MOORE PUBLIC SCHOOLS
HOUCHIN ELEMENTARY SCHOOL
HVAC REPLACEMENT

INDEPENDENT DISTRICT NO. 2
CLEVELAND COUNTY, MOORE, OKLAHOMA

3200 N. WEBSTER
MOORE, OKLAHOMA 73160

PROJECT MANUAL

AUGUST 2024

AGP | the Abla Griffin Partnership

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AGP | the Abla Griffin Partnership

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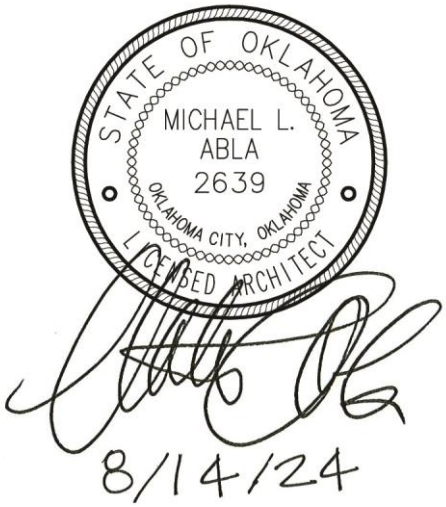

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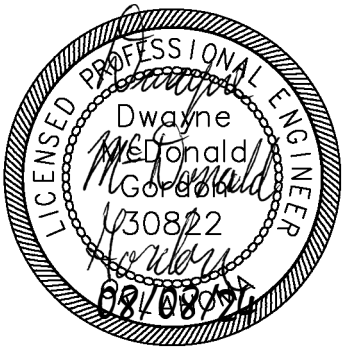

Engineer of Record
Divisions 22, 23
Dwayne McDonald Gordon
Mechanical Engineer
Salas O'Brien, LLC
OK 30822 / EXP 02.28.2026
CA 7058 / EXP 06.30.2025

DIVISION 22 - PLUMBING

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

Engineer of Record
Divisions 26
Timothy Van Ostran
Electrical Engineer
Salas O'Brien, LLC
OK 32650 / EXP 03.31.2025
CA 7058 / EXP 06.30.2025

DIVISION 26 - ELECTRICAL

END OF SECTION

SPECIAL CONDITIONS

TIME FOR COMPLETION AND LIQUIDATED DAMAGES:

A. Upon execution of the contract agreement between the Owner and the Contractor, it shall become an obligation of the contractor to complete all work to be performed under this agreement for the Construction of the Houchin Elementary School HVAC Replacment to be located at 3200 N. Webster, Moore, OK - **within 180 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 and thereafter, if the manner of completion of the Work and its progress are and remain satisfactory to the Architect, and in absence of other good and sufficient reasons, he shall on presentation by the Contractor of Consent of Surety for each application, authorize any **remaining** partial payments to be paid at 100% of amount due. The retainage held to that point shall be retained until the project is completed.

The full contract retainage may be reinstated if the manner of the completion of the Work and its progress do not remain satisfactory to the Architect, (or if the Surety withholds his consent), or for other good and sufficient reasons.

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 11.1 and 11.2. Furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits.

D. T**he 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. 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.

D. MEASUREMENTS

Before doing any work or ordering any materials, the Contractor shall verify all measurements of existing and new work, and shall be responsible for their correctness.

Any differences which may be found shall be submitted to the Architect for consideration before proceeding with the work. No extra compensation will be allowed because of differences between actual dimensions and measurements indicated on the working drawings.

E. MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS

Install all manufactured items of materials or equipment in strict accordance with manufacturer's recommended specifications, except that the specifications herein, where more stringent, shall be complied with.

At the completion of the project and prior to final acceptance by the Owner, provide the Owner with three complete sets of operating and maintenance instructions, and demonstrate to him the procedures for proper operation and maintenance of all equipment.

F. JOB MAINTENANCE

During the course of their work, all crafts and trades shall protect all work which preceded theirs from damage, and they shall make repairs or replacements to any damage caused either directly or indirectly by them.

G. COMPLIANCE WITH STATE AND FEDERAL LAWS

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.

H. 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.

I. 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. 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: Houchin Elementary School HVAC Replacement – Moore Public Schools.
2. Location: 3200 N. Webster – Moore, Oklahoma 73160.

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 the HVAC Replacement as directed by the Contract Documents. And, limited demolition of portions of the existing equipment, etc. 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:
   Todd Stapleton, Assistant Superintendent, Operations
   Moore Public Schools
   1500 SE 4th Street
   Moore, OK 73160
   405-735-4200

C. Design Team:

1. Architect:
   Mike Abla, Principal Architect
   AGP
   313 SE 5th Street
   Moore, OK 73160
   405-735-3477
2. Structural Engineer:
   Brandon Birch, Structural Engineer
   KFC Engineering, Inc.
   525 Central Park Drive, Suite 202
   Oklahoma City, OK 73105
   405-528-4596

3. Mechanical, Electrical and Plumbing Engineers:
   Dwayne Gordon, Mechanical Engineer
   Salas O'Brien
   2600 Van Buren St., Suite 2604
   Norman, OK 73072
4. Construction Management Team:
   Joe Sherga, Project Manager
   Omni Construction LLC
   1909 S. Eastern Ave.
   Moore, OK 73160
   405-735-3992

1.04 Work to be Provided and Installed By Others:
Not applicable.

1.05 Use of the Site:
A. Confine operations at the site to the areas permitted under the contract. Portions of the site beyond areas on which work is indicated are not to be disturbed.
B. Keep facility free from accumulation of waste material, rubbish or construction debris.

1.06 Safety of Persons and property:
A. Contractor 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.

SECTION 01010-SUMMARY OF THE WORK

1.08 Project Scheduling:

A. The Contractor is responsible for the scheduling of construction and must prepare a schedule and charting system described below. This schedule is to ensure adequate planning and execution of the work by the contractor and to assist the Architect in appraising the schedule and evaluating the progress of the work.

B. The project schedule shall be presented within ten (10) days after receipt of the Notice to Proceed. 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 Moore.

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 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.

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

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

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 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

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 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 Sections, apply to this Section.

1.02 Summary
- A. This Section includes the following:
  1. Exterior and interior non-load-bearing wall framing.
- B. Related Sections include the following:
  1. 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.
  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.
- 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.

