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**IFB NO. Y20-720-RM**

**ISSUED: October 9, 2019**

**INVITATION FOR BIDS**

**FOR**

**ORANGE COUNTY SOLID WASTE ADMINISTRATION BUILDING ROOF  
REPLACEMENT**

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**PART H  
TECHNICAL SPECIFICATIONS**

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**PART H  
Volume II**

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# CONSTRUCTION DOCUMENTS

## PROJECT MANUAL

May 8, 2019  
(Revision 1: May 30, 2019)  
(Revision 2: August 8, 2019)

### SOLID WASTE ADMINISTRATION BUILDING ROOFING REPLACEMENT PROJECT

5901 YOUNG PINE ROAD  
ORLANDO, FLORIDA 32829

Prepared for:  
Orange County - Utilities Department



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PART I GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work of this Contract comprises building, site work and related construction work to produce a complete and functional roof assembly, including but not limited to the removal of the existing skylights and the filling of the skylight voids and the removal and replacement of the existing roofing assembly including the roof membrane, roof insulation, and metal roof flashings.

1.02 CONTRACT METHOD

- A. Construct the work under a single lump sum contract (or as otherwise defined in bid documents).

1.03 CONTRACTOR'S PAYMENTS TO COUNTY FOR OVERTIME WORK

- A. **Revision 1: County Inspector Work Hours: Normal work hours for the County's inspector(s) are defined as any 8-hour period between the hours of 7:00 a.m. and 7:00 p.m. on the weekdays of Monday through Friday. Any County Inspector(s) work beyond the aforementioned normal work hours shall be requested in writing 48-hours in advance. All overtime, any County holidays or weekend work compensation for the County's Inspector(s) to work beyond the normal working hours are considered overtime compensation and shall be paid for by the Contractor. The overtime pay rate will be \$51.00 per hour or the most current rate as listed in the County Fee Directory prepared by the Office of Management and Budget, in section "Orange County Utilities Engineering & Construction", under the heading of "Inspection Fee other than Normal Working Hours". The Contractor agrees that the County shall deduct charges for work outside normal work hours and for overtime pay from payments due the Contractor.**

1.04 COORDINATION

- A. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to and placing in service, such equipment. Differences shall be brought to the Owner's attention during bid process or remain the responsibility of the Contractor.
- C. Coordinate space requirements and installation of items, such as, but not limited to, mechanical and electrical work which are indicated diagrammatically or otherwise on drawings. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance and for repairs.

- D. In finished areas (except as otherwise shown), conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Execute cutting and patching to integrate elements of work, uncover ill timed, defective and nonconforming work, provide openings for penetrations of existing surfaces and provide samples as specified in individual sections for testing. Seal penetrations of existing surfaces and provide samples as specified in individual sections for testing. Seal penetrations through floors, walls and ceilings, and fire safe where necessary as part of the lump sum price.

1.05 REFERENCE STANDARDS

- A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect when a specified date is specified.
- C. Obtain copies of referenced standards listed in individual specification sections. Maintain copy at job site during progress of the specific work.

END OF SECTION 01 00 50

## SECTION 01 01 00 - SUMMARY OF WORK

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 PROJECT DESCRIPTION

- A. Performance of all tasks specified in the contract documents shall be the responsibility of the contractor unless specified otherwise.
- B. **Revision 1: Skylight Removal: Remove all existing skylights and install structural framing and roof deck. Install roof insulation to match adjacent existing roof surfaces.**
- C. **Revision 1: Reroofing: Remove all existing roofing assemblies from surface of existing steel roof deck. Install flat insulation and install tapered insulation as required to provide positive slope to the roof edge. Install cover board over the insulation and secure the cover board and insulation to the existing steel deck with mechanical fasteners. Over the roof surface, torch apply a 3-ply modified bituminous roof membrane over the cover board consisting of a smooth surface base sheet, a smooth surface inner ply, and a granulated surface cap sheet. Over the adjacent vertical surfaces, install a cover board and torch apply a 2-ply modified bituminous base flashing over the cover board consisting of a smooth surface base flashing inner ply and a granulated surface base flashing outer ply. Fabricate and install stainless steel flashings with all non-moving seams fully soldered.**

#### 1.03 BUILDING/SITE SECURITY

- A. **Revision 1: The construction site and building areas shall be secured as required to prevent unauthorized entry into the construction area.**
- B. Refer to Section 01 50 00 for specified requirements for construction fence.

#### 1.04 CONTRACTOR USE OF PREMISES

- A. General: During the construction period, the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the Owner's right to perform construction operations with its own forces or to employ separate contractors on portions of the project.

**B. Revision 1: General: Limit use of the premises to construction activities and material storage areas where indicated within the limit of the premises-**

1. Confine operations to areas within Contract limits indicated on the Drawings. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
2. Keep driveways and entrances serving the premises clear and available to the Owner and the Owners' 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.
3. Burial of Waste Materials: Do not dispose of organic and hazardous material on site, either by burial or by burning.

1.05 DISTRIBUTION OF RELATED DOCUMENTS

- A. The Contractor is solely responsible for the distribution of ALL related documents/drawings to ALL appropriate vendors/subcontractors to ensure proper coordination of all aspects of the project and its related parts during bidding and construction.

1.06 CONSTRUCTION BULLETIN BOARD

- A. Revision 1: The Contractor shall erect and maintain a weather protected bulletin board of sufficient size to display all permits, notices and other documents required to be posted for the Project. Said bulletin board shall be in a location that provides unobstructed access for inspection by the Architect, the Project Manager, Owner's Representatives, and authorities having jurisdiction over the project.**

PART 2 PRODUCTS

2.01 ASBESTOS FREE MATERIAL

- A. Contractor shall provide a written and notarized statement on company letterhead(s) to certify and warrant that ONLY ASBESTOS FREE MATERIALS AND PRODUCTS were provided as required by the Architect in Section 01 40 00, QUALITY CONTROL. Such statement shall be submitted with the final payment request. Final payment shall not be made until such statement is submitted. Contractor agrees that if materials containing asbestos are subsequently discovered at any future time to have been included in the construction, the Contractor shall be liable for all costs related to the redesign or modification of the construction of the project so that materials containing asbestos are removed from the facility. If construction has begun or has been completed pursuant to a design that includes asbestos containing materials, the Contractor shall also be liable for all costs related to the abatement of such asbestos.

PART 3 EXECUTION (Not applicable).

END OF SECTION 01 01 00



## SECTION 01 02 70 - APPLICATION FOR PAYMENT

### PART I GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
- B. The Contractor's Construction Schedule and Submittal Schedule are included in Section 01 30 00 – SUBMITTALS

#### 1.03 SCHEDULE OF VALUES

- A. Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Submit the Schedule of Values to the Owner at the earliest feasible date, but in no case later than Preconstruction Meeting. Refer to Section 01 20 00.
  - 2. Sub-Schedules: Where the Work is separated into phases that require separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
  - 1. Identification: Include the following project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of the Architect
    - c. Project Number
    - d. Contractor's name and address
    - e. Date of submittal
  - 2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
    - a. Generic name
    - b. Related Specification Section
    - c. Change Orders (numbers) that have affected value
    - d. Dollar Value
    - e. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted

to total 100 percent

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items:
  - a. A value will be given for at least every major specification section (subsections can logically be grouped together).
  - b. A single material subcontractor will not be required to be broken down into labor and material unless it is anticipated the materials will be stored and invoiced prior to installation.
  - c. All multiple item subcontracts or work items (i.e. concrete, roofing, painting, mechanical, electrical items, etc.) will be shown broken down at least in labor and material (all taxes, burden and overhead and profit included).
  - d. Mobilization (move-on, bond, insurance, temporary office and sanitary service installation) shall not exceed 2 1/2% of contract price.
  - f. Logical grouping of specification subsections is permitted.
4. Round amounts off the nearest whole dollar, the total shall equal the Contract Sum.
5. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
6. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
  - a. At the Contractors' option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
7. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the contract sum.

#### 1.04 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as reviewed by the Owner representative and paid for by the Owner.
  - 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the Final Application for Payment involve additional requirements. See items G, I, J and K of this section.
- B. Payment Application Times: The period of construction work covered by each Application of Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use the Owner's most updated form as the form for Application for Payment. Form given at the Preconstruction Conference.
- D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.
  - 1. Entries shall match data on the Schedule of Values and Contractors' Construction Schedule. Use updated schedules if revisions have been made.
  - 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit five (5) original executed copies of each Application for Payment to the Project Manager by means ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien and similar attachments, when required.
  - 1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Project Manager.
- F. Payment will be processed once a month. Payment for item will be based on percentage completed as determined and approved by the Owner Project Manager or invoice for stored materials. Retainage (10%) will be held for all applications.
- G. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work. Application shall also include all items listed in Part H. above.
- H. Final Payment Application: Administrative actions and submittals, which must precede or coincide with submittal of the final payment. Application for Payment includes the following:
  - 1. Completion of Project Close-Out requirements
  - 2. Completion of items specified for completion after Substantial Completion (Punch List)

3. Contractor's release of lien (on Owner's form)
4. Subcontractor and material supplier release of lien
5. Consent of Surety
6. Power of attorney
7. Asbestos-free letter

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 02 70

## SECTION 01 03 50 - MODIFICATION PROCEDURES

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

#### 1.02 SUMMARY

- A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.

#### 1.03 MINOR CHANGES IN THE WORK

- A. Supplemental instructions authorizing minor changes in the work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Project Manager.

#### 1.04 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Proposed changes in the work that will require adjustment to the Contract Sum or Contract Time will be issued by the Project Manager, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
  - 1. Proposal requests issued by the Project Manager are for information only. Do not consider them instruction either to stop work in progress, or to execute the proposed change.
  - 2. Unless otherwise indicated in the proposal request, within 7 days of receipt of the proposal request, submit to the Project Manager from the Owner's review, an estimate of cost necessary to execute the proposed change.
    - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include a statement indicating the effect the proposed change in the work will have on the Contract Time.
    - d. Contractor and subcontractors will provide a complete detailed labor and material breakdown to justify change order request amount.

- B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions in mutual accord with the Owner Representative's findings require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
  2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
  3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  4. Comply with requirements in Section 01 63 10 Product Substitutions- if the proposed change in the work requires that substitution of one product or system for a product or system not specified.
  5. Contractor and subcontractors will provide a complete detailed labor and material breakdown to justify change order request amounts.

#### 1.05 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Project Manager may issue a Construction Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

#### 1.07 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal Request, the Project Manager will issue a Change Order for signatures of the Owner and Contractor on County's Change Order form, as provided in the Conditions of the Contract.

#### PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 03 50

## SECTION 01 04 00 - PROJECT COORDINATION

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for project coordination including, but not necessarily limited to:
  - 1. Coordination
  - 2. Administrative and supervisory personnel
  - 3. General installation provisions
  - 4. Cleaning and protection
- B. Progress meetings, coordination meetings And Pre-installation conferences are included in Section 01 20 00 'Project Meetings'.
- C. Requirements for the Contractor' Construction Schedule are included in Section 01 30 00 'Submittals'.

#### 1.03 COORDINATION

- A. Coordination: Coordinate construction activities included under various Sections of these Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specification that are dependent upon each other for proper installation, connection, and operation.
  - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
  - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.



- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required: notices, reports, and attendance at meetings.
  - 1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Schedules
  - 2. Installation and removal of temporary facilities
  - 3. Delivery and processing of submittals
  - 4. Progress meetings
  - 5. Project close-out activities
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
  - 1. Salvage materials and equipment (if any) involved in performance of, but not actually incorporated in, the Work.
- E. Lack of coordination as specified in this and other sections of the contract documents are in grounds for assessment of back charges and/or termination in order to remediate the situation.

#### 1.04 SUBMITTALS

- A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
  - 1. Show the interrelationship of components shown on separate Shop Drawings.
  - 2. Indicate required installation sequences.
  - 3. Comply with requirements contained in Section Submittals.

