

TECHNICAL SPECIFICATIONS AND DRAWINGS  
FOR  
HOUSTON COMMUNITY COLLEGE  
HCCS WLS ROOFING RETROFIT

5505 WEST LOOP SOUTH, HOUSTON, TX 77081

WALTER P MOORE PROJECT NUMBER D03.19171.00

DECEMBER 12, 2019

**TECHNICAL SPECIFICATIONS AND DRAWINGS**

**FOR**

**HOUSTON COMMUNITY COLLEGE  
HCCS WLS ROOFING RETROFIT  
5505 WEST LOOP SOUTH, HOUSTON, TX 77081**

**WALTER P. MOORE AND ASSOCIATES, INC.**

1301 McKinney Street, Suite 1100  
Houston, Texas 77010  
713.630.7300

**D03.19171.00**

SECTION 00 01 05 – TITLE/CERTIFICATION PAGE

PROJECT: HOUSTON COMMUNITY COLLEGE  
HCCS WLS ROOFING RETROFIT  
5505 West Loop South, Houston, Tx 77081

PROJECT NUMBER: Walter P Moore Project No. D03.19171.00

ENGINEER: Walter P. Moore and Associates, Inc.  
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Walter P. Moore and Associates, Inc.  
MBuckley@walterpmoore.com

END OF SECTION 00 01 05

SECTION 00 01 07 – SEALS PAGE

I HEREBY CERTIFY THAT THESE PLANS AND TECHNICAL SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF TEXAS.

Walter P. Moore and Associates, Inc.  
TBPE Firm Registration No. 1856



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Kimani Augustine, P.E. (TX P.E. No. 104891)  
Walter P. Moore and Associates, Inc.  
TBPE Firm No. 1856

END OF SECTION 00 01 07

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SECTION 01 10 00 – TASK ITEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General Conditions and Division 01 Specification sections, apply to work of this section.
- B. This section is for the convenience of the Contractor only and shall not be construed as a complete accounting of all work to be performed.
- C. The extent of the Task Items is indicated on the drawings and by the requirements of each section of the specifications.
- D. **Field Verification:** Information provided in the contract documents is for the contractor's general reference only and requires field verification. The contractor shall examine the site and shall be responsible for verifying all existing construction, conditions, and dimensions. No extra payment will be considered for work additional to that shown or noted, if such work would have been apparent in an inspection of the premises.
- E. **Coordination:** Coordinate the work throughout the duration of the project as to minimize disruption of facility operations.
  - a. As indicated in certain task items below which require Inspector or Engineer review of existing conditions, provide adequate notice to prevent delays to construction, as described in the General Conditions.

PART 2 - PRODUCTS (see EXECUTION section)

PART 3 - EXECUTION

3.1 TASK ITEM (T.I.) DESCRIPTION

T.I. 1.1 PROJECT MOBILIZATION

A. Scope of Work

- 1. Work consists of coordinating, scheduling, obtaining and assembling at construction site all equipment, materials, permits, supplies, manpower and other essentials and incidentals necessary to perform work.
- 2. Coordinate all aspects of work with Owner and all trades.
- 3. Provide protective measures in and around the building as directed by the Owner prior to beginning work. The contractor shall take measures as necessary to keep access to the building free and clear of all hazards.
- 4. **Contractor shall install certified temporary fall protection systems meeting all regulatory and governmental requirements prior to**

**performing any work on the roof. Provide signed and sealed drawings of all temporary fall protection systems for the Owner's records. Contractor shall be responsible for performing an independent safety assessment prior to bidding the project and include allowances for all necessary institutional, regulatory, and governmental safety provisions in their Bid Submittal. All required safety systems must remain in place for the entire duration of the roofing construction and shall continuously be used in strict accordance with all institutional, regulatory, and governmental requirements.**

5. Contractor is advised that this work is being performed at a law enforcement critical facility and shall take all necessary precautions to limit noise, odor, and dust pollution from impacting the operations of the facility as directed by the Owner. Perform disruptive or noisy work during times indicated by Owner. Coordinate with Owner if weekend or evening hours are required.
6. Salvage existing material which has been indicated for reinstallation according to work items below. Store salvaged materials in clean, dry locations and protect from moisture, extreme temperatures, and direct sunlight.
7. Properly dispose of all debris and waste construction materials in accordance with all applicable laws and regulations.
8. Prepare project staging, phasing, building enclosure protection (water, dust, and odor), and demolition haul-off plans and submit to Owner for their review and approval. Provide signed and sealed engineered shop drawings if required for any trash shoot or demolition related structural building attachments to be used during demolition.

B. Repair Drawings and Specifications

1. Not Applicable.

T.I. 2.1 DEMOLITION AND SUBSTRATE PREPARATION

A. Scope of Work

1. Interior Protection: Contractor shall include in their bid all costs, materials, and equipment required to protect interior of building from water / dust / odor infiltration and debris that could enter the building during this work. This includes plastic drape dust protection and protection of all interior finishes and furniture. The contractor shall clean all areas affected by any interior operations. Where metal roof R-panel sections are to be removed to replaced wetted under-roof insulation (see T.I. 7.1), provide protection in the area below the work area and coordinate the work with the facilities management so that personnel in affected areas can be notified.



2. Odor Controls: Contractor shall include in their bid all costs, materials, and equipment required to mitigate odor infiltration during roofing installation including but not limited to low VOC adhesives, from infiltrating the interior of building during this work. This includes performing a pre-construction survey of potentially unsealed thru-deck penetrations, deck-to-wall transitions, mechanical ducts, etc. The contractor shall identify these locations prior to start of work, prepare an odor mitigation plan to be submitted to Owner for review and approval, and implement approved odor mitigation prevention procedures as necessary to prevent disruption of the interior operations of the facility. Where necessary, provide protection in the interior areas below the work area and coordinate the work with the facilities management so that personnel in affected areas can be notified.
  3. Existing Roofing system (top-down):
    - a. 2-foot wide metal roofing panels with standing seams attached to structural z-purlin roof framing; z-purlins are spaced at 5-feet on center.
    - b. Fibrous glass blanket faced insulation suspended across the structural steel z-purlin roof framing.
  4. Remove all debris from roof area and properly dispose of all materials off site.
  5. Remove all existing base flashings, counterflashings, pipe flashings, vents and associated components necessary for application of new recover membrane base flashing.
  6. Implement all necessary work procedures and protocols to ensure that the building is protected from environmental elements during ongoing construction operations. Only perform roofing demolition operations at roof area extents within each daily work period as can be temporarily made weathertight at the end of that day. Submit a building enclosure protection plan for Owner's review and records.
  7. At the end of each day, ensure that all gutters are in proper working order, that gutters are clear, downspouts are completely clear, and that the facility is left in a completely weathertight condition. Implement any required corrective measures before leaving the job site that day.
- B. Repair Drawings and Specifications
1. Refer to Drawing Sheets R1.0 for locations of work.
- T.I. 5.1 CLEAN AND COAT REPAIRS – METAL ROOF PANELS
- A. Scope of Work
1. Inspect existing metal roof panel surfaces to locate areas of corroded or deteriorated metal.

2. Clean, wire brush, and prime coat any surface-rusted metal panels in accordance with the protective coating manufacturer's recommendations prior to applying galvanizing repair coating; do not damage adjacent uncorroded metal roof R-panel surfaces. Metal Panel surfaces to be coated shall be cleaned in accordance with manufacturer's requirements, i.e., devoid of grease, oil, mill scale, oxidation, loosely adherent rust, paint, etc.
3. Install galvanizing repair coating in accordance with manufacturer's recommendations. Galvanizing repair coating shall be "ZRC Galvalite" as manufactured by ZRC Chemical Products or a paint complying with SSPC-Paint 20, Level 1.

B. Drawings and Specifications

1. Refer to Drawing Sheet R1.0 for locations of work.
2. Refer to Detail 8/R3.0 for installation details.

T.I. 6.1 ROUGH CARPENTRY

A. Scope of Work

1. Work consists of installation of new lumber nailers, sleepers, curbs, and edging as required for installation of the recover roofing system and associated flashings. For bidding purposes, assume all existing lumber will require replacement.
2. Install replacement nailers where deteriorated components were removed or new nailers as indicated by project details. Add nailers along roof edges to accommodate new recover roofing assembly and edge flashings.
3. All Task Item 6.1 roofing attachments shall be installed to resist the wind uplift pressure ratings specified in the Drawings. Contractor shall submit engineered shop drawings for all new wood framing assemblies required for the overlay roofing system installation; the shop drawings shall be signed and sealed by a structural engineer in licensed in the State of Texas.

B. Drawings and Specifications

1. Refer to Sheet R2.0 for locations of work.
2. Refer to Sheet R3.0 for installation details.
3. Refer to specification Section "Rough Carpentry" for work requirements, materials, and procedures.

T.I. 7.1 UNDER-DECK ROOFING INSULATION REPLACEMENT

A. A. Scope of Work

1. Work consists of removing wetted suspended fibrous glass blanket faced insulation under existing metal panels and replacing in-kind.
2. At wetted fibrous glass blanket faced insulation locations identified and shown on the Drawings, Contractor shall remove the existing metal panel sections as necessary to access, remove, and replace the wetted insulation. Carefully store the remove metal panel sections and fasteners to allow for reinstallation.
3. Follow all manufacturer's requirements during installation of the new hung insulation panels.
4. After replacement of the wetted insulation panels, reinstall the metal panels to their original construction and attachment.

B. Drawings and Specifications

1. Refer to Sheets R2.0 for locations of work.
2. Acceptable Replacement Insulation Material: EcoTouch Certified R Metal Building Insulation by Owens Corning (thickness and facer to match existing)

T.I. 7.2 SINGLE-PLY PVC MEMBRANE ROOFING RECOVER RETROFIT

A. Scope of Work

1. Work consists of installation of a recover roofing assembly over the existing metal panel roofing.
2. Recover roofing assembly shall generally consist of polyisocyanurate insulation infilled between the metal panel flutes, coverboard, single-ply roofing membrane, all membrane flashings, and other accessories.
3. Remove and replace wetted roof insulation as identified in Task Item 7.1.
4. Perform surface preparation of metal panel surfaces per manufacturer requirements. Ensure all roof penetrations are properly secured and prepared to receive new roofing materials.
5. Loose lay beveled polyisocyanurate flute filler insulation between the metal roof panel flutes. Tightly butt insulation boards together.
6. Install 0.5-inch thick cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Secure to deck using mechanical fasteners designed and sized for fastening specified cover board to deck type.

7. Install PVC single-ply roofing membrane using electromagnetic induction welding application methods in accordance with roofing system manufacturer's written instructions.
8. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
9. Install all components of recover retrofit roofing assembly in accordance with manufacturer's written testing literature to resist wind uplift pressures at corners, perimeter, and field areas of roof as specified in the Drawings.

