

PROJECT SPECIFICATIONS AND DRAWINGS

UTHSCH UNIVERSITY
CENTER TOWER (UCT)
ROOFING REPAIRS

HOUSTON, TEXAS

PREPARED FOR:

UTHSCH

WALTER P MOORE PROJECT NUMBER D03.12130.00

1301 MCKINNEY, SUITE 1100
HOUSTON, TEXAS 77010

AUGUST 16, 2013

WALTER P MOORE

TECHNICAL SPECIFICATIONS AND DRAWINGS

FOR

**UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER – HOUSTON
UNIVERSITY CENTER TOWER
ROOFING REPAIRS
HOUSTON, TX**

WALTER P. MOORE AND ASSOCIATES, INC.

1301 McKinney, Suite 1100
Houston, TX 77010
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D03.12130.00

DOCUMENT 000001

TITLE/CERTIFICATION PAGE

PROJECT: UTHSCH UCT Roofing Repairs

PROJECT NUMBER: Walter P. Moore Project No. D03.12130.00

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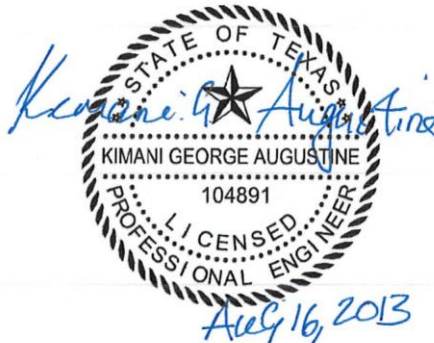
SECTION 000107

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.

Kimani Augustine, P.E. TX#104981
Walter P Moore and Associates, Inc.
TBPE Firm Registration No. 1856

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



END OF SECTION 000107

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END OF SECTION 000110

SECTION 011000

TASK ITEMS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. 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.
- B. The extent of the Task Items is indicated on the drawings and by the requirements of each section of the specifications.
- C. **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.
- D. **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 Engineer review of existing conditions, provide Engineer minimum 7 working days notice to prevent delays to construction.
- E. **Unit Price Work:** Several task items below include instructions for performing work per unit price. Contractor shall include in the Base Bid a cost for performing the number of units assumed in the Task Item. Contractor shall also provide an Add/Deduct cost for performing a single unit of the work. The Base Bid amount will be adjusted using this Add/Deduct cost according to actual work units completed.

PART 2 – PRODUCTS (See EXECUTION section)

PART 3 – EXECUTION

3.1 TASK ITEM (T.I.) – DESCRIPTION – **BASE BID**
UTHSCH UCT ROOFING REPAIRS

T.I. 1.1 PROJECT MOBILIZATION AND GENERAL CONDITIONS

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. Perform disruptive or noisy work during times indicated by Owner. Coordinate with Owner if weekend or evening hours are required.
5. 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.
6. Properly dispose of all debris and waste construction materials in accordance with all applicable laws and regulations.

B. Materials

1. Not Applicable.

C. Repair Drawings and Specifications

1. Not Applicable

T.I. 2.1 DEMOLITION AND SUBSTRATE PREPARATION

A. Scope of Work

1. Work consists of coordinating, scheduling, obtaining and assembling at the construction site all equipment, materials, permits, supplies, manpower and other essentials and incidentals necessary to perform Work.
2. Coordinate all aspects of demolition work with Owner's Representative and all other trades.
3. Provide protective measures in and around the building as directed by the Owner's Representative prior to beginning roofing work. The building will be in use throughout the project with public traffic in and out continuously. The contractor shall take measures as necessary to keep access to the building free and clear of all hazards.
4. Interior Protection: Contractor is to include in their bid all costs and equipment required to protect interior of building from water 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 curbs are being removed and existing openings filled in, 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.

5. Existing roofing system:
 - a. 2-ply modified bitumen roofing with mechanical fastened base ply
 - b. 4-1/2" to 7-1/2"± Lightweight insulating concrete fill, sloped to drains
 - c. 24-gauge steel deck
 6. Remove all existing roofing membrane down to the lightweight insulating concrete. Tear off all base flashings. Remove all existing wood and fiber cants at base of curbs and walls.
 7. Remove obsolete roof penetrations and curbs identified on the roof plan. Where curbs and supports are removed, patch or fill in the metal deck as required. Contractor shall coordinate equipment removal with the Owner. Contractor shall perform all necessary service disconnects and relocations as may be required.
 8. Contractor shall inspect the condition of the lightweight concrete. Where spalling or other distress or deterioration of the lightweight concrete is observed, contact the Engineer immediately for review. **Do not proceed with roofing work until provided further direction by Engineer.**
 - a. Patch spalled or deteriorated areas of lightweight concrete per the patching material's manufacturer's recommended installation procedures.
 - i. The contract price will include the following allowances:
200 Square Feet.
 - ii. Materials:
 1. Zono-Patch by Sika Sarnafil
 2. Approved Equal product which is acceptable to both Engineer and roofing membrane Manufacturer and is approved in writing prior to submitting bids.
 9. Remove and dispose of existing sheet metal.
 10. Remove all debris from roof area and properly dispose of all materials off site.
 11. At the end of each day, ensure that all drains are in proper working order and that drain lines are clear to the first elbow and downspouts are completely clear. Implement any required corrective measures before leaving the job site that day.
- B. Materials
1. Not Applicable.
- C. Repair Drawings and Specifications
1. Refer to Sheet S-2.2 for location of work.

2. Refer to specification section "Selective Demolition" for work requirements, materials, and procedures.

T.I. 6.1 ROUGH CARPENTRY

A. Scope of Work

1. Work consists of installation of lumber nailers, sleepers, curbs, and edging as required for installation of new roofing system. For bidding purposes, assume 10% of 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 insulation board.
3. Install new curbs and platforms as necessary to provide a minimum of 8 inch freeboard as required by the membrane manufacturer.

