

**MOORE PUBLIC SCHOOLS  
MOORE WEST JUNIOR HIGH SCHOOL  
LOCKER ROOM ADDITION**

**INDEPENDENT DISTRICT NO. 2  
CLEVELAND COUNTY, MOORE, OKLAHOMA**

**9400 SOUTH PENNSYLVANIA  
OKLAHOMA CITY, OKLAHOMA 73170**

**PROJECT MANUAL**

**MAY 2023**

**AGP** | the Abla Griffin  
Partnership



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NOT USED

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NOT USED

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NOT USED

## 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 **Locker Room Addition at Moore West Junior High School** - to be located at 9400 South Pennsylvania, Oklahoma City, OK - **within 240 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. Owners 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 B.1 and B.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. Contractor 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. Shop drawings and samples shall be dated and marked to show the names of the Project, Architect, Contractor, 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.
- D. If materials or specified items other than those specified in these Contract Documents are supplied - and approved by the Architect - it shall be the Contractor'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 time keepers, watchmen and clerks, hand tools, incidentals, general office expense, and all other expenses not included in "cost".
- B. Subcontractor 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, DVD, flash drive, memory stick, etc.). 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 contractor shall engage all testing laboratories / subcontractors as approved by the Architect; and, pay for ALL testing as required by the drawings and specifications.** The Contractor 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 Contractor 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 insure 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 Contractor 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 deems special inspection necessary, provide assistance and facilities that will expedite his inspection.

**Contractor shall be responsible for obtaining and paying for ALL building permits required for this project. This cost shall be included in the Contractor'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. CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS

Conflicts between the drawings and specifications shall be brought to the immediate attention of the Architect. Failure to bid item(s) noted on the drawings and omitted from the specifications **does not** remove responsibility from the Construction Manager and applicable Subcontractor(s) to provide and install such with no additional cost to the Owner.

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 a portion of the Contract Documents shall not absolve the construction manager or subcontractor of the requirement to perform the work of their respective disciplines and/or trade.

F. 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.

G. 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.

H. COMPLIANCE WITH STATE AND FEDERAL LAWS

Contractor 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 to. Contractor agrees to furnish Owner, upon request, a certificate or other evidence of compliance therewith.

I. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (OSHA)

The Contractor shall comply with the latest edition and revision of The Federal Occupational Safety and Health Act of 1970 for construction.

J. GUARANTY BONDS

1. Prior to the Owner signing the contract agreement, he will require the Contractor 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 Contractor shall include in his proposal amount the total premiums for all required bonds.
4. Unless noted otherwise, 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 West Junior High School Locker Room Addition - Moore Public Schools.
  - 2. Location: 9400 South Pennsylvania, Oklahoma City, Oklahoma 73170.

##### 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 a new locker room addition including new sidewalks 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 Coordinator  
Moore Public Schools  
1500 SE 4<sup>th</sup> Street  
Moore, OK 73160  
405-735-4221
- C. Design Team:
  - 1. Architect:  
AGP  
201 N. Broadway, Suite 210  
Moore, OK 73160  
405-735-3477
  - 2. Structural Engineer:  
WDB Engineering, PLLC  
6330 SE 74<sup>th</sup> Street  
Oklahoma City, OK 73135  
405-741-7090

## DIVISION 1 - GENERAL REQUIREMENTS

### SECTION 01010-SUMMARY OF THE WORK

- D. Construction Management Team:
  - 1. Construction Manager's Representative:  
Joe Sherga, Project Manager  
Omni Construction, LLC  
1909 South Eastern Avenue  
Moore, OK 73160  
405-735-3992
- 1.04 Work to be Provided and Installed By Others:
  - A. Provision and installation of furniture.
- 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 shall at all times protect the building from damage from rainwater.
  - B. Contractor shall provide barricades and clearly mark work zone areas.
  - C. Refer to Special Conditions "Temporary Services" for additional information.
  - D. During the period of construction, the OSHA Standards shall be followed as applicable by law.
  - E. 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.
      - 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

## DIVISION 1 - GENERAL REQUIREMENTS

### SECTION 01010-SUMMARY OF THE WORK

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. Three (3) 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 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

## **DIVISION 1 - GENERAL REQUIREMENTS**

### **SECTION 01010-SUMMARY OF THE WORK**

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: Not applicable.

**End of Section**

## 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; complete demolition of the existing curbs as necessary to construct new entry driveways; removal of existing trees; and all 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



## DIVISION 2 - SITE WORK

### SECTION 02050 - DEMOLITION

- may be caused thereby to any part or parts of existing streets, 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

**DIVISION 2 - SITE WORK**

**SECTION 02050 - DEMOLITION**

Contractor off the Owner=s premises and credit for the 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 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

## DIVISION 2 - SITE WORK

### SECTION 02200 - EARTHWORK

- backfilling.
- B. Top Soil: Material shall be native, fertile, neutral top soil of loamy character, free from heavy clay, coarse sand, stones, 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 in all directions until concrete is placed and has set.
- B. Footings:
  - 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



## DIVISION 2 - SITE WORK

### SECTION 02200 - EARTHWORK

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 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 Structural Drawings concerning additional preparation procedures.** The proposed

## DIVISION 2 - SITE WORK

### SECTION 02200 - EARTHWORK

subgrade area shall extend beyond the building footprint a minimum of five feet laterally (5'-0"). After performing the required stripping and excavating, proofroll proposed area 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 as per Structural instructions. Scarify existing soil at base of fill to 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.

**DIVISION 2 - SITE WORK**

**SECTION 02200 - EARTHWORK**

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 topsoil.
- 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.

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		90	

3.07 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 2 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 2 tests per layer.

## DIVISION 2 - SITE WORK

### SECTION 02200 - EARTHWORK

#### 3.08 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 8" 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 topsoil. 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).
  - C. **Testing: All required tests, and their fees, shall be the**

## DIVISION 2 - SITE WORK

### SECTION 02202 - EARTHWORK FOR UTILITIES

**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 un-stratified 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 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

DIVISION 2 - SITE WORK

SECTION 02202 - EARTHWORK FOR UTILITIES

for use as shoring and bracing.

1.08 Minimum Burial Depths:

- A. Water Lines: refer to Drawings.
- B. Sewer Lines: refer to 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 of overcut shall be crushed stone. Bedding shall be GW.
2. Metallic Water Service Line Pipe (Steel, Copper Tube).	AWWA C600

## DIVISION 2 - SITE WORK

### SECTION 02202 - EARTHWORK FOR UTILITIES

- |    |   |  |
|----|---|--|
| 3. | Polyethylene (PE) Pressure              | ASTM D2774, except bedding pipe, 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 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



## DIVISION 2 - SITE WORK

### SECTION 02202 - EARTHWORK FOR UTILITIES

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 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

## DIVISION 2 - SITE WORK

### SECTION 02202 - EARTHWORK FOR UTILITIES

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.**

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.

## DIVISION 2 - SITE WORK

### SECTION 02202 - EARTHWORK FOR UTILITIES

- 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 D1556 or ASTM D2922 and ASTM D3017 as follows: one test per 100 lineal feet in each lift.

**End of Section**

## DIVISION 2 - SITE WORK

### SECTION 02280 - SOIL TREATMENT

#### 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. Soil shall be treated by an established, licensed pest control firm thoroughly familiar with local soils and chemicals.
- B. Contractor shall submit documentation for type of treatment to be used to the Architect for approval prior to commencing the work covered by this section.

##### 1.03 Product Delivery, Storage and Handling:

- A. Precaution: Soil Termite Control is a toxic by ingestion, absorption through the skin, or inhalation and absorption through the respiratory tract. Strict adherence to the instructions printed by the manufacturer on the labeled containers shall be maintained while handling, mixing, and applying this material. Refer to label on containers for antidote and first aid. Erect and maintain suitable warning signs or barriers while application is underway and until treated surfaces are covered by new construction or soil fill.

#### Part 2 - Products

##### 2.01 Materials:

- A. Soil Termite Control:
  - 1. Use working solutions containing any one of the following emulsion soil chemicals at the listed minimum concentrations:
    - a. Premise 75, Bayer 0.1% concentrate

#### Part 3 - Execution

##### 3.01 General:

- A. All stumps, roots, fallen timber and other wood or wood products shall be removed from foundation area before treatment.
- B. To avoid surface flow of the chemical from the treated area, treatments shall not be made when the soil or fill is excessively wet or immediately after heavy rains.
- C. When treating under slabs, care shall be taken not to disturb perimeter excavations.

##### 3.02 Installation - based on 0.1% dilution:

- A. Under Concrete Slab: Apply solution at the rate of one gallon per 10 sq. ft. of fill. Apply two gallon per 5 lin. ft. under

**DIVISION 2 - SITE WORK**

**SECTION 02280 - SOIL TREATMENT**

foundation beams and at all plumbing risers.