B. Drawings and Specifications

1. Refer to Sheet R0.2 for wind uplift pressure requirements.
2. Refer to Sheet R2.0 for locations of work at the roofing areas indicated.
3. Refer to Sheet R3.0 for installation details.
4. Refer to specification Section "Metal Roof Recover Retrofit" for work requirements, materials, and procedures.

T.I. 7.4 SHEET METAL FLASHING AND TRIM

A. Scope of Work

1. Work consists of installation of all sheet metal flashing and trim as indicated on project drawings and specifications.
2. Install new edge metal and flashing.
3. Install new counter-flashings.
4. Install new formed metal flashings at flues, pipes, etc.
5. Install new perimeter gutters, conductors, and downspouts.

B. Materials

1. Refer to Sheet R2.1 for locations of work at the roofing areas indicated.
2. Refer to Sheet R3.0 for installation details.
3. Refer to specification Section "Sheet Metal Flashing and Trim" for work requirements, materials, and procedures.

T.I. 7.5 ROOFING SYSTEM WARRANTY

A. Scope of Work

1. Work consists of providing a manufacturer and contractor warranties for new roofing system.
2. Provide a 20 Year “Roof System/Labor Guaranty” material and labor warranty for the new recover retrofit roofing PVC roofing system, including the membrane, insulation, overlay board, and other accessories.
3. Provide a 10 year “Waterproofing System/Labor Guaranty” material and labor warranty for the new fluid-applied roofing system.
4. Warranty shall be the shared responsibility of the Roofing Contractor and the Roofing Membrane Manufacturer for the first two (2) years. The contractor shall provide a standard NRCA warranty form.
5. The Contractor shall make all necessary notices for warranty purposes to the primary roofing manufacturer, to secure timely inspections and issuance of the warranty.

B. Drawings and Specifications

1. Refer to Sheet R2.0 for locations of work at the roofing areas indicated.
2. Refer to Sheet R3.0 for installation details.

T.I. 7.6 JOINT SEALANT REPLACEMENT/INSTALLATION

A. Scope of Work

1. Work consists of removal and replacement or installation of sealant joints.
2. Remove existing sealant from joints.
3. All joints shall be thoroughly cleaned by either abrasive methods or grinding to remove all laitance, unsound substrate, and curing compounds which may interfere with adhesion. Joint shall be air blasted to remove remaining debris.
4. Prime joint surfaces as needed.
5. Install backer rod or bond breaker in strict accordance with manufacturer’s instructions.
6. Install sealant with concave profile and overall dimensions to conform with manufacturer’s recommendations for best practice for sealant installation.
7. Do not allow sealant to ooze or sag.
8. Where double sealant joints are indicated, allow the inner sealant joint to fully cure before installation of the outer sealant joint.

- B. Drawings and Specifications
  - 1. Refer to Sheet R2.0 for locations of work at the roofing areas indicated.
  - 2. Refer to Sheet R3.0 for installation details.
  - 3. Refer to Specification Section “Joint Sealants” for work requirements, materials, and procedures.
  
- T.I. 10.1 CLEAN AND COAT CORRODED STEEL
  - A. Scope of work
    - 1. Work consists of furnishing all labor, materials, equipment, supervision, staging, shoring, bracing, and incidentals necessary to clean corroded plates and connections between precast concrete members. Provide surface preparation by abrasive blasting of steel plates or steel connection members and apply an epoxy coating. Refer to Sheet R2.0 for locations of work.
  
  - B. Materials
    - 1. Primer: Pre-Prime 167 by ICI Devoe coatings.
    - 2. Finish coat: Devran 224 HS by ICI Devoe coatings. Color to match existing surface.
  
  - C. Execution
    - 1. Prepare surfaces in strict accordance with manufacture’s specifications. Steel surfaces to be coated shall be clean, i.e. Devoid of grease, oil, mill scale, oxidation, loosely adherent rust, paint, etc. Abrasive blast steel surfaces to SSPC-SP6.
    - 2. Apply epoxy coating system (primer and finish coat) in strict accordance with manufacturer’s specifications.
  
- T.I. 22.1 PLUMBING WORK
  - A. Scope of Work
    - 1. Work consists of cleaning existing downspouts, installing new gutters at roof perimeter, and other drainage items.
    - 2. Clean and rod out all downspouts.
    - 3. Install piping extensions as required to raise curbs, vents, stacks, and soil pipes to a minimum of 8-inches above the finished roof surface.
    - 4. Install new pipe supports on top of new roofing membrane with sacrificial pad.

5. At locations the existing roof drains need to be replaced, install new retrofit roof drains, including but not limited to all plumbing extensions and accessories. Flash retrofit roof drains in accordance with roofing manufacturer's requirements.
  6. All plumbing retrofit work shall be performed by a licensed and experienced plumber and shall be performed according to all applicable current codes and regulations.
- B. Repair Drawings and Specifications
1. Plumbing piping, supports, fasteners, and other accessories, as needed.
  2. Refer to Sheet R2.0 for locations of work at the roofing areas indicated.
- T.I. 23.1 MECHANICAL WORK
- A. Scope of Work
1. Work consists of raising equipment curbs, conduits, gas lines, ducts, and pipes to accommodate and protect new roofing system.
  2. Temporarily remove mechanical ducts interfering with the installation of the new roofing membrane and sheet metal flashing. Mechanical to wall connections to be left in place.
  3. Remove abandoned curbs and rooftop equipment as indicated in project drawings.
  4. Raise all curbs and platforms to a minimum of 8 inches or as indicated in project details above the finished roof surface and flash over the tops of the curbs to install proper counter-flashing.
  5. All mechanical equipment retrofit work shall be performed by a licensed contractor experienced in this type of work and shall be performed according to all applicable current codes and regulations.
- B. Repair Drawings and Specifications
1. Pipe supports, fasteners, and other accessories, as needed.
  2. Refer to Sheet R2.0 for locations of work at the roofing areas indicated.
- T.I. 26.1 ELECTRICAL WORK
- A. Scope of Work
1. Work consists of removing and reinstalling conduits, wiring, cameras, lights, and other electrical work during installation of new roofing system.

2. All electrical work shall be performed by a licensed and experienced electrician and shall be performed according to all applicable current codes and regulations.
3. Raise existing electrical conduit to a minimum of 8 inches above the finished roof surface. Provide extensions of services to allow for goosenecks to be installed.
4. Install new conduit supports on top of new roofing membrane with sacrificial pads of modified bitumen cap sheet.

B. Repair Drawings and Specifications

1. Conduit supports, fasteners, and other accessories, as needed.
2. Refer to Sheet R2.0 for locations of work at the roofing areas indicated.

T.I. 26.2 LIGHTNING PROTECTION SYSTEM

A. Scope of work

1. Work consists of temporarily removing and reinstalling the existing lightning protection system during installation of new roofing system. This work shall be performed at all roofing replacement construction areas whether shown on the drawings or not.
2. Removal and reinstallation of the existing lightning protection system shall be performed by a lightning protection institute certified master installer.
3. Upon completion the contractor will deliver to the owner as as-built drawing and the appropriate system certification documents under the underwriter's laboratory and the lightning protection institute programs
4. Provide sacrificial cap sheet ply under all conductor cables, attachments, rods, and connection points.

B. Repair drawings and specifications

1. Refer to sheet R2.0 for locations of work.
2. Refer to sheet R3.0 for installation details.

END OF SECTION 011000



SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including conditions included by Owner.

1.2 GENERAL DESCRIPTION OF WORK:

- A. The Work of this Contract will be performed in the facility as shown on Drawings.
- B. Contractor shall furnish all material, labor, tools, supplies, permits, equipment, transportation, superintendence, barricades, temporary protection, bracing, shoring, temporary construction of every nature, insurance, taxes, contributions and all services and facilities, unless specifically excepted, and install all materials, items, and equipment required to complete the construction of the Project, as set forth in the Contract Documents.
- C. Refer to Section “Task Items” for a description of work. Task Item specifications, details, and drawings shall govern all repair operations. Locations where Task Items apply are shown on Drawings as symbols.
- D. Final Payment shall be made on basis of actual approved Work performed as measured in place.

1.3 MEASUREMENTS:

- A. Before ordering any material or doing any Work, Contractor shall verify all measurements at the Project Site and shall be responsible for correctness of same.
- B. Before proceeding with each Task Item, Contractor shall locate, mark, and measure quantity of each item and report quantities to Engineer. If measured quantities exceed those indicated on the bid form, Contractor shall obtain written authorization to proceed from Owner before executing Work required for that Task Item.
- C. Cost of Work included in each Task Item for quantities as indicated in the Contract Documents shall be included in Base Bid without substitution of materials, construction sequence, or limitations on construction means where indicated.

1.4 WORK SEQUENCE:

- A. Prior to commencement of Work, meet with Engineer and Owner representatives to establish sequence and schedule of Work. Contractor shall give Owner notice of areas to be cleared at least 7 working days in advance of actual Work.
- B. Contractor shall notify Owner’s representative at least 24 hours prior to commencing any abrasive blasting such as sandblasting, etc. operations.
- C. Work will be conducted in phases to provide least possible interference to activities of Owner’s personnel and facility users.

1. Contractor's work hours shall be limited to comply with noise ordinances. Contractor is allowed to work as necessary to complete work within Owner's time schedule and conditions conducive to temperature sensitive materials.
  - D. Contractor shall remove debris from Work Area on daily basis and dispose of same at authorized sites.
  - E. Contractor shall remove dust and air transported material from remainder of facility at conclusion of operations in Work area.
- 1.5 CONTRACTOR'S USE OF PREMISES:
- A. Contractor shall limit their use of adjacent premises for Work, construction operations and storage to allow for:
    1. Public use, including parking.
    2. Owner Occupancy:
      - a. Where it is necessary for the Contractor to use portions of existing buildings and/or grounds for operations, such use shall be strictly in accordance with requirements and approval of the Owner.
      - b. Contractor shall organize the work in order that inconvenience to the building occupants is minimized.
      - c. Keep driveways and entrances serving the premises clear and available to the Owner and building occupants at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
      - d. Unless otherwise indicated or specified, or unless otherwise directed by Owner; water, gas, lighting, power and telephone conduits and wires, sewer lines, and other surface and subsurface structures and lines, shall be maintained by Contractor and shall not be disturbed, disconnected or damaged by the Contractor during progress of Work. Should the Contractor in performance of Work disturb, disconnect or damage any of above, expenses arising from the disturbance replacement or repair shall be borne by Contractor.
      - e. Elevators shall not be used for transfer of materials or equipment unless approved by the Owner's Representative in writing. When permitted by the Owner's Representative the Contractor shall take care not to overload or damage the elevator.
    3. Contractor shall:
      - a. Not unreasonably encumber Site with materials and equipment.
      - b. Not load structure with weight that will endanger the structure.
      - c. Assume full responsibility for protection and safekeeping of stored products.