B. Materials

1. Lumber and plywood.
2. Fasteners, sealants, and other accessories.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.
2. Refer to Sheets S-3.0 through S-3.6 for installation details.
3. Refer to specification section "Rough Carpentry" for work requirements, materials, and procedures.

T.I. 7.2 LOW SLOPE ROOFING MEMBRANE – 2-PLY APP MODIFIED BITUMEN

A. Scope of Work

1. Work consists of installation of a 2-ply APP modified bitumen roofing membrane, all membrane flashings, and other accessories.
2. Install a 120-mil modified bitumen base sheet on top of the cover board substrate in accordance with the membrane manufacturer's instructions. Nominal sheets will not be acceptable. Fully adhere in cold adhesive. Electric heat weld all seams.
3. Install a 140-mil modified bitumen highly reflective cap sheet in accordance with the membrane manufacturer's instructions. Nominal sheets will not be acceptable. Fully adhere in cold adhesive to substrate. Electric heat-weld all seams.

Cap sheet shall meet the following cool roofing requirements:

Minimum initial total solar reflectance: 0.70

Minimum initial thermal emittance: 0.75

4. Install base flashing per manufacturer's specifications.

5. Install sacrificial sheet membrane under all pipe, duct, and conduit supports.
6. Where indicated, install liquid resin flashing around penetrations. Apply a primer, a two part resin, woven fleece membrane and a second coat of the two part resin.
7. Install walkway pad and/or sacrificial caps sheets at areas indicated.
8. Membrane attachment to substrate shall be designed to resist the following wind uplift pressures based on ASCE 7-05:
 - a. Main Roof Area:
 1. Interior (Zone 1): - 39 psf
 2. Edge (Zone 2): - 63 psf
 3. Corner (Zone 3): - 63 psf
 4. Perimeter and Corner width is 8-feet
 - b. Penthouse Roof Areas:
 1. Interior (Zone 1): - 39 psf
 2. Edge (Zone 2): - 64 psf
 3. Corner (Zone 3): - 89 psf
 4. Perimeter and Corner width is 3-feet

B. Materials

1. Modified bitumen base and cap sheets.
2. Base flashings, adhesive, sealants, fasteners, and other accessories.

C. Drawings and Specifications

1. Refer to Sheets S-2.0 and S-2.2 for location of work.
2. Refer to Sheets S-3.0 through S-3.6 for installation details.
3. Refer to specification section "APP Modified Bituminous Membrane Roofing" for roofing system performance requirements, work requirements, materials, and procedures.

T.I. 7.3 FLASHING AND SHEET METAL 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 metal pitch pans, filler and collars. Bonnets shall be installed on all pitch pans.
5. Install new continuous sheet metal caps for all new curbs. Provide a minimum vertical lip of 4" on the cap.
6. Install new formed metal flashings at flues, pipes, etc.

7. Install new soil pipe lead flashings.
8. Install reinforced resin flashing where indicated.
9. Provide gooseneck hoods at all HVAC line penetrations to eliminate gang pitch pans. All hoods shall extend above the finished roof system a minimum of 8".
10. Provide all necessary sealants, sealant tapes, and fasteners to ensure a watertight installation.

B. Materials

1. Base flashings, adhesive, sealants, fasteners, and other accessories.
2. Prefinished sheet metal flashing and trim. Color shall be per Owner's selection from Manufacturer's standard colors.
3. Stainless steel sheet metal flashing and trim.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.
2. Refer to Sheets S-3.0 through S-3.6 for installation details.
3. Refer to specification section "APP Modified Bituminous Membrane Roofing" and "Sheet Metal Flashing and Trim" for work requirements, materials, and procedures.

T.I. 7.4 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 roofing system, including the membrane, insulation, overlay board, and other accessories.
3. Warranty shall be the shared responsibility of the Roofing Contractor and the Roofing Membrane Manufacturer for the first **five (5)** years. The contractor shall provide a standard NRCA warranty form.
4. 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. Materials

1. Not applicable.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.
2. Refer to specification section "APP Modified Bituminous Membrane Roofing" and "Product Warranties" for work requirements, materials, and procedures.

T.I. 22.1 PLUMBING WORK

A. Scope of Work

1. Work consists of cleaning existing drain lines, repairing damaged drains, and other drain related work items.
2. Clean and rod out all drains.
3. **Check drain bowl to deck connection to ensure watertight connection prior to roofing tear-off.** Check drain bowl to interior downspout connection to ensure watertight connection prior to roofing tear-off. Contact Engineer prior to roofing tear-off if existing interior drain connections may lead to interior water leakage.
4. Reuse existing drain bowls and deck plates. Reuse existing clamping rings, fasteners, and strainers. Report missing or damaged drain bowls and clamping rings to the Engineer. Clean and coat steel if required.
5. Install new metal strainers at all drains where strainer is missing or damaged.
6. Install piping extensions as required to raise curbs, vents, stacks, and soil pipes to a minimum of 8-inches above the finished roof surface.
7. Install new pipe supports on top of new roofing membrane with sacrificial pad.

B. Materials

1. Roof drain strainer; Contractor to submit product.
2. Anti-corrosion coating for drain bowl.
3. Piping extensions and accessories, as needed; Contractor to submit products.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.

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. Remove abandoned curbs and rooftop equipment as indicated in project drawings.
3. 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.
4. Raise all gas lines as necessary to provide 8 inches clearance above finished roofing for new insulation thicknesses.
5. Install new gas line supports on top of new roofing membrane with sacrificial pad.