PART 2 - PRODUCTS

2.01 Manufacturers

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:

1. Allied Studco.
2. AllSteel Products, Inc.
3. California Expanded Metal Products Company.
4. Clark Steel Framing.
5. Consolidated Fabricators Corp.; Building Products Division.
6. Craco Metals Manufacturing, LLC.
7. Custom Stud, Inc.
8. Dale/Incor.
9. Design Shapes in Steel.
10. Dietrich Metal Framing; a Worthington Industries Company.
11. Formetal Co. Inc. (The).
12. Innovative Steel Systems.
13. MarinoWare; a division of Ware Industries.
14. Quail Run Building Materials, Inc.
15. SCAFCO Corporation.
16. Southeastern Stud & Components, Inc.
17. Steel Construction Systems.
18. Steeler, Inc.
19. Super Stud Building Products, Inc.
20. United Metal Products, Inc.

2.02 Materials

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
   1. Grade: ST33H (ST230H).
   2. Coating: G60 (Z180).

B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
   1. Grade: 50 (340), Class 1 or 2.
   2. Coating: G90 (Z275).

2.03 Exterior Non-Load-Bearing Wall Framing

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0428 inches (1.09 mm).
   2. Flange Width: 1-5/8 inches (41 mm).

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.

2.04 Ceiling 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.

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 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 which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation, specified in Division 7 Section "Building Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 Exterior Non-Load-Bearing Wall Installation

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to bottom track, unless otherwise indicated. Fast both flanges to top track if required by deflection option selected. Space studs as follows:

1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Single Deflection Track Option: Install single-leg deflection tracks and anchor to building structure.
2. Double Deflection Track Option: Install double deep-leg deflection tracks and anchor outer track to building structure.
3. Deflection Clip Option: Connect vertical deflection clips to infill studs and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track Option: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of

flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

a. Install solid blocking at maximum 96-inch centers and as shown on approved Shop Drawings.

2. Bridging Options:

a. Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.

b. Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

c. Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

3.04 Joist Installation

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.

1. Unless shown otherwise in drawings, install joists over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).

2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on drawings.

C. Space joists not more than 2 inches (51 mm) from abutting walls, and as follows:

1. Joist Spacing: As indicated.

D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.

E. Install bridging at intervals indicated. Fasten bridging at each joist intersection as follows:

1. Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.

F. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles,

continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.05 Field Quality Control

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.06 Repairs And Protection

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensures the cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

DIVISION 5 – STRUCTURAL STEEL

SECTION 05500 – METAL FABRICATIONS

PART 1 – GENERAL

1.01 Section Includes
- A. Shop fabricated steel items.

1.02 Related Requirements - where applicable.
- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 05 2100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
- E. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
- F. Section 05 5100 - Metal Stairs.

1.03 Reference Standards
- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- K. MPI #79 - Primer, Alkyd, Anti-Corrosive for Metal.
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

SECTION 05500 – METAL FABRICATIONS

1.04 Submittals

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.

a. Include the following, as applicable:

1) Design criteria.

2) Engineering analysis depicting stresses and deflections.

3) Member sizes and gauges.

4) Details of connections.

5) Support reactions.

6) Bracing requirements.

PART 2 – PRODUCTS

2.01 Materials - Steel

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

F. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: As required below, complying with VOC limitations of authorities having jurisdiction.

1. Steel Exposed to Exterior Weather or an Uncontrolled Environment: Two-component, high performance, zinc-rich, aromatic urethane, compatible with topcoat and complying with SSPC-Paint 20.

2. Interior Steel: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI #79 and compatible with topcoat.

J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

2.02 Fabrication

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 Fabricated Items

A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking and joists; prime paint finish.

B. Lintels: As detailed; prime paint finish.

C. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.

D. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.

E. Toilet Partition Suspension Members: Steel channel sections; prime paint finish.

2.04 Finishes - Steel

A. Prime paint steel items.

1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Prepare surfaces to be primed in accordance with SSPC-SP3 for interior steel or SSPC-SP6 for all steel exposed to exterior weather or an uncontrolled environment.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 Fabrication Tolerances

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.
D. Maximum Bow: 1/8 inch in 48 inches.
E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 – EXECUTION

3.01 Examination
A. Verify that field conditions are acceptable and are ready to receive work.
3.02 Preparation
A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
3.03 Installation
A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Field weld components as indicated on drawings.
D. Perform field welding in accordance with AWS D1.1/D1.1M.
E. Obtain approval prior to site cutting or making adjustments not scheduled.
F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
3.04 Tolerances
A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

DIVISION 6 - WOOD & PLASTIC

SECTION 06100 - ROUGH CARPENTRY

Part 1 - General

1.01 Work Included:
- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:
- A. Wood Treatment - Section 06300

1.03 Quality Assurance:
- A. Grades specified shall conform to the most recent grading rules as established by the following bureaus and associations.
  1. PS 20 - American Softwood Lumber Standard.
  2. Western Wood Products Association
  3. Southern Pine Inspection Bureau
- B. Grade and trade mark each piece of lumber or bundle on bundled stock. Use only the recognized official marks of association under whose rules it is graded. Grade and trade marks will not be required if each shipment is accompanied by certificate of inspection issued by grading association.

1.04 Submittals:
- A. Product Data: for each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  1. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer’s written instructions for handling, storing, installing and finishing treated material.
  2. As requested by authorities having jurisdiction include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply wit 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.

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

marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.04 Panel Products:

A. Miscellaneous Concealed Plywood: shear wall sheathing, span rating to suit framing in each location, and thickness indicated. Refer to Structural Drawings.

B. Telephone and Electrical Equipment Backing Panels: DOC PS 1, C-D Plugged, fire-retardant treated, in thickness indicated, or if not indicated, not less than ½ inch thick.

2.05 Fasteners:

A. All nails, spikes, bolts, connectors and other fasteners used in connections with this work shall be galvanized.

1. Nails, wire, brads and staples – FS-FF-N-105.
2. Power-driven Fasteners – CABO NER-272.
3. Wood screws – ASME B18.6.1.
4. Screws for fastening to cold formed metal framing: ASTM C954 length as recommended by screw manufacturer for material to be fastened.
5. Lag bolts – ASME B18.2.1.
6. Bolts – steel bolts complying with ASTM A 307, Grade A with ASTM C563 hex nuts and, where indicated, flat washers.
7. Expansion anchors – anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
   a. Material for interior applications: carbon steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
   b. Material for exterior applications: stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, alloy group 1 or 2.

2.06 Metal Framing Anchors:

A. General: provide galvanized steel framing anchors of structural capacity, type, and size indicated and acceptable to authorities having jurisdiction.

B. Galvanized Steel Sheet: hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

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. Predrill 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

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 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 insulation, observe good fire safety practice, including job site housekeeping.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:
- A. Rigid Insulation: FS-HH-I-1972/1, Class 2 Rigid Insulation.
  - 1. Type: Glass fiber reinforced polyisocyanurate core with foil facing each side (glass fiber facing at roof insulation), and a compressive strength of 25 p.s.i. and a maximum water vapor transmission rate of >.03 perm-inch.
    - a. Application: 1 layer of rigid insulation. First layer shall be 1” thick to match existing thickness, field verify, for installation above metal decking. Refer to Drawings.
  - 3. Adhesive: as recommended by manufacturer of rigid insulation board.
- B. Fibrous Insulation: ASTM C 665-84, Type 1
  - 1. Type:
    - a. 6" thick (approx.) mineral wool or fiberglass fire resistant insulating blanket or batt, with kraft paper facing. Thermal resistance R-19. Provide as necessary.

