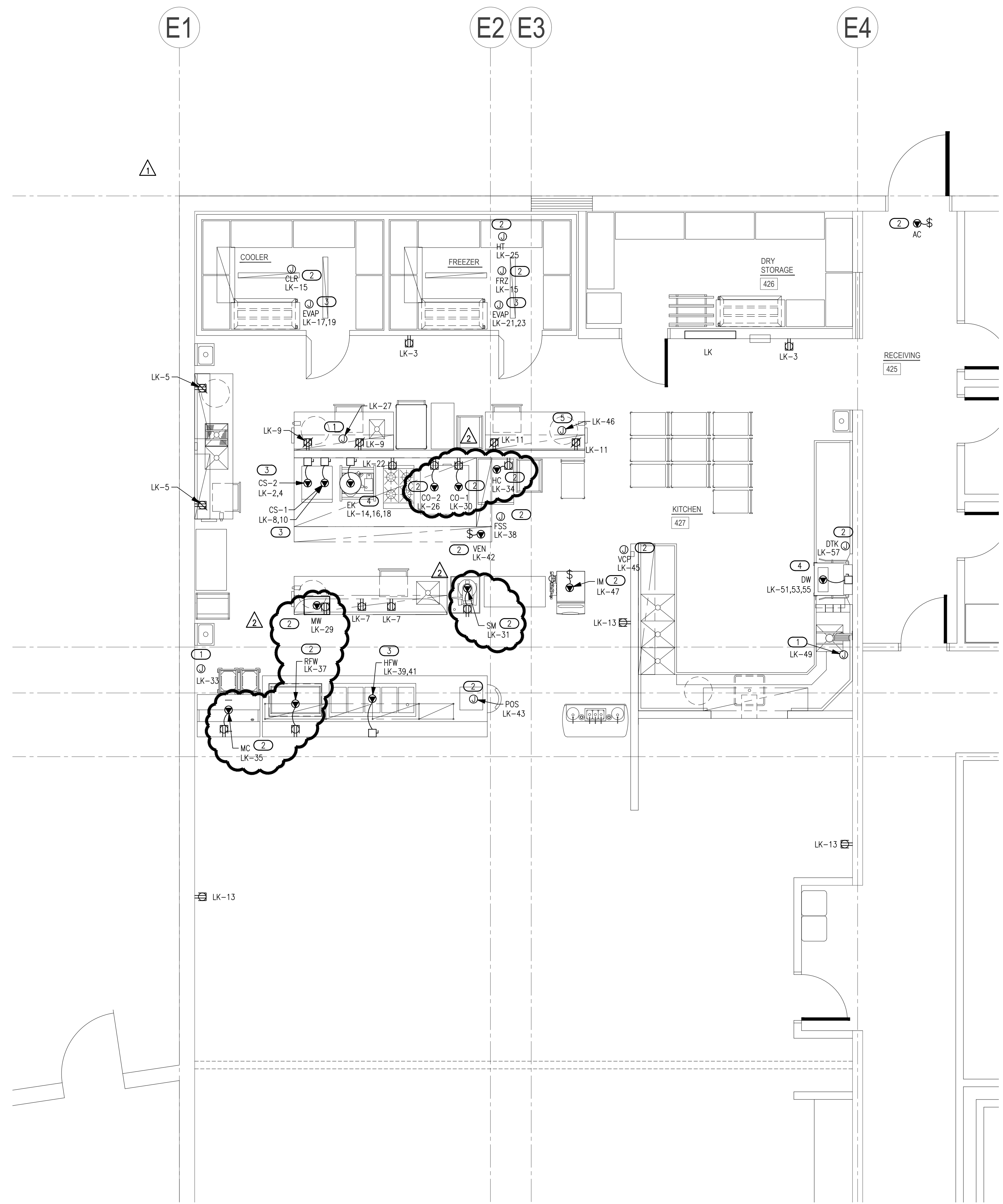
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1 ELECTRICAL ROOF PLAN
SCALE: 3/32" = 1'-0"





KITCHEN GENERAL NOTES

- COORDINATE KITCHEN/FOODSERVICE EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MANUFACTURER, AND FOOD SERVICE CONTRACTOR PRIOR TO BEGINNING WORK. REFER TO FOOD SERVICE PLANS FOR ADDITIONAL INFORMATION.
- COORDINATE KITCHEN HVAC EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, MECHANICAL CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO MECHANICAL PLANS FOR ADDITIONAL INFORMATION.
- COORDINATE KITCHEN PLUMBING EQUIPMENT EXACT INSTALLATION LOCATIONS AND REQUIREMENTS WITH THE ARCHITECT, PLUMBING CONTRACTOR, AND ALL OTHER ASSOCIATED TRADES PRIOR TO ROUGH-IN. REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION.
- E.C. SHALL COORDINATE WITH OWNER, KITCHEN EQUIPMENT PROVIDER, AND OTHER TRADES PRIOR TO ROUGH IN TO ENSURE ALL ROUGH IN LOCATIONS ARE CONCEALED IN THE WALL AND STUBBED OUT IN THE PROPER LOCATIONS.
- GFCI PROTECTION REQUIRED FOR ALL 120V 15 AND 20A RECEPTACLES, BY GFCI FUNCTION ON BREAKER OR RECEPTACLE, PER NEC 210.8 (B) (2).
- HOOD STAND ALONE FIRE SUPPRESSION SYSTEM SHALL HAVE INPUT TO BUILDING FIRE ALARM SYSTEM.
- PROVIDE A 20 A MP, 1 HP, 120V POWER SUPPLY FOR KITCHEN EXHAUST FAN ANSUL SYSTEM. THE ACTIVATION OF THE FIRE SUPPRESSION SYSTEM SHALL AUTOMATICALLY SHUT DOWN THE FUEL AND ELECTRICAL POWER SUPPLY TO THE COOKING EQUIPMENT UNDER THE KITCHEN HOOD. THE FUEL AND ELECTRICAL POWER SUPPLY RESET SHALL BE MANUAL. SHUNT TRIP CIRCUIT BREAKERS SHALL BE USED FOR ELECTRICALLY SUPPLIED APPLIANCES LOCATED UNDER THE HOOD.

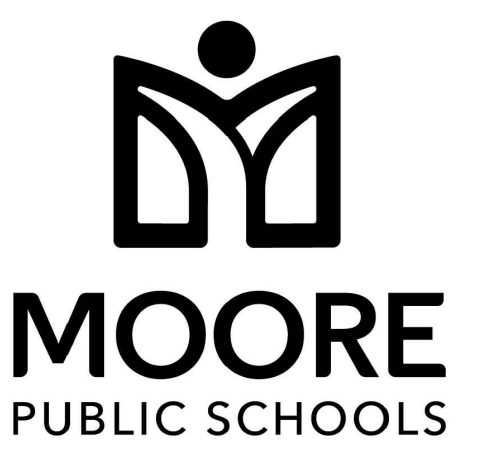
KEYED NOTES

- PROVIDE 120V CONNECTION FOR TRAP PRIMER. COORDINATE FINAL LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
- PROVIDE 120V CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
- PROVIDE 208V SINGLE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
- PROVIDE 208V THREE PHASE CONNECTION FOR EQUIPMENT. COORDINATE RECEPTACLE TYPE WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN.
- PROVIDE 120V CONNECTION FOR GAS SOLENOID VALVE ON SHUNT TRIP BREAKER. INTERLOCK WITH EXHAUST HOOD FIRE SUPPRESSION.



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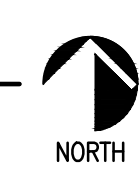


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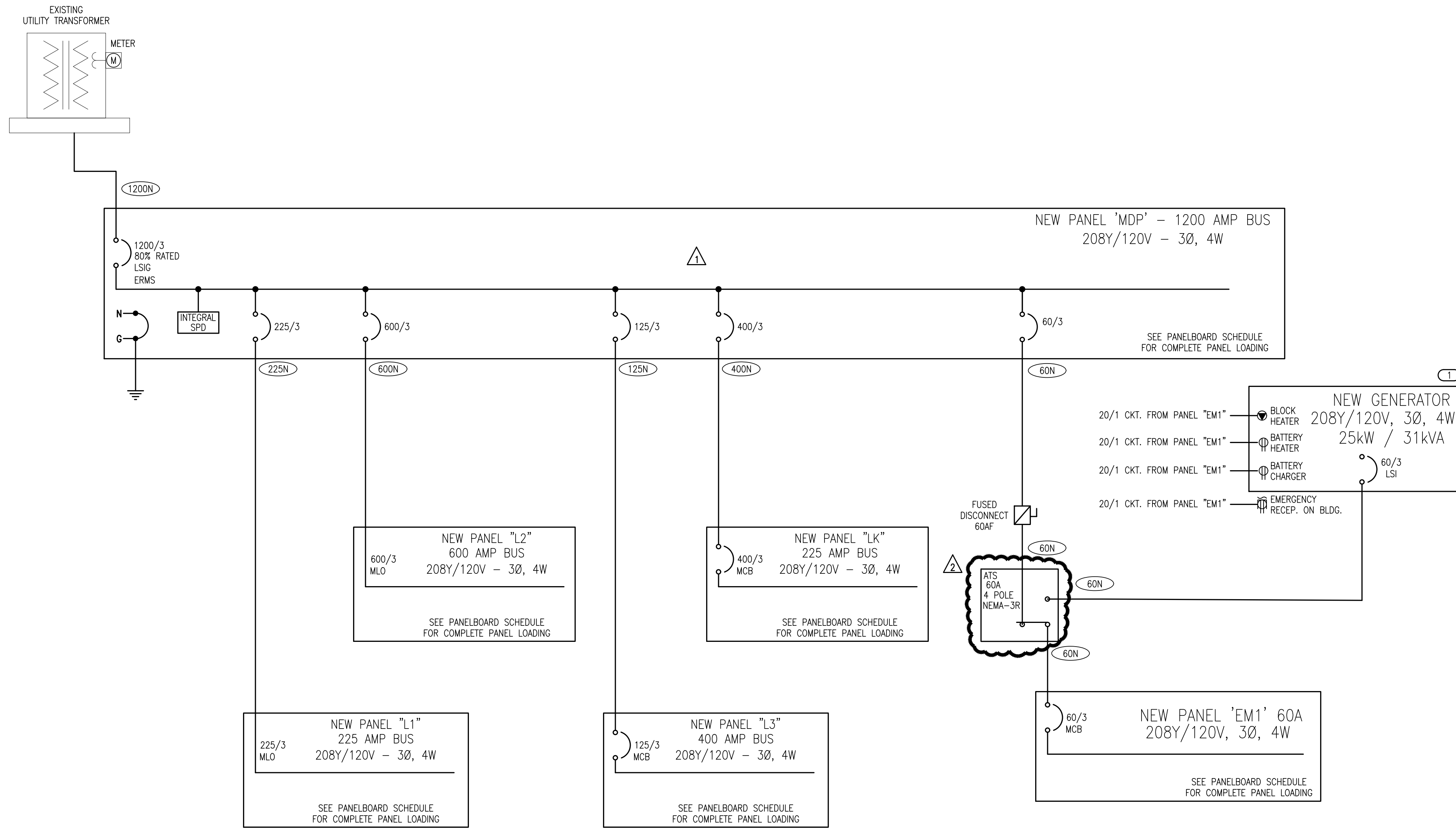
E203

1 ENLARGED ELECTRICAL KITCHEN PLAN
SCALE: 1/4" = 1'-0"



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1 ONE-LINE DIAGRAM
NO SCALE

FEEDER SCHEDULE				
AMPS	CONDUIT SIZE 4W	CONDUIT SIZE 3W	PHASE CONDUCTORS	EQUIPMENT GROUND CONDUCTOR
20	3/4"	3/4"	#12	#12
25	3/4"	3/4"	#10	#10
30	3/4"	3/4"	#10	#10
35	1"	3/4"	#8	#10
40	1"	3/4"	#8	#10
45	1"	1"	#6	#10
50	1"	1"	#6	#10
60	1 1/4"	1 1/4"	#4	#10
70	1 1/4"	1 1/4"	#4	#8
80	1 1/4"	1 1/4"	#3	#8
90	1 1/2"	1 1/4"	#2	#8
100	1 1/2"	1 1/4"	#2	#8
110	2"	1 1/2"	#1	#6
125	2"	1 1/2"	#1	#6
150	2"	1 1/2"	#1/0	#6
175	2"	2"	#2/0	#6
200	2"	2"	#3/0	#6
225	2 1/2"	2"	#4/0	#4
250	3"	2 1/2"	250 kcmil	#4
300	3"	3"	350 kcmil	#4
350	3 1/2"	3"	500 kcmil	#3
400	(2) 2"	(2) 2"	2 SETS OF #3/0	#3
450	(2) 2 1/2"	(2) 2"	2 SETS OF #4/0	#2
500	(2) 2 1/2"	(2) 2 1/2"	2 SETS OF 250 kcmil	#2
600	(2) 3"	(2) 3"	2 SETS OF 350 kcmil	#1
700	(2) 3 1/2"	(2) 3"	2 SETS OF 500 kcmil	#1/0
800	(3) 3"	(3) 2 1/2"	3 SETS OF 300 kcmil	#1/0
900	(3) 3 1/2"	(3) 3"	3 SETS OF 400 kcmil	#2/0
1000	(3) 3 1/2"	(3) 3"	3 SETS OF 500 kcmil	#2/0
1200	(4) 3"	(4) 3"	4 SETS OF 350 kcmil	#3/0
1600	(5) 3 1/2"	(5) 3"	5 SETS OF 500 kcmil	#4/0
1800	(6) 3 1/2"	(6) 3"	6 SETS OF 400 kcmil	250 kcmil
2000	(6) 3 1/2"	(6) 3"	6 SETS OF 500 kcmil	250 kcmil
2500	(7) 3 1/2"	(7) 3"	7 SETS OF 500 kcmil	350 kcmil

NOTES:
 1. FEEDER SIZES ARE ON THE PLAN WHERE 60 REFERS TO A 60A FEEDER WITHOUT NEUTRAL AND 60N REFERS TO A 60A FEEDER WITH NEUTRAL.
 2. SOME FEEDER SIZES DO NOT MATCH BREAKER SIZE DUE TO UP-SIZING OF THE FEEDER FOR VOLTAGE DROP.
 3. CONDUITS ARE SIZED PER NEC TABLES FOR THHN/THWN AND MAY BE UPSIZED FOR EASE OF PULLING OR DOWNSIZED AS ALLOWED PER NEC FOR CONDUIT TYPE(S) BEING INSTALLED.
 4. ALL CONDUCTORS 100A AND LESS ARE SIZED PER 60 DEGREE LUGS, EC MAY SIZE CONDUCTORS FOR ACTUAL RATING OF LUGS PER NEC.