- B. Adjacent to concrete slabs: Provide a maximum 8" deep trench continuous at perimeter of slab and apply solution at the rate of one gallon per 5 lin. ft. of trench. Fill trench with soil and repeat application of solution at the rate of one gallon per 5 lin. ft. Cover final application with top soil.

**End of Section**

## DIVISION 2 - SITE WORK

### 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. 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 40 degrees Fahrenheit nor when temperature of the surface on

## DIVISION 2 - SITE WORK

### SECTION 02500 - PAVING AND SURFACING

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 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.

##### 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 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. 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.

###### B. Adjoining Paving: where new work adjoins existing, warp carefully to flush surface, with seal over joint.

###### C. Construction Joints: As noted on the Drawings or as directed by the Architect:

1. At joints, thoroughly clean surfaces and remove all

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- laitance.
2. In addition, vertical surfaces shall be thoroughly wetted and coated with cement grout before placing new concrete.
- D. 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.
- E. Control Joints: Provide scored lines and weak plane joints on exterior and interior concrete slabs as indicated on the Drawings, and as approved by the Architect. Fill with sealant.
- F. Finishes:
1. Concrete Walks:
    - 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.
- G. Repair any damage to finished pavement surfaces that may result from subsequent construction to a smooth, true, and uniform surface.
- H. 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.
- I. 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.

**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

## DIVISION 2 - SITE WORK

### SECTION 02900 - TURF ESTABLISHMENT

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

## DIVISION 2 - SITE WORK

### SECTION 02900 - TURF ESTABLISHMENT

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,

## DIVISION 2 - SITE WORK

### SECTION 02900 - TURF ESTABLISHMENT

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**

## DIVISION 2 - SITE WORK

### 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:

## DIVISION 2 - SITE WORK

### SECTION 02910 - TEMPORARY EROSION CONTROL

- |  |                     |
|--|---------------------|
| 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

## DIVISION 2 - SITE WORK

### SECTION 02910 - TEMPORARY EROSION CONTROL

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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### SECTION 02910 - TEMPORARY EROSION CONTROL

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.



## DIVISION 2 - SITE WORK

### SECTION 02910 - TEMPORARY EROSION CONTROL

1. Good Housekeeping:  
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, manufacturer's, 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

## DIVISION 2 - SITE WORK

### SECTION 02910 - TEMPORARY EROSION CONTROL

a covered shed. The contents of any partially used 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.

DIVISION 2 - SITE WORK

SECTION 02920 - LANDSCAPE GRADING

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. Section 07900 - 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.
- Q. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

## DIVISION 3 - CONCRETE

### SECTION 03300 - CAST-IN-PLACE 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.
- B. Hot Weather: Hot weather is any combination of the following conditions that tends to impair the quality of

## DIVISION 3 - CONCRETE

### SECTION 03300 - CAST-IN-PLACE CONCRETE

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.
- D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless

## DIVISION 3 - CONCRETE

### SECTION 03300 - CAST-IN-PLACE CONCRETE

manufacturer's representative is present for placement as required by the manufacturer's warranty.

#### 1.07 Warranty

- A. 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.

#### 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.



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- 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.
  - E. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed

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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](http://www.barrierone.com/#sle).
  - b. Substitutions: Substitutions shall comply with the use of concrete staining/dye products.

#### 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-redisersable 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](http://www.euclidchemical.com/#sle).
- b. SpecChem, LLC; SpecFilm Concentrate or SpecFilm:  
[www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
- c. W. R. Meadows, Inc ; Evapre or Evapre-RTU:  
[www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- d. Substitutions: as approved by Architect.

#### 2.08 Curing Materials

- A. Moisture-Retaining Sheet: ASTM C171.

1. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.

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- 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.
    - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.

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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 accurately placed, positioned securely, and will not interfere with concrete placement.

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#### 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.

#### 3.06 Floor Flatness And Levelness Tolerances

- A. An independent testing agency, as specified in Section 01

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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 blackburnish 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.
- E. In areas with floor drains, maintain floor elevation at

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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



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concrete is identified.

- 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 4 - MASONRY

### SECTION 04810 - UNIT MASONRY ASSEMBLIES

#### PART 1 - GENERAL

##### 1.01 Related Documents:

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

##### 1.02 Summary

- A. Section Includes:
  - 1. Concrete block.
  - 2. Mortar and grout.
  - 3. Reinforcement and anchorage.
  - 4. Lintels.
  - 5. Accessories.

##### 1.03 Related Sections:

- A. Section 05500 - Metal Fabrications: Loose steel lintels and fabricated steel items.
- B. Section 07900 - Joint Sealers: Backing rod and sealant at control and expansion joints.

##### 1.04 References:

- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International; 2008.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM A 82/A 82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2005a.
- D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- E. ASTM C 129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2006.
- F. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar; 2004.
- G. ASTM C 150 - Standard Specification for Portland Cement; 2005.
- H. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006.
- I. ASTM C 270 - Standard Specification for Mortar for Unit Masonry; 2007.
- J. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout; 2006.
- K. ASTM C 476 - Standard Specification for Grout for Masonry; 2002.

##### 1.05 Submittals:

- A. Product Data: Provide data for masonry units, mortar, and

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- masonry accessories.
- B. Samples: Submit 10 samples of facing brick units to illustrate color, texture, and extremes of color range.
- 1.06 Quality Assurance:
  - A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents
- 1.07 Pre-Installation Meeting:
  - A. Convene one week before starting work of this section.
- 1.08 Delivery, Storage, and Handling:
  - A. Deliver, handle, and store masonry materials by means that will prevent mechanical damage and contamination by other materials.
- 1.09 Project Conditions:
  - A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
    - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
  - C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

### PART 2 - PRODUCTS

- 2.01 Concrete Masonry Units:
  - A. Type: Lightweight (Standard Modular Sizes).
  - B. Quality: ASTM C-90, Type 1, Grade N, steam cured for a minimum of 8 hours at 350 degrees Fahrenheit under 150 psi. CMU shall be made by the Johnson CO 2 or Autoclave method. Other methods shall have approval by the Architect.
  - C. Face Dimension: As indicated on the drawings.
  - D. Thickness: As indicated on the drawings.
  - E. Shapes: Provide all shapes as shown on the drawings or others as required.
  - F. Units shall be uniform in all dimensions and texture,

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straight and free from cracks, spalls and other defects.

#### 2.02 Mortar and Grout Materials:

- A. Portland Cement: ASTM C 150, Type I.
  - 1. Hydrated Lime: ASTM C 207, Type S.
  - 2. Mortar Aggregate: ASTM C 144.
  - 3. Grout Aggregate: ASTM C 404.
- B. Water: Clean and potable.

#### 2.03 Reinforcement and Anchorage:

- A. Manufacturers of Joint Reinforcement and Anchors:
  - 1. Dur-O-Wal: [www.dur-o-wal.com](http://www.dur-o-wal.com).
  - 2. Hohmann & Barnard, Inc: [www.h-b.com](http://www.h-b.com).
  - 3. Masonry Reinforcing Corporation of America: [www.wirebond.com](http://www.wirebond.com).
  - 4. Substitutions: as approved by Architect / Engineer.
- B. Reinforcing Steel: ASTM A 615/A 615M Grade 40 (280) deformed billet bars; galvanized.
- C. Single Wythe Joint Reinforcement: Truss type; ASTM A 82/A 82M steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- D. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
- E. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
  - 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
  - 2. Wire ties: Triangular shape, 0.1875 inch thick.
  - 3. Vertical adjustment: Not less than 3-1/2 inches.

#### 2.04 Flashings:

- A. Metal Flashing Materials: Galvanized Steel if applicable.

#### 2.05 Accessories:

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35%; formulated from neoprene, urethane or PVC.
- C. Bond Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type 1 (No. 15 asphalt

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- felt).
- D. Weeps: Free-draining mesh made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe.
    - 1. Manufacturers:
      - a. Mortar Net USA, Ltd; Product - Mortar Net Weep Vents: [www.martarnet.com](http://www.martarnet.com)
      - b. Substitutions: as approved by Architect / Engineer.
  - E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- 2.06 Mortar and Grout Mixes:
- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds or other admixtures, unless otherwise indicated.
    - 1. Do not use calcium chloride in mortar or grout.
    - 2. Limit cementitious materials in mortar to portland cement and lime.
  - B. Mortar for Unit Masonry: ASTM C 270, using the Proportion Specification.
    - 1. All masonry: Type S.
      - a. Portland Cement Mixture: One part Grey Portland Cement; 1/4 to 1/2 part lime; sand, not less than 2-1/4 and not more than three times the sum of the volumes of cement and lime used, measured in damp, loose conditions.
      - b. Mortar color at exterior face brick to be selected by Architect to match 2018 Field House building on campus.**
  - C. Grout for Unit Masonry: Comply with ASTM C 476.
    - 1. Use grout of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
    - 2. Provide grout with a slump of 8 to 11 inches as measure according to ASTM C 143/C 143M.
  - D. Mortar Mixing
    - 1. All mortars shall be machine mixed in equipment that is free of dirt, oil or grease and which is thoroughly cleaned and rinsed after each day's use. Mix no more mortar than can be used before setting takes place.
    - 2. Mortars shall be mixed placing all dry ingredients in the mixer first and mixing until uniform in color. Then mixed for 3 to 5 minutes with the maximum amount of water to provide workable consistency.