B. Materials

1. Pipe supports, fasteners, and other accessories, as needed.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.

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 (except the existing lightning protection system) 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 current code.
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. Materials

1. Conduit supports, fasteners, and other accessories, as needed.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.

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.
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 an 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. Materials

1. Not applicable.

C. Drawings and Specifications

1. Refer to Sheet S-2.2 for location of work.
2. Refer to Sheet S-3.6 for installation details.

END OF SECTION 011000

SECTION 011100
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, plant, supplies, permits, equipment, transportation, superintendence, barricades, 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 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 Engineer's estimate, 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 Contract Documents shall be included in Base Bid.

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 hrs. 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 his use of adjacent premises for Work, construction operations and for 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 his work in order that inconvenience to the people in the facility is minimized.
 - c. Keep driveways and entrances serving the premises clear and available to the Owner and Owner's employees 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 him during progress of Work; provided that should Contractor in performance of Work disturb, disconnect or damage any of above, expenses arising from disturbance or in replacing or repair shall be borne by Contractor.
 - e. Elevators shall not be used for transfer of materials or equipment.
 3. Contractor shall:
 - a. Not unreasonably encumber Site with materials and equipment.
 - b. Not load structure with weight that will endanger structure.
 - c. Assume full responsibility for protection and safekeeping of stored products.
 - d. Move 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 zone. 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 his operations as to ensure the least inconvenience to the general public.

1.7 SURVEY OF EXISTING CONDITIONS:

- A. Contractor acknowledges by submitting a Bid, that he has visited and inspected the Project Site in which the Work is to be performed, that he has satisfied himself 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 Contractor to have acquainted himself 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.

1.8 INFORMATION OR CLARIFICATION OF CONDITIONS

- A. When Contractor encounters a condition requiring further information or a clarification, Contractor shall submit to Walter P. Moore and Associates a written Request For Information (R.F.I.) numbered sequentially. Walter P. Moore and Associates will respond in writing to all R.F.I.'s.

END OF SECTION 011100

SECTION 012513

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.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of Contract.
- B. Contractor's Construction Schedule and Schedule of Submittals are included under Section "Submittal Procedures."
- C. Engineer's policy is to reject requests for substitution. Vendors wishing inclusion in Engineer's master specification: contact Engineer for procedure.

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 3 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.
 - 2. Identify product, or fabrication 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. 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.
- d. 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.
- e. 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.
- f. Cost information, including proposal of net change, if any in Contract Sum.
- g. Certification by Contractor 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.

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 product or method of construction cannot be provided within Contract Time. Specified product or method 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 product or method of construction cannot be provided in manner that is compatible with other materials, and where Contractor certifies that substitution will overcome incompatibility.
 4. Specified product or method of construction cannot be coordinated with other materials, and where Contractor certifies that proposed substitution can be coordinated.
 5. Specified product or method 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 acceptance of Shop Drawings, Product Data 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 012513

REQUEST FOR SUBSTITUTION

To: WALTER P. MOORE

Attention:

From:

Name of Company

Address

City, State, Zip Code

Phone

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 requested. Only first product listed will be considered on forms with more than one product listed.

Specification Section Number: _____ Drawing Number: _____

Para Number: _____ Detail Number: _____

Specified Product: _____

Proposed Substitution: _____

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 _____

SECTION 012900
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. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules 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 Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - 1) 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 of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

- E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. 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. 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.
 5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- G. 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. Initial settlement survey and damage report if required.
- H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 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.

- I. 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 012900

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

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 provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Coordination Drawings.
 - 3. Administrative and supervisory personnel.
 - 4. 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. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space 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 [15] 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 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.

1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within 3 days of the meeting.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than [15] days after execution of the Agreement. Hold the conference at Project site or another convenient location. 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, including 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: 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: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
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: 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.
 4. 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
 5. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

END OF SECTION 013100

SECTION 013300
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 "Closeout Procedures" for submitting warranties.
 - 4. 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 7 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: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer [and Construction Manager].
 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. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer [or Construction Manager] observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Engineer [and Construction Manager].
 2. Additional copies submitted for maintenance manuals will [not] be marked with action taken and will be returned.

- H. 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.
- I. 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.
- J. Use for Construction: Use only final submittals with mark indicating action taken by Engineer [and Construction Manager] in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submit electronic files of each submittal, unless otherwise indicated. Engineer will return electronic files of reviewed submittals. Mark up and retain one returned copy as a Project Record Document.
- 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 1 Section "Project Management and Coordination."

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
- 1. Number of Copies: Submit three copies of each submittal, unless otherwise indicated. Engineer [and Construction Manager] will not return copies.
 - 2. 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.
- B. 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.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- 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 013300

UTHSCH UTC ROOFING REPAIRS
HOUSTON, TX
WALTER P MOORE PROJECT NO. D03.12130.00

SUBMITTAL PROCEDURES
013300 - 7

SECTION 017329
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 02 through 09 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.
 - 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 minimize interruption of services to occupied areas. **Coordinate modification of existing services with Owner.**

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. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. 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.

5. 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. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 017329

SECTION 017423

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 09.
- 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

3.1 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 unoccupied spaces.
 7. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo if required.
 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 air disposable 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 have become Owner's property, dispose of these materials as directed.

END OF SECTION 017423

SECTION 017700
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. Closeout requirements for specific construction activities are included in appropriate Sections in Divisions 02 through 09.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete following. List exceptions in request.
 - 1. In 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.
 - 2. Advise Owner of pending insurance change-over requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 - 4. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
 - 5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
 - 6. Deliver tools, spare parts, extra stock, and similar items.
 - 7. Make final change-over of permanent locks and transmit keys to Owner. Advise Owner's personnel of change-over in security provisions.

8. 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.