- B. Staff Names: At the Preconstruction Conference submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1. **Revision 1: ~~Post copies of the list in the project meeting room, the temporary field office, and each temporary telephone.~~**

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to Project Manager for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect/Project Manager for final decision.

### 3.02 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as directed by the Project Manager and as frequently as necessary to ensure its integrity and safety through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where the applicable, such exposures include, but are not limited to, the following:
  - 1. Excessive static or dynamic loading
  - 2. Excessively high or low temperatures
  - 3. Excessively high or low humidity
  - 4. Air contamination or pollution
  - 5. Water
  - 6. Solvents
  - 7. Chemicals
  - 8. Soiling, staining and corrosion
  - 9. Rodent and insect infestation
  - 10. Combustion
  - 11. Destructive testing
  - 12. Misalignment
  - 13. Excessive weathering
  - 14. Unprotected storage
  - 15. Improper shipping or handling
  - 16. Theft
  - 17. Vandalism

END OF SECTION 01 04 00

## SECTION 01 04 50 - CUTTING AND PATCHING

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

#### 1.03 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
  - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
  - 2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
  - 3. List products to be used and firms or entities that will perform Work.
  - 4. Indicate dates when cutting and patching is to be performed.
  - 5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
  - 6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

#### 1.04 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load carrying capacity or load-deflection ratio.
  1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements.
    - a. Foundation construction
    - b. Bearing and retaining walls
    - c. Structural concrete
    - d. Structural steel
    - e. Lintels
    - f. Timber and primary wood framing
    - g. Structural decking
    - h. Miscellaneous structural metals
    - I. Stair systems
    - j. Exterior curtain wall construction
    - k. Equipment supports
    - l. Piping, ductwork, vessels and equipment
    - m. Structural systems of special construction in Division 13.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety. ~~Refer to Divisions 15 and 16 regarding Fire Rated Penetrations.~~ (Revision 2: August 8, 2019.)
  1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems.
    - a. Shoring, bracing and sheeting
    - b. Primary operational systems and equipment
    - c. Air or smoke barriers
    - d. Water, moisture, or vapor barriers
    - e. Membranes and flashings
    - f. Fire protection systems
    - g. Noise and vibration control elements and systems

- h. Control systems
  - I. Communication systems
  - j. Conveying systems
  - k. Electrical wiring systems
  - l. Special construction specified by Division-13 Sections
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.
- 1. If possible, retain the original installer or fabricator to cut and patch the following categories of exposed work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:
    - a. Processed concrete finishes
    - b. Preformed metal panels
    - c. Window wall system
    - d. Stucco and ornamental plaster
    - e. Acoustical ceilings
    - f. Carpeting
    - g. Wall covering
    - h. HVAC enclosures, cabinets or covers
    - I. Roofing systems

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect unless otherwise indicated by Architect/Owner. Use materials whose installed performance will equal or surpass that of existing materials.

## PART 3 EXECUTION

### 3.01 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting, and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with all 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.

### 3.02 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 the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas and interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

### 3.03 PERFORMANCE

- A. General: Employ skilled workmen 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 activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
  1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a Carborundum saw or diamond core drill.
  4. Comply with requirements of applicable Sections of Division-2 where cutting and patching required excavating and backfilling.
  5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
  2. 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. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color 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 smooth, painted surfaces, extend final coat over entire unbroken surfaces containing the patch, after the patched area has received primer and second coat.

### 3.04 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged materials to their original condition.

END OF SECTION 01 04 50



## SECTION 01 09 50 - REFERENCE STANDARDS AND DEFINITIONS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. Indicated: The term *indicated* refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as shown, noted, scheduled and specified are used, it is to help the reader locate the reference; no limitation on location is intended.
- C. Directed: Terms such as directed, requested, authorized, selected, accepted, required, and permitted mean directed by the Project Manager, requested by the Architect/Project Manager and similar phrases.
- D. Approved: This term approved means accepted, where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
- E. Regulations: The term Regulations includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. Furnish: The term furnish is used to mean supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. Install: The term install is used to describe operations at project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. Provide: The term provide means to furnish and install, complete and ready for the intended use.
- I. Installer: An Installer is the Contractor, or an entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
  - 1. The term experienced, when used with the term Installer, means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

2. Trades: Use of titles such as carpentry is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.
- J. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- K. Testing Laboratories: A testing laboratory is an independent entity engaged to perform specific inspections or tests, either at the Project sites or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

#### 1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 36 Division format and MASTER FORMAT numbering system.
- B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
  1. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Words and meaning shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.
  2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
    - a. The words, shall be included by inference wherever a colon (:) is used within a sentence or phrase.

#### 1.04 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copies directly into the Contract Documents to the extend reference. Such standards are made part of the Contract Documents by reference.
- B. Publication Dates: Comply with the standard in effect as of the date of the Contract

Documents.

- C. **Conflicting Requirements:** Where compliances with two or more standards are specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels. Refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.
  - 1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect/Owner for a decision before proceeding.
- D. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed for performance of a required construction activity. The Contractor shall obtain copies directly from the publication source or any other authorized source.
- E. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. See Trade Reference List at the end of this Section refer to the Encyclopedia of Associations, published by Gale Research Co., available in most libraries.

1.05 GOVERNING REGULATIONS/AUTHORITIES

- A. The Architect has contacted authorities having jurisdiction where necessary to obtain information necessary the preparation of Contract Documents. Contact authorities having jurisdiction directly for information and decisions having a bearing on the work.

1.06 SUBMITTALS

- A. **Permits, Licenses, and Certificates:** For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulation bearing upon performance of the Work.

1.07 TRADE REFERENCES

Acronyms for abbreviations used in the Specifications or other Contract Documents mean the recognized name of the trade association, standards generating organization, authority that have jurisdiction or other entity applicable to the context of the text provision.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturer's Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADC	Air Diffusion Council
AGA	American Gas Association
AHA	American Hardboard Association
AI	Asphalt Institute
AIHA	American Industrial Hygiene Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
APA	American Plywood Association
ARI	Air Conditioning and Refrigeration Institute
ASA	Acoustical Society of America
ASC	Adhesive and Sealant Council
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers

ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society of Testing of Materials
AWI	Architectural Woodwork Institute
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
CISPI	Cast Iron Soil Pipe Institute
CRSI	Concrete Reinforcing Steel Institute
DHI	Door and Hardware Institute
DLPA	Decorative Laminate Products Association
EIMA	Exterior Insulation Manufacturers Association
FGMA	Flat Glass Marketing Association
FM	Factory Mutual Engineering and Research
GA	Gypsum Association
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IESNA	Illuminating Engineering Society of North America
MBMA	Metal Building Manufacturer's Association
ML/SFA	Metal Lath/Steel Framing Association
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAMM	National Association of Architectural Metal Mfgs.
NAPA	National Asphalt Pavement Association

NAPF	National Association of Plastic Fabricators (Now DLPA)
NBHA	National Builder's Hardware Association (Now DHI)
NCMA	National Concrete Masonry Association
NEC	National Electric Code
NECA	National Electric Contractors Association
NEII	National Elevator Industry, Inc.
NFPA	National Fire Protection Association
NHLA	National Hardwood Lumber Association
NPA	National Particle board Association
NPCA	National Paint and Coatings Association
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association (Now NWWDA)
NWWDA	National Wood Window and Door Association (Formerly NWMA)
PDI	Plumbing and Drainage Institute
RFCI	Resilient Floor Covering Institute
RMA	Rubber Manufacturers Association
SDI	Steel Deck Institute
S.D.I.	Steel Door Institute
SGCC	Safety Glazing Certification Council
SHLMA	Southern Hardwood Lumber Manufacturers Association (Now HMA)
SIGMA	Sealed Insulating Glass Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SJI	Steel Joist Institute
SPRI	Single Ply Roofing Institute

SSPC	Steel Structures Painting Council
SWI	Steel Window Institute
TCA	Tile Council of America
UL	Underwriters Laboratories
WCMA	Wall Covering Manufacturers Association
WRI	Wire Reinforcement Institute
WSFI	Wood and Synthetic Flooring Institute

#### 1.08 FEDERAL GOVERNMENT AGENCIES

- A. Names and titles of federal government standard or Specification producing agencies are frequently abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard of Specification producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up-to-date as of the date of the Contract Documents.

CE Corps of Engineers  
(US Department of the Army)  
Chief of Engineers - Referral  
Washington, DC 20314 (202) 272-0660

CFR Code of Federal Regulations  
Available from the Government Printing Office  
North Capitol St. Between G and H Street, NW  
Washington, DC 20402 (202) 783-3238

CPSC Consumer Product Safety Commission  
5401 Westbard Avenue  
Washington, DC 20816 (800) 638-2772

CS Commercial Standard  
(US Department of Commerce)  
Government Printing Office  
Washington, DC 20402 (202) 377-2000

DOC Department of Commerce  
14th Street and Constitution Ave., NW  
Washington, DC 20230 (202) 377-2000

DOT Department of Transportation  
400 Seventh St., SW

Washington, DC 20590 (202) 426-4000

EPA Environmental Protection Agency  
401 M. St., SW  
Washington, DC 20460 (202) 382-2090

FAA Federal Aviation Administration  
(U.S. Department of Transportation)  
800 Independence Avenue SW  
Washington, DC 20590 (202) 366-4000

FCC Federal Communications Commission  
1919 M. Street NW  
Washington, DC 20554 (202) 632-7000

NBS National Bureau of Standards  
(U.S. Department of Commerce)  
Gaithersburg, MD 20899 (301) 921-1000

OSHA Occupational Safety and Health Administration  
(U.S. Department of Labor)  
Government Printing Office  
Washington, DC 20402 (202) 523-7001

PS Product Standard of NBS  
(U.S. Department of Commerce)  
Government Printing Office  
Washington, DC 20402 (202) 783-3238

USDA U.S. Department of Agriculture  
Independence Avenue  
Between 12th and 14 Street, SW  
Washington, DC 20250 (202) 447-8732

PART 2 PRODUCTS  
(Not Applicable)

PART 3 EXECUTION  
(Not Applicable)

END OF SECTION 01 09 50



## SECTION 01 20 00 - PROJECT MEETINGS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
  - 1. Pre-Construction Conference
  - 2. Pre-Installation Conference
  - 3. Coordination Meetings
  - 4. Progress Meetings
- B. Construction schedules are specified in Section 01 30 00 Submittals.

#### 1.03 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction conference and organizational meeting at the project site or other convenient location no later than 20 days after execution of the agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. **Revision 1: Attends: The Owner's Representative, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.**
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
  - 1. Tentative construction schedule
  - 2. Critical Work sequencing and/coordinating
  - 3. Designation of responsible personnel
  - 4. Procedures for processing field decisions and Change Orders
  - 5. Procedures for processing Applications for Payment
  - 6. Distribution of Contract Documents
  - 7. Submittal of Shop Drawings, Product Data and Samples
  - 8. Preparation of record documents
  - 9. Use of the Premises
  - 10. Office, Work and storage areas
  - 11. Equipment deliveries and priorities
  - 12. Safety procedures
  - 13. First aid
  - 14. Security

15. Housekeeping
16. Working hours

D. Contractor must submit at the time of the meeting at least the following items:

1. Schedule of Values
2. Listing of key personnel including project superintendent and subcontractors with their addresses, telephone numbers, and emergency telephone numbers.
3. Preliminary Construction Schedule
4. Submittal Schedule

#### 1.04 PRE-INSTALLATION CONFERENCE

A. Conduct a Pre-installation conference at the site before each construction activity that requires coordination with other construction. The 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 at least 48 hours in advance the Project Manager of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:

- a. Contract Documents
- b. Options
- c. Related Change Orders
- d. Purchases
- e. Deliveries
- f. Shop Drawings, Product Data and Quality Control Samples
- g. Possible conflicts
- h. Compatibility problems
- I. Time schedules
- j. Weather limitations
- k. Manufacturer's recommendations
- l. Comparability of materials
- m. Acceptability of substrates
- n. Temporary facilities
- o. Space and access limitations
- p. Governing regulations
- q. Safety
- r. Inspection and testing requirements
- s. Required performance results
- t. Recording requirements
- u. Protection

2. Record significant discussions and agreements and disagreements of each

conference along with and approved schedule. Distribute the record of the meeting to everyone concerned promptly including the Owner and Architect.