## DIVISION 4 - MASONRY

### SECTION 04810 - UNIT MASONRY ASSEMBLIES

3. No add-mixtures shall be used at any time in the mortar on this project, unless approved in writing by the Engineer.
4. Construct one or two wooden boxes 12"x12"x6" deep and use them to measure the sand required in a batch. Add the cement or lime by the bag. Then add water, measuring by pail. When the desired consistency of mix is determined, mark the level of the mortar in the mixing drum. Use that as the mark for later batches when sand will be added by the shovel full. Repeat the measuring process halfway through the day or whenever the inspector requests it.
5. Testing: General Contractor will observe a minimum of three (3) observed mixing sessions to verify that the quantities are being mixed as described in the proportions paragraph for Type "S" mortar.

### PART 3 - EXECUTION

#### 3.01 Examination:

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

#### 3.02 Erection:

- A. Construction Requirements (Masonry Being Worked On)
  1. Air Temperature 40 F to 32 F: Heat sand or mixing water to minimum of 70 F and maximum of 160 F.
  2. Air Temperature 32 F to 25 F: Heat sand and mixing water to minimum of 70 F and maximum of 160 F.
  3. Air Temperature 25 F to 20 F: Heat sand and mixing water to minimum of 70 F and maximum of 160 F. Use salamanders or other sources of heat on both sides of walls under construction. Employ windbreaks when wind is in excess of 15 mph.
  4. Air Temperature 20 F and Below: Heat sand and mixing water to minimum of 70 F and maximum of 160 F. Provide enclosure and auxiliary heat to maintain air temperature above 32 F. Temperature of units when laid shall be not less than 20 F.
- B. Protection Requirements (Completed Masonry or Sections Not Being Worked On)
  1. Mean Daily Air Temperature 40 F to 32 F: Protect

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### SECTION 04810 - UNIT MASONRY ASSEMBLIES

- masonry from rain or snow for 24 hrs.
2. Mean Daily Air Temperature 32 F to 25 F: Completely cover masonry for 24 hrs.
  3. Mean Daily Air Temperature 25 F to 20 F: Completely cover masonry with insulating blankets for 24 hrs.
  4. Mean Daily Air Temperature 20 F and Below: Maintain masonry temperature above 32 F for 24 hrs. by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps or other approved method.
- C. No masonry shall be laid when the ambient temperature is below 40 degrees F. All masonry shall be laid plumb, true to line and level, with accurately spaced courses, with each course breaking joints with the course below, unless noted otherwise on the drawings. A story pole and template shall be used, and work checked with a surveying instrument to maintain level coursing.
- D. Work required to be built into masonry, including anchors, frames, bolts, sleeves, inserts, compressible fillers, expansion joints and flashing shall be built in as erection progresses. Concrete block into which anchor bolts will be installed shall be filled solid with mortar.
- E. Laying Out Block Work: All concrete block work shall be laid out with uniform joints approximately 3/8" thick and shall be bonded at corners where possible and as consistent with good appearance. Where cutting is required, the cuts shall be made symmetrical above openings and as a general rule with no cuts less than 4" with power equipment designed for purpose.
- F. Corners shall be made using half blocks in order to maintain head joints centered over block in adjoining courses above and below. Where intersecting masonry partitions occur, galvanized Durowall Joint Reinforcing shall be used at every 2<sup>nd</sup> course.
1. Concrete blocks shall be laid dry in a full bed of mortar and ends buttered on both edges. Care shall be used to prevent smearing mortar on exposed faces of the blocks and such accumulations that occur shall be removed immediately. The exposed face of blocks shall be wiped clean with burlap as the work proceeds. Those surfaces exposed to sight in their final position shall be further cleaned to provide for the application of finishes as required.
  2. Joints in block work shall be tooled concave in such a manner as to squeeze the mortar back into the joints

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### SECTION 04810 - UNIT MASONRY ASSEMBLIES

and to ensure complete contact is made along the edges of the units, compressing and sealing the surface of the joints.

3. Control joints shall be provided in concrete block partitions at door heads where masonry extends above the door frames, where partitions abut exterior walls and elsewhere as noted on the drawings. Joints shall be raked out 3/8" deep and caulked as specified in Division 7. Bond beams shall be installed as indicated and shall be filled with concrete and reinforced with two (2) No. 4 bars unless noted otherwise.
  - G. Lintels shall be provided where shown and for all openings in masonry work where other types of lintels have not been provided. Concrete block lintels shall bear not less than six inches (6") on each jamb. Lintel blocks shall be solid bottom trough block filled with concrete and reinforced as detailed on drawings.
  - H. Masonry Reinforcement: Joint reinforcement shall be installed in all concrete block partitions in the joints of every second block course for the full height of the wall.
  - I. The Subcontractor shall be responsible for furnishing all required labor, tools, and equipment as required to complete all areas of masonry work on the project. This shall be inclusive of all scaffolding, walk-boards and bracing as required to support the work until fully incorporated into the structure.
  - J. Subcontractor shall also furnish all materials including concrete block, mortar, reinforcing, ties and other accessories necessary for the execution of the masonry work.
- 3.03 Preparation:
- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
  - B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- 3.04 Coursing:
- A. Establish lines, levels, and coursing indicated. Protect from displacement.
  - B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
  - C. Concrete Masonry Units:
    1. Bond: Running.
    2. Coursing: One unit and one mortar joint to equal 8



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### SECTION 04810 - UNIT MASONRY ASSEMBLIES

inches.

3. Mortar Joints: Concave.

#### 3.05 Placing and Bonding:

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Masonry work shall be laid true to dimensions, plumb, square and in bond and properly anchored with vertical joints in line, plumb and true.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Provide a 3/8" joint around hollow metal door jambs and window frames to allow for sealant and expansion.

#### 3.06 Weeps/Cavity Vents:

- A. Install weeps in veneer walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

#### 3.07 Reinforcement and Anchorage - General:

- A. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.
- B. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches around perimeter.
- C. Locate anchor sections to allow maximum vertical differential movement of ties up and down.

#### 3.08 Reinforcement And Anchorage - Concrete Masonry Units:

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 8 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Reinforce joint corners and intersections with strap

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anchors 16 inches on center.

#### 3.09 Masonry Flashings:

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
  - 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
  - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
  - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.
- C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

#### 3.10 Lintels:

- A. Install loose steel lintels over openings.

#### 3.11 Control Joints:

- A. Do not continue horizontal joint reinforcement through control joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Size control joint in accordance with Section 07900 for sealant performance.

#### 3.12 Built-In Work:

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

#### 3.13 Tolerances:

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation from Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft

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### SECTION 04810 - UNIT MASONRY ASSEMBLIES

and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls:  
1/4 inch.

#### 3.14 Cutting And Fitting:

- A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

#### 3.15 Cleaning:

- A. Remove excess mortar and mortar droppings.
- B. Clean soiled surfaces with cleaning solution.

#### 3.16 Protection Of Finished Work:

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

**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, apply to this Section.

##### 1.02 Summary

- A. This Section includes 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.

##### 1.04 Submittals

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

## DIVISION 5 - METALS

### SECTION 05400 - COLD-FORMED METAL FRAMING

- 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 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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### SECTION 05400 - COLD-FORMED METAL FRAMING

#### 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 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.
- 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.

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### SECTION 05400 - COLD-FORMED METAL FRAMING

- 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.

#### 3.04 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.

#### 3.05 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 - METALS

### SECTION 05500 - METAL FABRICATIONS

#### Part 1 - General

1.01 Summary: Metal fabrications as specified and as shown on the drawings. The extent of metal fabrications work is shown on drawings and includes items fabricated from steel shapes, plates, tubes, and pipes which are not a part of structural steel or other metal systems in other sections of these specifications.