B. Inspection Procedures: On receipt of request for inspection, Engineer will either proceed with inspection 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 inspection when requested and assured that Work has been substantially completed.
2. Engineer will provide one repeat inspection under its contract with Owner. Subsequent inspections shall be at Contractor's expense.
3. Results of completed inspection will form basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection 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 inspection 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. 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.
5. Submit consent of surety to final payment.
6. Submit final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

PART 2 - PRODUCTS (NOT APPLICABLE).

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operating and 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 operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives.

END OF SECTION 017700

SECTION 017836

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 09 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. **Forms for special warranties may be obtained from the Engineer.** 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 09 Sections for specific content requirements and particular requirements for submittal of special warranties
- D. Bind warranties and bonds 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 in. by 11in. paper.
 - 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 each binder on front and spine with typed or printed title "WARRANTIES," Project title or name, and name of Contractor.
 - 3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

END OF SECTION [01787] [017836]

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HOUSTON, TX
WALTER P MOORE PROJECT NO. D03.12130.00

PRODUCT WARRANTIES
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SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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 blue- or black-line white-prints of Contract Drawings and Shop drawings for Project Record Document purposes. Mark with red erasable colored pencil all deviations from the original drawings.
- B. Upon Substantial Completion of the project, incorporate all changes into reproducible transparencies stamped "As-Built". Walter P. Moore and Associates will make originals available to Contractor's print shop. Contractor shall produce two sets of blue-lines and submit these with the reproducible transparencies to Walter P. Moore and Associates.

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.
- B. Upon completion of mark-up, submit record specifications to the Engineer for Owner's records.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 RECORDING

Post changes and modifications to the documents as they occur. Do not wait until the end of the project. The Engineer will periodically review record documents to assure compliance with this requirement.

END OF SECTION 017839

SECTION 02 07 00

SELECTIVE DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including all sections incorporate in the Project Manual apply to the work of this Section.

1.2 SUMMARY

- A. This Section requires the selective removal and subsequent reinstallation or off site disposal of the following:
 - 1. Removal and disposal of existing roofing membranes, metal flashings and trim, fiber cants, wood nailers, and miscellaneous hardware and accessories.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - 1. Schedule indicating proposed sequence of operations for selective demolition work, location of trash collection containers, and method of removal from the site to Owner's Representative for review prior to start of work. Include coordination of operations together with details for dust and noise control protection.
 - 2. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
- B. **Coordinate with Owner's continuing occupation of the existing building.**

1.4 JOB CONDITIONS

- A. Occupancy: Owner's staff and visitors will occupy all of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. **Provide minimum of 1 week advance notice to Owner of demolition activities that will affect Owner's normal operations.**
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's operations prior to start of selective demolition work.
- C. Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public to occupied portions of building.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public from injury due to selective demolition work.
2. Erect temporary covered passageways at each entrance and other areas of high traffic.
3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
4. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building. Temporary weather protection shall be provided at the building openings that is weather-tight and secured in place and capable of withstanding wind and rain forces normally encountered in this region.
5. Safety: Provide safety measures for workmen as required by OSHA, the Owner, and other authorities having jurisdiction.
6. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
7. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
 - a. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
8. Environmentally Controlled Substances: It is the Contractor's responsibility to determine if controlled substances are contained in any of the materials to be removed and to dispose of any material containing controlled substances in accordance to the rules and regulation of the local municipality and government. Contractor shall contact Owner if environmentally controlled substances are uncovered.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
- B. If unanticipated structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.2 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
 - 1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

3.3 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from the site.
 - 1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work at no cost to the Owner.

END OF SECTION 02 07 00

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-1 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. Plywood Product Standards: Comply with PS 1 (ANSI A 199.1) or, for products not manufactured under PS 1 provisions, with applicable APA Performance Standard for type of panel indicated.
- C. 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).
- D. 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.
 - 3. Fire-Retardant Treatment: Include certification by treating plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

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.

- 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. Plywood (PWD):
 1. Trademark: Identify each plywood panel with appropriate American Plywood Association (APA) trademark.
 2. Concealed Performance-Rated Plywood: Where plywood panels will be used for the following concealed types of applications, provide APA Performance-Rated Panels complying with requirements indicated for grade designation, span rating, exposure durability classification, edge detail (where applicable) and thickness.
 - a. Roof Sheathing: APA RATED SHEATHING.
 - (1) Exposure Durability Classification: EXTERIOR.
 - (2) Exposure Durability Classification: EXPOSURE 1.
 - (3) Exposure Durability Classification: EXPOSURE 2.
 - (4) Span Rating: As required to suit rafter spacing indicated.
 - (5) Span Rating: 16/0.
 - (6) Span Rating: 24/0.
 - (7) Span Rating: 24/16.
 - (8) Span Rating: 32/16.
 - (9) Span Rating: 48/24.

- F. 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).

2.7 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. Pressure-treat the following with water-borne preservatives for ground contact use complying with AWPB LP-22:
 - a. Wood members in contact with ground.
 - b. Wood members in contact with fresh water.
 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: Where "FR-S" lumber or plywood is specified or otherwise indicated provide materials which comply with AWPA standards for pressure impregnation with fire-retardant chemicals, and which have a flame spread rating of not more than 25 when tested in accordance with UL Subject 723 or ASTM E 84, and show no increase in flame spread and significant progressive combustion upon continuation of test for additional 20 minutes.

Where treated items are exposed to exterior or to high humidities or are to have a transparent finish in form of stain or sealer, provide materials which show no change in fire-hazard classification when subjected to standard rain test (UL Subject 790 or ASTM D 2898).

Use fire-retardant treatment which will not bleed through or adversely affect type of finish indicated and which does not require brush treatment of field-made end cuts to maintain fire-hazard classification.

1. Where transparent finish is indicated use type of treatment and species which permits milling of lumber after treatment without altering indicated fire-hazard classification, as determined by fire testing.