C. Vapor Retarder:
   1. Roof Deck Installation:
      a. Two layers of high strength kraft paper laminated with an adhesive, and reinforced at edges with fiberglass yarns.
      b. Type Example: Permstop - Owens Corning.

Part 3 - Execution

3.01 Installation - Rigid Insulation:

A. Install rigid insulation horizontally to roof deck, as shown on the Drawings.

B. **Rigid insulation and other components applied to metal decking at membrane roofing shall be fastened with approved fasteners at the rate of 1 per 2 square feet to meet FM I-90 requirements.**

C. Install number of layers required of rigid insulation to metal roof deck to match existing thickeness. Stagger joints of insulation to provide continuous insulation coverage.

D. Cut insulation by means of a saw, knife, or other sharp tool to fit around obstructions across the wall, such as vents, louvers, pipes and conduit.

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

End of Section

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07550 – MODIFIED BITUMEN MEMBRANE ROOFING SYSTEM

Part 1 - General

1.01 Section Includes:
- A. Preparation of Substrate to Receive Roofing Materials
- B. Roof Insulation Application to Prepared Substrate
- C. Roof Membrane Application
- D. Roof Flashing Application
- E. Incorporation of Sheet Metal Flashing Components and Roofing Accessories into the New / Existing Roof Systems

1.02 Products Installed But Not Furnished Under This Section:
- A. Sheet Metal Flashing and Trim

1.03 Related Sections:
- A. Rough Carpentry - Section 06100
- B. Insulation - Section 07200
- C. Flashing & Sheet Metal Section 07600

1.04 Reference Standards:

References in these specifications to standards, test methods and codes, are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies which may be used as references throughout these specifications.

ASTM	American Society for Testing and Materials Philadelphia, PA
FM	Factory Mutual Engineering and Research Norwood, MA
NRCA	National Roofing Contractors Association Rosemont, IL
OSHA	Occupational Safety and Health Administration Washington, DC
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Chantilly, VA
UL	Underwriters Laboratories, Northbrook, IL

1.05 Description Of Work:
- A. **Project Type:** Patch/repair of existing system after HVAC unit and structural supports installation.
  Deck: Metal Slope: **1/8 inch ±** per foot .
- B. **Rigid Insulation:**
  1. Top and Bottom Layers: Polyisocyanurate, having an approximate thickness of **1.0"** – field verify. Refer to Section 07200, Insulation.
  2. Crickets: Polyisocyanurate (tapered to match existing).
- C. **Gypsum sheathing panel:** having a thickness of 1/2 inch, mechanically attached, as per FM I-90 requirements.
- D. **Roof System:** Modified Bitumen Base, applied in cold adhesive; stripping and Flashing, applied in cold adhesive. Modified Bitumen Finish Ply, applied in cold adhesive.

E. **Flashing System:** SBS with continuous metal-foil surfacing, torch applied.

1.06 Submittals:

A. Submittals Prior to Contract Award:
   1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.
   2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the manufacturer's requirements in order to qualify the project for the specified guarantee.

B. Submittals Prior to Project Close-out:
   1. Manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.

1.07 Quality Assurance:

A. Acceptable Products: Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.

B. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.
   1. Underwriters Laboratories Class A acceptance of the proposed roofing system without additional requirements for coatings.

C. Acceptable Contractor: Contractor shall have a minimum of 10 years of experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products for a minimum of 5 years prior to the date of bid opening.
   1. Torch Applicators: Contractor shall employ torch applicators who have successfully passed the CERTA (Certified Roofing Torch Applicator) program requirements as provided by the National Roofing Contractors Association (NRCA).
   2. The Contractor shall have an office, warehouse with supplies, and permanent roofing crews within a 50 mile radius of Moore, Oklahoma. Contractor shall have had "NDL" (No Dollar Limit) approval for 5 years AT THIS AREA OFFICE from manufacturer and shall perform a minimum of ten (10) NDL manufacturer guarantees per

year.

3. **Owner's Roofing Contractor (Universal Roofing and Sheet Metal located in Moore, Oklahoma) shall be utilized on this project. The bid shall be based on the provided drawings and specifications, and agreed-to pricing.**

D. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full-time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractors Association, amended to include the acceptance of a phased roof system installation.

E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

F. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

G. Contractor shall have one of the following approved Contractor Certification levels prior to bid opening:
   Johns Manville - Peak Advantage Contractor
   Soprema – Soprema Certified Applicator
   Siplast – Siplast Select Applicator
   GAF - Master Select Contractor

1.08 Product Delivery Storage And Handling:

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: Store materials out of direct exposure to the elements. Store roll goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents, adhesives, and asphalt cutback products away from open flames, sparks, or excessive heat. Cover all material using a breathable cover such as a

canvas. Polyethylene or other non-breathable plastic coverings are not acceptable.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, removed, and replaced at the Contractor's expense.

1.09 Project/Site Conditions:

A. Requirements Prior to Job Start

1. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.
3. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.

B. Environmental Requirements:

1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application.
   Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
2. Temperature Restrictions: At ambient temperatures between 40F and 50F, prepare / warm adhesive as directed by manufacturer.

C. Protection Requirements:

1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
2. Torch Safety: Designate one person on each crew to perform a daily fire watch. The designated crew member shall watch for fires or smoldering materials on all areas of roof construction. Continue the fire watch after roofing material application has been suspended for the day.
3. Limited Access: Prevent access by the public to materials, tools, and equipment during the course of the project.
4. Debris Removal: Remove all debris daily from the

project site and take to a legal dumping area authorized to receive such materials.

5. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.

1.10 Guarantee/Warranty:

A. Roof Membrane Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with **the manufacturer's ten year labor and materials membrane guarantee.** The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner. This guarantee shall not exclude random areas of ponding from coverage.

1.11 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Only the four systems listed in 2.02 Description of Systems below will be accepted for installation on this project.**

Part 2 - Products:

2.01 Roofing System Assembly/Products:

A. Rigid Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Refer to Section 07200.

B. Recover Board Sheathing Panel for Roof Membrane Substrate: A panel composed of high density fiberboard, non-structural water resistant core material integrally bonded having a nominal thickness of 1/2 inch.