GENERAL NOTES

- AIC RATINGS ARE ESTIMATED BASED ON AVAILABLE DATA DURING DESIGN. CONTRACTOR TO VERIFY AVAILABLE FAULT CURRENT WITH UTILITY.

KEYED NOTES

(1) GENERATOR SHALL BE DUAL FUEL - NATURAL GAS AND PROPANE. GENERATOR SHALL HAVE FUEL TYPE AUTOMATIC SWITCHOVER CAPABILITY. BASIS OF DESIGN - KOHLER MODEL 250CL 25/31 KW/KVA.

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CHILD CARE FACILITY
 201 N. EASTERN AVE.

sheet no:
E401

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Panel L2		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000	ROOM MOUNTING SURFACE		VOLTS 208Y/120V 3P 4W	AIC 65,000			
CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	25/3	5.48	RTU-1	a	2	35/3	7.21	RTU-9			
3				b	4						
5				c	6						
7	40/3	7.49	RTU-2	a	8	40/3	7.49	RTU-10			
9				b	10						
11				c	12						
13	25/3	5.48	RTU-3	a	14	50/3	13.3	RTU-11			
15				b	16						
17				c	18						
19	40/3	7.49	RTU-4	a	20	35/3	7.21	RTU-12			
21				b	22						
23				c	24						
25	50/3	13.3	RTU-5	a	26	50/3	13.3	RTU-13			
27				b	28						
29				c	30						
31	25/3	5.48	RTU-6	a	32	25/3	7.21	RTU-14			
33				b	34						
35				c	36						
37	50/3	13.3	RTU-7	a	38	25/3	5.48	RTU-15			
39				b	40						
41				c	42						
43	50/3	13.8	RTU-8	a	44	25/3	5.48	RTU-16			
45				b	46						
47				c	48						
49	20/1	0	SPACE	a	50	20/1	0	SPACE			
51	20/1	0	SPACE	b	52	20/1	0	SPACE			
53	20/1	0	SPACE	c	54	20/1	0	SPACE			
55	20/1	0	SPACE	a	56	20/1	0	SPACE			
57	20/1	0	SPACE	b	58	20/1	0	SPACE			
59	20/1	0	SPACE	c	60	20/1	0	SPACE			

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LARGEST MOTOR	13.8	3.46 (25%)	TOTAL LOAD	142
MOTORS	138	(100%)	BALANCED 3-PHASE LOAD	394 A
			PHASE A	100%
			PHASE B	100%
			PHASE C	100%

Panel EM1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000	ROOM MOUNTING SURFACE		VOLTS 208Y/120V 3P 4W	AIC 65,000			
CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	20/1	0.432	LIGHTING	a	2	15/1	1.18	SF-1			
3	20/1	0.441	LIGHTING	b	4	15/1	0.696	SF-2			
5	20/1	1	LIGHTING	c	6	15/1	0.696	SF-3			
7	20/1	0.981	LIGHTING	a	8	20/1	0.5	BLOCK HEATER			
9	20/1	0.55	LIGHTING	b	10	20/1	0.5	BATTERY HEATER			
11	20/1	0.643	LIGHTING	c	12	20/1	0.5	BATTERY CHARGER			
13	20/1	0.568	LIGHTING	a	14	20/1	0.18	RECEPTACLE			
15	20/1	0.477	LIGHTING	b	16	20/1	0	SPACE			
17	20/1	0	SPACE	c	18	20/1	0	SPACE			
19	20/1	0	SPACE	a	20	20/1	0	SPACE			
21	20/1	0	SPACE	b	22	20/1	0	SPACE			
23	20/1	0	SPACE	c	24	20/1	0	SPACE			
25	20/1	0	SPACE	a	26	20/1	0	SPACE			
27	20/1	0	SPACE	b	28	20/1	0	SPACE			
29	20/1	0	SPACE	c	30	20/1	0	SPACE			

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	5.09	6.37 (125%)	MOTORS	2.57
LARGEST MOTOR	1.18	0.294 (25%)	RECEPTACLES	1.68
			BALANCED 3-PHASE LOAD	10.9
			TOTAL LOAD	30.3 A
			PHASE A	123%
			PHASE B	85.8%
			PHASE C	91.2%

Panel L1		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000	ROOM MOUNTING SURFACE		VOLTS 208Y/120V 3P 4W	AIC 65,000			
CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	20/1	0.9	ROOFTOP RECEPTACLE	a	2	20/1	1.28	LIGHTING			
3	20/1	0.36	RM 431 RECEPTACLE, RM 433 RECEPTACLE	b	4	20/1	0.806	LIGHTING			
5	20/1	0.36	I.T. RECEPTACLE	c	6	20/1	0.706	LIGHTING			
7	20/1	0.36	I.T. RECEPTACLE	a	8	20/1	0.48	LIGHTING			
9	20/1	0.36	I.T. RECEPTACLE	b	10	20/1	0.636	LIGHTING			
11	20/1	0.36	I.T. RECEPTACLE	c	12	20/1	1.06	LIGHTING			
13	20/1	0.54	RM 434 RECEPTACLE	a	14	20/1	0.528	CP-3			
15	20/1	0.54	RM 434 RECEPTACLE	b	16	20/1	0.1	WH-3			
17	20/1	0.54	RM 430 RECEPTACLE	c	18	20/1	0.1	WH-4			
19	20/1	0.36	RM 430 RECEPTACLE	a	20	20/1	0.1	WH-1			
21	20/1	0.9	RM 429 RECEPTACLE, SMARTBOARD	b	22	20/1	0.1	WH-2			
23	20/1	0	SPACE	c	24	20/1	0.1	WH-5			
25	20/1	0.72	RM 1E RECEPTACLE, RM 5 RECEPTACLE	a	26	20/1	0.528	CP-2			
27	20/1	0.93	CORRIDOR 428 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 435 RECEPTACLE, TRAP PRIMER	b	28	15/1	0.696	EF-1			
29	20/1	0.54	RM 5 RECEPTACLE	c	30	30/2	4.5	EFH-1			
31	20/1	0.72	RM 1D RECEPTACLE, RM 4 RECEPTACLE	a	32						
33	20/1	0.54	RM 4 RECEPTACLE	b	34	15/1	0.696	EF-5			
35	20/1	0.54	RM 3 RECEPTACLE	c	36	15/1	0.696	EF-6			
37	20/1	0.72	RM 1C RECEPTACLE, RM 3 RECEPTACLE	a	38	15/1	0.696	EF-2			
39	20/1	0.72	RM 1B RECEPTACLE, RM 2 RECEPTACLE	b	40	20/1	0.528	CP-1			
41	20/1	0.54	RM 2 RECEPTACLE	c	42	20/2	2	EFH-1			
43	20/1	0.54	RM 103 RECEPTACLE	a	44						
45	20/1	0.72	RM 101C RECEPTACLE, RM 103 RECEPTACLE	b	46	20/2	2	EFH-4			
47	20/1	0.72	RM 101B RECEPTACLE, RM 102 RECEPTACLE	c	48						
49	20/1	0.54	RM 102 RECEPTACLE	a	50	15/1	0.696	EF-7			
51	20/1	0.72	RM 101A RECEPTACLE, RM 101 RECEPTACLE	b	52	20/1	0.9	RM 301A RECEPTACLE, RM 301 RECEPTACLE, RM 303 RECEPTACLE			
53	20/1	0.54	RM 101 RECEPTACLE	c	54	20/1	0.72	RM 301 RECEPTACLE, SMARTBOARD			
55	20/1	0.72	RM 101D RECEPTACLE, RM 104 RECEPTACLE	a	56	20/1	0.72	RM 422 RECEPTACLE			
57	20/1	0.54	RM 104 RECEPTACLE	b	58	20/1	0.54	RM 423 RECEPTACLE, RM 424 RECEPTACLE, RM 425 RECEPTACLE			
59	20/1	0.72	RM 101E RECEPTACLE, RM 105 RECEPTACLE	c	60	20/1	0.72	RM 205 RECEPTACLE			
61	20/1	0.9	CORRIDOR 436 RECEPTACLE, RM 105F RECEPTACLE, RM 105 RECEPTACLE	a	62	20/1	0.72	RM 201E RECEPTACLE, RM 205 RECEPTACLE			
63	20/1	0.72	RM 201C RECEPTACLE, RM 203 RECEPTACLE	b	64	20/1	0.73	RM 201D RECEPTACLE, RM 204 RECEPTACLE, TRAP PRIMER			
65	20/1	0.54	EXTERIOR RECEPTACLE	c	66	20/1	0.72	RM 204 RECEPTACLE			
67	20/1	1.1	CORRIDOR 419 RECEPTACLE, CORRIDOR 420 RECEPTACLE, CORRIDOR 428 RECEPTACLE, RM 421 RECEPTACLE, TRAP PRIMER	a	68	20/1	0.72	RM 202 RECEPTACLE			
69	20/1	0.36	TELECOM EQ	b	70	20/1	0.72	RM 201B RECEPTACLE, RM 202 RECEPTACLE			
71	20/1	0	SPACE	c	72	20/1	0.72	RM 203 RECEPTACLE			
73	20/1	0	SPACE	a	74	20/1	0.415	DRYER, DRYER BOOSTER FAN			
75	20/1	0	SPACE	b	76	20/1	0.84	WASHER			
77	20/1	0	SPACE	c	78	20/1	0.18	FACP			
79	20/1	0	SPACE	a	80	20/1	0	SPACE			
81	20/1	0	SPACE	b	82	20/1	0	SPACE			
83	20/1	0	SPACE	c	84	20/1	0	SPACE			

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	4.97	6.21 (125%)	MOTORS	5.56
LARGEST MOTOR	0.696	0.174 (25%)	RECEPTACLES	30.3
			HEATING	8.5
			BALANCED 3-PHASE LOAD	40.6
			TOTAL LOAD	113 A
			PHASE A	111%
			PHASE B	95.3%
			PHASE C	95.5%

Panel MDP		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000	ROOM MOUNTING SURFACE		VOLTS 208Y/120V 3P 4W	AIC 65,000			
CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	225/3	49.3	PANEL L1	a	2	600/3	138	PANEL L2			
3				b	4						
5				c	6						
7	125/3	36.1	PANEL L3	a	8	400/3	93.3	PANEL LK			
9				b	10						
11				c	12						
13	20/1	0	SPACE	a	14	60/3	9.34	TRANSFER SWITCH ATS			
15	20/1	0	SPACE	b	16						
17	20/1	0	SPACE	c	18						
19	20/1	0	SPACE	a	20	20/1	0	SPACE			
21	20/1	0	SPACE	b	22	20/1	0	SPACE			
23	20/1	0	SPACE	c	24	20/1	0	SPACE			
25	20/1	0	SPACE	a	26	20/1	0	SPACE			
27	20/1	0	SPACE	b	28	20/1	0	SPACE			
29	20/1	0	SPACE	c	30	20/1	0	SPACE			

CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	16.5	20.6 (125%)	MOTORS	236
LARGEST MOTOR	18	4.5 (25%)	RECEPTACLES	59
			HEATING	15.3
			TOTAL LOAD	310
			BALANCED 3-PHASE LOAD	862 A
			PHASE A	104%
			PHASE B	100%
			PHASE C	95.7%

Panel L3		ROOM MOUNTING SURFACE	VOLTS 208Y/120V 3P 4W	AIC 65,000	ROOM MOUNTING SURFACE		VOLTS 208Y/120V 3P 4W	AIC 65,000			
CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CTKT #	CTKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	20/1	0.18	RM 410 RECEPTACLE	a	2	20/1	0.73	LIGHTING			
3	20/1	0.18	RM 410 RECEPTACLE	b	4	20/1	0.619	LIGHTING			
5	20/1	0.18	RM 410 RECEPTACLE	c	6	20/1	0.838	LIGHTING			
7	20/1	0.72	RM 410 RECEPTACLE	a	8	20/1	0.918	LIGHTING			
9	20/1	0.72	RM 409 RECEPTACLE	b	10	20/1	0.99	LIGHTING			
11	20/1	0.72	RM 406 RECEPTACLE	c	12	20/1	0.72	ROOFTOP RECEPTACLE			
13	20/1	0.72	RM 405 RECEPTACLE	a	14	20/1	0.37	WATER COOLER RECEPTACLE			
15	20/1	0.72	RM 404 RECEPTACLE	b	16	20/1	0.54	RM 1 RECEPTACLE			
17	20/1	1.2	COPY MACHINE	c	18	20/1	1.09	CORRIDOR 412 RECEPTACLE, CORRIDOR 416 RECEPTACLE, CORRIDOR 435 RECEPTACLE, RM 411 RECEPTACLE, TRAP PRIMER			
19	20/1	0.36	RM 403 RECEPTACLE	a	20	20/1	0.72	RM 1A RECEPTACLE, RM 1 RECEPTACLE			
21	20/1	0.36	RM 402 RECEPTACLE	b	22	20/1	0.55	RM 436A RECEPTACLE, RM 436 RECEPTACLE, TRAP PRIMER			
23	20/1	0.36	RM 402 RECEPTACLE	c	24	20/1	0.36	RM 436 RECEPTACLE			
25	20/1	0.54	RM 402 RECEPTACLE	a	26	20/1	0.9	RM 105G RECEPTACLE, RM 201 RECEPTACLE			
27	20/1	0.72	RM 401 RECEPTACLE	b	28	20/1	0.54	RM 201A RECEPTACLE, RM 201 RECEPTACLE			
29	20/1	0.72	RM 305 RECEPTACLE, SMARTBOARD	c	30	20/1	0.9	RM 301B RECEPTACLE, RM 302 RECEPTACLE			
31	20/1	0.72	RM 301E RECEPTACLE, RM 305 RECEPTACLE	a	32	20/1	0.7				