Kiln-dry treated items to maximum moisture content of 19%.

Provide UL label on each piece of fire-retardant lumber or plywood.

- C. Inspection: Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

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. 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.
2. 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.
3. 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.

C. Installation of Plywood:

1. General: Comply with applicable recommendations contained in Form No. E 30G, "APA Design/Construction Guide - Residential & Commercial", for types of plywood products and applications indicated.

END OF SECTION 06 10 00

SECTION 075213

APP MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. APP Modified Bituminous Roof Systems.
- B. Roof Insulation.
- C. Roof Flashing and Accessory Application

1.2 RELATED SECTIONS

- A. Division 01 Specifications.
- B. Section 061000 - Rough Carpentry: Roof blocking installation and requirements.
- C. Section 076200 - Sheet Metal Flashing and Trim: Metal flashing and counter flashing scuppers and downspouts installation and requirements.

1.3 REFERENCES.

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

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

The following is a specific list of references that apply to this specification, but is not necessarily all applicable standards.

- A. American Society of Civil Engineers (ASCE).
 - 1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures.
 - 2. ASTM International (ASTM) – Annual Book of ASTM Standards.
 - 3. ASTM C 728 – Standard Specification for Perlite Thermal Insulation Board.
 - 4. ASTM C 1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - 5. ASTM D 41 – Standard Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.
 - 6. ASTM D 312 – Standard Specification for Asphalt Used in Roofing.
 - 7. ASTM D 4586 – Standard Specification for Asphalt Roof Cement, Asbestos-Free.
 - 8. ASTM D 4601 – Standard Specification for Asphalt-Coated Glass Fiber Base

- Sheet Used in Roofing.
9. ASTM D 5147 – Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
 10. ASTM D 6223 – Standard specifications for APP modified bitumen sheet materials using a combination of polyester and fiberglass reinforcements.
 11. ASTM D 6509 – Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Base Sheet Materials Using Glass Fiber Reinforcements.
 12. ASTM E 408 – Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
- B. Factory Mutual (FM Global) - Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
- C. Federal Specification # HH-I-1972: Faced polyisocyanurate roof insulation board.
- D. Membrane Immersion Test: Modified Bitumen Membrane Asphaltic Impregnation Evaluation, as published in the "Proceedings of the Fourth International Symposium on Roofing Technology".
- E. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
- F. NBS-BSS #55: Tensile strength for fully adhered, asphalt based roof systems.
- G. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- H. Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TGFU).

1.4 DEFINITIONS

- A. Roofing Terminology: Refer to 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.

1.5 PERFORMANCE REQUIREMENTS

- A. Provide an installed roofing membrane and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
 4. Manufacturer's published specifications, base flashing details, and installation instructions for the specified system.
 5. Submit Material Safety Data Sheets on all roofing materials to be used.
- C. 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.
 5. Tapered insulation design.
- D. Submit written proof of contractor's approval by specified roof system manufacturer including written confirmation that the manufacturer has reviewed the project documents and that the roof system as specified meets the requirements for the manufacturer's guaranty.
- E. Submit copies of proposed manufacturer's guaranty.
- F. Selection Samples: For each product specified, two samples representing manufacturer's full range of available colors and types.
- G. Verification Samples: For each finish product specified, two samples representing actual product, color, and finish.

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.
1. ISO 9000 Certification: The manufacturer must provide documentation showing the manufacturer has current ISO 9001:2000 certification for the specific manufacturing plant where the modified bitumen membrane products are produced.
 2. ISO 14000 Certification: The manufacturer must provide documentation showing current ISO 14001:1996 certification for the specific manufacturing plant where the modified bitumen membrane products are produced.
- B. Product Performance Requirements:
1. Minimum Solar Reflectance: Initial Value – See Article 1.8
3-Year Aged Value (un-cleaned surface) – 0.68
 2. Minimum Thermal Emittance: Initial Value – See Article 1.8
3-Year Aged Value (un-cleaned surface) – 0.75
 3. Solar Reflective Index: Initial Value – 0.92
3-Year Aged Value (un-cleaned surface) – 0.82
 4. Reflective Cap Sheet products are required to have a minimum of 10 years of performance and manufacturing track record in the United States.
 5. Laminated or post-manufacturing coated Cap Sheet products will not be accepted.
 6. Reflective Cap Sheet products must be PH neutral and are required to have been tested as having no impact on the quality of water run-off.
 7. Reflective Cap Sheet products must be grease and fungus resistant.
- C. Installer Qualifications: All products listed in this section are to be installed by a single

installer with a minimum of ten (10) years demonstrated experience in installing products of the same type and scope as specified.

- D. 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, roof drains, penetrations, curbs, 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.
- E. The roofing systems manufacturer will provide qualified company personnel to attend pre-construction and in-progress meetings, and to perform periodic job site visits as necessary. 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.
- F. 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.

1.8 REGULATORY REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Exterior Fire Test Exposure: Provide a roofing system achieving a UL Class rating for roof slopes indicated on the Contract Drawings.
 - 1. UL Class A rating.
- C. 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 listed in the current FM Approval Guide.
 - 1. See Division 01 Section "Task Items" for required wind pressures.
- D. Energy Star – Roof system shall meet or exceed the initial and aged reflectivity required by the U.S. Federal Government's Energy Star Program.

- E. "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. 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. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
- C. 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.
- D. Environmental Requirements
 1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
 2. Temperature Restrictions - 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.
- E. Store and dispose of hazardous materials, and materials contaminated by hazardous

materials, in accordance with requirements of local authorities having jurisdiction.