1.02 References: Comply with the current edition of the following codes and standards, except as otherwise shown or specified:

AISC	"Load and Resistance Factor Design, LRFD Specification for Structural Steel Buildings", including "Commentary" and "Supplements"
AISI	"Specification for the Design of Cold-Formed Steel Structural Members"
ANSI/AWS	"D1.1 - Structural Welding Code, Steel"
ANSI/AWS	"D1.3 - Structural Welding Code, Sheet Steel"
NAAMM	"Metal Finishes Manual"
SSPC	Systems and Specifications as referenced

1.03 Submittals:

- A. General: Submit copies as required by Supplementary Conditions. Contract drawings shall not be copied for use as shop or erection drawings.
- B. Product Data: Submit manufacturer's product information and installation instructions for manufactured items, including prime paint.
- C. Shop Drawings: Submit shop drawings for fabrications and erection of miscellaneous metal fabrications. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items.

1.04 Quality Assurance:

- A. Erector Qualifications: Firms regularly engaged in the erection of metal fabrications for similar type and size projects. The metal fabrications erector shall be responsible to the structural steel fabricator.

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### SECTION 05500 - METAL FABRICATIONS

- B. Qualification of Welding Work: Qualify the welding procedures and welding operators in accordance with ANSI/AWS "D1.1 Structural Welding Code - Steel".

#### 1.05 Project/Site Conditions:

- A. Field Measurements: Check actual locations of walls and structure to which metal fabrications must fit. Record accurate field measurements before fabrication; show recorded measurements on final shop drawings.

#### Part 2 - Materials and Components:

2.01 General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

- A. Steel Plates, Shapes and Bars: ASTM A 36, unless noted otherwise.
- B. Steel Plates to be Bent or Cold Formed: ASTM A 36, unless noted otherwise.
- C. Steel Tubing: ASTM A 500, Grade B
- D. Steel Bars and Bar-Size Shapes: ASTM A 36.
- E. Cold-Finished Steel Bars: ASTM A 108, grade as selected by fabricator.
- F. Cold-Rolled Carbon Steel Sheets: ASTM A 366.
- G. Galvanized Carbon Steel Sheets: ASTM A653, with G60 zinc coating.

2.02 Non-Metallic, Non-Shrink Grout: Refer To Section 03300.

#### 2.03 Fasteners:

- A. General: Provide zinc coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
- B. Unfinished Threaded Fasteners: Regular hexagon head type, ASTM A 307, Grade A

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### SECTION 05500 - METAL FABRICATIONS

- C. High Strength Threaded Fasteners: ASTM A 325 heavy hexagon, structural bolts with nuts and hardened washers.
- D. Lag Bolts: Square head type, FS FF-B561.
- E. Machine Screws: Cadmium plated steel, FS FF-S-92.
- F. Wood Screws: Flat head or oval head carbon steel, FS FF-S-111.
- G. Plain Washers: Round, carbon steel, FS FF-W-92.
- H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
- I. Lock Washers: Helical spring type carbon steel, FS FF-W-84.
- J. Stainless Steel Bolts and Screws: ASTM F 593 or AISI 304.
- K. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

#### 2.04 Paint:

- A. Steel Primer Paint:
  - 1. Interior:
    - a. The Society for Protective Coatings Specification 15-68T, Type 1 (gray oxide) or a shop primer paint which meets the same minimum performance requirements.
- B. Bituminous Paint: Cold applied asphalt mastic conforming to SSPC-Paint 12 except containing no asbestos fibers.
- C. Galvanizing Repair Paint: Tnemec 90-97, "Tneme-Zinc", zinc-rich urethane primer.

## DIVISION 5 - METALS

### SECTION 05500 - METAL FABRICATIONS

#### 2.05 Fabrication, General:

- A. Workmanship: Use materials of size and required thickness to produce strength and durability in finished product. Work to dimensions shown using proven details of fabrication and support.
1. Form exposed work true to line and level with accurate angles and surfaces and straight, sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Refer to AISC "Manual of Steel Construction: for Minimum Radius for Cold Bending Bent Plates.
  2. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
  3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts.
  4. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finish hardware and similar items.
- B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural integrity of joined pieces. Clearly mark units for assembly and coordinated installation.
- C. Fabricate joints that will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.



## DIVISION 5 - METALS

### SECTION 05500 - METAL FABRICATIONS

#### 2.06 Finishing:

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes. Finish metal fabrications after assembly.
- B. Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized as follows:
  - 1. ASTM A 153 for galvanizing iron and steel hardware.
  - 2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
  - 3. ASTM A 53 for galvanizing steel pipe.
- C. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Remove grease and oil in accordance with The Society for Protective Coatings Specification, SSPC SP-1, "Solvent Cleaning".
  - 1. Interior Steel:
    - a. Final clean all steel with SSPC SP-3, "Power Tool Cleaning".
  - 2. Exterior Steel: Final clean steel exposed to the exterior atmosphere with SSPC SP-6, "Commercial Blast Cleaning".
- D. Shop Painting:
  - 1. Shop paint miscellaneous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded or high-strength bolted with slip-critical connections and galvanized surfaces, unless otherwise specified.
  - 2. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's

## DIVISION 5 - METALS

### SECTION 05500 - METAL FABRICATIONS

standards, and at a rate to provide minimum uniform dry film exposed surfaces. Apply one shop coat to fabricated metal items, except apply two coats of paint to surfaces inaccessible after assembly or erection.

3. Dissimilar Materials: Paint dissimilar metals on contact surfaces and aluminum where in contact with concrete, mortar, fire or preservative treated wood or absorptive materials subject to wetting. Protect with one coat of bituminous paint.

#### 2.07 Miscellaneous Framing, Supports, Trim And Rough Hardware:

- A. General: Provide steel framing, supports and trim for applications indicated or which are not a part of structural steel framework, as required to complete work.
- B. Fabricate to sizes, shapes, and profiles indicated and required to receive item retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers and similar items.
- C. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required. Manufacture or fabricate, items of sizes, shapes and dimensions required. Furnish steel washers in all locations.
- D. Finish: Prime paint, refer to Paragraph 2.04 for type.

#### 2.08 Loose Bearing And Leveling Plates:

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required.

## DIVISION 5 - METALS

### SECTION 05500 - METAL FABRICATIONS

- B. Finish: Galvanize after fabrication, refer to Paragraph 2.07 for type.

#### Part 3 - Execution

3.01 Preparation: Furnish setting drawings, diagrams, instruction, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete construction. Coordinate delivery of such items to project site.

#### 3.02 Installation, General:

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, free of rack and measured from established lines and levels.
- C. Provide temporary bracing or anchors for items that are to be built into concrete, masonry or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.
- E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work and the following:

## **DIVISION 5 - METALS**

### **SECTION 05500 - METAL FABRICATIONS**

1. Use material and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
5. Use weld curtains to protect surroundings if necessary.

#### **3.03 Installation Of Metal Fabrications Items:**

- A. General: Install as specified and in accordance with final shop drawings and manufacturer's instructions, where applicable.

3.04 Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas with the same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness equal to specified prime coat. Touch up galvanized areas with galvanizing repair paint specified.

**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 trademark 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 trademarks 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.

## DIVISION 6 - WOOD & PLASTIC

### 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

## DIVISION 6 - WOOD & PLASTIC

### 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. Exposed Plywood: wall sheathing at interior side of batting area exterior partitions shall be fire-retardant material. Refer to drawings for locations.
- C. 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.

## DIVISION 6 - WOOD & PLASTIC

### 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 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 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

## DIVISION 6 - WOOD & PLASTICS

### SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

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:

## DIVISION 6 - WOOD & PLASTICS

### SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

- 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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### SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

- 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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### SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

- 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:

**DIVISION 6 - WOOD & PLASTICS**

**SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)**

- 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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### SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

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.

## DIVISION 6 - WOOD & PLASTICS

### SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

- 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.

## DIVISION 6 - WOOD & PLASTICS

### 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

**DIVISION 6 - WOOD & PLASTICS**

**SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)**

and solid colors matched to Wilsonart® and  
Formica® laminates.

**End of Section**

## DIVISION 7 -THERMAL & MOISTURE PROTECTION

### SECTION 07100 - WATERPROOFING

#### 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. Federal Specifications:
    - a. SS-C-153B, Cement, Bituminous, Plastic.
    - b. SS-A-701B, Asphalt, Weatherproofing.
    - c. LLL-1-535A, Insulation Board, Thermal.

##### 1.03 Submittals:

- A. Provide submittals in the form of samples, and documentation, to the Architect for review.

#### Part 2 - Products

##### 2.01 Materials:

- A. Solvent Based Asphalt Water Barrier: FS-SS-A-701B.
- B. Flashing Membrane: 20 mil elastomeric modified sheet vinyl.
- C. Asphalt Plastic Cement: SS-C-153B, Type 1.
- D. Accessories: As recommended by manufacturer.
- E. Protection Board: Insulation Board, FS-LLL-1-535A, Class A.
- F. Vapor Barrier under floor slab: refer to Section 07260 - Vapor Barrier.