- d. Move or remove stored products which interfere with operations of Owner.
- e. Obtain and pay for use of additional storage and work areas needed for operations.
- 4. Contractor Parking:
  - a. Contractor's personal vehicles shall park outside of construction area. Only vehicles equipment or delivering materials should be in the construction area. Coordinate with owner's representative.
- 1.6 OWNER OCCUPANCY:
  - A. Cooperate with the Owner's Representative in all construction operations to minimize conflict and to facilitate Owner usage.
  - B. Contractor shall at all times conduct operations to ensure the least inconvenience to the general public.
- 1.7 SURVEY OF EXISTING CONDITIONS:
  - A. Contractors acknowledges by submitting a Bid, that they have visited and inspected the Project Site in which the Work is to be performed, that they have satisfied themselves as to the nature and location of the Work, including any obstructions, amount of work, actual levels, the equipment and facilities needed preliminary to and during the prosecution of the Work, and all other matters which can in any way affect the Work or the cost thereof under this Contract.
  - B. Failure by Contractors to have acquainted themselves with available information concerning Site conditions, including factors affecting costs and liabilities, shall not relieve Contractor of responsibility for performance of Work in accordance with requirements of Contract Documents, and for amount of consideration named or otherwise determined.

END OF SECTION 01 11 00

## SECTION 01 25 13 – PRODUCT SUBSTITUTION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to this Section.
- B. Contractor's Construction Schedule and Schedule of Submittals are included under Section "Submittal Procedures."

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of Contract.

#### 1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify meaning of other terms used in Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by Contractor after award of Contract are considered requests for "substitutions." Following are not considered substitutions:
  - 1. Revisions to Contract Documents requested by Owner or Engineer.
  - 2. Specified options of products and construction methods included in Contract Documents.
  - 3. Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

#### 1.4 SUBMITTALS

- A. Substitution Request Submittal: Requests for substitution will be considered if received within 15 days after commencement of Work. Requests received more than 15 days after commencement of Work may be considered or rejected at discretion of Engineer.
  - 1. Submit electronic copies of each request for substitution for consideration. Submit requests on forms included at end of this Section and in accordance with procedures required for Change Order proposals. Engineer will make the Substitution Request Form at the end of this Section available to the Contractor as an electronic file upon request by the Contractor.
  - 2. Identify product, fabrication, and/or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with requirements for substitutions, and the following information, as appropriate:

- a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
- b. Samples, where applicable or requested.
- c. Full specification sections from requested manufacturer specifying line item material information for each item specified in the basis-of-design construction documents.
- d. Manufacturer details for each condition specified in the drawings, if different from what is shown in the basis-of-design construction documents.
- e. Detailed comparison of significant qualities of proposed substitution with those of Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
- f. Coordination information, including list of changes or modifications needed to other parts of Work and to construction performed by Owner and separate Contractors that will become necessary to accommodate proposed substitution.
- g. Statement indicating substitution's effect on Contractor's Construction Schedule compared to schedule without approval of substitution. Indicate effect of proposed substitution on overall Contract Time.
- h. Cost information, including proposal of net change, if any in Contract Sum.
- i. Certification by Contractor and Manufacturer that substitution proposed is equal to or better in every significant respect to that required by Contract Documents, and that it will perform adequately in application indicated. Include Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of substitution to perform adequately.
- j. Any additional information that the Engineer may request.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Contractor shall investigate and document compatibility of proposed substitution with related products and materials.
- B. For proposed substitution system, products, the Engineer may request the Contractor engage a qualified testing agency to perform compatibility tests recommended by manufacturers, durability test recommended by the Engineer, additional quality assurance testing, and/or additional quality control testing. Additional cost associated with the proposed substitution request shall be paid for by the Contractor.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Conditions: Contractor's substitution request will be received and considered by Engineer when one or more of following conditions are satisfied, as determined by Engineer; otherwise

requests will be returned without action except to record noncompliance with these requirements.

1. Specified products or methods of construction cannot be provided within Contract Time. Specified products or methods of construction cannot receive necessary approval by governing authority, and requested substitution can be approved.
  2. Substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities Owner may be required to bear. Additional responsibilities for Owner may include additional compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner or separate Contractors, and similar considerations.
  3. Specified products or methods of construction cannot be provided in manner that is compatible with other materials, and where Contractor certifies that substitution will overcome incompatibility.
  4. Specified products or methods of construction cannot be coordinated with other materials, and where Contractor certifies that proposed substitution can be coordinated.
  5. Specified products or methods of construction cannot provide warranty required by Contract Documents and where Contractor certifies that proposed substitution provide required warranty.
- B. Contractor's submittal and Engineer's review of Shop Drawings, Product Data and/or Samples that relate to construction activities not complying with Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

END OF SECTION 01 25 13

REQUEST FOR SUBSTITUTION

To: WALTER P MOORE

Attention: Kimani Augustine

From: \_\_\_\_\_  
Name of Company

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State\Province, Zip Code

\_\_\_\_\_  
Phone

\_\_\_\_\_  
Email

Fully answer all information requested below. Failure to answer any item may cause rejection of request for substitution. If requested by Engineer, submit information about manufacturer and vendor history, financial stability, distribution and support systems. Use one form for each product/assembly requested. Only first product/assembly listed will be considered on forms with more than one product listed.

Specification Section Number: \_\_\_\_\_ Drawing Number: \_\_\_\_\_

Para Number: \_\_\_\_\_ Detail Number: \_\_\_\_\_

Specified Product/Assembly: \_\_\_\_\_

Proposed Substitution: \_\_\_\_\_

Please answer the following questions. Attach an explanation sheet on your company's letterhead when required.

Does the proposed substitution affect dimensions indicated on Drawings?

No \_\_\_\_\_ Yes \_\_\_\_\_ (If yes, explain below).

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Does the proposed substitution require changes in Drawings and/or design or installation changes?

No \_\_\_\_\_ Yes \_\_\_\_\_

If yes, is the cost of these changes included in the proposed amount? No \_\_\_\_\_ Yes \_\_\_\_\_

Does the proposed substitution affect other trades? No \_\_\_\_\_ Yes \_\_\_\_\_

(If yes, explain who and how)

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If the proposed product does affect the work of other trades, has the cost impact on their work been included in the price of the proposed substitution?

No \_\_\_\_\_ Yes \_\_\_\_\_

Does the proposed product's guarantee differ from that of the specified product's?

No \_\_\_\_\_ Yes \_\_\_\_\_ (If yes, explain below).

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Why is this proposal for substitution being submitted? List reasons below.

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Attach a listing of 3 projects using the proposed substitution, completed within the past 5 years in similar to the geographic and climatic region of the Project. At least one of the applications shall have been in service for at least 3 years.

Attach product data/brochures and this Request for Substitution Form for the specified products and proposed substitute product.

Undersigned has examined Construction Documents, is familiar with specified product, understands indicated application of product, and understands design intent of Engineer. Undersigned states that proposed substitution complies with Construction Documents and will perform at least equally to specified product within limitations stated above. Undersigned accepts responsibility for coordinating application and installation of proposed substitution and waives all claims for additional costs resulting from incorporation of proposed substitution into Project or its subsequent failure to perform according to specified requirements.

Submitted By: \_\_\_\_\_  
Typed Name

\_\_\_\_\_  
Signature

Date: \_\_\_\_\_



SECTION 01 29 00 – PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with Continuation Sheets.
    - b. Submittals Schedule.
  - 2. Submit the Schedule of Values to Engineer at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual Bid Form Task Items as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of Engineer.
    - c. Engineer's project number.

- d. Contractor's name and address.
  - e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Task Item, Specification Section or Division.
    - b. Description of the Work.
    - c. Unit price of the Work
    - d. Name of subcontractor.
    - e. Name of manufacturer or fabricator.
    - f. Name of supplier.
    - g. Change Orders (numbers) that affect value.
    - h. Dollar value as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
  3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
  4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  5. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  6. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

#### 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is the **15th day** of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15days before the date for each progress payment.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment or Owner's approved forms.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at the time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Stored Materials: Where applicable, include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Electronically submit signed and notarized scans of each Application for Payment to Engineer. Include waivers of lien and similar attachments if required by the Owner's Representative.
1. Include a cover page listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item, if applicable.
  2. When an application shows completion of an item, submit final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  5. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.
    - a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  6. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of Values.
  3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list.
  5. Schedule of unit prices.
  6. Submittals Schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
  13. Certificates of insurance and insurance policies.
  14. Performance and payment bonds.
  15. Initial settlement survey and damage report if required.
- I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing final percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. Evidence that claims have been settled.
7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
8. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 29 00

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General project coordination procedures.
  - 2. Coordination Submittals.
  - 3. Requests for Information (RFIs).
  - 4. Administrative and supervisory personnel.
  - 5. Project meetings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 01 Section "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
  2. Preparation of the Schedule of Values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Pre-installation conferences.
  6. Project closeout activities.

#### 1.4 COORDINATION SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Indicate relationship of components shown on separate Shop Drawings.
  2. Indicate required installation sequences.
- B. Staff Names: Within ten days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.

#### 1.5 REQUESTS FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Engineer will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project Name.
  2. WPM Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Engineer.

6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Where applicable, contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Email the RFI to the Engineer.
1. Title the subject line of the email with: WPM Project number - Project Name - RFI number
  2. Attachments shall be electronic files in PDF format.
- D. RFI Forms: Generate the RFI in the Owner's project management software.
1. Where the Owner's project management software does not include space for the information above Include information as an electronically attached MS word file.
  2. Attachments shall be electronic files preferably in PDF format if permitted by the Owner's software.
- E. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Engineer's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.
  2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.
  3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.



- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following in the RFI Log:
1. Project name.
  2. Name of Contractor.
  3. Name of Engineer.
  4. RFI number including RFIs that were returned without action or withdrawn.
  5. RFI summary description.
  6. Date the RFI was submitted.
  7. Date Engineer's response was received.
- G. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven 7 days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

#### 1.6 OWNERS PROJECT WEB SITE

- A. If applicable, use Owner's Project Web Site for purposes of hosting and managing project communication and documentation until Final Completion. Owner's Project Web site may include the following functions:
1. Project directory.
  2. Project correspondence.
  3. Meeting minutes.
  4. Contract modifications forms and logs.
  5. RFI forms and logs.
  6. Task and issue management.
  7. Photo documentation.
  8. Schedule and calendar management.
  9. Submittals forms and logs.
  10. Payment application forms.
  11. Drawing and specification document hosting, viewing, and updating.
  12. Online document collaboration.
  13. Reminder and tracking functions.
  14. Archiving functions.
- B. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Engineer.