F. Protection Requirements

1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
2. Torch Safety: Crew members handling torches shall be trained by an Authorized Certified Roofing Torch Applicator (CERTA) Trainer, be certified according to CERTA torch safety guidelines as published by the National Roofing Contractor's Association (NRCA), and follow torch safety practices as required by the contractor's insurance carrier. Designate one person on each crew to perform a daily fire watch. The designated crew member shall watch for fires or smoldering materials on all areas during roof construction activity, and for the minimum period required by CERTA guidelines after roofing material application has been suspended for the day.
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.

1.11 WARRANTY

- A. Provide manufacturer's roof system guaranty with single source coverage and no monetary limitation (NDL) where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.
1. Duration: Twenty (20) years from the date of completion.
 2. The guarantee must have unlimited dollar coverage for the entire guaranty period.
 3. Perimeter metal fascias and copings shall be guaranteed for wind speed coverage up to 150 mph. Counterflashings shall be guaranteed for wind speed coverage up to 110 mph for a maximum of 15 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers
1. Derbigum, Kansas City, MO
 2. Approved equal based on roofing membrane performance requirements specified herein. Requests to use equivalent products of other manufacturers shall be submitted minimum **five (5) working days (one calendar week) prior to the bid due date** for review and approval/rejection by Engineer and Owner. Requests for substitutions not submitted for approval during the bidding process will NOT be considered.

2.2 SCOPE / APPLICATION

- A. Install a roof specification consisting of one ply of APP modified ply sheets and one ply of APP granular surfaced cap sheet qualifying for the specified warranty.
- B. Where located on the Contract Drawings, remove and properly dispose of the existing roof membrane, base flashings, roof insulation, and sheet metal flashing and trim.

- C. Install a new roof system consisting of new rigid roof insulation, a multiple ply modified bitumen membrane system installed in cold adhesive, and new sheet metal flashing & trim.

2.3 INSULATION AND SUBSTRATE MATERIALS

- A. Rigid Board Insulation: 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: 48 inch by 48 inch (1219mm x 1219mm) for fully adhered boards. 48 inch by 96 inch (1219mm x 2438mm) for mechanically fastened boards only.
 - 2. Minimum Thickness: 4-1/2 inches continuous thickness, built up with 1-1/2 inch boards, with additional thickness as needed to create slope to drains.
 - 3. Average Thermal Resistance (LTTR value): 9 per 1-1/2 inch thick board.
 - 4. Available Products: DerbiBoard and DerbiBoard Tapered.
- B. Cover Board: 1/4-inch gypsum cover board with a primed glass fiber facer. Thickness: 1/4 inch (6mm).
 - 1. Dimensions: 48 inch by 48 inch (1219mm x 1219mm) for fully adhered boards. 48 inch by 96 inch (1219mm x 2438mm) for mechanically fastened boards only.
 - 2. Available products: DensDeck Prime.
- C. Alternate Cover Board: Securock fiber reinforced cementitious roof board.
 - 1. Thickness: 1/4 inch (6mm).
 - 2. Dimensions: 48 inch by 96 inch (1219mm x 2438mm).
- D. Modified Bitumen cant Strip: Atactic Polypropylene (APP) cant strip cut at angles to provide a 45 degree angle between horizontal and vertical surfaces.
- E. Perlite Tapered Edge Strip: Tapered expanded perlite edge strips meeting or exceeding the requirements of Fed. Spec. HH-I-529b and ASTM C 728.

2.4 BASE PLY

- A. Base Sheets: Smooth, fiberglass reinforced, Atactic Polypropylene (APP) base ply. Waterproof when side and end laps are welded.
 - 1. Thickness: 120 mils (3mm).
 - 2. Tensile Strength at 77 F (MD/XD): 90 lbf/in / 80 lbf/in.
 - 3. Available Products: DerbiBase Ultra.

2.5 MODIFIED BITUMINOUS CAP PLY

- A. Cap Sheet: ASTM D 6223 Type II dual reinforced, granule surfaced Atactic Polypropylene (APP) membrane with fiberglass and polyester dual reinforced mat.
 - 1. Thickness: 140 mils (3.5mm).
 - 2. Tensile Strength at 77 F (MD/XD): 85 lbf / 85 lbf
 - 3. Elongation at 77 F (MD/XD): 5.50 percent / 5.50 percent.
 - 4. Tear Resistance at 77 F (MD/XD): 130 / 130
 - 5. Low Temperature Flex: -20 C.
 - 6. Available Products: DerbiBrite

2.6 WALKWAY PLY

- A. Walkway Ply: Where indicated on roof plans, provide a fully-adhered walkway ply. Walkway pad material shall be the same as the modified bituminous cap ply, unless directed otherwise by manufacturer.

2.7 ISOLATION PLY

- A. Isolation Ply: Where indicated on roof plans, provide a fully-adhered ply to isolate equipment supports, sleepers, lightning protection systems, and other rooftop equipment from the cap ply. Isolation pad material shall be the same as the modified bituminous cap ply, unless directed otherwise by manufacturer.

2.8 FASTENERS AND ACCESSORIES

- A. Standard Roofing Fastener: Drill point fastener for installation of insulation and base sheets to steel and wood decks.