1. Acceptable Manufacturer: Fiberboard Coated High Density Roof Insulation, by Huebert.

C. Gypsum Sheathing Panel for Wood/Plywood Surfaces to Receive Flashing Coverage: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of 1/2 inch. The panel surface shall be factory primed with a non-asphaltic primer.

1. Acceptable Manufacturer: DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

2.02 Description Of Systems:

A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Both reinforcement mats shall be

impregnated/saturated and coated each side with an SBS modified bitumen blend. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14F - or show evidence of other independent testing indicating resistance fatigue, membrane cracking and delamination. Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.

1. Acceptable Manufacturer: Johns Manville roof system:
   a. Modified Bitumen Base, Stripping, and Flashing Reinforcing Ply.
      JM DynaBase
   b. Modified Bitumen Finish Ply
      JM DynaGlas FR
   c. Stripping Ply and Flashing Reinforcing Sheet
      JM DynaPly

B. Flashing Membrane Assembly: A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements.

1. Acceptable Manufacturer: Johns Manville flashing system, aluminum finish
   a. Cant Backing Sheet for Wood/Plywood Surfaces to Receive Flashing Coverage: applicable JM product.
   b. Metal-Clad Modified Bitumen Flashing Sheet: JM DynaClad Flashing
   c. Cant Strip: JM FesCant Plus Cant Strips

C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

1. Acceptable Manufacturer: Flashing System by Johns

Manville; Denver, CO

D. Additional Roof Systems: The following additional roof systems are acceptable for use in lieu of the specified roof system.
   1. GAF Materials Corp., Wayne, NJ
      Base Ply B Ruberoid Mop Smooth
      Finish Ply B Ruberoid Mop FR - cap ply Plus
      Flashing Sheet B Ruberoid Ultraclad SBS
      Stripping Ply and Flashing Reinforcing Sheet - Ruberoid Mop Smooth
   2. Soprema, Inc., Wadsworth, OH
      Base Ply – Elastophene Sanded 2.2
      Finish Ply – Elastophene LS FR GR
      Flashing Sheet – Sopralast 50 TV ALU
      Stripping Ply and Flashing Reinforcing Sheet - Elastophene Sanded 2.2

2.03 Roofing Accessories:

A. Roofing Adhesives:
   1. Membrane Cold Adhesive: An asphalt, solvent blend conforming to ASTM D 3019, Type III requirements.
      a. Acceptable Manufacturer: MBR Cold Application Adhesive by Johns Manville; Denver, CO

B. Bituminous Cutback Materials:
   1. Primer: An asphalt, solvent blend conforming to ASTM D 41 requirements.
   2. Mastics: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D 4586 Type II requirements.

C. Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.

D. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.

E. Metallic Powder: A finely graded metal dust as supplied or approved by the membrane manufacturer, used for covering of bitumen overruns over the foil surfaced membrane.

F. Perlite Cant Strips: A cant strip composed of expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt based coating. The face of the cant shall have a nominal 4 inch dimension.

G. Fasteners:
   1. Gypsum Sheathing Panel Fasteners for Roofing

Substrates and Wood/Plywood Flashing Surfaces: Gypsum sheathing panel fasteners and plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The fastening pattern for each panel to be used shall be as recommended by the panel manufacturer and approved by the manufacturer of the primary roofing products. Acceptable panel fastener manufacturers for specific substrate types are listed below.

a. Wood/Plywood Flashing Surfaces: Gypsum sheathing panel mechanical fasteners shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable fastener types for wood/plywood substrates are listed below.
   1) A fluorocarbon coated screw type roofing fastener having a minimum 0.220 inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3 inch diameter, as supplied by the fastener manufacturer.

b. Acceptable Manufacturer=s:
   1) Ultrafast Fastener with UltraFast Round Metal Plates by Johns Manville; Denver, CO
   2) Dekfast #12 with Dekfast Steel Hexagonal Plates by Construction Fasteners, Inc.; Wyomissing, PA
   3) Standard Roofing Fastener by Olympic Manufacturing Group, Agawam; MA

2. Flashing Reinforcing Sheet Fasteners: Fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable fasteners for specific substrate types are listed below.

a. Wood/Plywood Substrates
   1) A 12 gauge, spiral or annular threaded shank, zinc coated steel roofing fastener having a minimum 1 inch head.
   2) Square Cap by W.H. Maze Co.; Peru, IL
      12 Gauge Simplex Nail by the Simplex Nail and Manufacturing Co., Americus, GA
   3) Fasteners shall be applied to meet FM-I90 requirements. At crickets, if insulation thickness prohibits satisfactory application of fasteners, use adhesive similar to Para-

STIK insulation adhesive.

H. Walktread: A prefabricated, puncture resistant polyester core reinforced, polymer modified bitumen sheet material topped with a ceramic-coated granule wearing surface.
   1. Thickness: 0.25 in
   2. Width: 32 in
   3. Acceptable Manufacturer: DynaTred Roof Walkway Pads by Johns Manville; Denver, CO

I. Pipe Supports Typical:
   1. Roller System: A Aroller-bearing@ pipe support for roof-mounted gas pipes, RTU condensate lines, and electrical conduit up to 4" I.D. or 5"O.D. Pipes rest on a self-lubricating roller system which is made of a stainless steel or glass-filled nylon rod and a sturdy polycarbonate resin roller. Pipe support base shall be manufactured of polycarbonate resin with a roller rod of glass-filled nylon, and stainless steel metal parts.
   2. Load Weight: Maximum load weight may not exceed 125 lbs. per pipestand.
   3. Spacing: Not to exceed 10 foot centers. Do not exceed 125 lbs. load weight and adjust pipe stand in height to even load.
   4. Acceptable Manufacturer: Pillow Block Pipestand Model 4-R, Miro Industries, Inc., 1780 West 2300 South, Salt Lake City, Utah 84119.

J. Pipe Supports at Turns In Large Piping:
   1. Pipe Support Hangers: A Aclevis hanger@ pipe support hanger for roof mounted gas pipes at all large (over 4" I.D.) piping corners, bends, and Atees@/pipe intersections. Pipes rest on a clevis hanger with a support base of stainless steel polycarbonate. All other metal parts are hot-dip galvanized steel.
   2. Load Weight: Maximum load weight not to exceed 310 lbs. per pipestand or 155 lbs. on each base.
   3. Spacing: Locate Aclevis@ type pipe hangers at all corners, bends, and Atees@/pipe intersections not to exceed 10'-0" o.c. maximum. Do not exceed 310 lbs. load weight (155 lbs. on each base) and make certain each pipestand is adjusted in height to even load at all pipestands.
   4. Acceptable Manufacturer: Pillow Block Pipestand Model 6-H, Miro Industries, Inc., 1780 West 2300 South, Salt Lake City, Utah 84119.