#### Part 3 - Execution

##### 3.01 Installation - Wall Waterproofing:

- A. Location: Apply to all exterior concrete surfaces below grade.
- B. General:
  - 1. Repoint all holes cracks and joints and allow to dry before waterproofing.
  - 2. Do not apply until all surfaces are completely dry and clean. Apply only during favorable weather conditions.
- C. Joint Membrane:
  - 1. Location: Apply to all joints in exterior concrete walls below grade.
  - 2. Embed a strip of flashing membrane in plastic cement. Membrane shall be a minimum of 12" wide.
- D. Water Barrier:
  - 1. Hold 4" down from finish grade line so that at no time is the mastic or membrane exposed to view.
  - 2. Apply two (2) coats to form a membrane water barrier, allowing the first coat to dry before applying the second coat. Apply in strict accordance with manufacturer's

**DIVISION 7 -THERMAL & MOISTURE PROTECTION**

**SECTION 07100 - WATERPROOFING**

instructions. Do not apply until surfaces are completely dry.

3. Apply in a continuous unbroken film free from pin holes or other surface breaks. Take care to seal around all ties, inserts, anchor slots, conduit, pipes, electrical boxes, etc.

E. Protection:

1. Install protection board over all waterproofing prior to backfilling.
2. All back filling shall be carefully done to protect waterproofing. Repair all damaged areas.

3.02 Under Slab Vapor barrier:

- A. Refer to Section 07260 - Vapor Barrier.

**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: expanded polystyrene insulation.
    - 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.
- B. Fibrous Insulation: ASTM C 665-84, Type 1
  - 1. Type:
    - a. refer to Section 13122 - Metal Building Systems.

#### Part 3 - Execution

##### 3.01 Installation - Rigid Insulation:

- A. Install rigid insulation horizontally against back-up wall as shown on the Drawings.
- B. Cut insulation by means of a saw, knife, or other sharp tool to fit around obstructions across the wall, such as vents,

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**SECTION 07200 - INSULATION**

louvers, pipes and conduit.

- C. If mastic adhesive is used to supplement holding the insulation in place, observe label directions.

**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/ft<sup>2</sup>/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.

## DIVISION 7 - THERMAL AND MOISTURE PROTECTION

### 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**

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### 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

**DIVISION 7 - THERMAL & MOISTURE PROTECTION**

**SECTION 07840 - FIRESTOPPING**

1.05 References:

- 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

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7	Electrical Bussduct Penetrations:	F, W, C	A, B, J, K, L	6001-6999
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		Joint Width
	Joint System	Movement Capability		
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
----	-------------------------

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

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07840 - FIRESTOPPING

work has resulted in construction with a record of 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 jobsite.
- C. Store materials under cover and protect from weather and

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07840 - FIRESTOPPING

damage in compliance with manufacturer's requirements, 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



## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07840 - FIRESTOPPING

as identified below:

1. Hilti, Inc., Tulsa, Oklahoma  
800-879-8000 / [www.us.hilti.com](http://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 ("solvent") 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

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07840 - FIRESTOPPING

- G. Intumescent sealants, caulking materials for use with 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

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07840 - FIRESTOPPING

3. Hilti CP 606 Flexible Firestop Sealant
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

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07840 - FIRESTOPPING

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**

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### 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

## DIVISION 7 - THERMAL & MOISTURE PROTECTION

### SECTION 07900 - SEALANTS

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. Lyntal, 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.
    - b. USG Corporation.

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### SECTION 07900 - SEALANTS

- 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 manufacturer's written instructions. Confine primers to



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### SECTION 07900 - SEALANTS

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 joints as the Work progresses by methods and with cleaning

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### SECTION 07900 - SEALANTS

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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### SECTION 08100 - METAL DOORS AND FRAMES

- 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 non-vented 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 114-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,

## DIVISION 8 - DOORS & WINDOWS

### SECTION 08100 - METAL DOORS AND FRAMES

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:

## DIVISION 8 - DOORS & WINDOWS

### 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

## DIVISION 8 - DOORS & WINDOWS

### SECTION 08100 - METAL DOORS AND FRAMES

- 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

## DIVISION 8 - DOORS & WINDOWS

### SECTION 08100 - METAL DOORS AND FRAMES

- 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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### SECTION 08100 - METAL DOORS AND FRAMES

- 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

## DIVISION 8 - DOORS & WINDOWS

### 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.

## DIVISION 8 - DOORS & WINDOWS

### SECTION 08100 - METAL DOORS AND FRAMES

- 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. Jams 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 Architect. Replace/repair any damaged items as directed above.

**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 06420
- C. Metal Doors and Frames - Section 08100

##### 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

##### 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 or part required to provide a complete and functional installation.
- 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.
- 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 ASAHC & 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 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	30-001	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

**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 STOREROOM LOCK	L9456T 03N	626	SCH
1	EA CLASSIC CORE	30-001	626	SCH
1	EA SURFACE CLOSER	4040XP 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. 003: Provide each SGL door(s) with the following:**

Quantity	Description	Model Number	Finish	Mfr
1	EA CONTINUOUS HINGE	224HD HEIGHT AS REQ	628	IVE
1	EA PANIC HARDWARE	CD9975L-03 LENGTH AS REQUIRED	626	VON
2	EA PRIMUS CORE ONLY	20-740	626	SCH
1	EA SURFACE CLOSER	4040XP SHCUSH MTG BKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	700SA H & J (INSTALL PRIOR TO OTHER HARDWARE)	AL	NGP
1	EA DOOR SWEEP	101VA LENGTH AS REQ	AL	NGP
1	EA OVERHEAD RAIN DRIP	16A DW + 4"	AL	NGP
1	EA THRESHOLD	892V LENGTH AS REQ	AL	NGP
1	EA DOOR STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE

PROVIDE ELECTRICAL FOR DOOR CONTACT, ETC. AS REQ'D BY OWNER.

**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 PRIVACY SET	L9444 03N	626	SCH
1	EA WALL STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

## DIVISION 8 - DOORS & WINDOWS

### SECTION 08700 - FINISH HARDWARE

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. <b>Schlage (No substitutions)</b>
4. Lock/Latch	A. <b>Schlage (No substitutions)</b>
5. Closers	A. <b>LCN (No substitutions)</b>
6. Exit Devices	A. <b>Von Duprin (No substitutions)</b>
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 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.

**DIVISION 8 - DOORS & WINDOWS**

**SECTION 08700 - FINISH HARDWARE**

- 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**



## 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 3<sup>rd</sup> 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.

C. Clean-up: Remove all glass cuttings, scraps, packaging, and rubbish upon completion of the work.

**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.

## DIVISION 9 - FINISHES

### SECTION 09120 - CEILING SUSPENSION SYSTEMS

7. Acceptable Manufacturer: 200 Snap-Grid System, Chicago Metallic Corporation
- 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 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

**DIVISION 9 - FINISHES**

**SECTION 09120 - CEILING SUSPENSION SYSTEMS**

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**

## DIVISION 9 - FINISHES

### 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 Fasteners:
  - A. Screws: Self-drilling, self-tapping, bugle head, Type S.
  - B. Nails: Annular ring: GWB-54.
- 2.03 Joint Treatment Materials:
  - A. Joint Tape: Perforated Tape, ASTM C-475.
  - B. Joint Compound: ASTM C-475.
- 2.04 Accessories:
  - A. Metal Edge: Similar to United States Gypsum Trim No. 402.

#### 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

## DIVISION 9 - FINISHES

### SECTION 09250 - GYPSUM WALLBOARD

- 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 recommendations.
- 3.03 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**

## DIVISION 9 - FINISHES

### 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



## DIVISION 9 - FINISHES

### SECTION 09300 - TILE

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

## DIVISION 9 - FINISHES

### SECTION 09300 - TILE

- 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. Daltile; Division of Dal-Tile International Inc.
  - 2. American Olean; Division of Dal-Tile International Inc.
  - 3. Crossville, Inc.

#### 2.02 Ceramic Tile:

- A. Wall Tile and Floor Tile:
  - 1. Type: Polished porcelain @ walls / unpolished porcelain @ bases and floors.
  - 2. Nominal Face Size: 12" x 24" - orient as per Drawings.
  - 3. Edge: All-purpose cushion.
  - 4. Acceptable Manufacturer: as noted above.
- 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.
- 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 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.

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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, 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.



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- 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 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

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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)

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**SECTION 09500 - ACOUSTICAL TREATMENT**

**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 wall base 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 base by the manufacturer.
- B. Manufacturer Qualifications: company specializing in manufacturing the specified wall base 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 products and installation materials in dry spaces protected from the weather, at temperatures required by the product manufacturer. Store wall base 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. 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.
- B. 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.
- C. Cleaner or other finishing material: As recommended by flooring manufacturer for the particular type of floor material.