2.9 ADHESIVES, COATINGS AND PRIMERS

- A. Cold Applied Roofing Adhesive: Cold applied adhesive for use with modified bitumen membranes and base sheets.
 - 1. Application Rate: 1.5 to 2.5 gallons per 100 square feet, depending on substrate (0.6 – 0.8 l/sm).
 - 2. Volatile Organic Compound (VOC) limits: 200 g/l.
 - 3. Available Products: Permastic.
- B. Cold Applied Roofing Isolation Adhesive: Cold applied adhesive for use with roofing insulation boards and cover boards.
 - 1. Application Rate: 1/4-inch to 1/2 –inch beads of adhesive at 12-inches on center, unless recommended otherwise by manufacturer.
 - 2. Available Products: Derbibond LR.
- C. Cold Applied Flashing Cement: Cold applied asphalt flashing cement for adhering modified bitumen membranes to vertical surfaces and flashing modified bituminous membranes to metal components.
 - 1. Application Rate: 7.5 gallons per 100 square feet (3.0 l/sm) at a 1/8 inch (3mm) bed.
 - 2. Volatile Organic Compound (VOC) limits: 165 g/l.
 - 3. Available Products: Perflash
- D. Cold Applied Liquid Flashing Resin: Cold applied, seamless, self-terminating flashing resin that is reinforced and UV stable, specifically formulated for use on atypical and/or rigid roof penetrations.
 - 1. Available Products: Derbiflash
- E. Reflective Tough-Up Coating: Water-based, white, reflective, high-performance roof coating specifically formulated to touch-up edges and seams of reflective cap sheets.
 - 1. Available Products: Derbiflash SD

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 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Lightweight Insulating Concrete Decks:
 - 1. Lightweight insulating concrete decks must have a minimum thickness of 2 inches (51 mm), a minimum compressive strength of 125 psi (0.86 MPa) and a minimum density of 22 pcf (352 kg/sm).
 - 2. Lightweight insulating concrete decks are acceptable only on slopes up to 1 inch per foot (83 mm/m).
 - 3. Prior to installing new roofing materials, patch existing lightweight concrete deck as specified in Division 01 Section "Task Items".

3.3 BASE PLY INSTALLATION

- A. Apply approved base sheets over insulation or deck surfaces using methods approved by the manufacturer for the specified roof system.
- B. Strap and backnail base and interply sheets where roof slopes exceed 2 inches per foot (2:12).

3.4 MEMBRANE INSTALLATION

- A. Apply roof system in strict accordance with manufacturer's published recommendations.
- B. Unroll membranes and allow them to relax prior to application. Application of sheet materials directly from the factory roll may increase the incidence of wrinkling during or subsequent to application.
- C. Starting at the low point of the roof area, unroll membrane into position with 3 inch (76mm) side laps and end laps staggered a minimum of 12 inches (305mm).
- D. Cold Process Membrane Application:
 - 1. Plan Work and foot traffic so adhesive is not tracked across the top of the finished base ply membrane.
 - 2. Starting at the low point of the roof area, rolls of modified cap sheet shall be unrolled into position with 3 inch (76mm) side laps and end laps staggered a minimum of 12 inches (305mm).
 - 3. Pull the end of each sheet straight back onto itself so that the sheet is folded approximately in half, maintaining alignment of the individual sheets and uniformity of the side laps.
 - 4. Apply adhesive uniformly over the previously marked area with a 1/4 inch notched squeegee at the minimum rate of 1 1/2 to 2 gallons per 100 SF, keeping the adhesive from the side and end lap areas of adjacent rolls.
 - 5. Roll the sheet into the adhesive commencing with the first roll in the gang, maintaining alignment of the roll and uniformity of the side laps. Broom the

- membrane as necessary to insure embedment of the membrane into the adhesive.
6. Repeat the procedure on the opposite end of the rolls of the membrane. Side and end laps must be left clean and free of adhesive.
 7. Provide heat welded or finishing of membrane edges and laps as required by manufacturer.

3.5 MEMBRANE BASE FLASHING

- A. Maximum flashing length is 10 ft. (3.05m) when the membrane flashings are between 8 inches (203mm) and 14 inches (356mm) high.
- B. Priming: Prime all metal surfaces with asphalt primer and allow them to dry prior to application of the flashing membrane.
- C. Sequence of Base Flashing Membrane:
 1. Install the first base flashing ply after completing the field base ply.
 2. At the conclusion of the field top ply, install the second ply of base flashing membrane. This will result in "lacing" of the field and base flashing membranes.
- D. Stripping Plies:
 1. At metal flanges, install a stripping ply over the field base ply, extending a minimum of four (4) inches (102mm) beyond the flange of the metal.
 2. Set the metal flange over the stripping ply in a bed of flashing cement and mechanically anchor.
 3. Apply top ply over the primed metal flange.
 4. Where the edge of stripping plies meets the metal detail (i.e., outside edge of perimeter metal or against vent pipes), apply a bead of flashing cement to provide a continuous seal and fill in any gaps that may allow standing water at this point.
- E. High Wall Flashings: When flashing vertical surfaces above 14 inches (356mm) high, the membrane must be installed the width of the roll and pre-cut to the desired height.
- F. Seal the top edges of all base flashings with asphalt flashing cement and reinforcing fabric to provide protection until metal counter flashing is installed.
- G. Curb and Corner Flashings:
 1. All inside and outside corners require a boot to provide weather protection at the lap joint. Boot must be a minimum 2 inch (51mm) radius beyond all intersecting surfaces, and have a minimum of 1/4 inch (6mm) follow of modified bitumen beyond all edges.
 2. Install boots at the inside and outside corners (underneath) prior to installing the flashing membrane.
 3. In lieu of membrane boots, the corners may be reinforced with a five-course treatment, consisting of alternating layers of flashing cement and glass fabric mesh.
- H. Mechanically fasten the top of all vertical base flashing membranes. Install fasteners appropriate to the substrate 8 inches (203mm) on center.
- I. Metal Counter Flashing: All vertical base flashings must be covered by metal counter flashing to form a continuous water shedding surface over the top of membrane flashing. Extend metal counter flashing a minimum of 3 inches (76mm) over the top of the membrane flashing.