MECHANICAL EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
CP-1	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-40	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
CP-2	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-26	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC
CP-3	CIRCULATION PUMP	120V 1P 2W	1/6 HP	0.53			L1-14	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-1	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-28	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-38	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-42	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC
EF-4	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-40	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC
EF-5	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-34	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-6	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-36	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-7	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L1-50	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EF-8	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	4	15	L3-52	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
EFH-1	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-42,44	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-2	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-48,50	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-3	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L3-44,46	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EFH-4	ELECTRIC FAN FORCED HEATER	208V 2P 2W		2			L1-46,48	3/4"C,2#10,1#10G	TOGGLE SWITCH	MFR	EC
EWH-1	ELECTRIC WATER HEATER	208V 2P 2W		4.5			L1-30,32	3/4"C,2#10,1#10G	NON-FUSED	EC	EC
RTU-1	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-1,3,5	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-2	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-7,9,11	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-3	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-13,15,17	3/4"C,3#8,1#10G	NON-FUSED	MFR	EC
RTU-4	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-19,21,23	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-5	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-25,27,29	3/4"C,3#6,1#10G	NON-FUSED	MFR	EC
RTU-6	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-31,33,35	3/4"C,3#8,1#10G	NON-FUSED	MFR	EC
RTU-7	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-37,39,41	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-8	ROOF TOP UNIT	208V 3P 3W		13.83	48	50	L2-43,45,47	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-9	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-2,4,6	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-10	ROOF TOP UNIT	208V 3P 3W		7.49	26	40	L2-8,10,12	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-11	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-14,16,18	3/4"C,3#6,1#10G	NON-FUSED	MFR	EC
RTU-12	ROOF TOP UNIT	208V 3P 3W		7.21	25	35	L2-20,22,24	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-13	ROOF TOP UNIT	208V 3P 3W		13.26	46	50	L2-26,28,30	1"C,3#4,1#10G	NON-FUSED	MFR	EC
RTU-14	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-32,34,36	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-15	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-38,40,42	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
RTU-16	ROOF TOP UNIT	208V 3P 3W		5.48	19	25	L2-44,46,48	3/4"C,3#10,1#10G	NON-FUSED	MFR	EC
SF-1	EXHAUST FAN	120V 1P 2W	1/2 HP	1.18	2	15	EM1-2	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC
SF-2	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-4	3/4"C,1#10,1#10G	TOGGLE SWITCH	EC	EC
SF-3	EXHAUST FAN	120V 1P 2W	1/4 HP	0.7	2	15	EM1-6	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC
WH-1	WATER HEATER	120V 1P 2W	F HP	0.1			L1-20	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
WH-2	WATER HEATER	120V 1P 2W	F HP	0.1			L1-22	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
WH-3	WATER HEATER	120V 1P 2W	F HP	0.1			L1-16	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
WH-4	WATER HEATER	120V 1P 2W	F HP	0.1			L1-18	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
WH-5	WATER HEATER	120V 1P 2W	F HP	0.1			L1-24	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC

KITCHEN EQUIPMENT SCHEDULE											
CALLOUT	DESCRIPTION	VOLTS	HP	KVA	MCA	MOCP	CIRCUIT	WIRE CALLOUT	DISCONNECT	DISC PROV BY	DISC INST BY
AC	AIR CURTAIN	120V 1P 2W	1 HP	1.92					TOGGLE SWITCH	EC	EC
CLR	COOLER LIGHTING	120V 1P 2W		0.3			LK-15	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
CO-1	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-30	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
CO-2	CONVECTION OVEN	120V 1P 2W	1/2 HP	1.18			LK-26	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
CS-1	CONVECTION STEAMER	208V 2P 2W		6			LK-8,10	3/4"C,2#8,1#10G	NON-FUSED	EC	EC
CS-2	CONVECTION STEAMER	208V 2P 2W		8			LK-2,4	3/4"C,2#6,1#10G	NON-FUSED	EC	EC
DOAS-1	ROOF TOP UNIT	208V 3P 3W		16.43	57.1	60	LK-71,73,75	1"C,3#4,1#10G	NON-FUSED	MFR	EC
DTK	DRAIN WATER TEMPERING KIT	120V 1P 2W		0.6			LK-57	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
DW	DISHWASHER	208V 3P 3W		18			LK-51,53,55	1"C,3#4,1#8G	NON-FUSED	EC	EC
EK	ELECTRIC KETTLE	208V 3P 3W		10.8			LK-14,16,18	3/4"C,3#8,1#10G	NON-FUSED	EC	EC
EVAP	EVAPORATOR	208V 2P 2W		0.21			LK-17,19	3/4"C,2#12,1#12G	JUNCTION BOX	EC	EC
EVAP	EVAPORATOR	208V 2P 2W		0.21			LK-21,23	3/4"C,2#12,1#12G	JUNCTION BOX	EC	EC
FRZ	FREEZER LIGHTING	120V 1P 2W		0.3			LK-15	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
FSS	FIRE SUPPRESSION SYSTEM	120V 1P 2W		0.12			LK-38	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
HC	HOT CABINET	120V 1P 2W		1.92			LK-34	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
HFV	HOT FOOD WELL	208V 2P 2W		2.81			LK-39,41	3/4"C,2#12,1#12G	NON-FUSED	EC	EC
HT	HEAT TAPE	120V 1P 2W		1.92			LK-25	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
IM	ICE MAKER	120V 1P 2W		1.62			LK-47	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC
KEF-1	KITCHEN EXHAUST FAN	208V 3P 3W		2.63			LK-65,67,69	3/4"C,3#10,1#10G	NON-FUSED	EC	EC
MC	MILK COOLER	120V 1P 2W		0.33			LK-35	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
MW	MICROWAVE	120V 1P 2W		1.5			LK-29	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
POS	POINT OF SALE SYSTEM	120V 1P 2W		0.12			LK-43	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
RFW	REFRIGERATED FOOD WELL	120V 1P 2W		0.84			LK-37	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
RS-1	REFRIGERATION SYSTEM	208V 3P 3W		9.73	29	40	LK-59,61,63	3/4"C,3#10,1#10G	NON-FUSED	EC	EC
SM	STAND MIXER	120V 1P 2W	1/2 HP	1.18			LK-31	3/4"C,1#12,1#12N,1#12G	DUPLEX RECEPTACLE GFI	EC	EC
VCP	VENTILATOR CONTROL PANEL	120V 1P 2W		0.12			LK-45	3/4"C,1#12,1#12N,1#12G	JUNCTION BOX	EC	EC
VEN	VENTILATOR	120V 1P 2W		1.8			LK-42	3/4"C,1#12,1#12N,1#12G	TOGGLE SWITCH	EC	EC

Panel	ROOM	MOUNTING	RECESSED	FED FROM	MDP	VOLTS	208Y/120V 3P 4W	BUS AMPS	400	AIC	65,000	MAIN BKR	400	LUGS	STANDARD
Panel	ROOM	MOUNTING	RECESSED	FED FROM	MDP	VOLTS	208Y/120V 3P 4W	BUS AMPS	400	AIC	65,000	MAIN BKR	400	LUGS	STANDARD
LK						NEUTRAL	100%								
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION								
1	20/1	0.726	LIGHTING	2	50/2	8	CS-2								
3	20/1	0.36	RECEPTACLE	4		0									
5	20/1	0.36	RECEPTACLE	6	-/1	0	SHUNT TRIP								
7	20/1	0.36	RECEPTACLE	8	40/2	6	CS-1								
9	20/1	0.36	RECEPTACLE	10		0									
11	20/1	0.36	RECEPTACLE	12	-/1	0	SHUNT TRIP								
13	20/1	0.54	RECEPTACLE	14	40/3	10.8	EK								
15	20/1	0.6	CLR, FRZ	16		0									
17	20/2	0.208	EVAP	18		0									
19				20	-/1	0	SHUNT TRIP								
21	20/2	0.208	EVAP	22	20/1	0.18	RECEPTACLE								
23				24	-/1	0	SHUNT TRIP								
25	20/1	1.92	HT	26	20/1	1.18	CO-2								
27	20/1	0.01	TRAP PRIMER	28	-/1	0	SHUNT TRIP								
29	20/1	1.5	MW	30	20/1	1.18	CO-1								
31	20/1	1.18	SM	32	-/1	0	SHUNT TRIP								
33	20/1	0.01	TRAP PRIMER	34	20/1	1.92	HC								
35	20/1	0.325	MC	36	-/1	0	SHUNT TRIP								
37	20/1	0.84	RFW	38	20/1	0.12	FSS								
39	20/2	2.81	HFV	40	-/1	0	SHUNT TRIP								
41				42	20/1	1.8	VEN								
43	20/1	0.12	POS	44	-/1	0	SHUNT TRIP								
45	20/1	0.12	VCP	46	20/1	0.18	GAS VALVE								
47	20/1	1.62	IM	48	-/1	0	SHUNT TRIP								
49	20/1	0.01	TRAP PRIMER	50	20/1	0	SPACE								
51	70/3	18	DW	52	20/1	0	SPACE								
53				54	20/1	0	SPACE								
55				56	20/1	0	SPACE								
57	20/1	0.6	DTK	58	20/1	0	SPACE								
59	40/3	9.73	RS-1	60	20/1	0	SPACE								
61				62	20/1	0	SPACE								
63				64	20/1	0	SPACE								
65	20/3	2.63	KEF-1	66	20/1	0	SPACE								
67				68	20/1	0	SPACE								
69				70	20/1	0	SPACE								
71	60/3	16.4	DOAS-1	72	20/1	0	SPACE								
73				74	20/1	0	SPACE								
75				76	20/1	0	SPACE								
77	20/1	0	SPACE	78	20/1	0	SPACE								
79	20/1	0	SPACE	80	20/1	0	SPACE								
81	20/1	0	SPACE	82	20/1	0	SPACE								
83	20/1	0	SPACE	84	20/1	0	SPACE								

	CONN KVA	CALC KVA		CONN KVA	CALC KVA
LIGHTING	0.726	0.907	(125%)	MOTORS	87
LARGEST MOTOR	18	4.5	(25%)	RECEPTACLES	2.73
				HEATING	2.81
				TOTAL LOAD	98
				BALANCED 3-PHASE LOAD	272 A
				PHASE A	107%
				PHASE B	103%
				PHASE C	89.5%

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KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL



DWG
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TVO
checked by
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11/22/2024 AD 02
12/12/2024 AD 03



CHILD CARE FACILITY
201 N. EASTERN AVE.

sheet no:

**MOORE PUBLIC SCHOOLS -
CHILD CARE CENTER**

Moore Public Schools - Moore, Oklahoma
AGP - Moore, Oklahoma

ADDENDUM NO. 4

December 19, 2024



This addendum applicable to work designated herein, shall be understood to be an Addendum, and as such shall be included in the Contract Agreement.

Receipt of this Addendum shall be acknowledged by the Construction Management Firm notifying this office in writing, and by any applicable subcontractor to the CM.

This addendum consists of two (2) pages with attachments of eight (8) 8.5"x11" pages and seven (7) 24"x36" sheets.

A. Drawings:

General

1. Updated Cover Sheet. Refer to attachment.

Civil

No changes.

Structural

No changes.

Architectural

1. Sheet A100, Detail 1, Overall Floor Plan: added cubbies and lockers to classrooms as indicated. Refer to attachment.
2. Sheet A100d, Slab Demolition Plan: added sheet in its entirety. Refer to attachment.
3. Sheet A108, Detail 1, LVT Dimension / Design Plan: added flooring layouts at Indoor Plan Area, Room #417. Refer to attachment.

4. Sheet A403, Interior Elevations and Sections: added sheet in its entirety for cubbies and locker elevations and details. Refer to attachment.
5. Sheet A601, Detail 1, Room Finish Schedule: revised flooring at Room #417, Indoor Play Area to LVT and added colors to Color Schedule. Refer to attachment.
6. Sheet A602, Detail 1, Door Schedule: revised Door #1 to aluminum door and frame. Refer to attachment.
7. Sheet A602, Detail 1, Door Schedule: revised frame elevation for Door #87 to Frame Elevation "B". Refer to attachment.
8. Sheet A602, Detail 1, Door Schedule: at Doors #41 and #89, add panic device to Hardware Set #4 at each door.

Mechanical, Electrical, and Plumbing

No changes.

Food Service Documents

No changes.

B. Specifications:

1. Section 08000, Glazing: added specification in its entirety.
2. 09670, Resinous Flooring: added specification in its entirety.

END OF ADDENDUM NO. 4

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLAZING

Part 1 - General

1.01 Work Included:

- A. The General Conditions and applicable sections of Division 1 shall apply to this entire section.
- B. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. Federal Specifications
 - a. DD-G-451d, Glass, Plate, Sheet (for glazing and other uses).
 - 2. Flat Glass Jobber Association: Glazing Manual.
- B. Comply with UBC 2406, and ANSI 97.1 with testing requirements of 16 CFR 1201, Cat II.