3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

#### 1.05 COORDINATION MEETINGS

- A. Conduct project coordination meeting at weekly intervals on day and time as established by the Project Manager or more frequently, if necessary convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved, to include subcontractors and representatives.
- C. Contractor shall record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### 1.06 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project site at bimonthly intervals or more frequently if necessary, as directed by the Project Manager. Notify the Owner at least 48 hours in advance of scheduled meeting time and dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and Architect, each subcontractor, supplier or other entity concerned with current progress of involved in planning, coordination or performance of future activities with the project and authorized to conclude matters relating to progress.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.
  1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time, ahead, or behind 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.
  2. Review the present and future needs of each entity present, including such items as:

- a. Interface requirements
- b. Time
- c. Sequences
- d. Deliveries
- e. Off-site fabrication problems
- f. Access
- g. Site utilization
- h. Temporary facilities and services
- I. Hours of work
- j. Hazards and risks
- k. Housekeeping
- l. Quality and work standards
- m. Change Orders
- n. Documentation of information for payment requests.

- D. Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, or progress since the previous meeting and report.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 20 00

## SECTION 01 30 00 - SUBMITTALS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:
  - 1. Contractor's Construction Schedule
  - 2. Submittal Schedule
  - 3. Daily Construction Reports
  - 4. Shop Drawings
  - 5. Product Data
  - 6. Samples
- B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
  - 1. Permits
  - 2. Applications for Payment
  - 3. Performance and Payment Bonds
  - 4. Insurance Certificates
  - 5. List of Subcontractors with start and finish dates (update as necessary)
  - 6. Schedule of Values
  - 7. Construction Schedule
- C. The Schedule of Values submittal is included in Section 01 02 70 Applications for Payment.
- D. Inspection and test reports are included in Section 01 04 00 Quality Control Services.

#### 1.03 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - 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 elements of the

Work so processing will not be delayed by the need to review submittals concurrently for coordination.

- a. The Project Manager reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
- a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Project Manager will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
  - b. If an intermediate submittal is necessary, process the same as the initial submittal.
  - c. Allow two weeks for reprocessing each submittal.
  - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
  2. Include the following information on the label for processing and recording action taken.
    - a. Project name
    - b. Date
    - c. Name and address of Architect
    - d. Name and address of Contractor
    - e. Name and address of subcontractor
    - f. Name and address of supplier
    - g. Name of manufacturer
    - h. Number and title of appropriate Specification Section
    - I. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Project Manager using transmittal form as

provided by the Project Manager. Submittals received from sources other than the Contractor will be returned without action.

1. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitation. Include Contractor's certification that information complies with Contract Document requirements.
  2. Transmittal Form: As provided by the Project Manager
- D. Contractor shall be responsible for cost of re-review of rejected submittals, shop drawing, etc. Costs for re-review shall be reimbursed to the Owner by deducting the cost from the Contractors monthly progress payments. Costs to be determined by applying the consultants standard billing rates, plus 10% handling by the County.
- E. Substitution request to specified products will be made within 30 days of Notice to Proceed. After the 30 day period, no requests for substitutions from the Contractor will be considered.
1. Substitution submitted within the first 30 days will have product data from specified and requested substitute submitted together and demonstrate better quality, cost savings if of equal quality, or show benefit to the Owner for excepting the substitute.
- F. Once submittals are approved or approved as noted, they will be scanned and converted to PDF documents with OCR (optical character recognition) and given to the owner.

#### 1.04 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Critical Path Method (CPM) Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction schedule. Submit in accordance with Section 01200 Project Meetings.
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated in the Schedule of Values.
  2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As work progresses, place a contrasting mark in each bar to indicate Actual Completion.
  3. Prepare the schedule on a sheet, series of sheets, stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
  4. Secure time commitments for performing critical elements of the work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the work.

5. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment request and other schedules.
  6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: Provide notations on the schedule to show how the sequence of the work is affected by requirements for phased completion to permit work by separate Contractors and partial occupancy by the Owner prior to Substantial Completion.
- C. Work Stages: Indicate important stages of construction for each major portion of the work, including testing and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Cost Correlation: At the head of the schedule, provide a two item cost correlation line, indicating precalculated and actual costs. On the line show dollar-volume of work performed as the dates used for preparation of payment requests.
1. Refer to Section Applications for Payment for cost reporting and payment procedures.
- F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the project meeting room and temporary field office.
1. When revision are made distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- G. Schedule Updating: Revise the schedule monthly or activity, where revisions have been recognized or made. Issue the updated schedule concurrently monthly pay request.

#### 1.05 SUBMITTAL LOG

- A. After development and acceptance of the Contractor's construction schedule, prepare a complete log of submittals.
1. Coordinate submittals log with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
  2. Prepare the log in chronological order; include all submittals required. Provide the following information:
    - a. Scheduled date for the first submittal



- b. Related Section number
  - c. Submittal category
  - d. Name of subcontractor
  - e. Description of the part of the work covered
  - f. Scheduled date for resubmittal
  - g. Scheduled date the Architect's final release or approval.
3. All submittals must be received within the first 25% of contract time.
- B. Distribution: Following response to initial submittal, print and distribute copies to the Project Manager, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- C. Log Updating: Revise the log after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

#### 1.06 DAILY CONSTRUCTION REPORTS

- A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Project Manager at weekly intervals:
1. List of subcontractors at the site
  2. Approximate count of personnel at the site
  3. High and low temperatures, general weather conditions
  4. Accidents and unusual events
  5. Meetings and significant decisions
  6. Stoppages, delays, shortages, losses
  7. Meter readings and similar recordings
  8. Emergency procedures
  9. Orders and requests of governing authorities
  10. Change Orders received, implemented
  11. Services connected, disconnected
  12. Equipment or system tests and start-ups
  13. Partial completions, occupancies
  14. Substantial Completions authorized

#### 1.07 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard

information prepared without specific reference to the Project is not considered a Shop Drawings and will be rejected.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. All required dimensions
2. Identification of products and materials included
3. Compliance with specified standards
4. Notation of coordination requirements
5. Notation of dimensions established by field measurement
6. Sheet Size: Except for templates, patterns and similar full-size Drawings on sheets at least 8 1/2" x 11" but no larger than 24" x 36".
7. Initial Submittal: Submit one correctable translucent reproducible print and one blue-or black-line print for the Project Manager's review; the reproducible print will be returned.
8. Initial Submittal: Submit 2 blue-or black-line prints for the Architect's review; one will be returned.
9. Final Submittal: Submit 5 blue-or black-line prints; submit 7 prints where required for maintenance manuals. 3 prints will be retained; the remainder will be returned.
10. Final Submittal: Submit 3 blue-or black-line prints; submit 5 prints where required for maintenance manuals. 2 prints will be retained; the remainder will be returned.
  - a. One of the prints returned shall be marked-up and maintained as a Record Documents.
11. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connections with construction.

C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

1. Preparation of coordination Drawings is specified in section Project Coordination and may include components previously shown in detail on Shop Drawings or Product Data.
2. Submit coordination Drawings for integration of different construction elements. Show sequence and relationships of separate components to avoid any conflict including conflicts in use of space.
3. Contractor is not entitled to additional payments due to lack of compliance with this Section.

## 1.08 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because

standard printed data is not suitable for use, submit as Shop Drawing.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
  - a. Manufacturer's printed recommendations
  - b. Compliance with recognized trade association standards
  - c. Compliance with recognized testing agency standards
  - d. Application of testing agency labels and seals
  - e. Notation of dimensions verified by field measurement
  - f. Notation of coordination requirements
  - g. Manufacturers local representative and phone number.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.
4. Submittals: Submit six (6) copies of each required submittal. The Project Manager will return two (2) sets to the Contractor marked with action taken and corrections or modifications required.
  - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
  - a. Do not proceed with installation until an applicable copy of Product Data applicable is in the Installer's possession.
  - b. Do not permit use of unmarked copies of Product Data in connection with construction.

#### 1.09 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of

qualities indicated. Prepare Samples to match the Architect's/Owner's Sample. Include the following:

- a. Generic description of the Sample
  - b. Sample source
  - c. Product name or name of manufacturer
  - d. Compliance with recognized standards
  - e. Availability and delivery time
2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
    - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
    - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
  3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
    - a. Preliminary submittals will be reviewed and returned with the Architect's/Owner's mark indicating selection and other action.
  4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
  5. Maintain sets of Samples, as returned, at the project site, for quality comparisons throughout the course of construction.
    - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
    - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
1. Field Samples specified in individual sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the work will be judged.

- a. Comply with submittal requirements. Process transmittal forms to provide a record of activity.

#### 1.10 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect/Project Manager will review each submittal, mark to indicate action taken, and return promptly.
  1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect/Project Manager will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, similarly as follows, to indicate the action taken:
  1. Final Unrestricted Release: Where submittals are marked 'No Exceptions Taken', that part of the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
  2. Final-But-Restricted Release: When submittals are marked 'Made Corrections Noted' that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
  3. Returned for Resubmittal: When submittal is marked 'Revise and Resubmit', do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary, to obtain a different action mark.
    - a. Do not permit submittals marked 'Revise and Resubmit' to be used at the Project site, or elsewhere where work is in progress.
  4. Rejected: Submittal does not comply with requirements of the Contract Documents. Submittal must be discarded, and entirely new submittal shall be forward to the Project Manager without delay.

PART 2 PRODUCTS

(Not Applicable)

PART 3 Execution

(Not Applicable)

END OF SECTION 01 30 00

SUBMITTALS

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## SECTION 01 38 00 - CONSTRUCTION PHOTOGRAPHS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including Contractual Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for construction photographs.

#### 1.03 SUBMITTALS

- A. General: Refer to Division 1 Section Submittals for general requirements for submitting photographs.
- B. Revision 1: Preconstruction Video: Prior to the commencement of construction, provide a video of all existing exposed site elements and the exterior and interior surfaces of the roofs including the ceilings and the exterior walls. Also submit a written list of any existing damaged components including the type of damage and the location of the damage.**
- C. Prints: Submit 3 prints of each view directly to the Project Manager within 5 days of taking photographs. The Project Manager will distribute prints as follows:
  - 1. One print to the Contractor shall be retained in the field office at the project site and available at all times for reference.
  - 2. One print to the Owner as the Owner's permanent record.
  - 3. One print shall be retained in the Architect's files.
- D. Extra Prints: When requested by the Architect, the photographer shall submit extra prints of photographs, with distribution directly to designated parties who will pay the costs for the extra prints directly to the photographer.
- E. Negatives: Retain the photographic negatives 3 years after date of Substantial Completion. During this period, the photographer shall fill orders by the Architect for extra prints. Extra prints shall be priced at prevailing local commercial prices.

#### 1.04 QUALITY ASSURANCE

- A. Engage a qualified commercial photographer to take photographs during construction.
- B. Photographer's Qualifications: Photographer shall be a firm or an individual of

established reputation who has been regularly engaged as a professional photographer for not less than 3 years.

- C. Associated Services: Cooperate with the photographer's work. Provide reasonable auxiliary services as requested, including access and use of temporary facilities including temporary lighting.