K. Penetration Dam/Sealer Pockets shall be similar to: **ChemCurb System:** gray polyester resin exterior forms,

structural sealant and One (1) part self-leveling moisture cure pourable sealer (gray).

Part 3- Execution

3.01 Preparation:

A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

3.02 Substrate Preparation - Metal Deck / Insulation:

A. Preparation of Wood/Plywood Substrates to Receive Flashing Materials: Mechanically attach the gypsum sheathing panels to all wood/plywood substrates that will be covered with the specified flashing membrane, using the specified screws/plates, at 12 inches o.c. staggered. Cut the cant backing sheet into 12 inch widths and peel the release film from the back of the sheet. Set the sheet into place extending 6 inches onto the field of the roof area and 6 inches up the gypsum sheathing panel surface utilizing minimum 3 inch side laps. Set the cant into place prior to installation of the roof membrane base ply.

B. Insulation Panel - two layers: Mechanically attach the insulation panels, using the specified fasteners, at a rate of 1 fastener for every 2.7 square feet of panel area (12 per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof area and by 75% at the corners. Meet FM I-90 requirements.

C. Gypsum Sheathing Panels: Install sheathing panels, and any tapered insulation in hot asphalt, with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions.

3.04 Roof Membrane Installation:

A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.

B. Aesthetic Considerations: An aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials including granules and metallic powder, and exercise care in ensuring that the finished application is acceptable to the Owner.

C. Priming: Prime metal and concrete and masonry surfaces with a uniform coating of the specified primer.

D. Membrane Adhesive Application: Membrane adhesive can be applied by roller, squeegee or spray unit. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate of 2 to 2 1/2 gal/sq over irregular or porous substrates. Utilize an application rate of 1 1/2 to 2 gal/sq for interply applications. Double the adhesive application rate at the end laps of granule surfaced sheets. In the areas surrounding details that are to receive the catalyzed acrylic resin primer and flashing system, apply membrane plies in a full coating of the specified elastomeric sealant in lieu of the solvent based adhesive a minimum 8 inches from the base of the penetration or curb.

E. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.

F. Roofing Application: Apply all layers of roofing free of wrinkles, creases, or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.

1. Apply all layers of roofing perpendicular to the slope of the deck.
2. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the asphalt applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.
3. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the cold adhesive applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.
4. Maximum sheet lengths and special fastening of the specified roof membrane system may be required at various slope increments where the roof deck slope exceeds 1/2 inch per foot. The manufacturer shall provide acceptable sheet lengths and the required fastening schedule for all roofing sheet applications

to applicable roof slopes.

G. Granule Embedment: Broadcast mineral granules over all bitumen overruns on the finish ply surface, while the bitumen is still hot or the adhesive is soft, to ensure a monolithic surface color.

H. Flashing Application - masonry surfaces: Flash masonry parapet walls and curbs using the reinforcing sheet and the metal foil flashing membrane. After the base ply has been applied to the top of the cant, fully adhere the reinforcing sheet, utilizing minimum 3 inch side laps and extend a minimum of 3 inches onto the base ply surface and 3 inches up the parapet wall above the cant. After the final roofing ply has been applied to the top of the cant, prepare the surface area that is to receive flashing coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches beyond the toe of the cant onto the prepared surface of the finished roof and up the wall to the desired flashing height. Exert pressure on the flashing sheet during application to ensure complete contact with the wall/roof surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See manufacturer's schematic for visual interpretation).

I. Flashing Application B surfaces sheathed with gypsum sheathing panels: After the gypsum sheathing panel and cant backing sheet have been installed, flash parapet walls and curbs with the specified reinforcing sheet and the metal foil flashing membrane. The reinforcing sheet shall have minimum 3 inch side laps and extend a minimum of 3 inches onto the base ply surface and to the top of the parapet wall or curb. Using the specified fasteners, mechanically attach the reinforcing sheet through the field of the sheet to the vertical flashing surface on 12 inch centers from the top of the cant to the top of the wall or curb. Fully adhere the remainder of the flashing reinforcing sheet that extends over the cant and roof level. Using a Leister Hand Welding Tool, seal the laps between flashing reinforcing sheets. After the final roofing ply has been applied to the top of the cant,

prepare the surface area that is to receive flashing coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches beyond the toe of the cant onto the prepared surface of the finished roof and up the wall to the desired flashing height. Exert pressure on the flashing sheet during application to ensure complete contact with the wall/roof surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See manufacturer's schematic for visual interpretation).

J. Catalyzed Acrylic Resin Flashing System: Install the liquid-applied primer and flashing system in accordance with the membrane system manufacturer=s printed installer=s guidelines and other applicable written recommendations as provided by the manufacturer.

K. Use of Metallic Powder: Broadcast metallic powder over all bitumen overruns on the metal foil membrane surface while the bitumen is still hot to ensure a monolithic surface color.

L. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

3.05 Roof System Interface With Related Components:

A. Walktread: Cut the walktread into maximum 5 foot lengths and allow to relax until flat. Adhere the sheet using the specified plastic cement. Apply the specified cement in a 3/8 inch thickness to the back of the product in 5 inch by 5 inch spots in accordance with the pattern as supplied by the walktread manufacturer. Walk-in each sheet after application to ensure proper adhesion. Use a minimum spacing of 2 inches between sheets to allow for proper drainage.

B. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.06 Field Quality Control And Inspections:

A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment, and related items after completion of job.

B. Notification Of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection:

1. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance Of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

End of Section

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07600 - FLASHING AND SHEET METAL

Part 1 - General

1.01 Work Included:
- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:
- A. Modified Bitumen Membrane Roofing System - Section 07550
- B. Sealants - Section 07900

1.03 Quality Assurance:
- A. Standards:
  - 1. American Society of Testing and Materials
    - a. ASTM A-526, Steel Sheet, Zinc-Coated (Galvanized), Commercial Quality.
    - b. ASTM B-32, Solder Metal
  - 2. Federal Specifications:
    - a. SS-C-153B, Cement, Bituminous, Plastics
  - 3. Sheet Metal and Air Conditioning Contractors National Association:
    - a. Architectural Sheet Metal Manual

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:
- A. Sheet Metal:
  - 1. Galvanized Sheet Steel: ASTM A-526, Commercial Quality.
  - 2. Gauge: 22 Gauge minimum or as required by Drawings or Specifications.
- C. Fasteners: Nails, screws, and other fasteners used in conjunction with this work shall be galvanized or cadmium plated.
- D. Solder: ASTM B-32, alloy grade 58, 50% tin, 50% lead.
- E. Flux: Muriatic acid with zinc.
- F. Sealants: Rubber based compound - refer to Section 07900.
- G. Bituminous Plastic Cement: FS SS-C-153B.
- H. Accessories: Provide accessories as recommended by manufacturer or as indicated on Drawings.