1.03 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Glass Types and Examples:
 - 1. 1/4" Tempered Glass:
 - a. Type example: 1/4" Clear Herculite - PPG.
 - 2. 1" Nominal Thickness Insulating Tempered Glass - 1/4" tinted glass @ exterior side and 1/4" 100 Low E glass @ interior side of 2" air space - **both sides tempered.** Low Emissivity coating on 3rd glass surface from building exterior.
 - a. Type Example: Versalux Green 2000 Insulated with Low-E, Visteon (Ford). **Note: Color will be a factor in approval.**
- B. Glazing Compounds and Preformed Glaze Sealants: Suitable type as approved for the installation, in accordance with Glazing Materials section of the FGJA Glazing Manual.
- C. Glazing Accessories: Provide miscellaneous materials such as cleaners, primers, setting blocks, spacers, filler rods, beads, etc., as required for complete installation.

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLAZING

Part 3 - Execution

3.01 Installation:

A. Glazing-General:

1. Items to be glazed may be field-or shop-glazed, using glass of the quality and thickness specified or indicated. Preparation of surrounds and glazing, unless otherwise specified, shall be in conformance with the details and general conditions governing glazing in the FGMA Glazing Manual, beads or stops which are furnished with the items to be glazed shall be used to secure the glass in place.
2. All glass shall be set with the waves parallel to the sill. Glass that has been misordered, i.e. with the width and height dimensions not properly correlated with the Drawing process in manufacturing, resulting in pronounced waviness at right angles to the sill, will be rejected.
3. Install plastic glass edging strips where indicated. Joints shall be as tight and imperceptible as possible.

B. Breakage: Replace all glass broken during or after setting. Breakage due to accident or carelessness or other will be charged to trade at fault.

C. Inspection: Prior to final acceptance of project, inspect all work done under this section and make all necessary adjustments, repairs or replacements of defective work, and clean all glass surfaces.

D. Clean-up: Remove all glass cuttings, scraps, packaging and rubbish upon completion of the work.

End of Section

DIVISION 9 - FINISHES

SECTION 09670 - RESINOUS FLOORING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
- C. No requests for substitutions shall be considered that would change the generic type of the specified System.
- D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
- E. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.
- F. A pre-installation conference shall be held between Applicator, General Contractor and the Architect for review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.03 Submittals:

- A. Provide submittals in the form of samples (3 x 3 inch square), and documentation, to the Architect for review.

1.04 Product Delivery, Storage and Handling:

- A. All materials shall be delivered to the job site with manufacturer's labels intact and stored in an enclosed dry storage area providing protection from damage, out of direct sunlight, and exposure to the elements in accordance with the manufacturer's recommendations and relevant health and safety regulations.

1.05 System Description:

- A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with Q-Rok quartz aggregate broadcast and novolac epoxy topcoat.
- B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/4 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- C. Cove base (if required) to be applied where noted on plans and

DIVISION 9 - FINISHES

SECTION 09670 - RESINOUS FLOORING

per manufacturers standard details unless otherwise noted.

1.06 Project Conditions:

A. Site Requirements:

1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
3. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured for 14 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests. Outside of these parameters manufacturer shall be consulted.
2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not to be used.
4. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements:

1. The Owner shall be responsible for the removal of foodstuffs from the work area.
2. Non-related personnel in the work area shall be kept to a minimum.

1.07 Waste Disposal:

- A. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.08 Warranty:

- A. Dur-A-Flex, Inc. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to Dur-A-Flex, Inc. published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
- B. Dur-A-Flex, Inc. liability with respect to this warranty is strictly limited to the value of the material purchase.

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SECTION 09670 - RESINOUS FLOORING

Part 2 - Products

2.01 Flooring:

- A. Dur-A-Flex, Inc, Poly-Crete MDB (self leveling broadcast quartz), Novolac topcoat seamless flooring system.
 - 1. System Materials:
 - a. Topping: Dur-A-Flex, Inc, Poly-Crete MD resin, hardener and MD aggregate.
 - b. The aggregate shall be Dur-A-Flex, Inc. Q-Rok quartz aggregate.
 - d. Topcoat: Dur-A-Flex, Inc. Dur-A-Glaze Novolac resin and hardener.
 - 2. Patch Materials:
 - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete MD (up to ¼ inch).
 - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Dur-A-Tex UM

2.02 Manufacturer:

- A. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802
- B. Manufacturer of Approved System shall be single source and made in the USA.

2.03 Product Requirements:

- A. Topping Poly-Crete MD
 - 1. Percent Reactive 100 %
 - 2. VOC 0 g/L
 - 3. Bond Strength to Concrete ASTM D 4541 >400 psi, substrates fails
 - 4. Compressive Strength, ASTM C 579 9,000 psi
 - 5. Tensile Strength, ASTM D 638 2,175 psi
 - 6. Impact Resistance @ 125 mils, MIL D-3134, >160 inch lbs
No visible damage or deterioration
- B. Topcoat Dur-A-Glaze Novolac
 - 1. Percent Solids 100 %
 - 2. VOC 8 g/L
 - 3. Flexural Strength, ASTM C 580 5,500 psi
 - 4. Tensile Strength, ASTM D 638 2,500 psi
 - 5. Flexural Modulus, ASTM D 790 1.95 x 10⁶ psi
 - 6. Coefficient of thermal expansion ASTM D 696 2.2 x 10⁻⁵ in/in/F
 - 7. Water Absorption ASTM D 570 0.05 %, 24 hrs in water
 - 8. Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles 0.075 mg weight loss
 - 9. Flammability, ASTM D 636 Self-Extinguishing

DIVISION 9 - FINISHES

SECTION 09670 - RESINOUS FLOORING

10. Potlife @ 70 F	30 minutes
11. Tack Free Time @ 70 F (ready for re-coat)	8-10 hours
12. Cure Time for Traffic @ 70 F	24 hours
13. Heat Resistance Limitation	250 F

Part 3 - Execution

3.01 Examination:

A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.02 Preparation:

A. General:

1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
 - a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.

3. Mechanical surface preparation

- a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-6 as described by the International Concrete Repair Institute.
- b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
- c. Wherever a free edge will occur, including doorways, wall perimeters, expansion joints, columns, doorways, drains and equipment pads, a ¼ inch deep by 1/4 inch wide keyways shall be cut in.

DIVISION 9 - FINISHES

SECTION 09670 - RESINOUS FLOORING

d. Cracks and joints (non-moving) greater than 1/4 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.

4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.03 Applying Texture Finishes:

A. General:

1. The system shall be applied in three distinct steps as listed below:
 - a. Substrate preparation
 - b. Topping/overlay application with quartz aggregate broadcast.
 - c. Topcoat application
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Topping:

1. The topping shall be applied as a self-leveling system as specified. The topping shall be applied in one lift with a nominal thickness of 3/16 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using a pin rake, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a 15/16 inch spiked roller.
 6. Quartz aggregate shall be broadcast to excess into the wet material at the rate of 1 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

DIVISION 9 - FINISHES

SECTION 09670 - RESINOUS FLOORING

- C. Topcoat:
 - 1. The topcoat shall be squeegee applied and back rolled with a coverage rate of 60 sf per kit
 - 2. The topcoat shall be comprised of a liquid resin and a liquid hardener that is mixed as a kit in and installed per the manufacturer's recommendations.
 - 3. The finish floor will have a nominal thickness of 1/4 inch.
- 3.04 Field Quality Control:
 - A. Tests, Inspection:
 - 1. The following tests shall be conducted by the Applicator:
 - a. Temperature
 - 1. Air, substrate temperatures and, if applicable, dew point.
 - b. Coverage Rates
 - 1. Rates for all layers shall be monitored by checking quantity of material used against the area covered.
- 3.05 Cleaning and Protection:
 - A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
 - B. Remove Masking - perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

End of Section



CG
drawn by _____
MA
checked by _____
OCTOBER 2024
date _____
revisions
A ADDENDUM #1
B ADDENDUM #2
C ADDENDUM #4

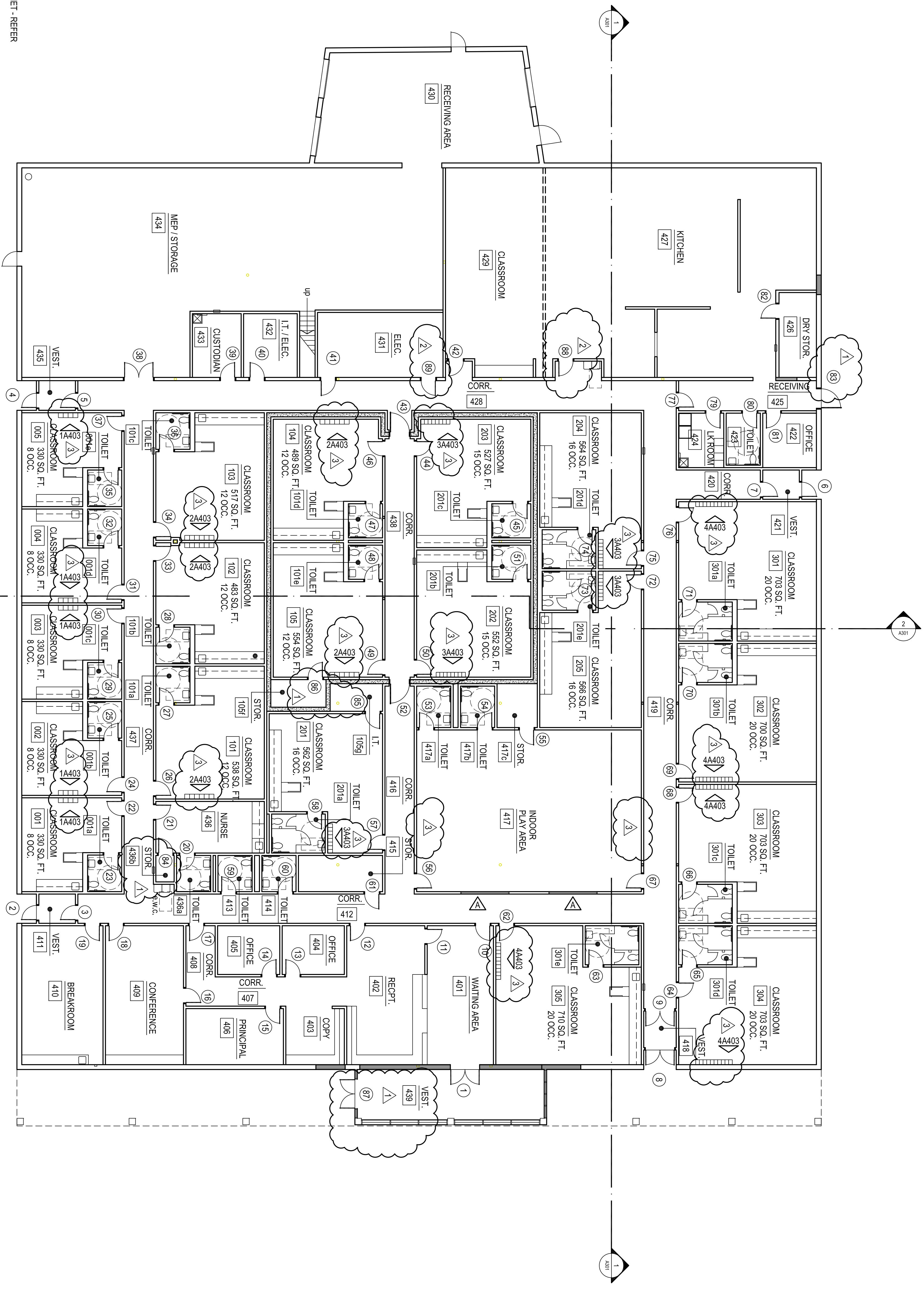


MOORE
PUBLIC SCHOOLS

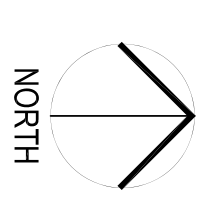
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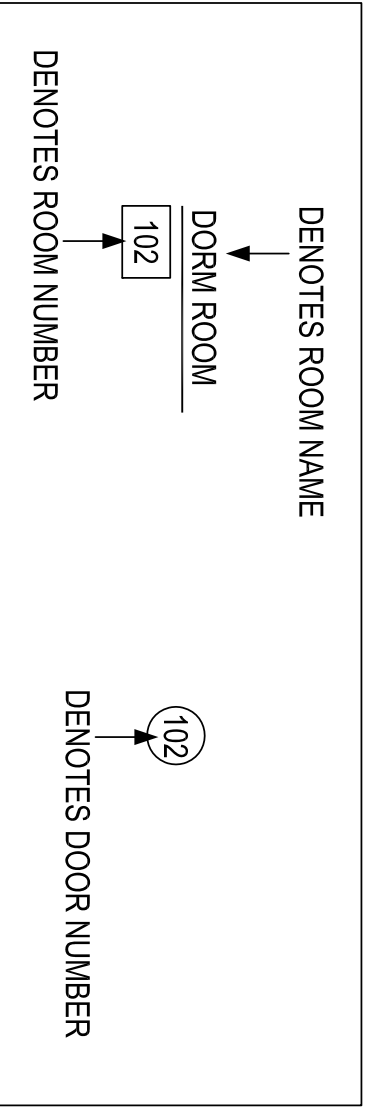