1.7 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.8 PROJECT MEETINGS

- A. General: Coordinate with the Engineer and Owner's Representatives in the scheduling and participation in meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform the Owner's Representative, Engineer, and Contractor of the date and time of each meeting. Contractor and Owner's Representative shall inform others involved, and individuals whose presence is required, of date and time of each meeting.
  2. Agenda: Engineer or Owner's Representative will prepare the meeting agenda and distribute the agenda to all invited attendees.
  3. Minutes: Contractor will record significant discussions and agreements achieved. Minutes will be distributed to everyone concerned, including Owner, Engineer, and Contractor.
- B. Preconstruction Conference: Coordinate with the Engineer and Owner's Representatives in the scheduling of a preconstruction conference before starting construction, at a time acceptable to the Contractor and convenient to Owner and Engineer but no later than 15 days after execution of the Agreement. Hold the conference at the Project site or another convenient location. The Engineer or Owner's Representative will conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, may include the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing.
    - d. Designation of responsible personnel.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for processing Applications for Payment.
    - g. Distribution of the Contract Documents.
    - h. Submittal procedures.
    - i. Preparation of Record Documents.
    - j. Use of the premises.
    - k. Responsibility for temporary facilities and controls.
    - l. Parking availability.
    - m. Office, work, and storage areas.
    - n. Equipment deliveries and priorities.

- o. First aid.
  - p. Security.
  - q. Progress cleaning.
  - r. Working hours.
- C. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer of scheduled meeting dates.
  - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related Change Orders.
    - d. Deliveries.
    - e. Submittals.
    - f. Compatibility problems.
    - g. Time schedules.
    - h. Weather limitations.
    - i. Manufacturer's written recommendations.
    - j. Warranty requirements.
    - k. Compatibility of materials.
    - l. Acceptability of substrates.
    - m. Temporary facilities and controls.
    - n. Space and access limitations.
    - o. Testing and inspecting requirements.
    - p. Protection of construction and personnel.
  - 3. Record significant conference discussions, agreements, and disagreements.
  - 4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Engineer or Owner's Representative will conduct progress meetings at weekly intervals. Contractor shall coordinate preparation of payment requests with dates of meetings.
- 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - b. Review present and future needs of each entity present, including the following:
    - 1) Sequence of operations.
    - 2) Status of submittals.
    - 3) Access.
    - 4) Site utilization.
    - 5) Temporary facilities and controls.
    - 6) Work hours.
    - 7) Hazards and risks.
    - 8) Progress cleaning.
    - 9) Quality and work standards.
    - 10) Change Orders.
    - 11) Documentation of information for payment requests.
3. Reporting: Engineer or Owner's Representative will distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
  - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

END OF SECTION 01 31 00

## SECTION 01 33 00 – SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Related Sections include the following:
  - 1. Division 01 Section "Payment Procedures."
  - 2. Division 01 Section "Project Management and Coordination" for submitting Coordination Drawings.
  - 3. Division 01 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals.
  - 4. Division 01 Section "Closeout Procedures" for submitting warranties.
  - 5. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

#### 1.4 SUBMITTAL PROCEDURES

- A. Resubmittals: Engineer will review each of Contractor's shop drawings and/or submittal data the initial time and, should resubmittal be required, one additional time to verify that reasons for resubmittal have been addressed by Contractor and corrections made. Resubmittal changes/revisions/corrections shall be circled. Engineer will review only circled items and will not be responsible for non-circled changes/revisions/corrections and additions. Should additional resubmittals be required, Contractor shall reimburse Owner for all costs incurred, including the cost of Engineer's services made necessary to review such additional resubmittals. Owner will in turn reimburse Engineer.
- B. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.

- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal.
  - 1. Initial Review: Allow seven (7) business days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
- E. Identification: Precede each submittal with a cover page for identification.
  - 1. Indicate name of firm or entity that prepared each submittal on the cover page.
  - 2. Provide a blank space approximately 4 by 5 inches on cover page to record Contractor's review and approval markings. Provide an additional 5 by 5 inches on the cover page for the Engineer's review.
  - 3. Include the following information on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Engineer.
    - d. Name and address of Contractor.
    - e. Name and address of Subcontractor.
    - f. Name and address of Supplier.
    - g. Name of Manufacturer.
    - h. Unique identifier, including revision number.
    - i. Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Other necessary identification.
- F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals, without review, received from sources other than Contractor.
  - 1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements of the Contract Documents,

- including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
  3. Transmittal Form: Provide locations on form for the following information:
    - a. Project name.
    - b. Date.
    - c. Destination (To:).
    - d. Source (From:).
    - e. Names of subcontractor, manufacturer, and supplier.
    - f. Category and type of submittal.
    - g. Submittal purpose and description.
    - h. Submittal and transmittal distribution record.
    - i. Remarks.
    - j. Signature of transmitter.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

## PART 2 - PRODUCTS

### 2.1 ACTION SUBMITTALS

- A. General: Prepare and electronically submit Action Submittals required by individual Specification Sections. Engineer will return submittal via email. Reviewed submittal will be stamp and may contain commentary and or redlines thought the submittal where warranted. Engineers review stamps are:
1. No Exceptions Taken: No commentary by the Engineer. No further resubmittal is required.
  2. Exception Noted: Commentary are contained throughout the submittal. No further resubmittal is required as long as the Engineer's comments are addressed.
  3. Revise and Resubmit: Commentary are contained throughout the submittal. Revise the submittal to account for the commentary. Additionally, submit additional parts or products not included in the original submittal where noted.
  4. Submit Specified Item(s): One or more submitted products, assemblies, or information does not comply with the project documents. Additionally, commentary may be contained throughout the submittal. Resubmit an acceptable product(s), assemblies, or information. Revise the acceptable portions of the submittal to account for the commentary. Provide additional submittal parts or products not included in the original submittal where noted.

5. Acknowledge Receipt for Records Only: Only acknowledges receipt of information requested by the Contract Documents and does not indicate that the information contained in the submittal has been reviewed for accuracy. The Contractor is responsible for confirming information on the submittal is coordinated and consistent with the Contract Documents.
  6. Reviewed for Reference and Information Only: Reviewed information requested by the Contract Documents but does not indicate that the information contained in the submittal has been reviewed for accuracy. The Contractor is responsible for confirming information on the submittal is coordinated and consistent with the Contract Documents.
  7. Reviewed for Impact to Structure Only: Reviewed information requested by the Contract Documents and whether it has an impact on the existing construction or the Engineer's design but does not indicate that the information contained in the submittal has been reviewed for accuracy. The Contractor is responsible for confirming information on the submittal is coordinated and consistent with the Contract Documents.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Standard color charts.
    - e. Manufacturer's catalog cuts.
    - f. Wiring diagrams showing factory-installed wiring.
    - g. Printed performance curves.
    - h. Operational range diagrams.
    - i. Mill reports.
    - j. Standard product operating and maintenance manuals.
    - k. Compliance with recognized trade association standards.
    - l. Compliance with recognized testing agency standards.
    - m. Application of testing agency labels and seals.
    - n. Notation of coordination requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.



- f. Shopwork manufacturing instructions.
  - g. Templates and patterns.
  - h. Schedules.
  - i. Design calculations.
  - j. Compliance with specified standards.
  - k. Notation of coordination requirements.
  - l. Notation of dimensions established by field measurement.
- D. Coordination Drawings: Comply with requirements in Division 01 Section "Project Management and Coordination."

## 2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
- 1. Electronically submit copies of each submittal, unless otherwise indicated.
  - 2. Number of Copies: Submit three copies of each submittal, unless otherwise indicated. Engineer will not return copies.
  - 3. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  - 4. Test and Inspection Reports: Comply with requirements in Division 01 Section "Quality Requirements."
- B. Contractor's Construction Schedule: Provide Level 3 Schedule with progress monitoring and project control level unless Owner has more stringent scheduling requirements.
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and owners, and other information specified.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

- I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.
- J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.
  - 6. Test procedures and results.
  - 7. Limitations of use.
- N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
  - 1. Preparation of substrates.
  - 2. Required substrate tolerances.
  - 3. Sequence of installation or erection.
  - 4. Required installation tolerances.
  - 5. Required adjustments.

6. Recommendations for cleaning and protection.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

### 2.3 REQUESTS FOR INFORMATION

- A. Engineer reserves the right to reject, unprocessed, any RFI that the Engineer, at its sole discretion, deems already answered in the Contract Documents.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

END OF SECTION 01 33 00

## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Quality-assurance services and quality-control services include inspections, tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by Engineer.
- C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- D. Related Requirements:
  - 1. Division 01 Section "Cutting and Patching" specifies requirements for repair and restoration of construction disturbed by inspection and testing activities.
  - 2. Division 01 Section "Submittal Procedures" specifies requirements for development of a schedule of required tests and inspections.
  - 3. Technical Specification Sections for specific test and inspection requirements.

#### 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
  - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
  - 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of 5 previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

#### 1.5 RESPONSIBILITIES

- A. Contractor Responsibilities:
  - 1. Retesting: Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
    - a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
  - 2. Associated Services: Cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
    - a. Provide access to the Work.
    - b. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
    - c. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
    - d. Provide facilities for storage and curing of test samples.
    - e. Deliver samples to testing laboratories.
    - f. Provide the agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.
    - g. Provide security and protection of samples and test equipment at the Project Site.
- B. Owner Responsibilities: Owner will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.
  - 1. Owner will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services which are the Owner's responsibility.

- C. Coordination: Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
  - 1. Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Contractor's quality-control personnel.
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

#### 1.7 ACTION SUBMITTALS

- A. Rough Carpentry Shop Drawings: Provide plans, sections, elevations, and details indicating materials, reinforcement, and attachment for the fabrication of new rough carpentry framing (signed and sealed by a structural engineer licensed in the state where the project is located).
- B. Roofing Slope Plan Shop Drawings: Provide plans, sections, elevations, and details indicating materials and attachment for fabrication of new tapered insulation sections based on field verified condition.
- C. Sheet Metal Flashing and Trim Shop Drawings: Provide plans, sections, elevations, and details indicating materials, lapping, and attachment for fabrication of new sheet metal flashing and trim assemblies based on field verified condition.
- D. Shop Drawings: For mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
  - 1. Indicate manufacturer and model number of individual components.
  - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- E. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- F. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.

9. Unique characteristics of each quality-control service.

## 1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than 5 days prior to preconstruction conference. Submit in format acceptable to Engineer. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  1. Project quality-control manager may also serve as a Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
  2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
  3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Engineer has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

## 1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  1. Date of issue.
  2. Project title and number.
  3. Name, address, and telephone number of testing agency.