## PART 2 PRODUCTS

### 2.01 PHOTOGRAPHIC COPIES

- A. Provide 8" x 10" smooth surface gloss color prints on single-weight commercial-grade stock, mounted on muslin. Allow a 1" wide margin punched for standard 3-ring binder. Place margin on the left edge for vertical shots and at the top for horizontal shots.
- B. Identification: Label each photograph on the front in the bottom margin with project name and date the photograph was taken. On the back of each print provide an applied label or rubber stamped impression with the following information:
  - 1. Name of the Project
  - 2. Name and address of the photographer
  - 3. Name of the Architect
  - 4. Name of the Contractor
  - 5. Date the photograph was taken
  - 6. Architect's Project No.
- C. Description of vantage point, in terms of location, direction (by compass point), and evaluation of story on construction.

## PART 3 EXECUTION

### 3.01 PHOTOGRAPHIC REQUIREMENTS

- A. Take three (3) color project photographs at monthly intervals, coinciding with the cutoff date associated with each Application for Payment. The photographer shall select the vantage points for each shot each month to best show the status of construction and progress since the last photographs were taken.
- B. Additional Photographs: From time to time the Architect may issue requests for additional photographs, in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum or an Allowance.
  - 1. The Architect will give the photographer 3 days notice, where feasible.
  - 2. In emergency situations, the photographer shall take additional photographs within 24 hours of the Architect's request.

- C. Circumstances that could require additional photographs include, but are not limited to:
  - 1. Substantial Completion of a major phase or component of Work.
  - 2. Owner's request for special publicity photographs.
  - 3. Special events planned at project site.
- D. Immediate follow-up when on-site events result in construction damage or losses. Photographs to be taken at fabrication locations away from project site; these are not subject to unit prices or unit-cost allowances. Extra record photographs at time of final acceptance.
- E. Construction projects over \$1,000,000 shall include at least one of the photographs listed in 3.01.A be aerial.

END OF SECTION 01 38 00



## SECTION 01 40 00 - QUALITY CONTROL SERVICES

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division -1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services.
- B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
  - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and test, cover production of standard products as well as customized fabrication and installation procedures.
  - 2. Inspection, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitates compliance with Contract Document requirements.
  - 3. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

#### 1.03 GENERAL QUALITY CONTROL

- A. The Contractor shall be responsible for maintaining and ensuring quality control over subcontractors, suppliers, manufacturers, materials, equipment, products, services, site conditions and workmanship to product work of specified quality. The completed work shall be of high quality throughout.

#### 1.04 WORKMANSHIP

- A. Comply with well-known standards recognized by each trade except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

- B. Perform work by persons qualified to produce workmanship of specified quality. Said qualifications shall be determined by well-known standards recognized by the trade for each respective portion of contract work.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and racking.

1.05 MANUFACTURER'S INSTRUCTIONS

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

1.06 MANUFACTURER'S CERTIFICATES

- A. When required by individual Specifications Section, submit manufacturer's certificate and supporting documentation, in duplicate, that products meet or exceed specified requirements.
- B. ASBESTOS FREE MATERIALS - Manufacturer and/or supplier shall provide a written and notarized statement on manufacturer's company letterhead to certify and warrant that product (s) utilized on project are asbestos free.

1.07 MOCKUPS

- A. When required by individual Specifications Section, erect complete, full scale mockup of assembly at Project Site.

1.08 MANUFACTURER'S FIELD SERVICES

- A. When specified in respective Specification Sections, require supplier and/or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, test, adjust and balance of equipment as applicable and to make appropriate recommendations.
- B. Representative shall submit written report to Owner listing observations, recommendations, and certifying full conformance and compliance with manufacturers standards or requirements.

1.09 TESTING LABORATORY SERVICES

- A. **Revision 1 5-30-2019: The Owner shall employ and pay for services of an Independent Testing Laboratory to perform inspections and tests for construction materials.**
- B. Services will be performed in accordance with requirements of governing authorities and with specified standards.
- C. **Revision 1: Reports will be submitted to the Owner, Contractor and Architect giving observations and results of tests, indicating compliance or noncompliance with specified standards and with Contract Documents.**

- D. Contractor shall cooperate with testing laboratory personnel; furnish tools, samples of
- QUALITY CONTROL SERVICES 01 40 00 - 2

materials, design, mix equipment, storage and assistance as requested.

1. The contractor shall be responsible for notifying the testing laboratory at least 24 hours prior to expected time for operations requiring testing services. Longer length of notice to testing laboratory shall be provided by Contractor when required by the testing laboratory to ensure the timely scheduling and performance of all tests required.
  2. The Contractor is responsible for obtaining and paying tests including but not limited to test and balance, portable water bacteriological tests and test required in Divisions 7 through 32.
- E. The costs of any tests which fail will be paid for by the Contractor. The amount to be reimbursed to the County by the Contractor, will be the amount invoiced to the County by the testing laboratory in accordance with the testing services fees set forth in its contract with the County.

#### 1.10 TEMPERATURE/HUMIDITY LOG

- A. The Contractor shall be responsible for preparing rain, temperature and humidity measuring devices at the project site and maintaining a log of temperature and humidity measurements.
- B. Said log shall contain a daily record of exterior temperature, rainfall amount and humidity conditions and where environmental conditions are specified in individual sections, a daily record of the temperature and humidity conditions where the work of those sections is stored and installed.
- C. The Temperature/Humidity Log shall be available to the Project Manager as part of the Contract Documents.

#### 1.11 RESPONSIBILITIES

- A. The Owner shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and these services include those specified to be performed by an independent agency and not by the Contractor.
- B. The Contractor shall cover all costs of tests or inspections to evaluate means and methods of installation performed as a substitution and not as originally specified.
  1. Re-testing: The Contractor is responsible for re-testing where results of required inspections, test or similar services prove unsatisfactory and do not indicate compliance with Contract Documents requirements, regardless of whether the original test was the Contractor's responsibility.
    - a. Cost of re-testing construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to:

- a. Providing access to the work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
  - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
  - c. Providing facilities for storage and curing the test samples.
  - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
  - e. Security and protection of samples and test equipment at the Project site.
- C. Duties of the Testing Agency: The independent testing agency engages to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with Architect and Contractor in performance of its duties and shall provide qualified personnel to perform required inspections and tests.
1. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
  3. The agency shall not perform any duties of the Contractor.
- D. Coordination: The Contractor and each agency engaged to perform inspection, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition, the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

## 1.12 SUBMITTALS

- A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are pre-qualified as complying with Recommended Requirements for Independent Laboratory qualification by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finished to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for Cutting and Patching.
- B. Protect construction exposed by or for quality control service activities and protects and repaired construction.
- C. Repair and protection in the Contractor's responsibility regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01 40 00

SECTION 01 41 00 - TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selection and payment
- B. Contractor Submittals
- C. Laboratory responsibilities
- D. Laboratory reports
- E. Limits on testing laboratory authority
- F. Contractor responsibilities
- G. Schedule of inspections and tests

1.02 RELATED SECTIONS

- A. General Conditions: Inspections, testing, and approvals required by public authorities.
- B. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.03 REFERENCES

- A. ANSI/ASTM D3740 or as required in Specifications Divisions 2-32 - Practice for Evaluation of Agencies Engages in testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ANSI/ASTM E329 or as required in Specifications Divisions 2-32 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.04 SELECTION AND PAYMENT

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740
- B. Laboratory: Authorized to operate in state in which Project is located.

- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.06 CONTRACTOR SUBMITTALS

NOT USED

1.07 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes
- B. Provide qualified personnel at site when required. Cooperate with Owner and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Owner and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional inspections and test required by Owner.
- G. Attend preconstruction conferences and progress meetings.

1.08 LABORATORY REPORTS

- A. After each inspection and test, promptly submit four copies of laboratory report to Owner, and to Contractor.
- B. Include:
  - 1. Date issued
  - 2. Project title and number
  - 3. Name of inspector
  - 4. Data and time of sampling or inspection
  - 5. Identification of product and Specifications Section
  - 6. Location in the Project
  - 7. Type of inspection or test
  - 8. Date of test
  - 9. Results of tests
  - 10. Conformance with Contract Documents
- C. When requested by Owner, provide interpretation of test results.

1.09 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor
- D. Laboratory has no authority to stop the work.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Cooperate with laboratory personnel and provide access to the work.
- B. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- C. Notify Owner and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
- D. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

1.11 SCHEDULE OF INSPECTIONS AND TESTS

- A. Section 05 12 00 - Steel Framing: Requirements for checking welds.
- B. Section 07 92 00 - Joint Sealants: Requirements for adhesion.

END OF SECTION 01 41 00



SECTION 01 50 00 - TEMPORARY FACILITIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
1. Water service and distribution
  2. Temporary electric power and light
  3. Telephone service
  4. Sanitary facilities
- C. Temporary construction and support facilities required include but are not limited to:
1. Temporary heat and ventilation as required to facilitate construction process and personnel.
  2. Field office and storage sheds.
  3. Sanitary facilities, including drinking water.
  4. Temporary enclosures.
  5. **Revision 1: Hoists and temporary elevator use.**
  6. **Revision 1: Temporary project identification signs and bulletin boards.**
  7. Waste disposal services.
  8. Rodent and pest control
  9. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities required include but are not limited to:
1. Temporary fire protections
  2. Barricades, warning signs, lights
  3. Sidewalk bridge or enclosure fence for the site.
  4. Environmental protection
  5. Fencing
  6. Barriers
    - a. **Revision 1: Contractor shall be responsible for providing a temporary 6' high chain link construction fence around the entire perimeter of the construction site. Fence shall be removed upon completion of the job. Limits of construction fence indicate on the site plan drawings.**

- b. Contractor shall be responsible for providing security measures as required to prevent public entry to construction areas and adjacent properties from damage from construction operations.
  - c. Contractor shall be responsible for providing a protective barrier around trees and plants designated to remain as indicated in plans. Project against vehicular traffic, stored materials, dumping, chemically injurious materials and puddling or continuous running water.
7. Enclosures
- a. Provide temporary weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, in allow for temporary heating, and to prevent entry of unauthorized persons. Provide temporary doors with self-closing hardware and locks.
8. Protection of Installed Work
- a. Provide temporary protection for installed products. Control work and traffic in immediate area to avoid damage.
  - b. Provide protective coverings at walls, projections, jambs, sills and soffits of openings. Provide barriers or coverings to protect roof and finished floors and stairs from work and traffic, movement of heavy objects and storage.
  - c. Prohibit work, traffic and storage on waterproofed and roofed surfaces, and on lawn and landscaped areas that is not a part of the work for those surfaces and areas.
9. Security and Maintenance
- a. Vehicular and pedestrian gates, when indicated or required, shall be securely locked at all times when no work is in progress and when not required for construction activities. During all work hours, gates which must be open shall be continuously monitored by the contractor to prevent unauthorized personnel or vehicles from entering the construction site.
  - b. Fencing shall be as specified in 1.02 D above and shall prevent pedestrian travel through the site for any reason.
  - c. Temporary fencing shall be removed only for construction reasons. If temporary fencing removal is required for non-construction reasons, fencing shall be immediately replaced and secured as soon as the activity for which its removal was required is completed, or if the activity cannot be completely by the end of the work day, temporary security measures shall be taken by the Contractor to ensure that there is no breach of security even during off-work periods.
  - d. 'No Trespassing' and similar signs shall be posted at gates and along fencing adjacent to public areas to inform non-construction personnel of the reason for the fence and potential hazards of entering the construction site. Said signs shall be of a size and spacing to be legible from any point along the entire perimeter of the construction site.

### 1.03 SUBMITTALS

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

### 1.04 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
  - 1. Building Code requirements
  - 2. Health and safety regulations
  - 3. Utility company regulations
  - 4. Police, Fire Department and Rescue Squad rules
  - 5. Environmental Protection regulations
- B. Standards: Comply with NFPA Code 241, 'Building Construction and Demolition Operations', ANSI-A10 Series standards for 'Safety Requirements for Construction and Demolition', and NECA Electrical Design Library 'Temporary Electrical Facilities'.
  - 1. Refer to 'Guidelines for Bid Conditions for Temporary Job Utilities and Services', prepared jointly by AGC and ASC, for industry recommendations.
  - 2. Electrical Services: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

### 1.05 PROJECT CONDITIONS

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use for the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, nor permit them to interfere with progress. Do not allow hazardous dangerous, unsanitary conditions, nor public nuisances to develop or persist on the site.
- C. Water Control: Grade site to drain. Maintain excavations free of water. Provide and operate pumping equipment if necessary. Provide silt barriers required by the Florida Department of Transportation, St. Johns, and any other authority having jurisdiction over the Project.