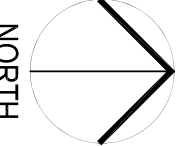
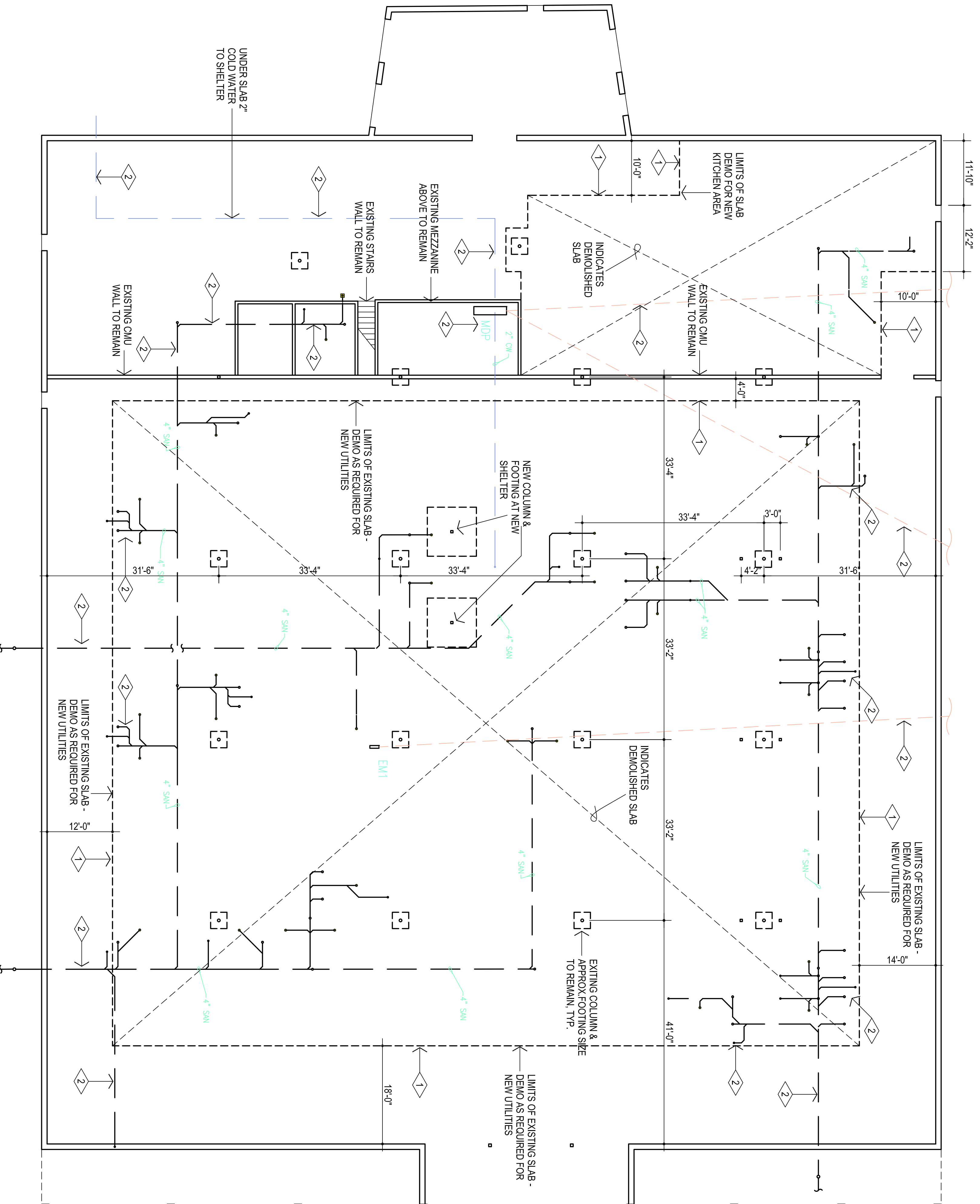
- GENERAL NOTES:
1. F.E.C. - FIRE EXTINGUISHER AND CABINET - REFER EQUIPMENT PLAN FOR LOCATIONS
 2. ADD CORNER GUARDS (C.G.) AT ALL INTERIOR LOCATIONS
 3. REFER SHEETS A103, A104 & A105 FOR ENLARGED PLANS
 4. REFER SHEETS A100a FOR DIMENSION PLAN
 5. NUMBER OF CLASSROOM STUDENT OCCUPANTS ARE BASED ON DEPARTMENT OF HUMAN SERVICES' 2022 LIMITS



1

OVERALL FLOOR PLAN
3/8" = 1'-0"





1

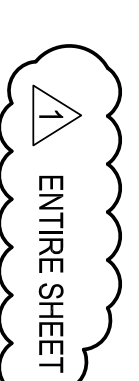
SLAB DEMOLITION PLAN

3/32" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO VISIT SITE PRIOR TO PREPARING BID, & VERIFY ALL ITEMS TO BE DEMOLISHED. ANY ADDITIONAL ITEMS REQUIRING DEMOLITION THAT ARE NOT INCLUDED IN THESE DOCUMENTS SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT AND INCLUDED IN THE BASE BID.
2. ALL SALVAGEABLE ITEMS TO REMAIN OWNERS' PROPERTY & SHALL BE STORED OR DISPOSED OF AS PER OWNERS' INSTRUCTIONS.
3. CONSTRUCTION SHALL MEET ALL APPLICABLE CODES, ORDINANCES, REGULATIONS & STANDARDS REQUIRED BY THE CITY OF MOORE, OKLAHOMA.
4. PROTECT EXISTING STRUCTURE TO REMAIN AS REQUIRED. PROTECT EXISTING CMU WALL TO REMAIN AS REQUIRED. PROTECT EXISTING EXTERIOR WALL TO REMAIN.

- DEMOLITION NOTES:**
- 1 - - - - - INDICATES EXISTING EDGE OF SLAB TO BE DEMOLISHED
 - AS REQUIRED FOR NEW UTILITIES
 - 2 - - - - - SAW CUT & REMOVE EXISTING CONCRETE FLOOR SLAB TO ALLOW FOR INSTALLATION OF NEW UNDERFLOOR CONDUIT, PLUMBING, ETC.





CG
drawn by
MA
checked by
OCTOBER 2024
title

revisions
ADDENDUM #1
ADDENDUM #4

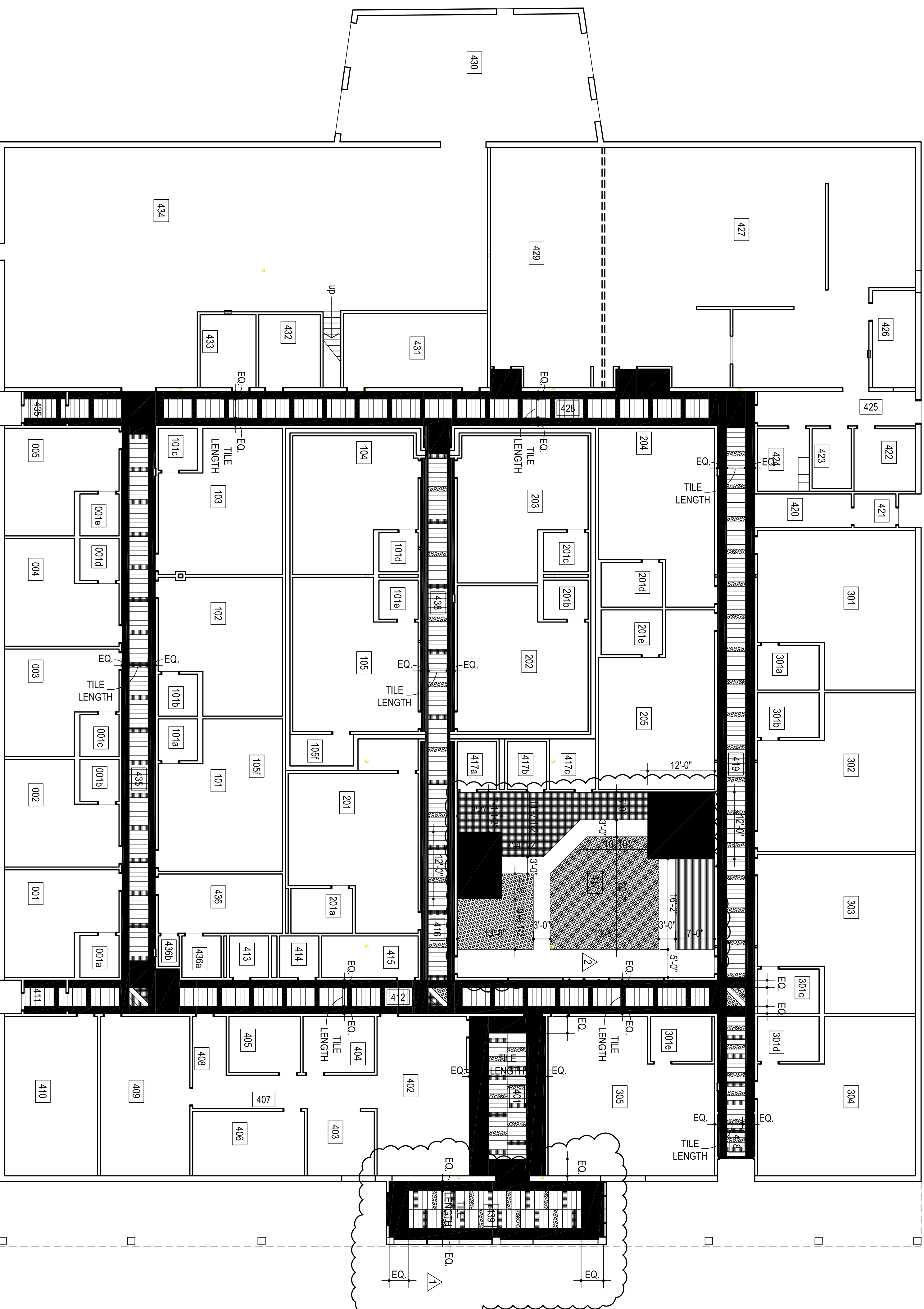


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Sheet no.:

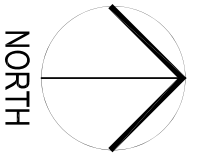
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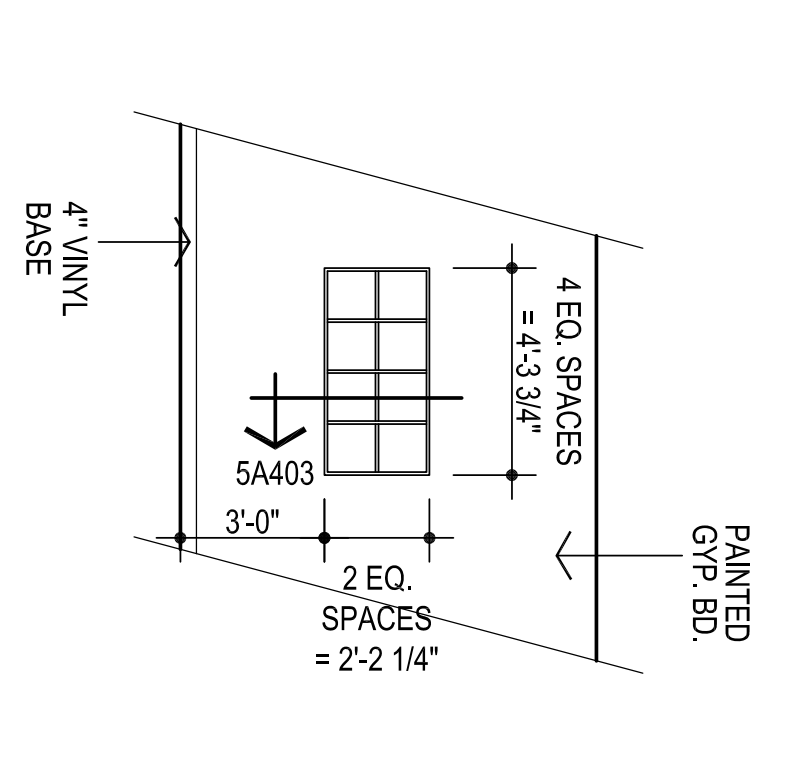
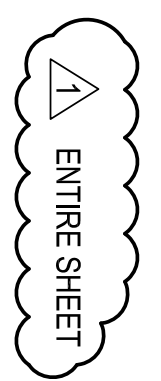


- LUXURY VINYL TILE LEGEND:
- INTERFACE LVT
STUDIO SET VOL. 2
COLOR - A00702 PEWTER (12)
 - INTERFACE LVT
STUDIO SET VOL. 2
COLOR - A00717 RED (13)
 - INTERFACE LVT
STUDIO SET VOL. 2
COLOR - A00716 ORANGE (13)
 - INTERFACE LVT
STUDIO SET VOL. 2
COLOR - A00714 YELLOW (13)
 - INTERFACE LVT
STUDIO SET VOL. 2
COLOR - A0021 ELECTRIC BLUE (13)
 - INTERFACE LVT
STUDIO SET VOL. 2
COLOR - A00701 SILVERLIGHT (13)

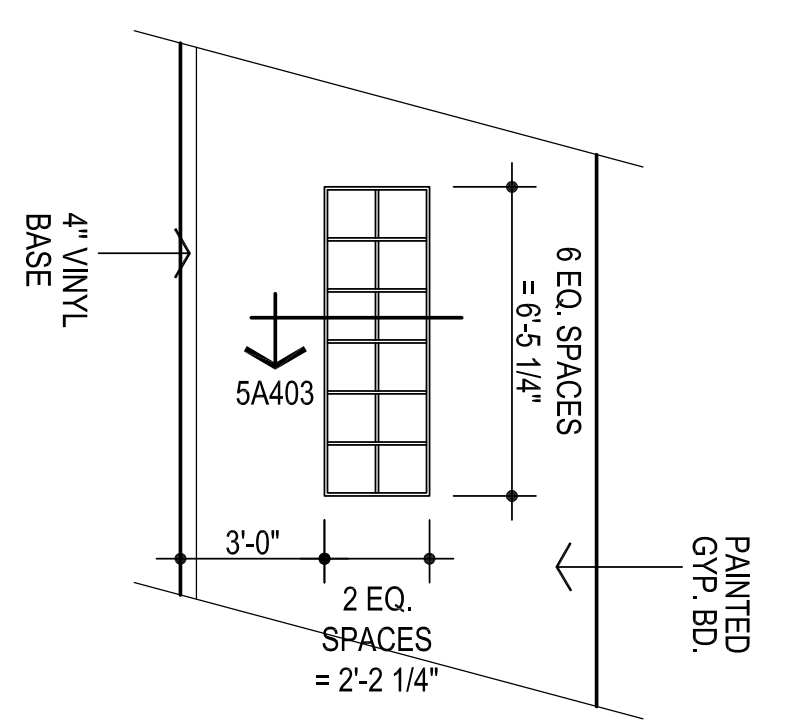
REFER TO ROOM FINISH SCHEDULE FOR ADDITIONAL LOCATIONS OF LVT