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### SECTION 09650 - RESILIENT FLOORING

#### Part 3 - Execution

##### 3.01 Installation:

- A. Comply with manufacturer's written instructions for installing specified wall base.
- B. The Contractor shall be responsible for the manufacturer's representative making mat moisture and PH tests and reporting condition of concrete slab/masonry walls 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 base.
- 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. Fit base material neatly and tightly into breaks and recesses, around pipes and penetrations, under saddles or thresholds, and around permanent cabinets and equipment.

##### 3.02 Cleaning:

- A. When, in the opinion of the Contractor, the wall base has sufficiently sealed itself to permit cleaning, the wall base shall be thoroughly cleaned with a neutral cleaner as recommended by the manufacturer of the wall base used. After the wall base has been cleaned, the Contractor shall protect them either with building paper or by keeping traffic off the floors until the building is ready for occupancy.

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**SECTION 09650 - RESILIENT FLOORING**

3.03 Replacement Base:

- A. Provide 20 linear feet of spare rubber wall base. Wall base shall be in perfect condition.

**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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### SECTION 09681 - CARPET TILE

- 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 - Aerial Flying Colors
- B. Yarn: 100% Nylon (with 4% post-consumer content and +/- 60% total recycled content)
- C. Dye Method: 100% Solution / Yarn Dyed
- D. Surface Texture: Tufted Texture Loop
- E. Gauge: 1/12
- F. Yarn Weight: 18 oz./SY
- G. Finished Pile Thickness: .116 inch (ASTM D-418)
- H. Density: 5,586
- I. Stitches Per Inch: 8.33
- J. Secondary Backings: GlasBac Tile
- K. Modular Size: 19.69" x 19.69"
- L. Color: refer to Room Finish Schedule.
- M. Special Treatments: ProTex® Fluorochemical

##### 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

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### SECTION 09681 - CARPET TILE

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 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. ≥ 4.0 @ 60 AFU's.

## DIVISION 9 - FINISHES

### SECTION 09681 - CARPET TILE

#### 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).
- 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. Enamel on Wood Trim:
    - 1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
    - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
  - F. Back-Painting, Interior Work:
    - 1. Two coats SW Promar 200 Alkyd Enamel Primer/Undercoat.
  - G. Enamel on Exposed Metal Piping:
    - 1. One coat SW Galvite primer.
    - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.



## DIVISION 9 - FINISHES

### SECTION 09900 - PAINTING

#### 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.
- 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

**DIVISION 9 - FINISHES**

**SECTION 09900 - PAINTING**

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.

## DIVISION 10 - SPECIALTIES

### 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: refer to Color Schedule, 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):

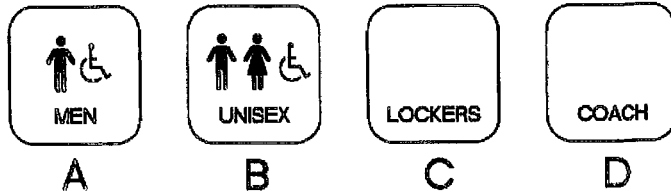
Quantity                      Plaque                      Mounting Location

\*\*Coordinate location with Architect

<b>Plaque</b>	<b>Quantity</b>	<b>Location</b>
A	1	1 each @ room no. 7
B	1	1 each @ door no. 4
C	1	1 each @ door no. 3
D	1	1 each @ door no. 5

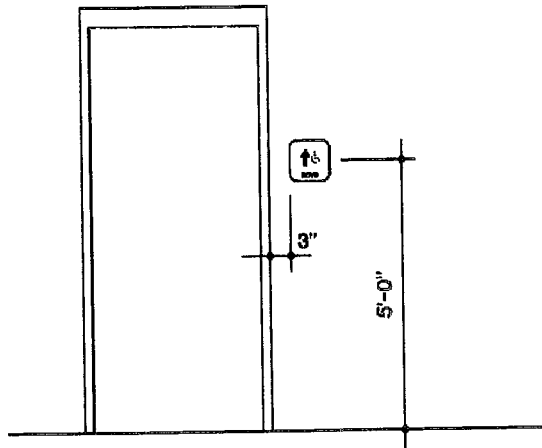
SECTION 10400 - INTERIOR SIGNAGE

2.04 Signage Plaques Required:



Note: all signage plaques shall have grade 2 braille translations under text.

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 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 All Welded Ventilated Lockers - at Locker Room:
  - 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

### 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.
  - d. Coat Hooks: provide three single prong coat hooks made of cadmium-plated or zinc-plated steel.
  - e. Ventilation: large diamond perforations in door.
  2. Quantity: Refer to Drawings.
  3. Size: 24"w x 24"d x 36"h per tier for a total locker height of 72".
  4. Base: None - mount to top of continuous concrete 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.
  7. Provide end finishing panels to closeout to adjacent / perpendicular walls and at corners.
  8. Color: refer to Color Schedule.
- B. **Lockers Type 2** - Single Tier All Welded Ventilated Lockers - at the Coach's Locker Room:
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

### 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.
- d. Coat Hooks: provide three single prong coat hooks made of cadmium-plated or zinc-plated steel.
- e. Ventilation: large diamond perforations in door.
2. Quantity: Refer to Drawings.
3. Size: 24"w x 18"d x 60"h.
4. Base: None - mount to top of continuous concrete masonry 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.
7. Provide end finishing panels to closeout to adjacent / perpendicular walls and at corners.
8. Color: refer to Color Schedule.
- C. Benches and Pedestals:
  1. Locker benches shall be laminated maple, 1-1/4" full finish thickness. All corners shall be rounded and sanded. Top / exposed edges shall receive two coats of a clear finish and one coat on the bottom of the bench. Bench tops shall be 9-1/2" wide and furnished in 4'-0" lengths.
  2. ADA compliant benches are to be 48" wide x 24" deep, laminated maple, 1-1/4" full finish thickness. All corners shall be rounded and sanded. Top / exposed edges shall receive two coats of a clear finish and one coat on the bottom of the bench. Four pedestals required. Bench shall have an overall height of 17-1/2".
  3. Pedestals: benches shall be mounted on moveable pedestals consisting of trapezoidal shaped aluminum pieces made from 3" wide by 1/4" thick bar stock,

## DIVISION 10 - SPECIALTIES

### SECTION 10500 - LOCKERS

anodized black color. Provide non-skid pads for each pedestal. Overall height to be 17-1/2".

- D. 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 provided.  
Secure lockers with anchor devices with a minimum pull-out force of 100 lbs.
- C. Provide any additional items necessary for support or to complete installation.
- D. 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



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**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 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 @ rooms 6 & 7
- B. Grab Bars:
  1. Model No. 8120-001420-42".
  2. Quantity: 1 @ rooms 6 & 7
- C. Grab Bars:
  1. Model No. 8120-001420-12".
  2. Quantity: 1 @ rooms 6 & 7
- D. Tilted Stainless Steel Mirror (Frame and Surface):
  1. Model No. 740-1830.
  2. Quantity: 1 @ rooms 6 & 7 (above lavatories)
- E. Stainless Steel Mirror (Frame and Surface):
  1. Model No. 781-1830
  2. Quantity: 1 @ room 7 (above lavatories)
- F. Shower Curtain and Rod:
  1. Model No. 9531 (by length required) w/ vinyl shower curtain 9537 and # of s.s. hooks required.Quantity: 1 @ room 5
- G. Handicap Shower Bench:
  1. Model No. 956 / 9561 as required
  1. Quantity: 1 @ rooms 5
- H. Shower Grab Bar:
  1. Model No. 036 / 037 as required

## DIVISION 10 - SPECIALTIES

### SECTION 10800 - TOILET AND BATH ACCESSORIES

- 2. Quantity: 1 @ room 5
- I. Toilet Paper Dispenser to be provided by Owner and installed by Contractor. 1 @ rooms 6 & 7
- J. Paper Towel Dispenser to be provided by Owner and installed by Contractor. 1 @ room 1 @ room 6 / 2 @ room 7
- K. Soap Dispenser to be provided by Owner and installed by Contractor. 1 @ room 6 / 2 @ room 7

#### 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**

## DIVISION 13 - SPECIAL CONSTRUCTION

### SECTION 13122 - METAL BUILDING SYSTEMS

#### Part 1 - General

##### 1.01 WORK INCLUDED:

- A. Pre-engineered metal building addition, complete with structural framing (**straight columns**, rafters, struts, purlins, girts); prefinished roofing and siding to match existing; roof and wall insulation with vapor barrier; metal flashings; trim; gutters and downspouts; diagonal bracing; fasteners; and roof and wall accessories and other components and material required for a complete and watertight installation.