Part 3 - Execution

3.01 Fabrication:
- A. Shape and install sheet metal as indicated on Drawings. Comply

with recommendations of SMACNA "Architectural Sheet Metal Manual."

B. Form exposed faces flat and free of buckles, excessive wave and tool marks. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

C. Hem all exposed edges.

D. Make waterproof corner joints by soldering solidly. Joints shall be full-lapped.

E. Soldering: Shall be done slowly with well heated coppers to thoroughly heat the sheet and completely sweat the solder through the full width of the seam. Ample solder shall be used and the seam shall show a least one full inch of evenly flowed solder. Soldering coppers: Shall be heavy and blunt design, properly tinned before using. Neutralize all excess flux.

F. Provide for thermal expansion of running trim, flashing and other items exposed for more than 15'-0" continuous length. Locate expansion seams at 10'-0" intervals and 2'-0" each side of corners and intersections.

G. Angle bottom edges of exposed vertical surfaces to form drips.

3.02 Installation and Application:

A. General:

1. Furnish those items to be installed by other trades to proper grade for installation.
2. Cooperate with and coordinate installation of sheet metal with roofing work as specified under Membrane Roofing - Section 07500.
3. Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
4. Embed all flashing in plastic cement. Coat dissimilar metals from contact with bituminous coating.

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

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	Construction Penetrated	Type Of Construction	UL Classification System Identification
1	No Penetrating Items:	F, W, C	A, B, J, K, L	0001-0999
2	Metallic Pipes, Conduit or Tubing:	F, W, C	A, B, J, K, L	1001-1999
3	Nonmetallic Pipe, Conduit or Tubing:	F, W, C	A, B, J, K, L	2001-2999
4	Electric Cables:	F, W, C	A, B, J, K, L	3001-3999
5	Cable, Trays with Electric Cables:	F, W, C	A, B, J, K, L	4001-4999
6	Insulated Pipes:	F, W, C	A, B, J, K, L	5001-5999

7	Electrical Bussduct Penetrations:	F, W, C	A, B, J, K, L	6001-6999
8	Mechanical Ductwork Penetrations:	F, W, C	A, B, J, K, L	7001-7999
9	Multiple Penetrations Through Common 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 of 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 of masonry walls greater than 8-inches thick
L-	Framed walls

JOINT UL CLASSIFICATION SYSTEM

Fire-Resistant Joint Systems		Joint System	Movement Capability	Joint Width
1	Floor-to-Floor	FF	D	0000-0999
2	Wall-to-Wall	WW	D	0000-0999
3	Floor-to-Wall:	FW	D	0000-0999
4	Head of Wall:	HW	D	0000-0999

UL Classification System

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

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 job-site.

C. Store materials under cover and protect from weather and

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

as identified below:

1. Hilti, Inc., Tulsa, Oklahoma
   800-879-8000 / www.us.hilti.com

2.03 Materials:

A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products are acceptable:
   1. Hilti CP 680-P Cast-In Place Firestop Device
      a. Add Aerator adaptor when used in conjunction with aerator (“sovent”) system.
   2. Hilti CP 681 Tub Box Kit for use with tub installations.
   3. Hilti CP 680-M Cast-In Place Firestop Device for use with noncombustible penetrants.
   4. Hilti CP 653 Speed Sleeve for use with cable penetrations.

C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
   1. Hilti FS-ONE Intumescent Firestop Sealant
   2. Hilti CP 604 Self-leveling Firestop Sealant
   3. Hilti CP 620 Fire Foam
   4. Hilti CP 606 Flexible Firestop Sealant
   5. Hilti CP 601s Elastomeric Firestop Sealant

D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
   1. Hilti CP 601s Elastomeric Firestop Sealant
   2. Hilti CP 606 Flexible Firestop Sealant
   3. Hilti FS-ONE Intumescent Firestop Sealant

E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
   1. Hilti CP 672 Speed Spray
   2. Hilti CP 601s Elastomeric Firestop Sealant
   3. Hilti CP 606 Flexible Firestop Sealant
   4. Hilti CP 604 Self-leveling Firestop Sealant

F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.
   1. Hilti CP 777 Speed Plugs
   2. Hilti CP 767 Speed Strips

G. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
   1. Hilti FS-ONE Intumescent Firestop Sealant

H. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
   1. Hilti FS-ONE Intumescent Firestop Sealant
   2. Hilti CP 620 Fire Foam
   3. Hilti CP 601s Elastomeric Firestop Sealant
   4. Hilti CP 606 Flexible Firestop Sealant

I. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
   1. Hilti CP 618 Firestop Putty Stick
   2. Hilti CP 658T Firestop Plug

J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
   1. Hilti CP 617 Firestop Putty Pad
   2. Hilti Firestop Box Insert

K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
   1. Hilti CP 643N Firestop Collar
   2. Hilti CP 644 Firestop Collar
   3. Hilti CP 648E/CP648S Wrap Strips

L. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
   1. Hilti CP 637 Firestop Mortar
   3. Hilti FS 657 FIRE BLOCK
   4. Hilti CP 620 Fire Foam
   5. Hilti CP 675T Firestop Board

M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
   1. Hilti FS 657 FIRE BLOCK
   2. Hilti CP 675T Firestop Board

N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
   1. Hilti CP 672 Speed Spray
   2. Hilti CP 601s Elastomeric Firestop Sealant

3. Hilti CP 606 Flexible Firestop Sealant
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

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

comply with the following limits for VOC content when calculated according to 40 CPR 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 CPR 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

include, but are not limited to, the following:
a. BASF Building Systems.
b. Bostik, Inc.
c. Lymtal, International, Inc.
d. Pecora Corporation.
e. Sika Corporation; Construction Products Division.
f. Tremco Incorporated.

D. Latex Joint Sealants: Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, GradeNF.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. BASF Building Systems.
b. Bostik, Inc.
c. Pecora Corporation.
d. Tremco Incorporated.

E. Preformed Joint Sealants: Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Dayton Superior Specialty Chemicals.
b. EM SEAL Joint Systems, Ltd.
c. Sandell Manufacturing Co.
d. Schul International, Inc.
e. Willseal USA, LLC.

F. Acoustical Joint Sealants: Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Pecora Corporation.

b. USG Corporation.

G. Joint Sealant Backing: cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type 0 (open-cell material) or any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
   1. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

H. Miscellaneous Materials: as recommended by sealant manufacturer.
   1. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
   2. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
   3. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
   4. Joint Cleaner
   5. Joint Primer/Sealer
   6. Bond Breaker Tape
   7. Joint Backer-Rod: Closed-cell compressible rod stock, size and shape as required by application.