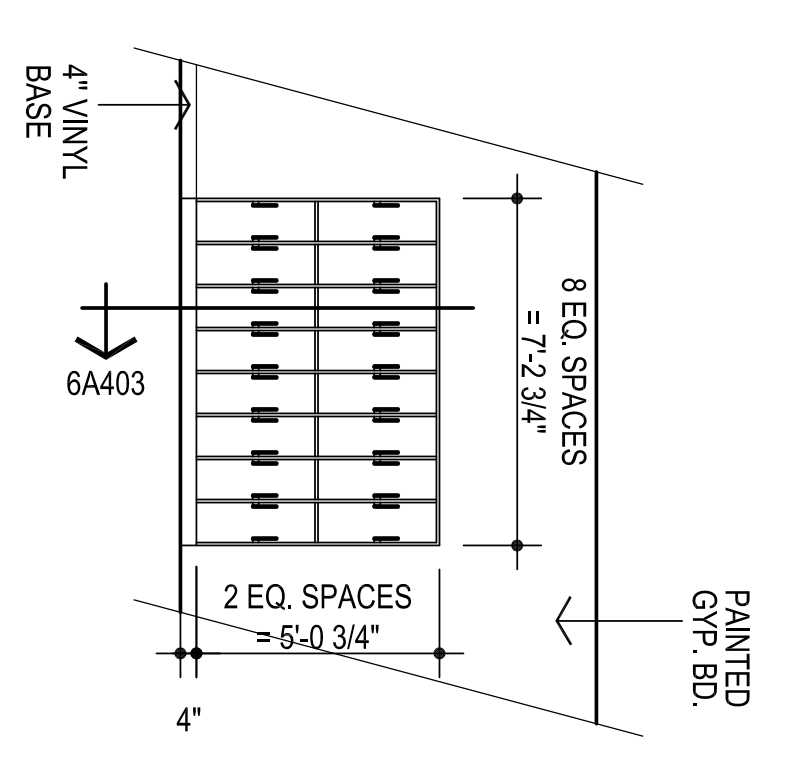
1
LVT DIMENSION / DESIGN PLAN
1/8" = 1'-0"



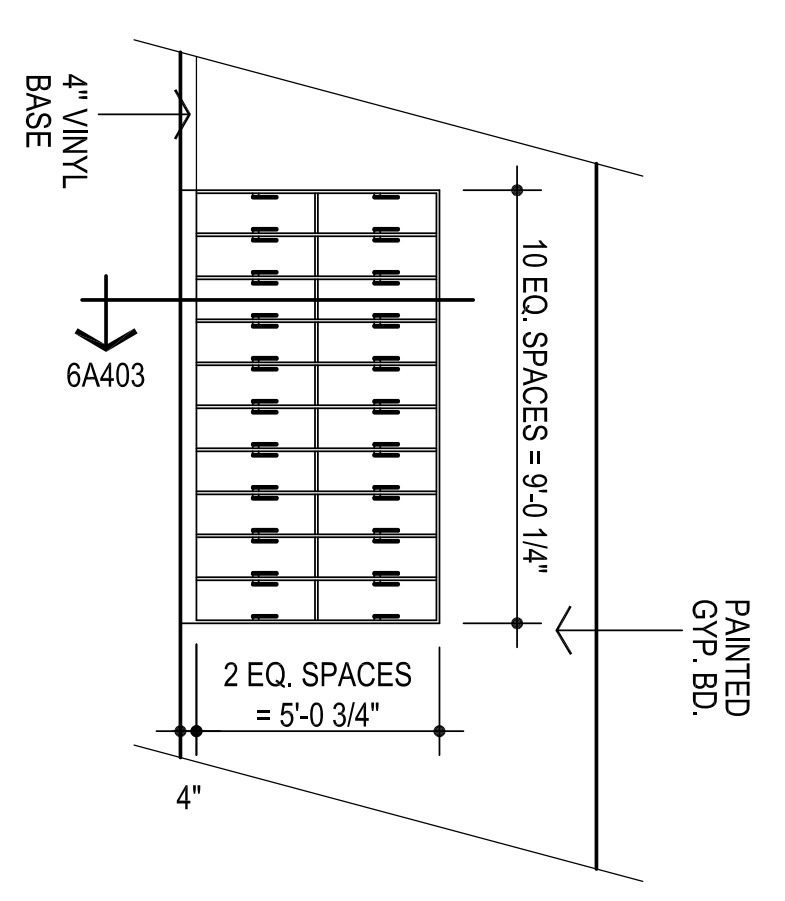
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TYP. 8 CUBBIE MILLWORK
1/4" = 1'-0"



2
TYP. 12 CUBBIE MILLWORK
1/4" = 1'-0"

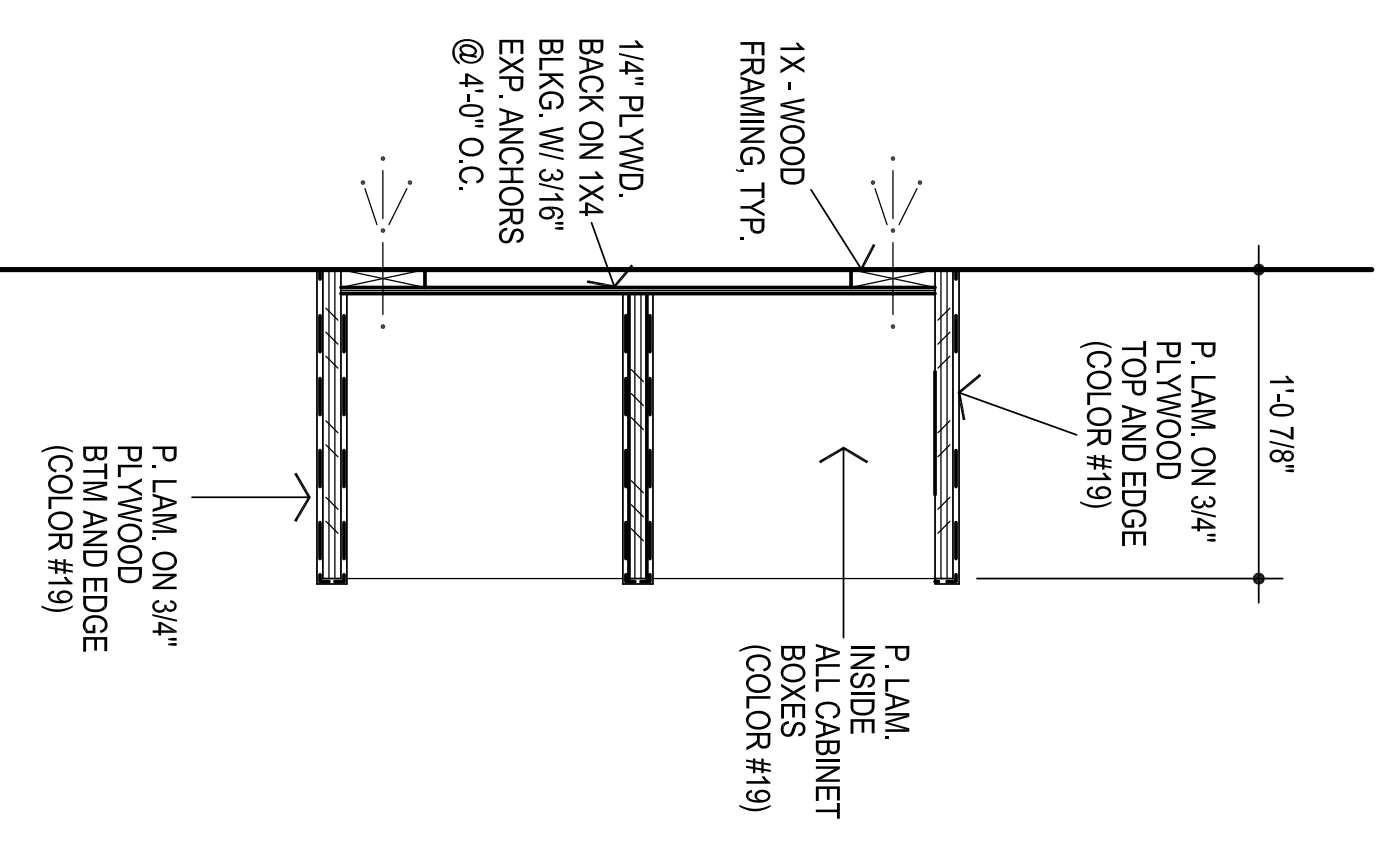


3
TYP. 16 LOCKER MILLWORK
1/4" = 1'-0"

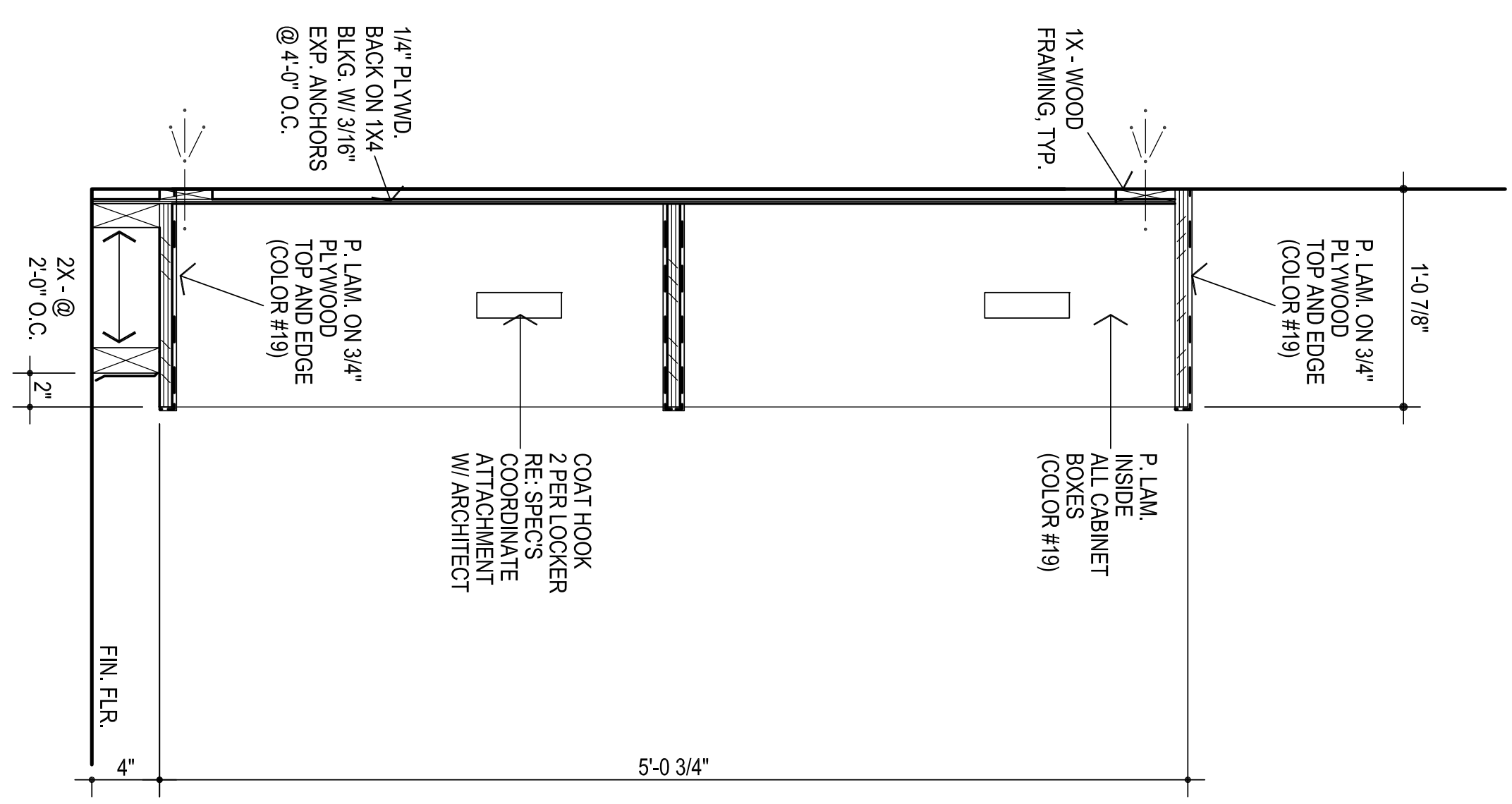


4
TYP. 20 LOCKER MILLWORK
1/4" = 1'-0"

NOTE: CONTRACTOR TO VERIFY THAT THE MOUNTING HEIGHTS & MINIMUM CLEARANCES OF ALL WALL MOUNTED FIXTURES (I.E. PLUMBING FIXTURES, GRAB BARS, MIRRORS, ETC.) MEET ALL APPLICABLE CODES & STANDARDS PRIOR TO INSTALLATION.