##### 1.02 DESCRIPTIONS:

- A. Building Type: Single span Straight Column Rigid Frame (SCRF) with straight steel columns and tapered rafter sections of shop welded steel plates.
- B. Roof Slope: match existing.
- C. Column Spacing at Exterior Walls: As shown on drawings compatible with placement of openings and other requirements.
- D. Eave Heights:
  - 1. New Locker Room Addition - match existing (approximately 11'-0") as indicated on drawings.
  - 2. Continuous Parapet: not applicable.
- E. **Additional Requirements: metal building manufacturer shall be responsible for investigating and field verifying all requirements, etc. necessary for a "seamless" addition and watertight connection to the existing building as indicated on the drawings. Any adjustments to the existing building necessary to meet the above requirements (including additional structural framing) shall be included in the subcontractor's bid and noted on all shop drawings, etc.**

##### 1.03 QUALITY ASSURANCE:

- A. Codes and Standards:
  - 1. Use following where applicable in building design:
    - a. AWS D1.1 "Structural Welding Code-Steel"
    - b. MBMA "Low-Rise Building Systems Manual, latest Edition.
    - c. AISI "Specifications for the Design of Cold Formed Steel Structural Members", latest Edition. AISC "Steel Construction Manual" and "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings."
    - d. AISC "Specification for Structural Joints Using ASTM A325 or A307 bolts."
    - e. SDI "Steel Roof Deck Design Manual."
  - 2. Use the following where applicable in other phases of design:

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- a. Building Code and regulations of other governing authorities having jurisdiction at project site.
- b. Federal (Fed. Spec.), Military (MIL) and Commercial (CS) Standards and Specifications, as referenced herein.
- c. American Society for Testing and Materials (ASTM), Standards as referenced herein.

#### B. Design Criteria:

1. Codes:
  - a. The building shall be designed and fabricated according to the latest codes as required by the City of Oklahoma City, Oklahoma.
2. The metal building manufacturer shall be responsible for both design and erection of the building. Approval of shop drawings, erection drawings, or other submittals shall not relieve the metal building manufacturer of total design responsibility.
3. Temperature Load: design temperature change shall be -30/+60 degrees fahrenheit. Combinations including snow loads need only consider -30 degrees fahrenheit.
4. Wind Load: wind load pressures shall be based on enclosed buildings.
5. Serviceability Criteria:
  - a. Rafter supporting gravity snow or live loads =  $\text{span}/120$ .
  - b. Purlins supporting snow live or 10 yr. wind loads =  $\text{span}/120$ .
  - c. Girts resisting 10 yr. wind loads =  $\text{span}/120$ .
  - d. Frame drift under 10 yr. wind =  $\text{eave height}/120$ .
6. Horizontal roof bracing, rigid frames, braced bays and/or portal frames shall be used to transmit lateral loads to the foundation. Diaphragm action in the roof and wall panels shall not be used to resist lateral loads.

#### 1.04 SUBMITTALS:

##### C. Shop Drawings and Calculations:

1. Design Calculations and Erection Drawings: Prepared by, or under direct supervision of, Registered Professional Engineer, licensed to practice in State of Oklahoma with all drawings and calculations bearing engineer's seal.
2. A complete three dimensional analysis or justifiable two dimensional analysis showing all calculations for frames and horizontal bracing is required. In addition, a complete design analysis showing all calculations for wall panels, roof decking, girts,

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### SECTION 13122 - METAL BUILDING SYSTEMS

purlins, connections, base plates, and anchor bolts is required. Calculations shall consider effects for dead, live, wind, seismic, temperature, and snow. Calculations and layout of the anchor bolts and the embedded items shall be submitted for approval with the shop drawings. Anchor bolt calculations shall consider embedment into concrete as part of the design. Shop drawings shall include details of all main frame members, connections (showing bolt holes and welds), and erection drawings. All rigid frames and portal frames shall be designed using pinned bases.

3. Show each type as applicable: Structural building frame required and their locations within structure; details of anchor bolt settings; sidewall, endwall, and roof framing; diagonal bracing and location within structure; roof insulation and types; longitudinal and transverse cross sections; details of curbs, roof jacks, and items penetrating roof; canopy support framing and details; trim, gutters, downspouts, wall and roof coverings, and all accessory items; materials; finishes; construction and installation details; and other pertinent information required for proper and complete fabrication, assembly and erection of watertight metal building system.
  - B. Material and Color Samples:
    - A. For each specific material sample requested by Architect, submit in size, form, and number directed.
    - B. Submit duplicate color sample sets showing full color range available, for selection purposes.
  - C. Product Data: Electronic copies of manufacturer's specifications and descriptive literature.
  - D. Certification: Two (2) copies of written certification, prepared and signed by Registered Professional Engineer licensed to practice in State of Oklahoma, attesting that building design meets specified loading requirements, requirements of codes and authorities having jurisdiction at project site, and other requirements specified.
  - E. Metal building manufacturer shall submit certification of design to the Contractor to be an approved manufacturer and that the roof system shall qualify for UL Class 90 and state construction number. Metal building manufacturer shall furnish to the Contractor certification that he is a member of the Metal Building Manufacturers' Association.
- 1.05 PRODUCT HANDLING, DELIVERY, AND STORAGE:
- A. Deliver and store prefabricated components, sheets, panels, and other manufactured items so they will not be damaged or

## DIVISION 13 - SPECIAL CONSTRUCTION

### SECTION 13122 - METAL BUILDING SYSTEMS

- deformed.
  - B. Stack materials on platforms or pallets above grade or on concrete slab, covered with opaque tarpaulins or other approved weather-resistant ventilated covering.
  - C. Store metal sheets and panels if subjected to water accumulation in such a manner so they will drain freely. Do not store sheets and panels in contact with other materials which might cause staining.
  - D. Damaged material must be reported to determine if replacement is required.
  - E. Inspect panels to prevent moisture between panels, and secure as required.
- 1.06 WARRANTIES:
- A. All Components: Manufacturer's standard one (1) year workmanship warranty.
  - B. Roof Panels Including Any Canopy Roof Panels: Manufacturer's standard paint finish warranty.
  - C. Wall Panels: Manufacturer's standard paint finish warranty.

#### Part 2 - Products and Fabrication

- 2.01 STRUCTURAL STEEL:
- A. Materials:
    - 1. Structural Plate or Bar Stock: Minimum yield strength (Fy) of 36,000 PSI conforming to requirements of ASTM-A36.
    - 2. Cold Formed Structural Steel: Minimum yield strength (Fy) of 55,000 PSI conforming to requirements of ASTM-A570.
    - 3. Primary Structural Bolts and Nuts: ASTM A325; size and quantity required by metal building system manufacturer.
    - 4. Prime Coat Paint: Primary structural shall be Alkyd red oxide metal rust inhibitive primer equal to Federal Standard #30111. Dry film thickness to be 1.0 mil. Secondary framing shall be red oxide rust inhibitive primer applied by vacuum coated process to 0.7-0.9 mil dry film thickness equal to Federal Standard #30111.
  - B. Prime Coat Paint: Manufacturer's standard.
    - 1. Primary Framing: Rigid frames of shop-welded steel plate columns and rafters, uniform depth sections as required by drawings, complete with all necessary stiffeners, connection plates and holes for field-bolted assembly.
      - a. Straight Columns and Rafters: Fabricated with

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### SECTION 13122 - METAL BUILDING SYSTEMS

- holes in web and/or flanges for attachment of secondary members.
  - b. Splice Plates: Factory fabricated for precision for all rafter-to-rafter and/or column-to-rafter connections, complete with connection bolt holes.
  - c. Base Plates, Cap Plates, Splice Plates and Stiffeners: Fabricate to sizes required, complete with all holes for connection of primary and secondary structural members. Factory weld into place.
  - d. Join flanges and webs of structural members fabricated of plate or bar stock together by continuous automatic submerged arc welding process with all welding performed under the supervision of certified welders in accordance with standard practices of AWS D1.1.
  - e. Make all primary rigid frame field-bolted connections with A325 high-strength bolts of size required by building system manufacturer.
  - f. Clean all components of oil, dirt, loose scale, and foreign matters. Factory paint with one (1) coat of manufacturer's standard primer.
2. Endwall Framing: Precision cold-formed and/or shop-welded steel plate members consisting of rafters and columns fabricated for field-bolted assembly.
- a. Straight Columns, Rafters, Splice Plates, Clips, Angles and Channels: Factory fabricate to size required.
  - b. Plate Stock Endwall Framing Members: Join flanges and webs by continuous automatic submerged arc welding process, under the supervision of welders certified in accordance with standard practices of AWS D1.1.
  - c. Clean components of oil, dirt, loose scale and foreign matter and apply one (1) coat of manufacturer's standard primer.
3. Secondary Framing, (Purlins, Girts, Struts, Flange Braces, Base Angles, as required - refer Drawings):
- a. Purlins: Manufacturer's standard 8" Z sections, roll formed from minimum (Fy) 55,000 PSI steel, punched for attachment.
  - b. Girts: minimum 8" Z or channel sections of roll formed Fy 55,000 PSI steel, punched for attachment with 1/2" diameter bolts.
  - c. Eave Struts: minimum 8" tall sections of cold formed minimum Fy 55,000 PSI steel, with vertical web to receive sidewall panels and four (4) A325