I. Caulking compound: Watertight, gun consistency, conforming to FS-TT-C-598, Type 1.

J. Accessories: As recommended by sealant manufacturer.

K. Color: to be selected from manufacturer’s standard colors.

Part 3 - Execution

3.01 Preparation:

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
   1. Remove laitance and form-release agents from concrete.
   2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant

manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.02 Installation: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

A. Do not leave gaps between ends of sealant backings.

B. Do not stretch, twist, puncture, or tear sealant backings.

C. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

G. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.

H. Clean off excess sealant or sealant smears adjacent to

joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.03 Joint Sealant Schedule:

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non traffic surfaces.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.

F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal non traffic surfaces.

3.04 Additional Information:

A. Application: All sight exposed caulking, and all exterior applications.

B. Comply with sealant manufacturer's printed instructions.

C. Any surfaces requiring priming, shall be prepared according to manufacturer's recommendations.

D. Install sealants to depths as shown or as recommended by sealant manufacturer. Smooth uneven surfaces.

F. Do not disturb compound by touching, washing, or otherwise until it has cured tack free.

G. Excess compound shall be removed from surfaces after curing.

H. Follow manufacturer's recommendations for painting over sealant.

End of Section

DIVISION 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.

7. Acceptable Manufacturer: 200 Snap-Grid System, Chicago Metallic Corporation
8. Acoustical "Cloud" Edge Trim:
   a. Axiom Classic Trim as manufactured by Armstrong World Industries, Inc.
   b. Commercial quality extruded aluminum alloy 6063 trim channel with factory applied baked polyester paint finish.
   c. Color - white (to match ceiling grid).
   d. Height - 8".
   e. Provide all necessary accessories including, but limited to, corner posts, T-bar connection clips, galvanized steel splice plates, etc. Do not hang acoustical clouds from edge trim.

B. Suspended Gypsum Board Ceilings:
1. Structural Channels: Cold-rolled, 16 gauge, galvanized steel.
2. Furring Channels: Roll-formed, hat sections, 20 gauge.

Part 3 - Execution

3.01 General:
A. Coordinate with electrical and mechanical contractors in placement of light fixtures, grilles, etc. to conform with ceiling pattern.
B. Construct necessary scaffolding, adequate and safe, in accordance with applicable laws and ordinances. Maintain during this work and remove after completion.
C. Provide thorough and competent foreman and skilled mechanics.

3.02 Installation:
A. Suspended Acoustical Ceiling:
1. Deflection of any component shall not exceed 1/360 of the span.
2. Main tees shall be suspended on 48" centers by 12 gauge wire spaced not more than 48" o.c. along main tee.
3. Cross tees shall be placed at 24" o.c. or as required by the Drawings.
4. Install wall angles at intersection of suspended ceiling and all vertical surfaces. Miter corners where wall molding intersects.
5. Install grid system and ceiling panels with faces in a plane.
6. Provide intersection clips at intersection of all tees.
7. Provide additional hangar wire at four corners of light fixtures.
8. Provide additional hangar wires to insure proper placement

and alignment of grid system.

9. Prior to the final acceptance of the building, examine and adjust water level to be certain that all planes and lines are plumb, square and smooth. Replace all marked, marred or otherwise damaged materials.

B. Suspended Gypsum Board Ceilings:

1. Coordinate location of hangars with other work.
2. Install ceiling framing independent of walls, columns and above ceiling work.
3. Install ceiling framing system in accordance with manufacturer's recommendations.
4. Reinforce openings in ceilings in accordance with manufacturer's recommendations.
5. Laterally brace entire suspension system where required.

3.03 Clean-Up:

A. Completely remove from the job site, at the completion of the work, all cartons, packaging, etc., and all other scraps and waste caused by this trade.

End of Section

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 Gypsum Wallboard:
A. Type: **Impact Resistant**, **Fire-rated**, ASTM C-36 / C-1396, Impact Resistance ASTM E-695, Indentation Resistance ASTM D-5420, Abrasion Resistance ASTM D-4977,
B. Size: 5/8" thick x 48" wide x 96" or as required.
C. Edges: Tapered.
D. Location: Where indicated on drawings and / or exposed in corridors.

2.03 Fasteners:
A. Screws: Self-drilling, self-tapping, bugle head, Type S.
B. Nails: Annular ring: GWB-54.

2.04 Joint Treatment Materials:
A. Joint Tape: Perforated Tape, ASTM C-475.
B. Joint Compound: ASTM C-475.

2.05 Accessories:
A. Metal Edge: Similar to United States Gypsum Trim No. 402.
B. Interior Trim: ASTM C 1047.
1. Material: Galvanized coated steel sheet.

2. Shapes:
    a. Cornerbead.
    b. L-Bead: L-shaped; exposed long flange receives joint compound.
    c. Expansion (control) joint.
    d. Curved-Edge Cornerbead: With notched or flexible flanges.

C. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
    1. Minimum Base Metal Thickness: 0.0312 inch.

D. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

Part 3 - Execution

3.01 Installation:

A. Apply gypsum board to horizontal surfaces first, then to vertical.

B. Install gypsum board parallel to studs at vertical surfaces.

C. To minimize joints, use panels of maximum practical lengths.

D. Position all ends and edges of gypsum board over nailing or fastening members. Fit ends and edges closely; do not force together. Stagger end joints.

E. Cut ends, edges, scribe or make cutouts within field of panel in a workmanlike manner.

F. Install trim at all intersections of gypsum board and other surfaces. Provide corner bead at all vertical or horizontal corners.

G. Fasteners:
    1. Drive fasteners in field of panel first, work toward ends and edges.
    2. Perimeter fasteners shall be a least 3/8" from ends and edges.
    3. Attach panels to wood framing members with specified nails spaced out 8" for ceiling, and 8" o.c. at ends and 12" o.c. at each support.
    4. Drive nail head slightly below surface of panel in a uniform dimple without breaking face paper.
    5. Screw fasteners shall be spaced 12" o.c. at each support in the field of the board and 8" o.c. at all edges and ends.
    6. Screws shall be power-driven with an electric screwdriver and screw heads shall provide a slight depression below surface of panel without breaking face paper.

3.02 Joint Treatment:

A. Treat all exposed joints and trim with a three-coat approved system applied in strict accordance with manufacturer's

recommendations.

3.03 Applying Texture Finishes:

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns. Provide light orange peel finish.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

3.04 Clean-Up:

A. Use all necessary care during execution of the Work of this Section to prevent undue scattering of drywall scraps and dust and to prevent tracking of joint and finishing compounds onto floor surfaces. On completion of each installation segment in a room or space, promptly pick up and remove from the working area all scraps, debris and surplus material.