- D. Cleaning During Construction: Control accumulation of waste materials and rubbish so as to maintain a neat, clean and orderly and safe project; periodically dispose of off-site as needed.
- Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.
- E. **Revision 1: Project Identification: ~~Provide a sign as outlined in SECTION 01580 PROJECT SIGN. Locate to provide an unobstructed view from adjoining roadway. Remove project sign upon final completion acceptance.~~**
- F. Field Office and Sheds: Office: Weather-tight with lighting, electrical outlets, heating, cooling, and ventilating equipment, and equipped with furniture.
- Storage Sheds for Tools, Materials, and Equipment: Weather-tight with adequate space for organized storage and access, and lighting for inspection of stored materials.
- Contractor provide 10 x 8 minimum size office with plan table, telephone, heat, a/c for projects exceeding 10,000 sq. ft. building area.
- G. Protection of Adjacent Properties: Locate on site construction operations that will generate noise and/or dust as far as practical from occupied structures on adjacent properties so as to minimize disturbances to the occupants of these structures or properties.
- Prevent dust or other contaminants caused by construction operations for this Project from being carried to adjacent properties by installation of protective barriers and/or suspension of construction operations during high winds.
- Dispose of all construction debris which may be carried to adjacent properties by winds. Remove debris daily and/or more often as required to prevent contamination of adjacent properties.
- H. Removal: Remove temporary materials, equipment and construction facilities prior to Substantial Completion inspection.
- Remove temporary utility services prior to Final Completion Inspection.
- Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations; grade and complete all work on site as indicated.
- I. Conversion to Public Utilities: General Contractor is to coordinate and arrange with the appropriate utility service providing agencies and make arrangements for the installation and connection to final utilities prior to Final Completion inspection.
- General Contractor shall provide any and all coordination, scheduling and layouts as may be required by the service utilities.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General: Provide new materials; of acceptable to the Project Manager, undamaged previously used materials in serviceable condition maybe used. Provide materials suitable for the use intended.
  
- B. Lumber and Plywood: Comply with requirements in Division 6 Section 'Rough Carpentry'.
  - 1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.
  - 2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1 of sizes and thickness indicated.
  - 3. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.
  - 4. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.
  
- C. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosure provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
  
- D. Water: Provide portable water approved by local health authorities.
  
- E. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel pipe post, 1" I.D. for line posts and 2" I.D. for corner posts.

2.02 EQUIPMENT

- A. General: Provide new equipment: if acceptable to the Project Manager, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
  
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. Long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shut-off nozzles at hose discharge.

- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset bottom and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use □hard-service□ cords where exposed to abrasion and traffic. Provide water proof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockage entrances, operable windows and serviceable finished. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.
- I. First Aid Supplies: Comply with governing OSHA and any other regulations.
- J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class □A□ fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable UL-rated, class 'ABC' dry chemical extinguishers, or a combination of extinguishers of NEPA recommended classes for the exposures.
  - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the project adequately and result in minimum interference with performance of the work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
  - 1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
  - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
  - 3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
  - 4. Use Charges: Cost of use charges for temporary facilities are not chargeable to the Owner or Architect and will not be acceptable as a basis of claims for a Change Order.
- B. Water Service: Install water service and distribution piping of sized and pressures adequate for construction until permanent water service is in use.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.
- D. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.
  - 1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
- E. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.
  - 1. At each telephone, post a list of important telephone numbers.

- F. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge or effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.
1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
- G. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by run-off of storm water from heavy rains.

### 3.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.
1. Maintain temporary construction and support facilities until Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Provide incombustible construction for offices, shops and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.
- C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- D. Heating Facilities: Except where use of the permanent system is authorized, provide electric vented self-contained LP gas or fuel oil heaters with individual thermostatic control.
1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
- E. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds maybe open shelters or fully enclosed spaces with the building or elsewhere on the site.



- F. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
  - 1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
- G. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted. Provide one toilet for each 15 workers on site and have serviced weekly as a minimum.
- H. Wash Facilities: Install wash facilities supplied with portable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
  - 1. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.
- I. Drinking Water Fixtures: Provide drinking water fountains including paper supply.
- J. Drinking Water Fixtures: Provide drinking water fountains including paper supply.
  - 1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 degree F (7 to 13 degree C).
- K. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- L. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
  - 1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  - 2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
  - 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.
- M. Temporary Lifts and Hoist: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting material are considered ‘tools and equipment’ and not temporary facilities.
- N. **Revision 1: Temporary Elevator Use: Refer to Division 14 ‘Elevator’ Sections.**
- O. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
  2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- P. Temporary Exterior Lighting: Maintain exterior yard and sign lights so that signs are visible when work is being performed.
- Q. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to raise above 80 degree F (27 degree). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of materials in a lawful manner.
- R. Rodent and Pest Control: Before foundation work has been completed, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches and other pests. Employ this service to perform extermination and control procedures at regular intervals so the project will be relatively free of pests and their residues at Substantial Completion. Perform control operations in a lawful manner using environmentally safe materials.

#### 3.04 SECURITY AND PROTECTIONS FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Project Manager.

- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 Standard for Portable Fire Extinguishers, and NFPA 141 Standard for Safeguarding Construction, Alterations and Demolition Operations.
1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access in fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
  4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- C. **Revision 1: Permanent Fire Protection: ~~At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.~~**
- D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting including flashing red or amber lights.
- E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.
1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.
- F. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of materials to minimize the opportunity for theft and vandalism.

- G. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and sub-soil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

### 3.05 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24 hour day basis where required to achieve indicated results and to avoid possibility of damage.
  - 2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than substantial completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
  - 2. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street pavings, curbs and sidewalks at the temporary entrances, as required by the governing authority.

3. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
  - a. Replace air filters and clean inside of ductwork and housings.
  - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
  - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use as noted by the Owner's representative.

END OF SECTION 01 50 00

SECTION 01 57 60 - MAINTENANCE OF TRAFFIC

PART 1 GENERAL

1.01 DEFINITION

- A. The term, maintenance of traffic, as used herein, includes all facilities, devices and operations required for the safety and convenience of the public during length of the project.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract in the general and supplemental conditions.

1.03 RESPONSIBILITY

- A. Responsibility for maintenance of traffic begins on the first day of work. Provide for normal access to residences and businesses along, or adjacent to the project.

1.04 REFERENCES

- A. All signs, barricades and road offset dimensions shall be in accordance with the Florida D.O.T. Manual of Traffic Control and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations.
- B. Maintenance of traffic activities are subject to the approval of the Florida Department of Transportation, and or Orange County Department of Traffic Engineering, unless Project is located within a City's jurisdiction.

1.05 LIABILITY

- A. Requirements, procedures and references made herein shall in no way act as a waiver of liability for contractor and its surety.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 MAINTENANCE OF ROADWAY SURFACES

- A. Maintain all lanes being used for maintenance of traffic to ensure a substantial, smooth and safe riding surface under all weather conditions.

3.02 MAINTENANCE OF TRAFFIC CONTROL DEVICES

- A. Traffic control devices as required shall be kept in correct position, properly directed, clearly visible and clean at all times.

3.03 INSTALLATION

- A. All traffic control devices shall be erected prior to the creation of any hazardous condition and in conjunction with any necessary rerouting of traffic.
- B. Immediately remove, turn or cover any devices which do not apply to existing conditions.
- C. Furnish and maintain all traffic control devices including signs, barricades, and panels.

3.04 FLAGMEN

- A. Provide personnel with required equipment, to direct traffic when required by construction operations in numbers and locations approved by the authority having jurisdiction.

END OF SECTION 01 57 60

## SECTION 01 60 00 - MATERIALS AND EQUIPMENT

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section 01 30 00 -Submittals.
- C. Standards: Refer to Section 01 09 50 Reference Standards and Definitions for applicability of industry standards to products specified.
- D. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section 01 63 10 'Product Substitution'.

#### 1.03 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents such as 'specialties', 'systems', 'structure', 'finishes', 'accessories', and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.
  - 1. 'Products' are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term 'product' includes the term 'material', 'equipment', 'system' and terms of similar intent.
    - a. 'Named Products' are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
    - b. 'Foreign Products', as distinguished from 'domestic products', are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens nor living within the United States and its possessions.
  - 2. 'Materials' are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the work.
  - 3. 'Equipment' is a product with operational parts, whether motorized or manually



operated, that requires service connections such as wiring or piping.

#### 1.04 SUBMITTALS

- A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Project Manager. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.
1. Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.
    - a. Related Specification Section Number
    - b. Generic name used in Contract Documents
    - c. Proprietary name, model number and similar designations.
    - d. Manufacturer's name and address
    - e. Supplier's name and address
    - f. Installer's name and address
    - g. Projected delivery date, or time span of delivery period.
  2. Initial Submittal: Within 30 days after date of commencement of the work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
    - a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.
  3. Complete Scheduled: Within 45 days after date of commencement of the Work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
  4. Architect's Action: The Architect will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers on products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include the following:
    - a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

#### 1.05 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with

products previously selected, even if previously selected products were also options.

- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on accessible surface that is not conspicuous.
  2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data.
    - a. Name of product and manufacturer
    - b. Model and serial number
    - c. Capacity
    - d. Speed
    - e. Ratings
    - f. Additional pertinent information

#### 1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deteriorating and loss, including theft.
1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
  3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
  4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
  5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
  6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
  7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate in prevent condensation.

Maintain temperature and humidity within range required by manufacturer's instructions.

## PART 2 PRODUCTS

### 2.01 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
  2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situation on other projects.
- B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous project experience. Procedures governing product selection include the following:
1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
    - a. Where products or manufacturers are specified by name, accompanied by the term 'or equal' or 'or approved equal' comply with the Contractor Document provisions concerning 'substitutions' to obtain approval for use of an unnamed product.
  2. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of those products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning 'substitutions' to obtain approval for use of an unnamed product.
  3. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
  4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application

indicated.

- a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
5. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
  6. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
    - a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning 'substitutions' for selection of a matching product in another product category, or for noncompliance with specified requirements.
  7. Visual Selection: Where specified product requirements include the phrase "as selected from manufacturer's standard colors, pattern, textures". or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.
  8. Asbestos free materials: No products containing asbestos shall be used for any part of the work for this product. Provide verification.

## PART 3 EXECUTION

### 3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each project securely in place, accurately located and aligned with other work.
  1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01 60 00

## SECTION 01 63 10 - PRODUCTS SUBSTITUTIONS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling request for substitutions made during bidding and after award of the Contract.
- B. The Contractor's Installation Schedule and the Schedule of Submittals are included under Section 013000 Submittals.
- C. Standards: Refer to Section 01 09 50 Reference Standards and Definitions for applicability of industry standards to products specified.
- D. Procedural requirements governing the Contractor's selection of products and product options are included under Section 01 60 00 Materials and Equipment.

#### 1.03 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of installation required by Contract Documents proposed by the Contractor during and bidding after award of the Contract are considered requests for substitutions. The following are not considered substitutions:
  - 1. Only substitutions requested by Bidders during the bidding period, and accepted prior to bid opening and award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in Section for substitutions.
  - 2. Revisions to Contract Documents requested by the Owner or Architect.
  - 3. Specified options of products and installation methods included in Contract Documents.
  - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

#### 1.04 SUBMITTALS

- A. Substitution Request Submittal: Request for substitution will be considered if received within thirty five (30) days after commencement of the Work. As long as this time allowance will not impact the construction schedule.
1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
  2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitution, 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. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
    - d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
    - e. A statement indicating the substitution's effect on the Contractor's construction schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
    - g. Certification by the Contractor that the Substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
  3. Architect's Action: Within two weeks of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request if needed. Within two (2) weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the project specified by name. Decision on the use of a product substitution or its rejection by the Architect is considered final. Acceptance will be in the form of a Change Order.