5
SECTION
1 1/2" = 1'-0"



6
SECTION
1 1/2" = 1'-0"



DC
drawn by
MA
checked by
OCTOBER 2024
date
revisions
ADDENDUM #1
ADDENDUM #4



CHILD CARE FACILITY
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PAINT:

- 1 GYP BOARD CEILINGS / EXPOSED STRUCTURE: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 2 WALLS - FIELD: SHERWIN-WILLIAMS - SW708 - ALABASTER
- 3 WALLS - @ SIDE & ABOVE DOORS WHERE INDICATED:
 - 39a DOORS 22, 24, 30, 31 & 57 - SW6868 REAL RED
 - 39b DOORS 26, 33, 34, 46 & 49 - SW6886 KNOCKOUT ORANGE
 - 39c DOORS 44, 50, 57, 72 & 75 - SW6903 CHEERFULL
 - 39d DOORS 62, 64, 68, 69 & 765 - SW6998 DYNAMIC BLUE
- 4 H.M. DOORS & FRAMES: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 5 MISCELLANEOUS METALS: SHERWIN-WILLIAMS - SW6992 - INKWEIL
- 6 WOOD DOORS & MILLWORK: ARCHITECTURAL WOOD DOORS - CLEAR CL07
- 7 EXPOSED STRUCTURE & UNDERSIDE OF DECK: SHERWIN-WILLIAMS - SW7006 - EXTRA WHITE
- 8 ACCEENT @ CORRIDORS: SW7073 DORIAN GRAY
- 9 EXTERIOR COLUMN COLORS:
 - 9a SW7006 EXTRA WHITE
 - 9b SW6992 INKWEIL
 - 9c SW6224 DIRECT GREEN
 - 9d SW6888 REAL RED
 - 9e SW6588 DYNAMIC BLUE
 - 9f SW6992 AFRICAN VIOLET
 - 9g SW6903 CHEERFULL

PREFINISHED COLORS:

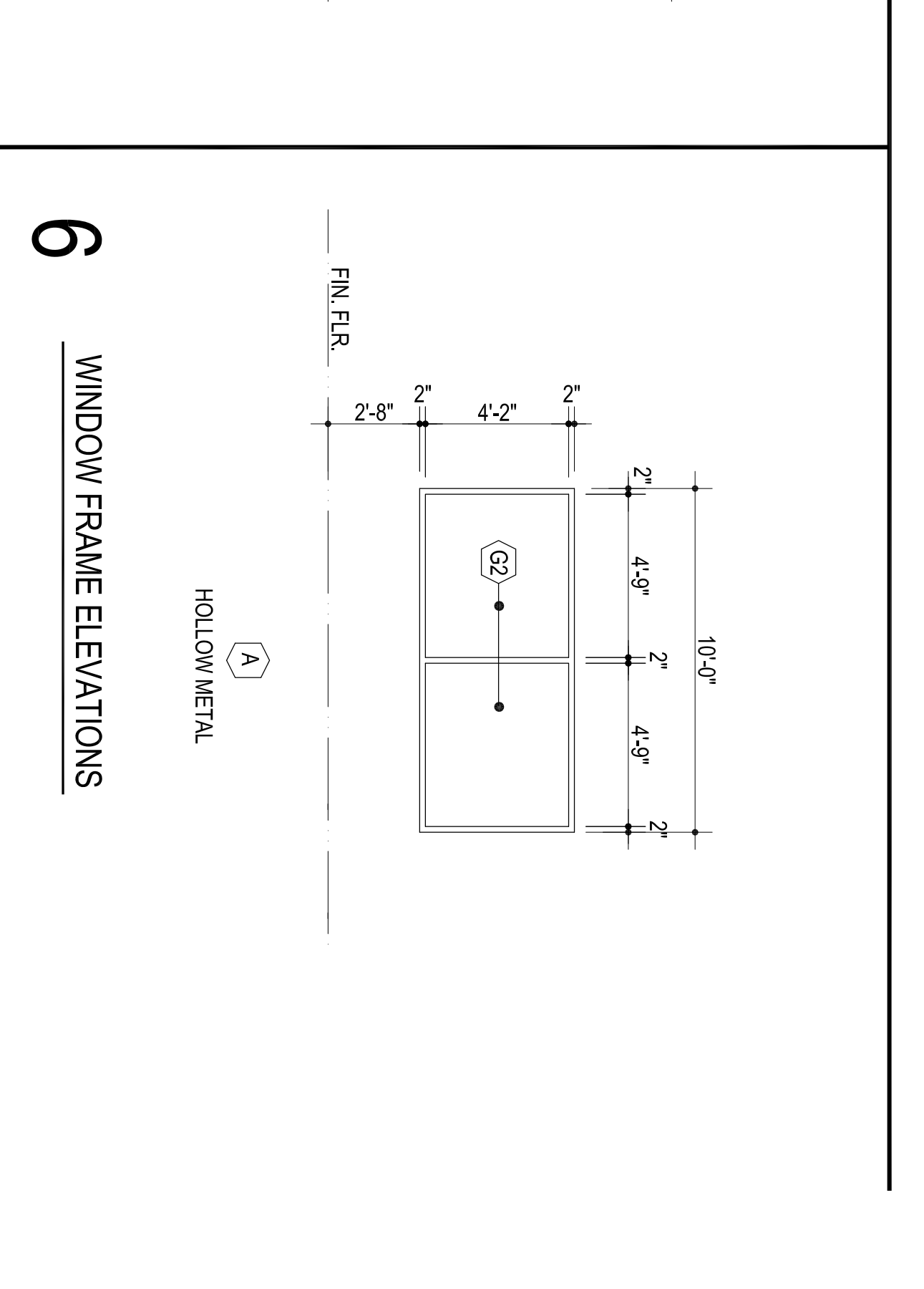
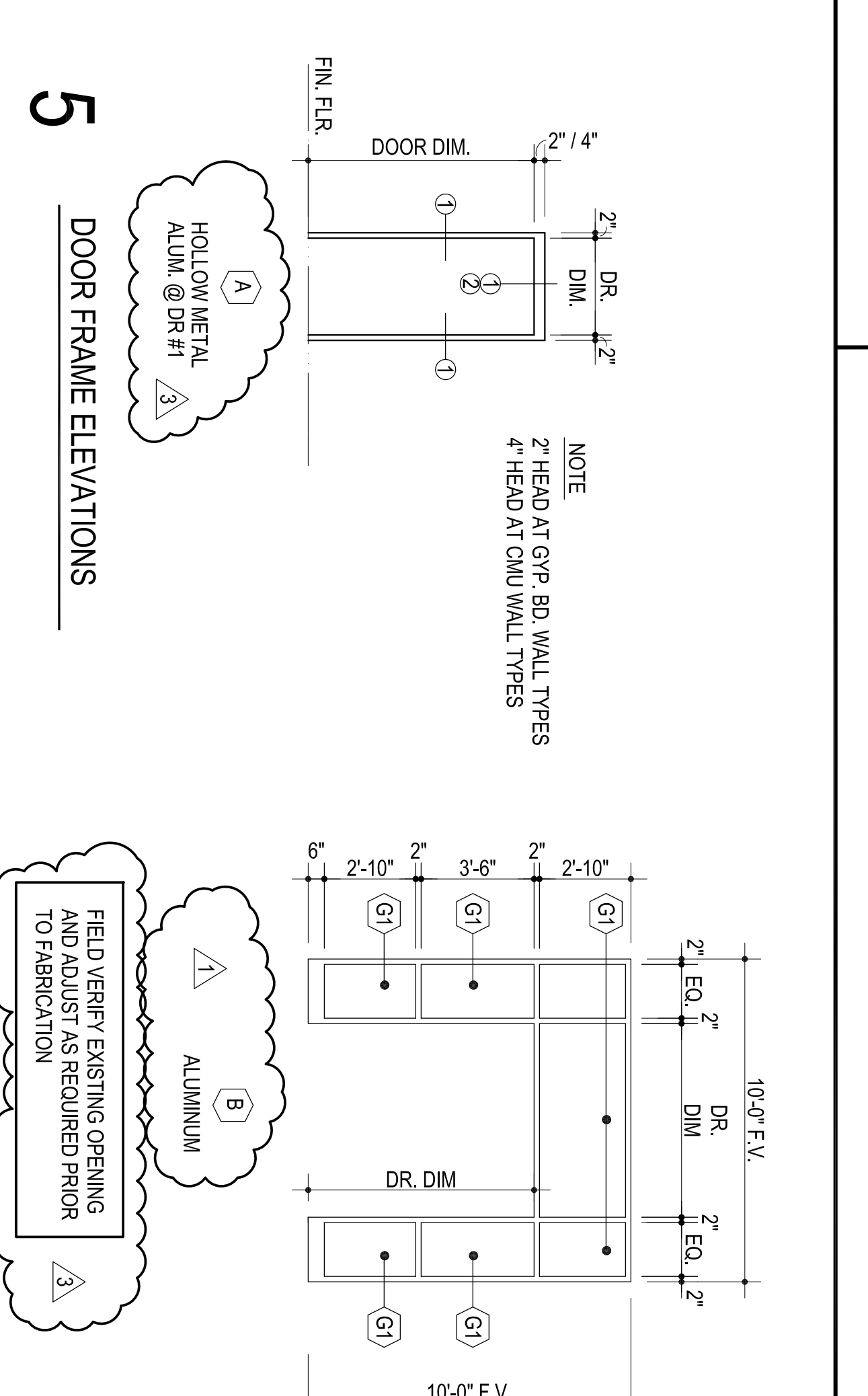
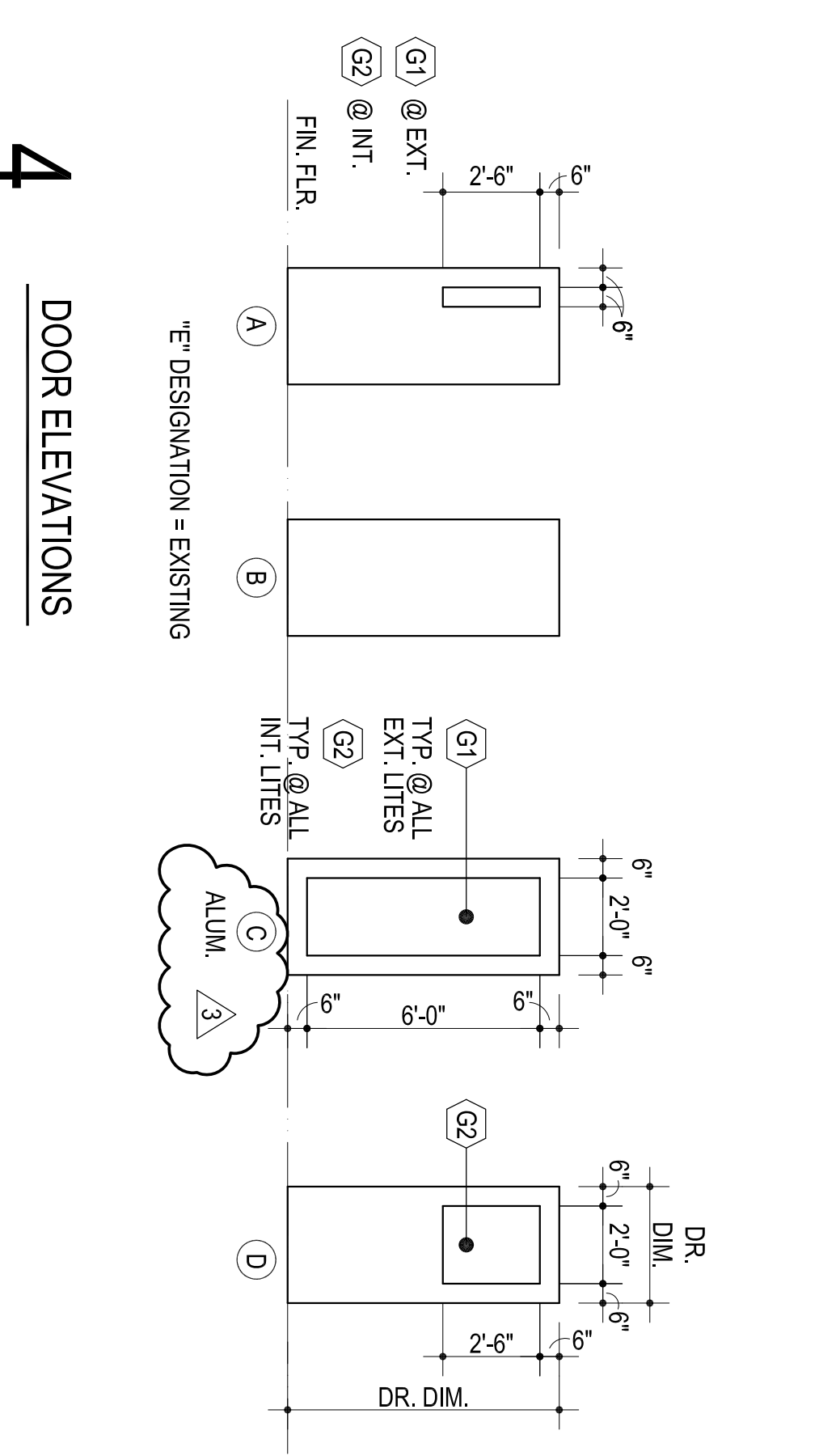
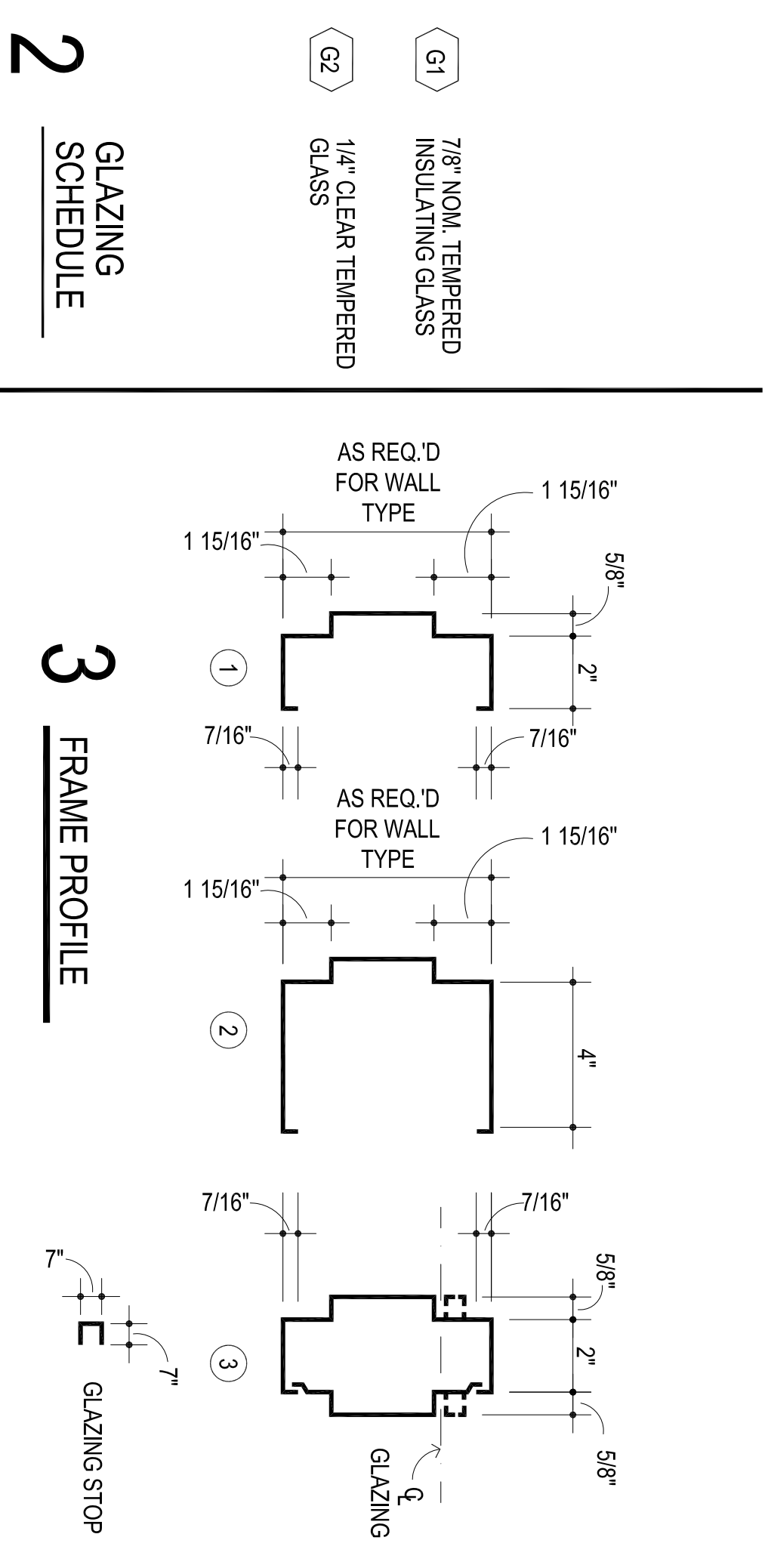
- 10 CARPET TILES: COLOR 'A': INTERFACE - COLOR 'B': INTERFACE -
- 11 RUBBER WALL BASE: ROPPE - 100 BLACK
- 12 LUXURY VINYL TILE COLOR: INTERFACE - A00702 PEWTER
- 13 LUXURY VINYL TILE ACCEENT COLOR:
 - 13a INTERFACE - A00717 RED
 - 13b INTERFACE - A00714 YELLOW
 - 13c INTERFACE - A00721 ELECTRIC BLUE
 - 13d INTERFACE - A00701 SILVERLIGHT
 - 13e INTERFACE - A00716 ORANGE
 - 13f INTERFACE - A00708 (11,26) 27