4. Dates and locations of samples and tests or inspections.
  5. Names of individuals performing tests and inspections.
  6. Description of the Work and test and inspection methods.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting when relevant.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and re-inspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- E. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

1.10 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. 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 the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an A2LA, an AAP, an NVLAP, a CMET, a CWI, a CWB Inspector, a PTI Level 2, an AAMA, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. General Requirements:
    - a. Each independent testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State\Province in which the Project is located.
    - b. The Testing Laboratory shall be an Approved Agency by the Building Official to perform Special Inspections and other tests and inspections as outlined in the applicable building code.
  - 2. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 3. A2LA: A testing agency accredited according to the American Association for Laboratory Accreditation.

4. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
  5. CMET: A Construction Materials, Engineering & Testing agency which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
  6. AAMA: A testing agency accredited according to the American Architectural Manufacturers Association.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to the Owner, Engineer, and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Engineer and Owner.
  2. Notify Engineer and Owner 7 days in advance of dates and times when mockups will be constructed.
  3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
  4. Demonstrate the proposed range of aesthetic effects and workmanship.
  5. Obtain Engineer's and Owner's approval of mockups before starting work, fabrication, or construction.
    - a. Allow 7 days for initial review and each re-review of each mockup.
  6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  7. Approved Mockup's may be integrated into final work. Demolish and remove non-approved mockups when directed unless otherwise indicated by the Owner or Engineer.
- L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
- M. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Technical Specification Sections.

#### 1.11 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

- a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
  2. Description of the Work tested or inspected.
  3. Date test or inspection results were transmitted to Engineer.
  4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.

### 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- B. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for Section "Cutting and Patching" as well as other the technical specification sections.
- C. Protect construction exposed by or for quality-control service activities.

- D. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

## SECTION 01 73 29 – CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
  - 1. Divisions 01 through 07 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

#### 1.3 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

#### 1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
    - a. Include description of provisions for temporary services and systems during interruption or permanent services and systems.
  - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.



7. Engineer's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

## 1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

## 1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 4. Proceed with patching after construction operations requiring cutting are complete.

- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
  4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01 73 29

## SECTION 01 74 23 - PERIODIC AND FINAL CLEANING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for final cleaning at Substantial Completion.
  - 1. Special cleaning requirements for specific elements of Work are included in appropriate Sections of Divisions 02 through 07.
- B. General Project closeout requirements are included in Section "Closeout Procedures."
- C. Environmental Requirements: Conduct cleaning and waste disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.
  - 1. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
  - 2. Burning or burying of debris, rubbish or other waste material on the premises will not be permitted.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by the 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.

### PART 3 - EXECUTION

#### 1.1 PERIODIC CLEANING

- A. General: Provide periodic cleaning operations at the following intervals.
  - 1. Publicly Accessible Areas: Clean all surfaces at least daily at the completion of work in each area before returning the area to service.

2. Secured Construction Areas: Clean all surfaces weekly to maintain a clean and safe construction site.
- B. Protection: Provide the following temporary protective measures during construction.
1. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion
  2. Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period
  3. Contractor shall utilize temporary containment measures to prevent the spread of contaminated air. Contractor shall coordinate all temporary containment measures with the Owner's representative.
- C. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Clean Project site in areas disturbed by construction activities, including landscape areas affected by construction. Remove all waste materials, litter, demolition debris, abrasive blasting agents, and foreign substances. Sweep paved areas broom clean. Remove chemical spills, stains, and other foreign deposits.
    - a. Comply with requirements of NFPA 241 for removal of combustible waste materials and debris.
    - b. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - c. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
  2. Remove tools, construction equipment, machinery and surplus material from the publicly accessible areas.
  3. Clean exposed exterior and interior hard-surfaced finishes affected by construction activities to a dirt-free condition, free of stains, films and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  4. Broom clean concrete floors in occupiable spaces. Broom clean concrete floors in unoccupied spaces if requested by the Owner.
  5. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
  6. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials.

Polish mirrors and glass, taking care not to scratch surfaces. Schedule chipped or broken glass and other damaged transparent materials to be replaced in a timely manner.

7. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
8. Inspect disposable and permanent air filters. Replace disposable filters and clean permanent air filters if they are contaminated with construction debris beyond a usable limit. Clean exposed surfaces of diffusers, registers, and grills. Clean ducts, blowers, and coils if units were operated without filters during construction.
9. Inspect light fixtures, lamps, globes and reflectors. Clean these elements if they are contaminated with construction debris beyond a usable limit.
10. Leave publicly accessible areas of the Project Site clean and ready for occupancy.

### 3.2 FINAL CLEANING

- A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
  1. Clean Project site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petro-chemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.
  2. Remove tools, construction equipment, machinery and surplus material from the site.
  3. Remove snow and ice to provide safe access to the building.
  4. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  5. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
  6. Broom clean concrete floors in all construction spaces.
  7. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap, clean according to manufacturer's recommendation if visible soil or stains remain.
  8. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
  9. Remove labels that are not permanent labels.
  10. Touch-up and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored, or that show evidence of repair or restoration. Do not paint over "UL" and similar labels, including mechanical and electrical name plates.

11. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
  12. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  13. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills. Clean ducts, blowers, and coils if units were operated without filters during construction.
  14. Clean food service equipment to a sanitary condition, ready and acceptable for its intended use.
  15. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace burned out bulbs, and defective and noisy starters in fluorescent and mercury vapor fixtures.
  16. Leave Project clean and ready for occupancy.
- B. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during remainder of construction period.
- C. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.
1. Where extra materials of value remain after completion of associated construction, that have become Owner's property, relocate or dispose of these materials as directed by the Owner.

END OF SECTION 01 74 23

## SECTION 01 77 00 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures.
2. Submittal of warranties.
3. Final cleaning.

- B. Related Sections:

1. Division 01 Section "Payment Procedures"
2. Division 01 Section "Periodic and Final Cleaning".
3. Division 01 Section "Project Record Documents"
4. Closeout requirements for specific construction activities are included in appropriate Sections 02 through 07.

#### 1.3 SUBSTANTIAL COMPLETION

- A. Submittals for Substantial Completion: Complete the following a minimum of [ten] days prior to requesting field review for of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals referenced in this and other Sections.
3. Submit as-built drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
5. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.



6. Submit an Application for Payment that coincides with, or first follows, date Substantial Completion is claimed, show 100% completion for portion of Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and statement showing an accounting of changes to Contract Sum.
    - a. If 100% completion cannot be shown, include list of incomplete items, value of incomplete construction, and reasons Work is not complete.
  - B. Procedures for Substantial Completion: Before requesting field review for Certification of Substantial Completion, complete the following. List exceptions in request.
    1. Advise Owner of pending insurance change-over requirements.
    2. Deliver tools, spare parts, extra stock, and similar items.
    3. Make final change-over of permanent locks and transmit keys to Owner. Advise Owner's personnel of change-over in security provisions.
    4. Complete start-up testing of systems, and instruction of Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from site, along with construction tools, mock-ups, and similar elements.
    5. Advise Owner of changeover of utilities if applicable.
    6. Participate with Owner in conducting inspection and walkthrough.
    7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
    8. Complete final cleaning requirements, including coating touchups.
    9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  - C. Field Review Procedures: On receipt of request for field review, Engineer will either proceed with the review of work or advise Contractor of unfilled requirements. Engineer will prepare Certificate of Substantial Completion following inspection, or advise Contractor of construction that must be completed or corrected before certificate will be issued.
    1. Engineer will repeat field review when requested and assured that Work has been substantially completed.
    2. Engineer will provide one repeat inspection under its contract with Owner. Subsequent field reviews shall be at Contractor's expense.
    3. Results of completed field reviews will form basis of requirements for final acceptance.
- 1.4 FINAL COMPLETION PROCEDURES
- A. Submittals for Final Completion: Before requesting final field review for certification of final acceptance and final payment, complete the following. List exceptions in request.
    1. Submit final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
    2. Submit an updated final statement, accounting for final additional changes to Contract Sum.
    3. Submit certified copy of Engineer's final field review list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and list has been endorsed and dated by Engineer.

4. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
5. Submit final meter readings for utilities, measured record of stored fuel, and similar data as of date of Substantial Completion, or when Owner took possession of and responsibility for corresponding elements of Work.
6. Submit consent of surety to final payment.
7. Submit final liquidated damages settlement statement.
8. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

PART 2 - PRODUCTS (NOT APPLICABLE).

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Maintenance Instructions: Arrange for each installer of equipment or materials that require regular maintenance to meet with Owner's personnel to provide instruction in proper maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives.

END OF SECTION 01 77 00

## SECTION 01 78 36 - PRODUCT WARRANTIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for warranties required by Contract Documents, including manufacturers' standard warranties on products and special warranties.
  - 1. Refer to General Conditions for terms of Contractor's period for correction of Work.
- B. Related Sections: Following Sections contain requirements that relate to this Section:
  - 1. Division 01 Section "Submittal Procedures" specifies procedures for submitting warranties.
  - 2. Division 01 Section "Closeout Procedures" specifies contract closeout procedures.
  - 3. Divisions 02 through 07 Sections for specific requirements for warranties on products and installations specified to be warranted.
  - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in Contract Documents.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on Work that incorporates products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

#### 1.3 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- B. Reinstatement of Warranty: When Work covered by warranty has failed and been corrected by replacement or rebuilding, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by warranty has failed replace or rebuild Work to an acceptable condition complying with requirements of Contract Documents.

Contractor is responsible for cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of Work through portion of its anticipated useful service life.

- D. Owner's Recourse: Expressed warranties made to Owner are in addition to implied warranties, and shall not limit duties, obligations, rights and remedies otherwise available under law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
  - 1. Rejection of Warranties: Owner reserves right to reject warranties and to limit selection to products with warranties not in conflict with requirements of Contract Documents.
- E. Where Contract Documents require a special warranty, or similar commitment on Work or part of Work, Owner reserves the right to refuse to accept Work, until Contractor presents evidence that entities required to countersign such commitments are willing to do so.

#### 1.4 SUBMITTALS

- A. Submit written warranties to Engineer prior to date certified for Substantial Completion. If Engineer's Certificate of Substantial Completion designates commencement date for warranties other than date of Substantial Completion for Work, or designated portion of Work, submit written warranties upon request of Engineer.
- B. When designated portion of Work is completed and occupied or used by Owner, by separate agreement with Contractor during construction period, submit properly executed warranties to Engineer within 15 days of completion of that designated portion of Work.
  - 1. When Contract Documents require Contractor, or Contractor and subcontractor, supplier or manufacturer to execute a special warranty, prepare written document that contains appropriate terms and identification, ready for execution by required parties. Submit draft to Owner through Engineer for approval prior to final execution.
- C. Prepare written document utilizing appropriate form, ready for execution by Contractor, or by Contractor and subcontractor, supplier or manufacturer. Submit draft to Owner through Engineer for approval prior to final execution.
  - 1. Refer to Divisions 02 through 07 Sections for specific content requirements and particular requirements for submittal of special warranties
- D. Electronically bind warranties, bonds, and operation and maintenance manuals in a PDF documents and electronically submit documents to the Owner's Representative and Engineer.
- E. Hard Copy: If requested by the Owner's Representative bind warranties, bonds, and operation and maintenance manuals in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8.5 inch by 11inch paper. Hard copy submittal shall be limited to one copy.
  - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark tab to identify product or installation. Provide typed description of product or

installation, including name of product, and name, address, and telephone number of Installer.