## PART 2 PRODUCTS

### 2.01 SUBSTITUTIONS

- A. Conditions: The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise request will be returned without action except to record noncompliance with these requirements.
1. Extensive revisions to Contract Documents are not required.
  2. Proposed changes are in keeping with the general intent of Contract Documents.
  3. The request is timely, fully documented and properly submitted.
  4. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.
  5. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
  6. A substantial advantage is offered to the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar consideration.
  7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
  8. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
  9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
- B. The Contractor's submittal and Project Manager's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

- C. Substitution request constitutes a representation that the Contractor:
1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
  2. Will provide the same warranty for substitution as for specified product.
  3. Will coordinate installation and make other changes which may be required for work to be complete in all respects.
  4. Waives claims for additional costs which may subsequently become apparent. All costs associated with the substitution will be paid by the Contractor regardless of approvals given, and regardless of subsequent difficulties experienced as a result of substitutions.

END OF SECTION 01 63 10



SECTION 01 70 00 - PROJECT CLOSE-OUT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for project close-out, including but not limited to:
  - 1. Inspection procedures
  - 2. Project record document submittal. (substantial completion requirements)
  - 3. Operating and Maintenance Manual Submittal (substantial completion requirements).
  - 4. Submittal of warranties (substantial completion requirement).
  - 5. Final cleaning
- B. Close-out requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 32.
- C. Final Payment to be made when the Owner has received all required close-out documents.

1.03 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for Certification of Substantial Completion, complete the following: List exceptions in the request.
  - 1. In the Application for Payment that coincided with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the 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 the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
  5. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- B. Inspection Procedures: On receipt of a request for inspection, the Project Manager will either proceed with inspection or advise the Contractor of unfilled requirements. The Project Manager will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. Results of the completed inspection will form the basis of requirements for final acceptance.
  2. Should the project fail to meet the standards required for Substantial Completion as defined in the documents, the Contractor will pay the expense of a second inspection by the Architect/Consultants and the Owner. Cost will be deducted from the Contractor's retainage.

#### 1.04 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following list exceptions in the request:
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and complete operations where required.
  2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
  3. Submit a certified copy of the Architect or Owner's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Project Manager.
  4. Submit final meter readings for utilities, a measured record of stored fuel and similar data as of the date of Substantial Completion, or when the Owner took possession of the responsibility for corresponding elements of the Work.
  5. Submit consent of surety to final payment.
  6. Submit a final liquidated damages settlement statement
  7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

- B. Reinspection Procedure: The Architect will reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
  - 1. Upon completion of reinspection, the Architect will prepare a certification of final acceptance, or advise the contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

#### 1.05 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation; where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Provide for project photographs if deemed necessary by Owner's representative.
  - 1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
  - 2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
  - 3. Note related Change Order numbers where applicable.
  - 4. Organize record drawing sheets, and print suitable titles, dates and other identification on the cover of each set.
  - 5. Provide three (3) additional sets of black line drawing sets of As-Builts Drawings.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Project Data.
  - 1. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

- D. Record Project Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variation in actual work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
1. Upon completion of mark-up, submit complete set of record Product Data in the three ring binder (indexed) to the Architect for the Owner's records.
- E. Record Sample Submitted: Immediately prior to the date or dates of substantial completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of substantial completion, complete miscellaneous record and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Project Manager for the Owner's records.
- G. Maintenance Manuals: Organize operating and maintenance data into five (5) suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions
  2. Spare parts list
  3. Copies of warranties
  4. Wiring diagrams
  5. Recommended turn-around cycles
  6. Inspection procedures
  7. Shop Drawings and Product Data
  8. Fixture lamping schedule

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 CLOSE-OUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that required regular maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. All items to be provided or completed prior to Certificate of Substantial Completion being issued by the Owner. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
4. Tools
5. Lubricants
6. Fuels
7. Identification systems
8. Control sequences
9. Hazards
10. Cleaning
11. Warranties and bonds
12. Maintenance agreements and similar continuing commitments
13. On site instructions to Owner maintenance personnel on major systems operations such as HVAC as per technical specifications.

B. As part of instruction for operating equipment, demonstrate the following procedures, prior to the Owner issuing Certificate of Substantial Completion:

1. Start-up
2. Shutdown
3. Emergency operations
4. Noise and vibration adjustments
5. Safety procedures
6. Economy and efficiency adjustments

3.02 PROJECT CLOSE-OUT MANUALS AT SUBSTANTIAL COMPLETION

- A. Submit Project Close-out Manuals prior to issuance of final application for payment. Provide three (3) copies.
- B. Bind in commercial quality 8 ½" X 11" three ring binder, indexed with hardback, cleanable, plastic covers.
- C. Label cover of each binder with typed title PROJECT CLOSE-OUT MANUAL, with title of project; name, address, and telephone number of Contractor and name of responsible Principal.

- D. Provide table of contents: Neatly typed, in the following sequence:
1. Final Certificate of Occupancy
  2. Warranty Service Subcontractors Identification List
  3. Final Lien Waivers and Releases
  4. Warranties and Guarantees
  5. Systems Operations and Maintenance Instruction
  6. Manufacturer's Certificates and Certifications
  7. Maintenance Service Contracts
  8. Spare Parts Inventory List
  9. Special Systems Operating Permits or Approvals
  10. Asbestos free materials notarized statement
- E. Provide all documents for each section listed. List individual documents in each section in the Table of Contents, in the sequence of the Table of Contents of the Project Manual.
- F. Identify each document listed in the Table of Contents with the number and title of the specification section in which specified, and the name of the product or work item.
- G. Separate each section with index to sheets that are keyed to the Table of Contents listing.
- H. Warranty Service Subcontractors List shall identify subcontractor supplier, and manufacturer for each warranty with name, address and emergency telephone number.
- I. Electronic Close-out DVD: At the completion of the project, submit one copy of a DVD with entire project close out information below in PDF format. All letter, legal and brochure size sheets shall be portrait and the As-build drawings will be landscape. All fonts will be Arial. All items will be in PDF with OCR (Optical Character Recognition). This will enable a search engine to identify words on the scanned documents.
1. Contacts: Set up a separate PDF for the contacts. No bookmarks are needed for this section.
  2. As-Built: All as-built drawings will be landscape.
  3. Submittals: All technical submittal items (approved and approved as noted) will be provided and sorted by the 32 standard divisions. Bookmarks will be needed for the appropriate divisions.
  4. Operations and Maintenance Manual: Specify the division name only in the bookmarks (1-16). Please note that all items will be in PDF with OCR (Optical Character Recognition). This will enable a search engine to identify works on the scanned documents.
  5. Permitting: This should include the Certificate of Occupancy and any other document that the Project Manager may include pertaining to the permitting for the project.

### 3.03 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and included in Section - Temporary Facilities.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
    - a. Remove labels that are not permanent labels.
    - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
    - c. Clean exposed exterior and interior hard-surfaced finished to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
    - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    - e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface. Remove waste and surplus materials from the site in an appropriate manner.
- C. Pest Control: Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects and other pests.
- D. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.
- E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
1. Where extra materials of value remaining after completion of associated work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 01 70 00

## SECTION 01 74 00 - WARRANTIES AND BONDS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contractor Documents, including manufacturers standard warranties on products and special warranties.
  - 1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
  - 2. General close-out requirements are included in Section 01 70 00 Project Close-Out.
  - 3. Specific requirements for warranties for the work and products and installations that are specified to be warranted, are included in the individual Sections of Division 2 through 32.
  - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties to not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

#### 1.03 WARRANTY REQUIREMENTS

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



- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligation, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligation, rights, or remedies.
  - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. The Owner reserves the right to refuse to accept work for the Project where a special warranty, certification, or similar commitment is required on such work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

#### 1.04 WARRANTY PERIOD

- A. The Contractor shall participate with the Owner and the Architect's representative, at the beginning of the tenth month of the warranty period, in conducting an on site review and evaluation of all items of equipment, materials and workmanship covered by the warranties and guarantees. Contractor shall act promptly and without cost to the Owner to correct all defects, problems, or deficiencies determined as such by the Architect/Owner during on the site review.
- B. All warranties and guarantees shall commence on the date of Substantial Completion except for items which are determined by the Owner to be incomplete or a non-comply status at the time of Substantial Completion. The coverage commencement date for warranties and guarantees of such work shall be the date of the Owner's acceptance of that work.
- C. Warranty period shall be manufacturer's standard for product specified except where specific warranty periods are specified in individual sections. But in no case less than one year.

#### 1.05 SUBMITTALS

- A. Submit written warranties to the Owner prior to the date certified for Substantial Completion. If the Architect's Certificate of substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the work, submit written warranties upon request of the Project Manager.
  - 1. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Project Manager within fifteen days of completion of that designated portion of the work.
- B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepared a written document that contains appropriate terms and identification, ready for executing by the required parties. Submit a draft to the Architect for approval prior to final execution.
  - 1. Refer to individual Sections of Division 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

- C. Form of Submittal: At Final Completion compile two (2) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  
- D. Bind (3) three sets of 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 ½" by 11" paper.
  - 1. Provide heavy paper dividers with Celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
  
  - 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the Project title or name, and the name of the Contractor.
  
  - 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 74 00

## SECTION 02 41 19 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

#### 1.2 MATERIALS OWNERSHIP

- ##### A. Unless otherwise indicated, demolition waste becomes property of Contractor.

#### 1.3 PREINSTALLATION MEETINGS

- ##### A. Pre-demolition Conference: Conduct conference at Project site.

#### 1.4 INFORMATIONAL SUBMITTALS

- ##### A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- ##### B. Schedule of selective demolition activities with starting and ending dates for each activity.
- ##### C. Pre-demolition photographs or video.

#### 1.5 CLOSEOUT SUBMITTALS

- ##### A. Inventory of items that have been removed and salvaged.

#### 1.6 FIELD CONDITIONS

- ##### A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- ##### B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- ##### C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. Hazardous materials will be removed by Owner before start of the Work.
  - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.
- G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

#### 1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Inventory and record the condition of items to be removed and salvaged.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. Arrange to shut off utilities with utility companies.
  - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components as required to complete the Work.

### 3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- C. Remove temporary barricades and protections where hazards no longer exist.

### 3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  - 4. Maintain fire watch during and for at least 8 hours after flame-cutting operations.
  - 5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area on-site.
  - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
  - 1. Clean and repair items to functional condition adequate for intended reuse.
  - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  - 3. Protect items from damage during transport and storage.
  - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 CLEANING

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

## SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

### PART 1.00 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including Contractual Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 DESCRIPTION OF WORK

- A. Extent of structural steel work is shown on drawings including schedules, notes and details which show size and location of members, typical connections, and type of steel required. Furnish all labor, materials, services, equipment and appliances required in conjunction with or related to the furnishing, fabrication, delivery, and erection of all structural steel defined below. Include all supplementary parts, members and connections necessary to complete the structural steel work, regardless of whether all such items are specifically shown or specified on the drawings.
- B. Structural steel shall be defined as that work prescribed in Section 2.1 of the AISC Code of Standard Practice and the following items, as applicable: shelf angles, frames for openings in floors and roofs, steel supports for elevator guide rails, miscellaneous metal deck support and edge angles, all connection material, temporary construction bracing, and all other structural steel shown on the drawings, specified, or required to complete the work. Labor shall include shop painting as specified, field touch-up painting, and grouting of base plates and bearing plates.
- C. Miscellaneous metal fabrications, architecturally exposed structural steel, metal stairs, ladders, steel joists, metal deck, and coldformed metal framing are specified elsewhere in these Specifications.