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- 1/2" diameter bolt attachments to rigid frame in factory-punched holes in column or bracket.
- d. Roof Struts: Provide as required, detailed and shown on final shop drawings, as required by design analysis, with attachment to top flange or rigid frame rafters by two (2) 2" minimum size diameter bolts at each end of strut.
  - e. Flange Braces: Steel angles attached to purlin or girt, to stiffen rigid frame flanges as dictated by design and noted on final shop drawings.
  - f. Base Angle for Wall Panels: continuous 3" x 4" x 0.071" angle of commercial grade steel, for field attachment to foundation with approved type drive anchors.
  - g. Clean secondary framing components to be free from oil, dirt, loose scale and foreign matter and apply one (1) coat of manufacturer's standard primer.
- 2.02 ROOFING & SIDING:
- A. Roofing Panels:
    - 1. Roof Panels:
      - a. Description: Shall be Standing Seam roof panels, roll-formed 24-gauge steel panels UL-90 rated with manufacturer's standard polyester finish, mechanically seamed together by 3-3/8" fixed lips to allow for insulation. The panels shall be produced from steel having a minimum yield strength of 50 ksi (345 N/sq.mm.).
      - b. Roof panel shall match existing.
    - 2. Wall Panels: match existing.
    - 3. Panel Colors:
      - a. Roof and Wall Panels: to be selected by Architect from manufacturer's standard colors to match existing - refer to Drawings.
- 2.03 WIND BRACING:
- A. Commercial grade steel rod bracing or portal frames located as determined by manufacturer on the final shop drawings. Clean components free of oil, dirt, loose scale and foreign matter.
- 2.04 WALL AND ROOF INSULATION:
- A. Exterior Wall and Roof Fiber Glass Insulation: with flexible white vinyl vapor barrier providing no more than 1.0 PERMS moisture vapor transmission.
  - B. Insulation Thickness: 6" thick at roof and walls.

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### SECTION 13122 - METAL BUILDING SYSTEMS

#### 2.05 ACCESSORIES:

- A. Gutters and Downspouts
  - 1. Gutters for standing seam roof shall be suspended box sections of 24-gauge galvanized steel formed to match the configuration of the gable trim. Gutters shall be independent of the roof seal and shall be attached to the eave strut adapter by means of a gutter hanger. Gutter hangers shall be spaced at 4'-0" centers and attached to inside face of gutter and eave adapter by #12 self-drilling screws and to outer face of gutter by trim fasteners. Gutter sections shall be lapped 2" and sealed with sealant and then fastened with fasteners as specified on manufacturer's drawings. Gutter end closures shall be sealed with sealant and fastened with pop rivets as specified on manufacturer's drawings.
  - 2. Downspouts shall be 24-gauge galvanized factory-colored steel with a minimum cross section of 12 or 20 square inches. Downspouts shall be located according to design requirements as specified. Downspouts shall be field attached to the gutter. Downspouts shall be attached to the wall panel using 26-gauge galvanized factory-colored steel straps on 10'-0" centers. A 75-degree elbow shall be provided at the base of all downspouts to direct the water flow away from the building.
  - 3. Finish: refer drawings.
- B. Walk Doors, Leafs, Frames, and Hardware, and Windows:
  - 1. To be supplied by manufacturer other than Metal Building manufacturer / supplier. Refer to Drawings and Sections 08100 and 08500.
- C. Roof Jacks and Pipe Flashing:
  - 1. Roof jack shall be a 26-gauge, Shell White steel cone factory installed and sealed to roof panel. Cone shall be made of same material.
    - a. Stack or pipe penetration shall be at the centerline of a major corrugation of the roof panel.
  - 2. Pipe flashing shall consist of a molded rubber cone with an aluminum ring bonded to the base. Pipe flashing shall accommodate pipe diameter as specified and be capable of flashing penetration at any location of the roof panel. Flashing shall be sealed and fastened in accordance with manufacturer's drawings.

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### SECTION 13122 - METAL BUILDING SYSTEMS

#### Part 3 - Execution

##### 3.01 ERECTION:

###### A. General:

1. Erection shall be accomplished by a trained, competent erector having experience in erecting metal buildings.
2. Install all metal building system components in strict compliance with manufacturer's instructions shown on final shop drawings.
3. Handle and store all materials to avoid damage and replace any damaged materials.
4. Erector shall observe and follow recommendations of the Metal Building Manufacturers Association (MBMA), the American Institute of Steel Construction (AISC), and the Occupational Safety and Health Administration (OSHA) practices, procedures and safety standards where applicable.
5. Do not field cut or alter structural members without approval from manufacturer.

###### B. Structural Frames:

1. Erect true to line, level and plumb, brace and secure with temporary bracing in all directions as required.
2. Level base plates and secure to anchor bolts to level plane with full bearing to foundation supporting structures.

###### C. Bracing:

1. Install all permanent diagonal rod or angle bracing in roof and sidewalls as approved by manufacturer.
2. Properly tighten rods to avoid excessive sag.

###### D. Framed Openings:

1. Securely attach to building structural framing members, square and plumb.

###### E. Roofing Panels:

1. General:
  - a. Install roof panels in such a manner to permit drainage to eaves of building, with panel ends square to eave.
  - b. Install wall panels with vertical edges plumb.
  - c. Arrange and nest sidelap joints away from prevailing winds when possible.
  - d. Apply panels and associated items for neat and weathertight enclosure.
  - e. Avoid "panel creep" or application not true to grid lines.
  - f. Protect factory finishes from mechanical damage or abrasions.
  - g. Install approved type closures to exclude

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### SECTION 13122 - METAL BUILDING SYSTEMS

weather.

1. Install weather seal under ridge cap. Flash and seal roof panels at eave, gable and perimeter of all openings through roof and elsewhere as required or shown on drawings.
  2. Flash and/or seal wall and liner panels at perimeter of all openings, under eaves and gable trims, along lower panel edges, and elsewhere as required or shown on drawings, as applicable.
- h. Remove all fastener or cutting shavings from roof and wall as erection is completed.
- F. Accessories: Install gutters, downspouts, flashings, trim, ridge covers, roof curbs, pipe flashings, closure strips, roof jacks, and other accessories and sheet metal items in accordance with manufacturer's recommendations for positive attachment to building and provide a weathertight mounting.
- G. Swing Doors and Frames (**by other subcontractor / suppliers**): Install doors and frames straight, plumb, and level. Securely anchor frames to building structure. Set units with 1/8" maximum clearance between door and frame at jambs and head, and 3/4" maximum between door leaf and floor. Adjust for proper operation.
- H. Louvers:
1. Install plumb and level, in compliance with requirements of final shop drawings. Anchor securely in final location with perimeter sealed with approved sealant used for trim and flash or roof panels. Adjust louver blades to operate smoothly and easily, without binding, and to be weathertight when in closed position.
- I. Thermal Insulation:
1. Install in accordance with manufacturer's recommended procedure, performed concurrently with installation of wall, roof panels, and protective poultry fencing.
  2. Roof Insulation: Install blankets straight and true. Fasten tabs together or lap and glue to provide complete vapor barrier. Place insulation with facing exposed to interior of building unless recommended otherwise.
- 3.02 PAINTING:
- A. Touch-up all abrasions, scratches, field welds or other damages in shop-primed or factory-finished painted surfaces consistent with shop primer or factory-finished painting.
- B. Apply finish paint coats to factory-primed items.
1. Provide finish coats which are compatible with metal building manufacturer's prime coat paints.

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2. Provide approved type barrier coats over incompatible primers where required.
  3. Notify Construction Manager in writing of anticipated problems using specified coatings with substrates primed by others.
  4. All finish coats by others should be solvent base or approved by manufacturer.
  5. Protect hardware and accessories and similar items in place and not to be finish-painted.
- C. All visible steel exposed to exterior weather or an uncontrolled environment shall be blast cleaned, primed with a zinc-rich primer, and field painted with a high-performance paint.

Non-visible steel exposed to exterior weather or an uncontrolled environment shall be blast cleaned and primed with a zinc-rich primer. Interior steel shall be shop primed and field painted.

#### 3.03 TOLERANCES:

- A. All framing members shall be erected plumb, level or aligned not to exceed a deviation 1:300.

**End of Section**