2. Identify binder on front and spine with typed or printed title "WARRANTIES," Project title or name, and name of Contractor.

END OF SECTION 01 78 36

## SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections apply to work specified in this Section.

#### 1.2 SUMMARY

- A. This section describes the administrative and procedural requirements of the Contractor for preparation of Project Record Documents.
- B. Store record documents and samples in the field office apart from Contract Documents used for construction. Do not permit Project Record Documents to be used for construction purposes. Maintain record documents in good order, and in a clean, dry, legible condition. Make documents and samples available at all times for inspection by the Engineer.

#### 1.3 RECORD DRAWINGS

- A. During the construction period, maintain a set of Contract Drawings and Shop drawings for Project Record Document purposes. Mark with red erasable colored pencil all deviations from the original drawings. Electronic PDF record documents may be maintained instead of a hardcopy.
- B. Upon Substantial Completion of the project, incorporate all changes into the documents and stamped them "As-Built". Engineer will make original electronic documents available to Contractor. Contractor shall email electronic "As-Built's" to the Owner's Representative and Engineer.

#### 1.4 RECORD SPECIFICATIONS

- A. During the construction period, maintain one copy of the project specifications, including addenda and modifications issued, for Project Record Document purposes. Mark any changes or modifications to the Specifications. Electronic PDF record documents may be maintained instead of a hardcopy.
- B. Upon completion of the Project mark-up, and email record specifications to the Owner's Representative and Engineer for their own records.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 RECORDING

- A. Post changes and modifications to the documents as they occur. Do not wait until the end of the project. The Engineer or Owner's Representative may periodically review record documents to assure compliance with this requirement.

END OF SECTION 01 78 39

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to work of this Section.

1.2 DESCRIPTION OF WORK

- A. Definition: Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated. Types of work in this section include rough carpentry for:

- 1. Wood grounds, nailers, blocking, and sleepers.

1.3 QUALITY ASSURANCE

The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.

- A. Lumber Standards: Comply with PS 20 and with applicable rules of the respective grading and inspecting agencies for species and products indicated.
- B. Source Inspection: Lumber of the specified species furnished under this section shall be inspected and comply with the grading rules of the appropriate following associations:
  - 1. Northeastern Lumber Manufacturer's Association, Inc. (NELMA).
  - 2. Southern Pine Inspection Bureau (SPIB).
  - 3. West Coast Lumber Inspection Bureau (WCLIB).
  - 4. Western Wood Products Association (WWPA).
  - 5. Redwood Inspection Service (RIS).
- C. Factory-mark each piece of lumber with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for materials listed below:
  - 1. Wood grounds, nailers, blocking and sleepers
- B. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values



for selected species and grade. Design values shall be as approved by the Board of Review of American Lumber Standards Committee.

- C. Wood Treatment Data: Submit treatment manufacturer's instructions for proper use of each type of treated material.
  - 1. Pressure Treatment: For each type specified, include certification by treating plant stating chemicals and process used, net amount of preservative retained and conformance with applicable standards.
  - 2. Water-Borne Preservatives: Include statement that moisture content of treated materials was reduced to a maximum of 15% prior to shipment to project site.
- D. Contractor shall provide engineered shop drawings, signed and sealed by a professional engineer licensed in the State of Texas, detailing the structural attachment of all new and replacement rough carpentry components to meet the wind uplift requirements specified in the Drawings.

## 1.5 PRODUCT HANDLING

- A. Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks.

## 1.6 JOB CONDITIONS

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of nailers, blocking, and similar supports to allow proper attachment of other work.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Lumber, General:
  - 1. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
    - a. Provide dressed lumber, S4S, unless otherwise indicated.
    - b. Provide seasoned lumber with 19% maximum moisture content at time of dressing.
    - c. Provide unseasoned lumber with moisture content in excess of 19% allowed at time of dressing.
- B. Framing Lumber (2" through 4" thick) (Wd-Frm):
  - 1. For light framing (less than 6" wide), provide "Stud" grade lumber for stud framing and "Standard" grade for other light framing, any species.

2. For structural light framing (less than 6" wide), provide the following grade and species:
    - a. Construction grade, any species.
    - b. Standard grade, any species.
    - c. Utility grade, any species.
  3. Any species and grade which meets or exceeds the following values:
    - a. Fb (minimum extreme fiber stress in bending); 1500 psi.
    - b. E (minimum modulus of elasticity); 1,500,000 psi.
- C. Boards (less than 2" thick):
1. Concealed Boards: Where boards will be concealed by other work, provide lumber of 19% maximum moisture content (S-DRY) and of following species and grade:  
  
Redwood Construction Common (RIS), Southern Pine No. 2 boards (SPIB), or any species graded construction boards (WCLIB or WWPA).  
  
Redwood Merchantable (RIS), Southern Pine No. 3 boards (SPIB), or any species graded standard boards (WCLIB or WWPA).
  2. Board Sizes: Provide sizes indicated or, if not indicated (for sheathing, subflooring and similar uses), provide 1" x 8" boards.
- D. Miscellaneous Lumber: Provide wood for support or attachment of other work including cant strips, bucks, nails, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, with a moisture content of 15% maximum for lumber items not specified to receive wood preservative treatment.
1. Grade: Construction Grade light framing size lumber of any species or board size lumber as required. Provide construction grade boards (RIS or WCLIB) or No. 2 boards (SPIB or WWPA).
- E. Miscellaneous Materials:
1. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.  
  
Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153).

## 2.2 WOOD TREATMENT

- A. Preservative Treatment: Where lumber or plywood is indicated as "Trt-Wd" or "Treated," or is specified herein to be treated, comply with applicable requirements of American

Wood Preservers Association (AWPA) Standards C2 (Lumber) and C9 (Plywood) and of American Wood Preservers Bureau (AWPB) Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.

1. Pressure-treat above-ground items with water-borne preservatives complying with AWPB LP-2. After treatment, kiln-dry to a maximum moisture content of 15%. Treat indicated items and the following:
    - a. Wood cants, nailers, curbs, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
    - b. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.
    - c. Wood framing members less than 18" above grade.
  2. Complete all fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.
- B. Fire-retardant Treatment: Identify treated wood with appropriate classification marking of Underwriters Laboratories Inc. or other testing and inspection agency acceptable to authorities having jurisdiction.
1. Dimension Lumber: Comply with AWPA C20.
    - a. Treatment Type: Interior Type A for protected wood and Exterior Type for wood exposed to weather.
  2. Plywood: Comply with AWPA C27.
    - a. Treatment Types: Interior Type A for protected wood and Exterior Type for wood exposed to weather.
  3. Available Products: Subject to compliance with requirements, provide one of the following:
    - a. Interior Type A Fire-Retardant-Treated Wood:
      - (1) "Dricon," Hickson Corporation
      - (2) "Pyro-Guard", Hoover Treated Wood Products
      - (3) "Flameproof LHC-HTT," Osmose Wood Preserving Co, Inc.
    - b. Exterior Type Fire-Retardant-Treated Wood:
      - (1) "Exterior Fire-X," Hoover Treated Wood Products
- C. Inspection: Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.
- D. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

- E. Application: Treat all rough carpentry unless otherwise indicated

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

A. General:

1. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
3. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
4. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

B. Wood Grounds, Nailers, Blocking and Sleepers:

1. For roofing applications, edge nailers shall match thickness of insulation and cover board.
2. For reroofing applications, replace existing nailers, blocking, and sleepers where missing or deteriorated. Supplement existing nailers, blocking, and sleepers as needed to match thickness of insulation and cover board.
3. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
4. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise show. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
5. Provide permanent grounds of dressed, preservative treated, key-bevelled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

END OF SECTION 06 10 00

SECTION 07 32 70 – METAL ROOF RECOVER RETROFIT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

- A. Division 01 Specifications.
- B. Section 06 10 00 – Rough Carpentry: Roof blocking installation and requirements
- C. Section 07 62 00 – Sheet Metal Flashing and Trim: Roofing transitions and termination
- D. Section 07 92 00 – Joint Sealants: Joint sealant material and installation requirements.

1.3 REFERENCES

- A. Roofing Terminology: Refer to the following:
  - 1. ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.
  - 2. Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual."
  - 3. Roof Consultants Institute "Glossary of Building Envelope Terms."
- B. Sheet Metal Terminology and Techniques: SMACNA "Architectural Sheet Metal Manual."

1.4 SCOPE

- A. To install a complete metal retrofit roofing system including membrane, flashings and other components.
- B. This work includes but is not limited to the installation of:
  - 1. Removal of Existing Roofing and Insulation
  - 2. Substrate Preparation
  - 3. Vapor Barrier
  - 4. Wood Blocking
  - 5. Insulation
  - 6. Separation Layers
  - 7. Roof Membrane

8. Fasteners
9. Adhesive for Flashings
10. Roof Membrane Flashings
11. Metal Flashings
12. Sealants

#### 1.5 PERFORMANCE REQUIREMENTS

- A. General: Installed retrofit roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer shall comply with current code requirements based on authority having jurisdiction.
- D. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

#### 1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each product required, including instructions for surface preparation and system application.
- B. Certifications by manufacturer of roofing and insulating materials that all materials supplied comply with all requirements of the identified ASTM and other industry standards or practices.
- C. Prior to beginning the work of this section, roofing sub-contractor shall provide a copy of the final System Assembly Letter issued by the manufacturer indicating that the products and system to be installed shall be eligible to receive the specified manufacturer's guarantee when installed by a certified contractor in accordance with our application requirements, inspected and approved by a manufacturer representative.
- D. Shop Drawings: Provide plan, section, elevation and perspective drawings as necessary to depict all flashing and project conditions on the project, including but not limited to the following:
  1. Roof system and base flashing configuration.