#### 1.03 QUALIFICATIONS

- A. Fabricator: The structural steel fabricator shall have not less than 5 years successful experience in the fabrication of structural steel similar to this project.
- B. Detailer:
  - 1. The structural steel detailer shall have not less than 3 years successful experience in the detailing of structural steel similar to this project.
  - 2. The structural steel detailer firm shall be certified under the Quality Procedures Program of the National Institute of Steel Detailing. The project shall be detailed by qualified structural steel detailers certified under the National Institute of Steel Detailing as a Class I or Class II Detailer in the Structural/Miscellaneous discipline or supervised by a detailer certified as a Class I Senior Detailer in the Structural/ Miscellaneous discipline.
- C. Erector: The structural steel erector shall have not less than 5 years successful experience in the erection of structural steel similar to this project.

1.04 QUALITY ASSURANCE

- A. The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.
- B. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
1. All federal (OSHA), state and local laws which govern safety requirements for steel erection and other requirements if more stringent than the codes and standards enumerated below. OSHA requirements include regulation 29 CFR 1926, Part R, "Safety Standard for Steel Erection".
  2. AISC "Code of Standard Practice for Steel Buildings and Bridges", latest edition adopted by local building code, except as noted herein.
    - a. Exception is taken to paragraph 1.8.2. In the second sentence, change the word "adequacy" to "design" so that the sentence reads, "The Structural Engineer of Record shall be responsible for the structural design of the structure in the completed project."
    - b. Certain sections in this specification contain requirements that are more restrictive and/or different than contained in this standard. In such cases, the requirements of this specification shall control.
  3. ANSI/AISC 360, "Specification for Structural Steel Buildings."
  4. Research Council on Structural Connections (RCSC) "Specification for Structural Joints using High-Strength Bolts."
  5. AISC, "Steel Construction Manual", Thirteenth Edition.
  6. ANSI/AWS D1.1, "Structural Welding Code - Steel."
  7. ANSI/AWS D1.3, "Structural Welding Code - Sheet Steel."
  8. ANSI/AWS D1.4, "Structural Welding Code - Reinforcing Steel."
  9. The Society of Protective Coatings, "SSPC Painting Manual", Volumes 1 and 2.
- C. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Structural Welding Code - Steel".
1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
  2. If recertification of welders is required, retesting will be Contractor's responsibility.
- D. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in the mill, shop, and field by the Owner's testing laboratory. Such inspections and tests will not relieve the Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements. The Contractor shall promptly remove and replace materials or fabricated components which do not comply.
- E. Question about Contract Documents: The Contractor shall promptly notify the Architect/Engineer whenever design of members and connections for any portion of the structure are not clearly indicated or when other questions exist about the Contract Documents. Such questions shall be resolved prior to the submission of shop drawings.
- F. Testing Laboratory Services: See Testing Laboratory Services section of these Specifications for requirements relating to structural steel. Inspection or testing by the Owner does not relieve the Contractor of his responsibility to perform the Work in accordance with the Contract Documents.



## 1.05 SUBMITTALS

- A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products; include laboratory test reports and other data to show compliance with specifications (including the specified standards):
1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
  2. Unfinished bolts and nuts.
  3. Welding electrodes (each type).
  4. Structural steel primer paint.
- B. Shop Drawings:
1. General Requirements: Submit structural steel shop drawings shall include the following minimum information:
    - a. Include details of cuts, connections, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Holes, flange cuts, slots and openings shall be made as required by the structural drawings, all of which shall be properly located by means of templates.
    - b. All drawings shall be drawn to scale.
  2. The fabricator alone shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members.
  3. All fabricated material and connections shall fit within architectural constraints.
  4. Structural steel members for which shop drawings have not been reviewed and approved shall not be fabricated.
  5. The omission from the shop drawings of any materials required by the Contract Documents shall not relieve the Contractor of the responsibility of furnishing and installing such materials, even though the shop drawings may have been reviewed and approved.
- C. Test Reports: Submit copies of reports of tests conducted on all material and on shop and field bolted and welded connections. Include data on type(s) of tests conducted and test results. See Testing Laboratory Services section of these Specifications for additional requirements.
- D. Qualification Data:
1. Submit qualification data for firms and persons specified in Article 1.03 – Qualifications, to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of owners and architects, and other information specified.
  2. Submit Welding Procedure Specifications (WPS) in accordance with ANSI/AWS D1.1 for all welded joints. Submit test reports showing successful passage of qualification tests for all non-qualified WPSs.

## 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials

from corrosion and deterioration. Do not store materials on structure in a manner that might exceed allowable loads on or cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed by Architect/Engineer.

- C. Furnish all fuel, maintenance, and equipment required for hoisting and placement of materials under this contract.
- D. Process, pay for and maintain all permits and certificates of on-site inspection required for derricks, cranes and hoisting equipment. No derrick, crane or hoisting equipment shall be operated without a certificate of operation and a certificate of on-site inspection, as required by governing authorities.
  - 1. In addition to the above, all hoisting equipment shall be installed, operated and maintained in accordance with all applicable regulations of authorities having jurisdiction.

#### 1.07 JOB CONDITIONS

- A. The Contractor shall coordinate the fabrication and erection of all structural steel work with the work of other trades.

### PART 2.00 - PRODUCTS

#### 2.01 MATERIALS

- A. Structural Steel: Hot rolled steel plates, shapes and bars: New steel conforming to ASTM A6. Structural steel shall comply with the provisions of the following ASTM Specifications as appropriate for the grades and types, and at the locations as specified on the drawings:
  - 1. Structural Steel Wide Flange and WT Shapes: ASTM A992 (Fy = 50 ksi).
  - 2. M-Shapes, S-Shapes, and Channels - Carbon Steel, ASTM A36.
  - 3. Structural Steel Plates and Bars - Carbon Steel, ASTM A36.
  - 4. Square and Rectangular HSS – ASTM A500, Grade B (Fy = 46 ksi).
  - 5. Angle Shapes: Carbon Steel, ASTM A36
- B. Structural Steel Surfaces: For fabrication of work which will be exposed to view in the completed structure, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.
- C. Structural Bolts and Threaded Fasteners: Structural bolts and threaded fasteners shall comply with the following ASTM Specifications as appropriate for the types and at the locations as specified on the drawings:
  - 1. ASTM A325 Type 1, "High-Strength Bolts for Structural Steel Joints".
  - 2. Bolts and Nuts, ASTM A307: Bolts and nuts shall be hex head and shall conform to ANSI Standards B18.2.1 and B18.2.2 and ASTM Material Standard ASTM A307, respectively.
- D. Electrodes for Welding: Comply with AWS D1.1, "Structural Welding Code - Steel". Electrodes for various welding processes shall be as specified below:
  - 1. SMAW: E70XX low hydrogen

2. SAW: F7X-EXXX
3. GMAW: ER70S-X
4. FCAW: E7XT-X

Electrodes shall be compatible with parent metal joined.

- E. Structural Steel Primer Paint: Primer paint shall be one of the following types with the indicated surface preparation:
1. Alkyd Zinc Chromate Metal Primer Bar-Ox 41837 Gray as manufactured by Devoe (SSPC-SP6 Commercial Blast Cleaning).
  2. Modified Alkyd Rust Inhibitive Primer 4-56 as manufactured by Tnemec Company, Inc. (SSPC-SP6 Commercial Blast Cleaning).
  3. Enviro-Guard, Heavy-Duty Primer Red 1-2900 as manufactured by Southern Coatings (SSPC-SP6 Commercial Blast Cleaning).

Refer to Architect's drawings and specifications for final paint finish requirements of structural steel. Primer paint shall be compatible with final paint requirements. Paint shall conform to all federal, state, and local regulations and shall have a VOC content not to exceed 3.5 lbs./gallon.

## 2.02 FABRICATION

- A. Shop Fabrication and Assembly:
1. Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specification and as indicated on approved final shop drawings. Fabricator shall coordinate joint fit-up procedures with erector. Provide camber in structural members where indicated. The General Contractor shall coordinate provision of all erection bolts, lifting lugs or other devices required for erection with the fabricator and the erector.
  2. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
  3. Clearly mark the grade of steel on each piece, distinguishable in the field from floor surfaces, for purpose of field inspection and confirmation of grade of steel.
  4. Milled surfaces of built-up sections shall be completely assembled or welded before milling.
- B. Dimensional Tolerances: Dimensional tolerances of fabricated structural steel shall conform to Section 6.4 of the AISC Code of Standard Practice.
- C. Cutting: Manual oxygen cutting shall be done only with a mechanically guided torch. An unguided torch may be used provided the cut is not within 1/8" of the finished dimension and final removal is completed by means such as chipping or grinding to produce a smooth surface quality free of notches or jagged edges. All corners shall be smooth and rounded to a minimum 1/2" radius.
- D. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members as shown on the contract documents, and/or the final shop drawings.
1. Provide specialty items as indicated to receive other work.
  2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

- E. Lifting and Erection Devices: The fabricator shall be responsible for designing, detailing and furnishing all lifting devices and erection aids required for erection. Such devices shall be removed after erection if they interfere with architectural finish requirements.

#### 2.03 WELDING

- A. Code: All shop and field welding shall conform to all requirements in the "Structural Welding Code - Steel", ANSI/AWS D1.1, as published by the American Welding Society (AWS).
- B. Welder Certification: All shop and field welders shall be certified according to AWS procedures for the welding process and welding position used.
- C. Minimum Size and Strength:
  - 1. Fillet Welds: Minimum size of fillet welds shall be as specified in Table J2.4 in the AISC Manual of Steel Construction.

#### 2.04 BOLTING

- A. Minimum Bolt Diameter: Minimum bolt diameter shall be 3/4".
- B. Connection Type: Unless noted otherwise on the drawings or in the General Notes, all bolted connections shall be bearing type connections using standard holes (hole diameter nominally 1/16" in excess of nominal bolt diameter) with threads included in the shear planes.
- C. Simple Beams: Simple shear connections shall be capable of end rotations of unrestrained beams as specified in Section J1.2 of the AISC Specification.
- D. Oversize, Short Slotted and Long Slotted Holes: The dimensions and washer requirements of oversize, short slotted, and long slotted holes shall conform to the high-strength bolting specification previously cited.
- E. Washers: Washers under the bolt head and/or nut shall be used as required by the bolt specification previously cited.
- F. Bolt Lubrication: All bolts shall be well lubricated at time of installation. Dry, rusty bolts will not be allowed. Bolts or nuts shall be wax dipped by the bolt supplier or "Johnson's Stick Wax 140" shall be used with all bolts in the shop or field.
- G. Impact Wrenches: Properly sized and lubricated air impact wrenches with adequate air pressure shall be utilized for all bolt installation.
- H. New Bolts: All bolts shall be new and shall not be reused.

#### 2.05 CONNECTIONS

- A. Typical connection details are indicated on the drawings.

- B. Design Intent: It is the intention of the plans and specifications that shop connections be welded or bolted and that field connections be bolted, unless detailed otherwise on the drawings.

## 2.06 SURFACE PREPARATION AND PAINTING

- A. Specification: Surface preparation, paint, and painting practices shall conform to the "Steel Structures Painting Manual", Volumes 1 and 2, as published by the Steel Structures Painting Council (SSPC).
- B. Scope: The following steel shall be shop painted after fabrication:
  - 1. All steel that will not be fireproofed or that will not be hot-dip galvanized
- C. Coordinate all shop painting of structural steel with architect's painting requirements as specified on the architectural drawings and in the specifications.
- D. Surface Preparation - Unpainted Steel: All structural steel that is not specified to receive a shop coat of primer paint shall be cleaned of oil and grease using solvent cleaners and cleaned of dirt and other foreign material by sweeping with a fiber brush or other suitable means.
- E. Surface Preparation and Primer Paint - Shop Painted Steel: All structural steel specified to be shop primed shall have paint applied in strict accordance with manufacturers instructions using prescribed surface preparation but not less than specified. Paint shall be applied immediately after surface preparation at a rate to provide a uniform dry film thickness of not less than 1.5 mils. Painting methods shall be used which result in full coverage of joints, corners, edges, and all exposed surfaces. Two coats shall be applied to surfaces which are inaccessible after assembly or erection. The color of the second coat shall be changed to distinguish it from the first coat.
  - 1. Coordinate shop primer paint requirements with architectural drawings and specifications.
- F. Touch-Up Painting: The General Contractor shall provide for cleaning and touch-up painting of welds, bolted connections, and abraded areas. Paint shall be applied to exposed areas using same materials and surface preparation as used for shop painting. Paint shall be applied by brush or spray with minimum dry film thickness of 1.5 mils.