- J. Metal Face Securement: Install Hook strips (cleats) on all metal extending over roof edges (coping metal, gravel stop/eave strip, perimeter curb metal, etc.) in accordance with recommendations in the NRCA Roofing and Waterproofing Manual. Appropriate provision must be made in accessory metal to allow for expansion and contraction of the metal sections without interrupting the integrity of the waterproofing assembly.
- K. Roof Drains:
1. All roof drains must be sumped and free of all rust, debris and dirt.
 2. Install the base ply and cut so that the base ply stops short of the clamping ring.
 3. Install a 36 inch square piece of smooth membrane over the drain opening, in accordance with manufacturers recommendations for the roof system specified. Cut a hole to the inside edge of the drain base.
 4. Thoroughly clean the drain bowl flange, and primed to receive the membrane. Apply flashing cement to the clamping ring area.
 5. Install a 30 inch (762mm) square, 4 lb (1.81 kg) lead flashing over the membrane into a bed of flashing cement and install the top layer of field membrane extending to the inside edge of the drain bowl.
 6. The field membrane, the new drain lead, and stripping membrane are to extend under the properly secured and tightened compression clamping ring assembly. Cut holes in the membrane to align with the clamping bolts, install the clamping ring and tighten the bolts to provide uniform compression of the flashing membrane at the drain.
- L. Pitch Pockets:
1. Fabricate and install new pitch pockets from stainless steel in accordance with NRCA recommendations.
 2. Fill the pocket halfway to the top with non-shrink grout and the remainder with pourable sealer.
 3. Slope fill away from the penetration to the edge of the pocket.
 4. Install metal rain collars with drawbands that cover and overlap the entire pocket and caulk the top of the drawband with sealant.
 5. Strip in the metal flanges of the pitch pocket per the sequence described above for stripping plies.

3.6 INSPECTION AND QUALITY CONTROL

- A. The primary manufacturer will provide a qualified, trained auditor to perform a final inspection to insure the roof system has been installed properly and according to the manufacturer's recommendations and guaranty requirements. Upon completion of the inspection, copies of the inspection report will be provided to the Owner and Contractor. Any corrective action deemed necessary to comply with the manufacturer's specifications must be completed by the contractor prior to final close-out.

3.7 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 masonry and 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.

END OF SECTION 075213

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 low-slope roof 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 "APP Modified Bituminous Membrane Roofing" for installation of new roofing membrane.
 - 3. 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:
 - 1. Wind Zone 3: For velocity pressures of 46 to 104 lbf/sq. ft. (2.20 to 4.98 kPa): 208-lbf/sq. ft. (9.96-kPa) perimeter uplift force, 312-lbf/sq. ft. (14.94-kPa) corner uplift force, and 104-lbf/sq. ft. (4.98-kPa) outward force.
- 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 (49 deg C), ambient; 180 deg F (82 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.
 - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- 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, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including

installers of roofing materials, roof accessories, unit skylights, 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: Type 304 Austenitic stainless steel in minimum 24-gauge, or as recommended by SMACNA for sheet metal flashing installations.

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. All fasteners shall be stainless steel.
 1. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 2. 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-Tin Alloy-Coated Stainless Steel: ASTM B 32, 100 percent tin.

- 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 for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Sealed Joints: Form nonexpansion 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. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
 - 1. Gutter Style: K, or other as approved by Owner and Engineer.
 - 2. Expansion Joints: Butt type.
 - 3. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following material:
 - a. Prepainted, Metallic-Coated Steel: 0.0217 inch (0.55 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. Prepainted, Metallic-Coated Steel: 0.0217 inch (0.55 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 or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
 - 1. Fabricate parapet scuppers from the following material:
 - a. Stainless Steel: 0.0187 inch (0.5 mm) thick.

2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop) and Fascia Caps: 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: Lap, 4 inches (100 mm) wide.
 - 2. Fabricate with scuppers spaced 10 feet (3 m) apart, of dimensions required with 4-inch- (100-mm-) wide flanges and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
 - 3. Fabricate scuppers from the following material:
 - a. Stainless Steel.
- B. Base Flashing: Fabricate from the following material:
 - 1. Stainless Steel.
- C. Counterflashing: Fabricate from the following material:
 - 1. Stainless Steel.
- D. Roof-Drain Flashing: Fabricate from the following material:
 - 1. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet.
 - 2. Copper Sheet: ASTM B 370, Temper H00 or H01, cold-rolled copper sheet.

2.6 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 sheet metal flashing and trim with bituminous coating 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 asphalt roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Hem all exposed edges of sheet metal flashing and trim.
- E. 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.
- F. 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. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

- G. 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.
- H. 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.
 - a. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
- I. 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 7 Section "Joint Sealants."

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. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored straps spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
 - 1. Fasten gutter spacers to front and back of gutter.
 - 2. Loosely lock straps to front gutter bead and anchor to roof deck.
 - 3. Anchor and loosely lock back edge of gutter to continuous cleat.
 - 4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
 - 5. Anchor gutter with spikes and ferrules spaced not more than 24 inches (600 mm) apart.
 - 6. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (15.24 m) apart. Install expansion joint caps.
 - 7. Install continuous gutter screens on gutters with noncorrosive fasteners, hinged to swing open for cleaning gutters.
- 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.

- 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. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
 - 2. Loosely lock front edge of scupper with conductor head.
 - 3. Seal or solder exterior wall scupper flanges into back of conductor head.
- E. Splash Pans: Install where downspouts discharge on low-sloped roofs. Set in asphalt roofing cement compatible with roofing membrane.

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 zone and as indicated.
 - 1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 24-inch (600-mm) centers.
- C. 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.

3.5 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 076200

SECTION 079200

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 JOINTS:

- A. Products: Acceptable joint sealants:
 - 1. "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.

2.3 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Flexible, non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back surface of joint. Provide self-adhesive taper where applicable.
- E. Acceptable Backer Rods:
 - 1. "Sof Rod" by Momaco Inc.
 - 2. "ITP Soft Type Backer Rod" by Industrial Thermo Polymers Limited

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 Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants in concave joint configuration per ASTM C 962, 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 079200