2. Penetration details.
  3. Termination details.
  4. Fastening patterns.
- E. Test Reports:
1. Roof deck fastener pullout test.
- F. Submit copies of proposed manufacturer's guarantee.
- G. Selection Samples: For each product specified, two samples representing manufacturer's full range of available colors and types.
- H. Verification Samples: For each finish product specified, two samples representing actual product, color, and finish.
- I. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
- C. A pre-installation conference will be held approximately two weeks prior to commencing Work specified in this section. Representatives of the owner, engineer/specifier, roofing contractor, sub-contractors, and manufacturer must be present.
1. Review installation procedures, materials to be used, submittals, schedules, and all related work required under this section. Finalize construction schedule and confirm availability of materials, equipment, contractor's personnel, and facilities needed to complete work as planned.
  2. Review forecasted weather conditions and procedures for coping with unfavorable conditions, and maintaining the water tightness of the roof system.
  3. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, penetrations, and any work performed by other trades.
  4. Review structural loading limitations of deck and inspect deck for acceptability as roof substrate.
  5. Review inspection and quality control procedures to be used.
  6. The contractor shall record discussions of conference, including decisions and agreements reached. Furnish copy of record minutes to each party attending. If

disagreements exist at the conclusion of the conference, determine how disagreements will be resolved, and set a date for reconvening conference.

- D. The roofing systems manufacturer will provide qualified company personnel to attend pre-construction and in-progress meetings, and to perform minimum bi-weekly job site visits or as required by Engineer. The manufacturer will also provide non-sales related field auditors for the purpose of performing quality assurance inspections, both in-progress and final inspections. Provide copies of the manufacturer's field auditor inspection report to the contractor, engineer/specifier, and building owner.
- E. Project Acceptance: Submit a completed manufacturer's application for roof guarantee form along with shop drawings of the roofs showing all dimensions, penetrations, and details. The form shall contain all the technical information applicable to the project including deck types, roof slopes, base sheet and/or insulation assemblies (with method of attachment, and fastener type), and manufacturer's membrane assembly proposed for installation. The form shall also contain accurate and complete information requested including proper names, addresses, zip codes and telephone numbers. The project must receive approval, through this process, prior to shipment of materials to the project site.
- F. Single Source Responsibility for Roof Assembly Materials: Obtain materials from a single manufacturer for each different product required.
- G. Review manufacturer's requirement for quality assurance.

#### 1.8 REGULATORY REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Windstorm Classification: Provide a roofing system which will achieve the required uplift resistance as calculated in accordance with the most current revision of ASCE 7 or as shown in the Drawings.
- C. Energy Star – Roof system shall meet or exceed the initial and aged reflectivity required by the U.S. Federal Government's Energy Star Program.
- D. "Cool Roofing" – The roof system shall meet or exceed the reflectivity and emissivity criteria to qualify for local "cool" roofing requirements.

#### 1.9 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. Do not double stack. 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 pail materials such as solvents, adhesives and asphalt cutback products in their original undamaged containers in clean dry protected locations away from open flames, sparks or excessive heat and within their specified temperature range. 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.

#### 1.10 PROJECT CONDITIONS

##### A. Requirements Prior to Job Start

- 1. Notification: Give a minimum of seven (7) 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. 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.
- 3. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

##### 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 the materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
- 2. Temperature Restrictions - cold adhesive: At low temperatures, the specified cold adhesive becomes more viscous, making even distribution more difficult. The optimal temperature of the adhesive at point of application is 70°F (21°C). To facilitate application when ambient temperatures are below 50°F (10°C), store the adhesive and roll goods in a warm place immediately prior to use. Roll or broom the sheets to ensure contact with the underlying adhesive. Suspend application in situations where the adhesive cannot be kept at temperatures allowing for even distribution.
- 3. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned and heat welded before leaving the job site that day.
- 4. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

5. All surfaces to receive new insulation, membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.
- C. Protection Requirements
1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
  2. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
  3. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
  4. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.
- D. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- E. All roofing, insulation, flashings and metal work removed during construction shall be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, are to be removed and disposed of in strict accordance with applicable City, State and Federal requirements.
- F. All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material.
- G. The Applicator shall take precautions that storage and application of materials and equipment does not overload the roof deck or building structure.
- H. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.
- I. The Applicator shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Applicator shall report any such blockages in writing to the Owner, Engineer, and manufacturer prior to the installation of the retrofit roof system.
- J. Applicator shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Owner and Engineer of such condition in writing for supplement instructions.
- K. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to the Owner's satisfaction.

- L. All landscaped areas damaged by construction activities shall be repaired at no cost to the Owner.
- M. The Applicator shall conduct fastener pullout tests in accordance with the latest version of the SPRI/ANSI Fastener Pullout Standard to verify condition of the deck/substrate and to confirm expected pullout values.
- N. The PVC roofing membrane shall not be installed under the following conditions without consulting the manufacturer for additional requirements:
  - 1. The roof assembly permits interior air to pressurize the membrane underside.
  - 2. The wall/deck intersection permits air entry into the wall flashing area.
- O. Precautions shall be taken when using adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.
- P. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.
- Q. PVC membranes are slippery when wet or covered with snow, frost, or ice. Working on surfaces under these conditions is hazardous. Appropriate safety measures must be implemented prior to working on such surfaces. Always follow OSHA and other relevant fall protection standards when working on roofs.

#### 1.11 WARRANTY

- A. Roof Membrane Manufacturer Warranty: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's 20 year labor and materials membrane warranty, including insulations, adhesives, fasteners and specialty penetration flashings. The warranty shall be a term type, without deductibles or limitations (NDL) on coverage amount, and shall be issued at no additional cost to the Owner. This warranty shall not exclude random areas of ponding from coverage.
  - 1. Duration: Twenty (20) years from the date of completion
- B. Contractor's Warranty: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:
  - 1. Guarantee Period: Two years from date of Substantial Completion.

#### PART 2 - PRODUCTS

##### 2.1 MANUFACTURERS

- A. Basis of Design:
  - 1. Sika Sarnafil S327 Rhinobond System Metal Retrofit

a. PVC Membrane Thickness: 80 mils

2. Approved equal based on roofing membrane performance requirements specified herein. Requests to use equivalent products of other manufacturers shall be submitted minimum seven (7) working days prior to the bid due date for review and approval/rejection by Engineer and Owner and shall include a detailed itemization of performance equivalency from the proposed substitution roofing manufacturer. Requests for substitutions will be considered in accordance with provisions of Division 01 Section, 'Product Substitution Procedures.' Approval of proposed roofing manufacturer substitution and/or products/systems shall be at the sole discretion of the Owner and Engineer. Requests for substitution of the approved roofing system manufacturer after Award of Contract will not be allowed.

## 2.2 SCOPE/APPLICATION

- A. Where located on the Contract Drawings, remove and properly dispose of the existing base flashings, roof insulation, and sheet metal flashing and trim.

## 2.3 INSULATION AND SUBSTRATE MATERIALS

- A. Coverboard: Rigid polyisocyanurate board with a glass fiber facer. Meets or exceeds the requirements of ASTM C 1289 and Fed. Spec. # HH-I-1972.

1. Dimensions: As required on Drawings for mechanically fastened boards .
2. Minimum thickness: 0.5-inch
3. Available Products: Sika Sarnatherm CG
4. Wood Nailer Strips: Comply with requirements in Division 06 Section " Rough Carpentry."

- B. Insulation Flute Filler: Polyisocyanurate Board Insulation. Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

1. Dimensions: As required on Drawings for mechanically fastened boards. Provide beveled metal roof flute filler insulation package with thickness to fill flutes the height of the standing seam.
2. Available Products: Sika Sarnatherm EPS (flat)

## 2.4 MEMBRANE

- A. PVC Membrane: ASTM D 4434, Type II/III, reinforced.

1. Sarnafil S327 thermoplastic membrane with polyester reinforcement and lacquer coating.
  - a. Thickness: Sarnafil S327-20, 80 mil (2.0 mm)
  - b. Color: EnergySmart White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 (ENERGY STAR listed).

## 2.5 SHEET METAL AND FLASHINGS

- A. See Section "Sheet Metal Flashing and Trim"

## 2.6 ACCESSORIES

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Metal Termination Bars
  - 1. Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- C. Membrane fasteners:
  - 1. Sarnadisc RhinoBond
- D. Insulation fasteners:
  - 1. Sarnafastener #12, Sarnaplate
- E. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for base flashings.
- F. Induction Welding Plate: A round specially coated Galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- G. Liquid Flashing:
  - 1. Sika Liquid Flashing SW
- H. Miscellaneous Accessories: Provide manufacturer approved pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, sealants, and other accessories.
- I. Installation tools
  - 1. Contact manufacturer for system installation requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

### 3.2 SCOPE/ APPLICATION

- A. Work consists of installation of a recover roofing assembly over the existing metal panel roofing.
- B. Recover roofing assembly shall generally consist of polyisocyanurate insulation infilled between the metal panel flutes, coverboard, single-ply roofing membrane, all membrane flashings, and other accessories.
- C. Remove and replace wetted under-deck roof insulation as identified in Task Item 7.1.
- D. Perform surface preparation of roof metal panel surfaces per manufacturer requirements. Ensure all roof penetrations are properly secured and prepared to receive new roofing materials.
- E. Loose lay beveled polyisocyanurate flute filler insulation between the metal roof panel flutes. Tightly butt insulation boards together.
- F. Install 0.5-inch thick cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Secure to deck using mechanical fasteners designed and sized for fastening specified cover board to deck type.
- G. Install PVC single-ply roofing membrane using induction welding application methods in accordance with roofing system manufacturer's written instructions.
- H. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- I. Install all components of recover retrofit roofing assembly in accordance with manufacturer's written testing literature to resist wind uplift pressures at corners, perimeter, and field areas of roof as specified in the Drawings.

### 3.3 PREPARATION

- A. General: Sweep or vacuum all surfaces, removing all loose material and foreign substances prior to commencement of roofing.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.
- D. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.4 FLUTE FILLER INSULATION INSTALLATION

- A. Coordinate installation of roof system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

- B. Comply with roofing system manufacturer's written instructions for installing roof insulation.
- C. Loose lay Polyisocyanurate flute filler insulation between the metal roof standing seams. Tightly butt insulation boards together.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.5 COVER BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with cover board.
  - 1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- D. Mechanically Fasten Cover Board: Install cover board and secure to purlins and deck using mechanical fasteners designed and sized for fastening specified cover board to deck type and purloin type.
  - 1. Provide fastener coverage as required by the manufacturer to resist the specified wind uplift pressures at corners, perimeter, and field areas of roof.
  - 2. Fasteners are to be installed consistently in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration of 1 inch (25 mm) through the structural deck.
  - 3. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.6 ROOFING MEMBRANE INSTALLATION (GENERAL)

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- C. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
  2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
  3. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.7 INDUCTION WELDED ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.
- B. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Always install membrane laps perpendicular to the steel deck flutes. "Picture Frame" installation method is not permitted.
- D. Apply roofing membrane with side laps shingled with roof slope, where possible.
- E. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane per manufacturer's written instructions to ensure a watertight seam installation.
1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
  2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
    - a. Remove and repair any unsatisfactory sections before proceeding with Work.
  3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
- F. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.
- G. Induction Welding Installation:
1. Perform calibration and set-up as detailed by the Induction Welder Owner's Manual
  2. Center the Induction Welder over the first plate in pattern and activate the weld.
    - a. Induction Welder shall be centered over the plate to create a 100% bond.