2 COLOR SCHEDULE

**COORDINATE ALL COLORS & THEIR
LOCATIONS, QUANTITIES, ETC. W/ THE
ARCHITECT PRIOR TO ACQUIRING MATERIALS**

DESCRIPTION	RM. NO.	FLOOR	BASE	CEILING	CLG. HT.	REMARKS	RM. NO.	WALLS	PAINT / COLOR SCHEDULE						
									WALLS					REMARKS	
								N	E	S	W				
CLASSROOM	001	LUXURY VINYL TILE CARPET TILE CERAMIC TILE EPOXY FLOORING EXPOSED CONCRETE W/ HARDENER	CERAMIC TILE RUBBER NONE	2 X 2 ACOUST. LAY-IN (TEG) 2 X 2 ACOUST. LAY-IN (SQ) GYP. BOARD EXPOSED STRUCTURE	9'-0"			CERAMIC TILE GYP. BOARD EXISTING	016						
TOILET	001a								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
TOILET	001b								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	001c								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	001d								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	001e								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
CLASSROOM	002								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	003								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	004								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	005								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	101								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
TOILET	101a								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	101b								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	101c								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	101d								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	101e								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
CLASSROOM	102								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	103								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	104								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	105								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	201								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
TOILET	201a								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	201b								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	201c								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	201d								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	201e								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
CLASSROOM	202								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	203								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	204								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	205								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	301								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
TOILET	301a								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	301b								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	301c								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	301d								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	301e								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
CLASSROOM	302								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	303								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	304								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	305								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
WAITING AREA RECEPTIONIST COPY	401 402 403								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
OFFICE	404								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
OFFICE	405								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
PRINCIPAL	406								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
CORRIDOR	407								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
CORRIDOR	408								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
CONFERENCE	409								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
BREAKROOM	410								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
VESTIBULE	411								(1) 21	(2) 21	(2) 21	(2) 21	(1) 21	(1) 21	(1) 21
CORRIDOR	412								(1) 21	(2) 21	(2) 21	(2) 21	(1) 21	(1) 21	(1) 21
TOILET	413								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	414								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
STORAGE	415								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
CORRIDOR	416								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
INDOOR PLAY AREA	417								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
TOILET	417a								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
TOILET	417b								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
STORAGE	417c								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
VESTIBULE	418								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
CORRIDOR	419								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
CORRIDOR	420								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
VESTIBULE	421								(1) 24	(2) 24	(2) 24	(2) 24	(1) 24	(1) 24	(1) 24
OFFICE	422								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
LOCKER ROOM	423								(1) 15	(1) 15	(1) 15	(1) 15	(1) 14	(1) 14	(1) 14
RECEIVING	424								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
DRY STORAGE	425								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
KITCHEN	426								(1) 28	(2) 28	(2) 28	(2) 28	(1) 28	(1) 28	(1) 28
CORRIDOR	427								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
CLASSROOM	428								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
CLASSROOM	429								(1) 23	(2) 23	(2) 23	(2) 23	(1) 23	(1) 23	(1) 23
RECEIVING	430								(1) 1	(2) 1	(2) 1	(2) 1	(1) 1	(1) 1	(1) 1
ELEC.	431								(1) 1	(2) 1	(2) 1	(2) 1	(1) 1	(1) 1	(1) 1
L.T. ELEC.	432								(1) 1	(2) 1	(2) 1	(2) 1	(1) 1	(1) 1	(1) 1
CUSTODIAN	433								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
MEP / STORAGE	434								(1) 2	(2) 2	(2) 2	(2) 2	(1) 2	(1) 2	(1) 2
VESTIBULE															

DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
1	401 EXT. C	A	ALUM.	3'-0"	7'-0"	1 3/4"	A	16A501	16A501	29A501	29A501	20 MIN. DR & FRAME	5
2	411 EXT. A	C	H.M.	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		7
3	412 411	←	←	←	←	←	←	4A501	16A501	11A501	11A501		10
4	435 EXT.	←	←	←	←	←	←	22A501	16A501	29A501	29A501		5
5	428 435	←	←	←	←	←	←	4A501	16A501	11A501	11A501		10
6	421 EXT.	←	←	←	←	←	←	22A501	16A501	29A501	29A501		5
7	420 421	←	←	←	←	←	←	4A501	16A501	11A501	11A501		10
8	418 EXT.	←	←	←	←	←	←	22A501	16A501	29A501	29A501		13
9	419 418	←	←	←	←	←	←	4A501	16A501	11A501	11A501		15
10	412 401	←	←	←	←	←	←	4A501	16A501	11A501	11A501		16
11	402 401	←	←	←	←	←	←	3A501	10A501	10A501	10A501		16
12	412 402	←	←	←	←	←	←	4A501	11A501	11A501	11A501		5
13	407 404	←	←	←	←	←	←	4A501	11A501	11A501	11A501		11
14	407 405	←	←	←	←	←	←	4A501	11A501	11A501	11A501		11
15	407 406	←	←	←	←	←	←	4A501	11A501	11A501	11A501		11
16	409 407	←	←	←	←	←	←	4A501	11A501	11A501	11A501		12
17	412 408	←	←	←	←	←	←	4A501	11A501	11A501	11A501		8
18	412 409	←	←	←	←	←	←	4A501	11A501	11A501	11A501		14
19	412 410	A	←	←	←	←	←	4A501	11A501	11A501	11A501		14
20	436 438a	B	←	←	←	←	←	3A501	10A501	10A501	10A501		2
21	435 436	A	←	←	←	←	←	4A501	11A501	11A501	11A501		14
22	435 001	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
23	001 001a	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
24	435 002	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
25	002 001b	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
26	435 101	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
27	101 101a	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
28	102 101b	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
29	003 101c	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
30	435 003	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
31	435 004	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
32	004 001d	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
33	435 102	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
34	435 103	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
35	005 001e	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
36	103 101c	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
37	435 005	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
38	428 434	B	←	←	←	←	←	2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	3
39	428 433	B	←	←	←	←	←	2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
40	428 432	B	←	←	←	←	←	2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
41	428 431	B	←	←	←	←	←	2A501	9A501	9A501	9A501	20 MIN. DR & FRAME	4
42	429 428	A	←	←	←	←	←	4A501	11A501	11A501	11A501		9
43	428 436	B	←	←	←	←	←	19A501	16A501	20A501	20A501	TORNADO DOOR & FRAME	11
44	436 203	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
45	203 201c	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
46	436 104	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
47	104 201d	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
48	105 201e	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
49	436 105	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
50	436 202	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
51	202 201b	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
52	436 416	B	←	←	←	←	←	19A501	20A501	20A501	20A501	TORNADO DOOR & FRAME	11
53	417 417a	B	←	←	←	←	←	4A501	11A501	11A501	11A501		12
54	417 417b	B	←	←	←	←	←	4A501	11A501	11A501	11A501		12
55	417 417c	B	←	←	←	←	←	4A501	11A501	11A501	11A501		12
56	416 417	A	←	←	←	←	←	4A501	11A501	11A501	11A501		9
57	416 201	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
58	201 201a	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
59	412 413	B	←	←	←	←	←	4A501	11A501	11A501	11A501		2
60	412 414	B	←	←	←	←	←	4A501	11A501	11A501	11A501		2
61	415 412	B	←	←	←	←	←	4A501	11A501	11A501	11A501		4
62	412 305	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
63	305 301e	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
64	419 304	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
65	304 301d	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
66	303 301c	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
67	419 417	A	←	←	←	←	←	4A501	11A501	11A501	11A501		9
68	419 303	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
69	419 302	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
70	302 301b	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
71	301 301a	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
72	419 205	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
73	205 201e	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
74	204 201d	B	←	←	←	←	←	3A501	10A501	10A501	10A501		12
75	419 204	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
76	419 301	D	←	←	←	←	←	4A501	11A501	11A501	11A501		9
77	419 425	B	←	←	←	←	←	4A501	16A501	11A501	11A501		9
78	NUMBER NOT USED							NUMBER NOT USED					
79	425 424	B	←	←	←	←	←	4A501	16A501	11A501	11A501		2
80	425 423	B	←	←	←	←	←	4A501	16A501	11A501	11A501		2
81	425 422	A	←	←	←	←	←	4A501	16A501	11A501	11A501		11
82	427 426	B	←	←	←	←	←	4A501	16A501	11A501	11A501		6
83	425 EXT.	B	←	←	←	←	←	1A501	15A501	8A501	8A501	8" GIP BD. WALL ADJUST FRAME AS REQUIRED	5
84	438d 436	B	←	←	←	←	←	1A501	16A501	11A501	11A501		12
85	105g 201	B	←	←	←	←	←	4A501	16A501	11A501	11A501		6



1 DOOR SCHEDULE

DOOR NO.	LOCATION FROM TO	DOOR ELEV.	DOOR MATL	DOOR SIZE			FRAME ELEV.	DOOR DETAILS			REMARKS	HWDR. SET NO.	
				WIDTH	HEIGHT	TH-K		HEAD	SILL	JAMB			
86	105f 105	B	WD	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		6
87	439 EXT.	C	ALUM	PR. 3'-0"	7'-0"	1 3/4"	B	17A501	15A501				1
88	427 428	A	WD	3'-0"	7'-0"	1 3/4"	A	4A501	16A501	11A501	11A501		9
89	431 428	B	WD	3'-0"	7'-0"	1 3/4"	A	2A501	16A501	9A501	9A501		4

Sheet No.: **A602**

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CHILD CARE FACILITY
201 N. EASTERN AVE.

MOORE
PUBLIC SCHOOLS

Revisions:
A ADDENDUM #1
B ADDENDUM #2
C ADDENDUM #4

CG
drawn by
MA
checked by
SEPTEMBER 2024
date

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Addendum #5 (ADD5) MPS Child Care Center 12/18/2024

- 1.) Bid package #1 Demo/Sitework is **not** a biddable package and has been removed from the bid process.