End of Section

DIVISION 9 - FINISHES

SECTION 09500 - ACOUSTICAL TREATMENT

Part 1 - General

1.01 Work Included:
- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:
- A. Ceiling Suspension Systems - Section 09120

1.03 Quality Assurance:
- A. Standards:
  - 1. American Society for Testing and Materials:
    - a. ASTM C-636 Recommended Practice of Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
    - b. ASTM E-84 Surface Burning Characteristics of Building Materials.
  - 2. Federal Specifications:
    - a. SS-S-118B, Sound Controlling Blocks and Boards. Underwriter's Laboratories, Inc.
- B. Submittals:
  - 1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers**

Part 2 - Products

2.01 Acoustical Ceiling Panels:
- A. 2x2 Tile - Square Edge:
  - 1. Type: FS-SS-S-118B, Class 25
  - 2. Size: 24" x 24" x 5/8". Provide special sizes as indicated on Drawings or as required by others.
  - 3. Finish: Board finish shall be a factory-applied white latex paint, medium textured non-direction fissured surface with a minimum light reflection of 80%.
  - 4. Noncombustibility: Board shall meet class 25-Federal Specification SS-S-118B, ASTM E-84; and, classified by Underwriter's Laboratories for Flame Spread Index 0-25.
  - 5. Type Example and Manufacturer:
    - a. Armstrong Fine Fissured No. 1728, square (2x2)
- B. 2x2 Tile - Tegular Edge:
  - 1. Type: FS-SS-S-118B, Class 25
  - 2. Size: 24" x 24" x 5/8". Provide special sizes as indicated on Drawings or as required by others.

3. Finish: Board finish shall be a factory-applied white latex paint, medium textured non-direction fissured surface with a minimum light reflection of 80%.
4. Noncombustibility: Board shall meet class 25-Federal Specification SS-S-118B, ASTM E-84; and, classified by Underwriter's Laboratories for Flame Spread Index 0-25.
5. Type Example and Manufacturer:
   a. Armstrong Fine Fissured No. 1732, beveled tegular 2x2).

Part 3 - Execution

3.01 Installation:

A. Install in specified grid system per ASTM C-636 and manufacturer's recommendations, as shown on the Drawings.

B. Provide ten (10) pieces of ceiling panels in cartons for future use. Panels shall be in perfect condition.

End of Section

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.**

SECTION 09900 - PAINTING

Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.

C. Wherever the abbreviation "SW" appears in the following detailed specification, it shall be understood to mean Sherwin-Williams.

D. Primers shall be as specified by manufacturers of finish paint used and as approved by the Architect.

2.02 Acceptable Manufacturers:

A. Sherwin-Williams.

B. PPG Industries.

C. Cook Paint and Varnish Co.

D. Pratt and Lambert.

E Kelly-Moore.

2.02 Exterior Finishes:

A. Enamel on Ferrous Metals:

1. One coat SW Kem Kromik Primer, (Alkyd primer).
2. Two coats SW Industrial Enamel, (Alkyd gloss enamel).

B. Enamel on Exterior Door Frames and Doors:

1. Shop coat by others-touch up as required.
2. Two coats SW Industrial Enamel, (Alkyd gloss enamel).

C. Enamel on Galvanized Metal:

1. One Coat SW Galvite primer.
2. 2 Coats SW Industrial Enamel, (Alkyd gloss enamel).

D. Enamel on Exterior Concrete Block:

1. One coat SW Promar Latex Block Filler B25W25.
2. Two coats SW A-100 Semi-Gloss Latex Enamel.

2.03 Interior Finishes:

A. Enamel on Metal: All miscellaneous and ornamental metal items which are left exposed, hollow metal doors and frames.

1. Shop coat by others - touch up as required.
2. Two coats SW Promar 200 Semi-Gloss. Enamel, (Alkyd semi-gloss enamel).

B. Enamel on Concrete Block:

1. One coat SW Promar 200 Block Filler (vinyl acrylic latex).
2. Two coats SW Promar 200 Semi-Gloss Enamel.

C. Enamel on Gypsum Board Ceilings/Facias/Walls

1. One coat SW Promar 200 Wall Primer with Medium Texture. (Vinyl Acrylic Latex Wall Primer.)
2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.

D. Tape and Float: Joints on Gypsum Board.

1. As per manufacturer's instructions.
2. All joints shall be sanded ready for primer's finish.

E. Interior Millwork and Cabinetry:

1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.

F. Enamel on Wood Trim:

1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.

G. Back-Painting, Interior Work:

1. Two coats SW Promar 200 Alkyd Enamel Primer/Undercoat.

H. Enamel on Exposed Metal Piping:
   1. One coat SW Galvite primer.
   2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.

Part 3 - Execution

3.01 Inspection:
   A. Notify Contractor of any surface not in proper condition to be finished before proceeding with the work. Starting work will constitute the painter's acceptance of preceding work, and conditions under which finish will be applied and his assumption of responsibility for results to be obtained.

3.02 Preparation of Surfaces:
   A. Wood:
      1. Sand to a smooth even surface, then dust off.
      2. Touch-up knots, resinous spots, etc., on all surfaces with shellac 18 hours before applying prime coat.
      3. Fill nail holes, cracks and blemishes flush after priming coat has dried.
   B. Concrete Block and Concrete:
      1. Repair cracks and irregularities to provide uniform surface texture.
   C. Ferrous Metal Surfaces:
      1. Remove rust and scale, clean grease or oil surfaces with turpentine or benzine before painting.

3.03 Application:
   A. Number of coats and quality of finish shall be in accordance with these specifications, which requires the use of material which will product first quality finish if properly applied.
   B. Apply coats of material in strict accordance with manufacturer's currently published specifications, except where requirements of these specifications are in excess or manufacturer's requirements.
   C. Except as otherwise approved by the Architect, the first two coats of painter's finish shall be applied by roller or brush application. Finish coats may be applied by spray application.
   D. Comply with recommendation of product manufacturer for drying time between succeeding coats allow additional as required until finish is dry.
   E. All work where a coat of material has been applied must be inspected and approved before application of succeeding coat, otherwise, no credit for the coat well be given. Notify Architect when a particular coat has been completed for inspection and approval.
   F. Shellacs, oils, turpentine, etc., shall be of the highest quality and subject to approval of Architect. Materials shall be mixed in and applied directly from containers which they are purchased except when use of other containers is approved.
   G. First Coat of all finishes, except of varnish and stains, shall be white.

H. Sand lightly between coats where shellac, varnish or enamel is used.

I. Remove all hardware, accessories, machined surfaces, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.

3.04 Clean-up:

A. Clean and paint spots from work and touch-up or otherwise repair any defective or damaged work.

B. Remove all surplus materials and equipment after work is completed.

C. Leave entire job clean and acceptable to the Architect.

End of Section