- b. If an error occurs during activation, refer to the induction welder owner's manual for corrective action.
  3. Prior to every use, clean face of Heat Sink Magnet.
  4. Place Heat Sink Magnet over the welded plate.
    - a. Keep Heat Sink Magnet in place at least 45 seconds while the assembly cools.
  5. Repeat process for each plate.
- H. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.8 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners per manufacturer's installation instructions.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.9 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. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Final Inspection/Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

- E. Issuance of the Warranty: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

3.10 PROTECTION AND CLEANING

- A. Protect new roof system during remainder of construction period. Plan work so traffic over new roof system is kept to a minimum. Where traffic must continue over new roof system, provide protection for the finished roof.
- B. Provide protection for other building surfaces against damage of staining from roofing operations. Any surfaces damaged or stained as a result of roofing operations shall be cleaned, repaired or replaced as necessary by the roofing contractor.
- C. Job site shall be maintained in a clean, orderly fashion, and free of debris. Store materials and equipment so operations of building are not interrupted.
- D. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 07 32 70

## SECTION 076200 - SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following sheet metal flashing and trim:
  - 1. Formed roof flashing and trim.
  - 2. Formed wall flashing and trim.
  - 3. Formed equipment support flashing and trim.
  - 4. Formed roof gutters, conductors, scuppers, etc. flashing and trim.
- B. Related Sections include the following:
  - 1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
  - 2. Division 07 Section "Joint Sealants" for field-applied sheet metal flashing and trim sealants.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 190 deg F (100 deg C), material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
  - 1. Identify material, thickness, weight, and finish for each item and location in Project.
  - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
  - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
- C. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.
  - 1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
  - 1. Sheet Metal Flashing: 12 inches (300 mm) long. Include fasteners, cleats, clips, closures, and other attachments.
  - 2. Trim: 12 inches (300 mm) long. Include fasteners and other exposed accessories.
  - 3. Accessories: Full-size Sample.

#### 1.5 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Approval of mockups is for other material and construction qualities specifically approved by Engineer in writing.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Engineer in writing.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1. Meet with Owner, Engineer, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing and trim.
3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

#### 1.7 COORDINATION

- A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

### PART 2 - PRODUCTS

#### 2.1 SHEET METALS

- A. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304. Minimum 24-gauge or as recommended by SMACNA for sheet metal flashing installation.
- B. Pre-finished Steel Sheet: Manufacture coping caps, parapet flashing, and other flashing visible from the exterior buildings areas as directed by Owner's representative, from metallic-coated 24-gauge minim steel sheet metal flashing pre-painted with coil coating. Color to be selected by Owner. Steel sheet metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.
  1. Exposed Finishes: Apply the following coil coating:
    - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
    - b. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- 1) Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2605.
  - 2) Color: to be selected by Owner's representative.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

## 2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
  1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
  2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
  3. Blind Fasteners: High-strength stainless-steel rivets.
- C. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Solder for Zinc: ASTM B 32, 60 percent lead and 40 percent tin with low antimony, as recommended by manufacturer.
- E. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

## 2.3 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  - 1. Seams: Fabricate nonmoving seams in accessories with flat-lock seams.
- D. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.
- F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
  - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application but not less than thickness of metal being secured.

#### 2.4 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Built-in Gutters: Fabricate to cross section indicated, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Fabricate expansion joints and accessories from same metal as gutters, unless otherwise indicated.
  - 1. Fabricate gutters with built-in expansion joints and gutter-end expansion joints at walls.
  - 2. Fabricate built-in gutters from the following material:
    - a. Stainless Steel: 0.0156 inch (0.4 mm) thick.
- B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
  - 1. Fabricate downspouts from the following material:
    - a. Stainless Steel: 0.0156 inch (0.4 mm) thick.
- C. Parapet Scuppers: Fabricate scuppers of dimensions required with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant into field of gutter body.
  - 1. Fabricate parapet scuppers from the following material:
    - a. Stainless Steel: 0.0187 inch (0.5 mm) thick.

- D. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape, to match the existing assembly, complete with outlet tubes, exterior flange trim, and built-in overflows.
  - 1. Fabricate conductor heads from the following material:
    - a. Stainless Steel: 0.0156 inch (0.4 mm thick).

## 2.5 ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Furnish with 6-inch- (150-mm-) wide joint cover plates.
  - 1. Joint Style: Butt, with 12-inch- (300-mm-) wide concealed backup plate and 6-inch- (150-mm-) wide exposed cover plates.
  - 2. Fabricate from the following material:
    - a. Prepainted Metallic-Coated Steel : 0.0276 inch (0.7 mm) thick.
- B. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.
  - 1. Joint Style: Butt, with 12-inch- (300-mm-) wide concealed backup plate and 6-inch- (150-mm-) wide exposed cover plates.
  - 2. Fabricate from the following material:
    - a. Prepainted Metallic-Coated Steel : 0.0396 inch (1.0 mm) thick.
- C. Base Flashing: Stainless steel: 0.0187 inch (0.5 mm) thick
- D. Counterflashing: Stainless steel: 0.0187 inch (0.5 mm) thick
- E. Flashing Receivers: Stainless steel: 0.0156 inch (0.5 mm) thick
- F. Roof-Penetration Flashing: Stainless steel: 0.0187 inch (0.5 mm) thick

## 2.6 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Stainless steel: 0.0187 inch (0.5 mm) thick

## 2.7 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.



- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
  - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 1. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
  - 1. Coat side of stainless-steel sheet metal flashing and trim with compatible adhesive for PVC roof membrane system where flashing and trim will contact wood, ferrous metal, or cementitious construction.
  - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
  - 3. Bed flanges in thick coat of compatible adhesive for PVC roof membrane system roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  - 1. Install continuous cleats. Fasten at 6 inches (150 mm) on center with screw or ring shanks.
- F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.
- G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
  - 1. Stainless steel: Use stainless-steel fasteners.
  - 2. Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
- H. Seal joints with elastomeric sealant as required for watertight construction.
  - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
  - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pretinned surface would show in finished Work.
  - 1. Do not solder prepainted, metallic-coated steel sheets.
  - 2. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
  - 3. Where surfaces to be soldered are lead coated, do not tin edges, but wire brush lead coating before soldering.
  - 4. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely.

### 3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Built-in Gutters: Join sections with riveted and soldered or lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.
  - 1. Install felt underlayment layer in built-in gutter trough and extend to drip edge at eaves and under felt underlayment on roof sheathing. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails. Install slip sheet over felt underlayment.
  - 2. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
  - 3. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (15.24 m) apart. Install expansion joint caps.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
  - 1. Provide elbows at base of downspout to direct water away from building.
  - 2. Connect downspouts to underground drainage system indicated.
- D. Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
  - 1. Loosely lock front edge of scupper with conductor head.
  - 2. Seal or solder exterior wall scupper flanges into back of conductor head.
- E. Conductor Heads: Anchor securely to wall with elevation of conductor head rim 1 inch (25 mm) below scupper discharge.
- F. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

### 3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where

possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind pressures and as indicated.
  - 1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 16-inches (400-mm) on centers.
- C. Roof Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind pressures and as indicated.
  - 1. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 16-inches (400-mm) on center.
  - 2. Anchor interior leg of coping with screw fasteners and washers at 24-inches (600-mm) on center.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with elastomeric sealant.
  - 1. Secure in a waterproof manner by means of anchor and washer at 36-inch (900-mm) centers.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
  - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
  - 2. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

### 3.5 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

### 3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each joint sealant product required, including instructions for joint preparation and joint sealant application.
- B. Certificates: Submit certificates from manufacturers of joint sealants attesting that their products comply with Specification requirements and are suitable for the use indicated.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required. Provide one year warranty on installation and materials.
- B. Review and approve joint details before construction.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project Site in original unopened containers, or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.5 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturers.
  - 2. When joint substrates are wet due to rain, frost, condensation or other causes.
  - 3. Joint Width Conditions: Do not proceed with installation of joint sealants when joint widths are less than allowed by sealant manufacturer for application indicated.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

### 2.2 SEALANT FOR HORIZONTAL (NON-COVE) JOINTS:

- A. Products: Acceptable joint sealants:
  - 1. MasterSeal SL 2 (formerly Sonolastic SL-2) by BASF
  - 2. Sikaflex-2c NS TG by Sika
- B. Self-leveling sealants require tooling in accordance with details.
- C. Compounds used for sealants shall not stain concrete or masonry. Aluminum pigmented compounds not acceptable..
- D. The color of sealants shall match adjacent surfaces.

### 2.3 SEALANT FOR VERTICAL JOINTS AND COVE JOINTS:

- A. Products: Acceptable joint sealants:
  - 1. MasterSeal NP 2 (formerly Sonolastic NP-2) by BASF
  - 2. Sikaflex-2c NS by Sika
- B. Compound used for sealants shall not stain concrete or masonry. Aluminum pigmented compounds not acceptable.
- C. The color of sealants shall match adjacent surfaces.

### 2.4 MISCELLANEOUS MATERIALS

- A. Primer: Provide type recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate and field tests.
- B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
- C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Require installer to inspect joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Obtain installer's written report listing any condition detrimental to performance of joint sealant work. Do not allow joint sealant work to proceed until unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturers and the following requirements:
  - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealant, including dust; paint, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; surface dirt and frost.
  - 2. Clean concrete, substrate surfaces, by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance from concrete.
- B. Joint Priming: Prime all joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply 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 with adjoining surfaces which 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.

#### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:



1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
  2. Do not leave gaps between ends of joint-fillers.
  3. Do not stretch, twist, puncture or tear joint-fillers.
  4. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.
  5. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joint where required to prevent third-side adhesion of sealant to back of joint.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability. Do not smear sealant onto adjacent surfaces.
- E. Tooling of Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants in concave joint configuration per ASTM C 1193, unless otherwise indicated to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
- F. Contractor and Engineer shall verify sealant profile as follows:
1. Contractor, at Engineer's direction, shall cut out lesser of 1% of total linear footage placed of total 100 linear ft of joint sealant at random locations for Engineer and Manufacturer's representative inspection of sealant profile.
  2. Contractor to repair all random joint sealant cut out sections at no cost to Owner.

#### 3.4 PROTECTION AND CLEANING

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and reseal joints with new materials to produce sealant installations with repaired areas indistinguishable from original work.
- B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by the manufacturer of the sealants and of the products used in the joints.

END OF SECTION 07 92 00