## PART 3.00 - EXECUTION

### 3.01 ERECTION

- A. Inspection: Erector shall examine areas and conditions under which structural steel work is to be installed and notify the Contractor and the Architect/Engineer in writing of conditions detrimental to proper and timely completion of the work.
- B. Erection Tolerances: Erection tolerances of anchor bolts, embedded items, and all structural steel shall conform to the AISC Code of Standard Practice.
- C. Field Modifications to Structural Steel: Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and structural fitting of parts shall be reported immediately to the Architect/Engineer, and approval of the method of correction shall be

obtained. Approved corrections shall be made at no additional cost to the Owner. Do not use cutting torches, reamers, or other devices in the field for unauthorized correction of fabrication errors.

- D. Miscellaneous Framing: Provide supplemental structural steel support framing for metal deck where normal deck bearing is interrupted by column flange plates or other framing members and other floor openings whether shown or not on either the architectural, mechanical, or structural drawings.
- E. Removal of Erection Aids and Devices: The erector shall remove all erection aids and devices that interfere with architectural finish or MEP requirements.
- F. Touch-Up Painting:
  - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas that have been shop painted. Apply paint to exposed areas using same material and surface preparation as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.
  - 2. All field welded galvanized connections shall have welds protected with "Z.R.C. Cold Galvanizing Compound" as manufactured by Z.R.C. Products Company.
- G. Clean Up: Clean up all debris caused by the Work of this Section, keeping the premises neat and clean at all times.
- H. Tests and Inspections: Refer to Testing Laboratory Services section of this specification for required tests and inspections.

END OF SECTION

## SECTION 05 31 00 – STEEL DECKING

### PART 1.00 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 - Specification sections, apply to work of this section.

#### 1.02 STANDARDS

- A. The following Standards are listed in this specification:
  - ASTM A611 Standard Specification for Structural Steel (SS), Sheet, Carbon, Cold-Rolled
  - ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  - ASTM B633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel

#### 1.03 DESCRIPTION OF WORK

- A. Supplier: The steel deck supplier shall furnish all steel deck materials and accessories indicated on the Architectural, Structural, and Mechanical Drawings required to produce a complete job including but not necessarily limited to deck units, cover plates, pour stops, hanger slots or clips, steel deck edge closures, cell closures, and all related accessories.
- B. Erector: The Subcontractor responsible for erecting the steel deck shall provide all labor and equipment as required to place all steel deck components and accessories as described above.

#### 1.04 QUALIFICATIONS

- A. The steel deck supplier shall be a manufacturer with a minimum of two years successful experience and with a minimum of two successful jobs of a comparable size and scope to this project.

#### 1.05 QUALITY ASSURANCE

- A. The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.
- B. Codes and Standards: Comply with provisions of the following codes and standards except as otherwise indicated or specified:
  - 1. "Design Manual for Composite Decks, Form Decks, and Roof Decks", as published by the Steel Deck Institute (SDI).

2. "Specification for the Design of Cold Formed Steel Structural Members", as published by the American Iron and Steel Institute (AISI).
  3. "Structural Welding Code – Sheet Steel", D1.3, as published by the American Welding Society (AWS).
- C. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with AWS procedures.
- D. Underwriters Label: Provide steel deck units which are listed and conform to Underwriters Laboratories "Fire Resistance Directory", with each deck unit bearing the UL label and marking for specific system detailed.
- E. Factory Mutual Listing: Provide steel roof deck units which have been evaluated by Factory Mutual Research Corporation and are listed in "Factory Mutual Research Approval Guide - Building Materials" for "Class 1" or "Non-Combustible" fire rated construction and 1-90 Windstorm Classification.

#### 1.06 SUBMITTALS

- A. Product Certification: Submit manufacturer's specifications and installation instructions for each type of deck specified. Also submit a certificate of product compliance with SDI Standards as specified.
- B. Shop Drawings: Submit detailed shop drawings showing type of deck, complete layout, attachment details, closures, edge strips, pans, deck openings, special jointing, supplementary framing, and all other accessories.
- C. Welding Certificates: Submit Copies of certificates for welding procedures and personnel.

### PART 2.00 - PRODUCTS

#### 2.01 GENERAL REQUIREMENTS

- A. See General Notes on the drawings for the location, depth, design thickness, design section properties, and type of deck required for all decks. For floor slabs over form deck, see General Notes on the drawings for concrete type, total slab thickness, and slab reinforcement.
- B. Acceptable manufacturers include the following:
1. BHP Steel Building Products USA, Inc.
  2. Canam Steel Corp.
  3. Consolidated Systems, Inc.
  4. Epic Metals Corp.
  5. United Steel Deck, Inc.
  6. Valley Joist, Inc.
  7. Vulcraft/Div. Nucor Corp.
  8. Wheeling Corrugating Co.



Other manufacturers may be used only with Architect/Engineer approval.

## 2.02 GRADE OF STEEL

- A. Steel form deck and roof deck shall be cold formed from steel sheets conforming to ASTM A611 Grade C or D or ASTM A653, Structural Steel Grade, with a minimum yield strength of 33 ksi. The delivered thickness of the uncoated steel shall not be less than 95% of design thickness. Sheet steel accessories shall conform to the same material specification as the deck product.

## 2.03 FINISH

- A. Galvanized: Composite steel deck shall be galvanized with a protective zinc coating conforming to ASTM A653 G90.
- B. Roof Deck: Roof deck shall be galvanized with a protective zinc coating conforming to ASTM A653 G90 class.
- C. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Department of Defense Specifications DOD-P-21035.

## 2.04 RELATED PRODUCTS

- A. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- B. Provide minimum 20 gauge ridge and valley plates, minimum 20 gauge cant strips, minimum 14 gauge sump pans, minimum 20 gauge inside or outside closure channels, minimum 20 gauge butt strips at change of deck direction, minimum 20 gauge filler sheets and minimum 20 gauge pour stops as required to provide a finished surface for the application of insulation and roofing.
- C. Flexible Closure Strips: Provide manufacturers standard vulcanized closed cell, synthetic rubber.
- D. Acoustic Sound Barrier Closures: Provide manufacturers standard mineral fiber closures.
- E. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch thick, with factory-punched hole of 3/8-inch minimum diameter.
- F. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- G. Galvanizing Repair Paint: ASTM A 780.

## 2.05 FABRICATOR

- A. Steel Deck Spans: Steel deck spans shall not exceed the maximum clear spans as required by SDI criteria. Where possible, all steel deck shall extend over three or more spans. Simple span deck will not be permitted unless it is shored at midspan. All steel deck shall be designed as unshored construction unless indicated otherwise on the drawings. Steel deck spans shall not exceed the maximum center to center spans as required by the Factory Mutual Research Corporation Approval Guide 2000 – Building Materials or as recommended by SDI, whichever is less.
- B. Cell Closure at Ends of Steel Deck Flutes: Fabricate steel closure strips of not less than 0.0358" minimum (20 gage) cold formed sheet steel. Form to provide tight fitting cell closures at open ends of cells or flutes to prevent wet concrete from leaking through open cells.
- C. Pour Stop Closures at Slab Edges: Provide sheet steel pour stop closures at all slab edges, columns, walls, and openings unless steel angles or bent plates are specified in details on the drawings. Provide a return lip on the vertical leg in accordance with the SDI Design Manual. The overhang dimension is measured from the edge of the flange to the edge of the slab.

## 2.06 OPENINGS IN STEEL DECK

- A. For unframed openings, provide blockout in slab for opening with deck uncut. Cut deck at opening after concrete has reached 75% of its design strength.

## 2.07 CHLORIDE ADMIXTURES

- A. The use of admixtures in concrete containing chloride salts shall not be permitted for steel deck concrete.

## 2.08 MECHANICAL FASTENERS

- A. Powder-Actuated or Pneumatically Driven Pins: Provide corrosion-resistant, powder-actuated or pneumatically driven fasteners manufactured from steel conforming to AISI 1060 or 1061 steel, austempered to a core hardness of 52 to 58 Rockwell C. Fasteners shall have a knurled shank and shall be zinc-plated in accordance with ASTM B633, Sc. I, Type III.

Subject to compliance with requirements, provide products of one of the following manufacturers:

1. Hilti, Inc., Tulsa, OK
2. ITWBuildex, Itasca, IL
3. Pneutek, Inc., Hudson, NH

- B. Self-Drilling Screw Fasteners: Provide corrosion-resistant, hexagonal head, steel self-drilling screws, austempered to a core hardness of Rockwell C 50. Subject to compliance with requirements, provide products of one of the following manufacturers:
  1. ITWBuildex, Itasca, IL

## 2.09 SIDE-LAP FASTENERS

- A. Provide Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

## PART 3.00 - EXECUTION

### 3.01 INSTALLATION

- A. General: Install deck units as accessories in accordance with manufacturers recommendations and approved shop drawings, and as specified herein:
  1. Place deck units on supporting framework and adjust to final position with ends accurately aligned and bearing 2" minimum on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.
  2. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
  3. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.
  4. Do not place deck units on concrete supporting structure until concrete has cured and is dry.
  5. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
  6. Do not use floor deck units for storage or working platforms until permanently secured.
  7. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.
  8. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
  9. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
  10. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
  11. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

### 3.02 DECK ATTACHMENT

- A. Method of Attachment: The deck shall be fastened to the structural support members using one of the following methods.
  1. Welding: Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work. Weld metal shall penetrate all layers of deck material at end laps and side joints and shall have good fusion to the supporting member. Welding washers shall be used only when welding steel deck less than 0.028" thickness. Welding washers shall be a minimum thickness of 0.0568 inches and have a nominal 3/8" diameter hole. Where welding washers are not required, a nominal 5/8" diameter puddle weld shall be used.
  2. Powder-Actuated or Pneumatically Driven Pins: An operator licensed by the manufacturer shall install all pins. Comply with the manufacturers requirements to install the pins through

all layers of the deck material and the manufacturer's required embedment into the supporting member.

3. Self-Drilling Fasteners: Comply with the manufacturer's requirements to install the screws through all layers of the deck material and the manufacturer's required embedment into the supporting member.

B. Attachment of Roof Deck:

1. The method of attachment, attachment pattern, and side lap fastener type and spacing, shall be designed to resist the net uplift load and the diaphragm shear as shown on the drawings but not less than the minimum requirements noted below.
2. Minimum Attachment Requirements: Unless a more stringent attachment requirement is specified elsewhere in this specification or on the drawings, roof deck units shall be attached to each structural support member at each rib where the sides lap and at a maximum of 12 inches on center in the typical condition in the field of the roof. Along the perimeter and at corners of the roof, the fastening pattern shall be reduced to a maximum of 6 inches on center. In decks with ribs greater than 6 inches on center this requirement will be met by placing two fasteners per rib. One of the following fastening methods shall be used.
3. Side Lap Fastening: Unless required otherwise by provisions of this specification, side laps of adjacent units shall be fastened by welding (on 20 gauge or heavier deck only) or #12 (min.) TEK screws so that spacing between supports and fasteners does not exceed the lesser of  $\frac{1}{2}$  the span or 36 inches. Button Punching is not allowable as a side-lap fastener.
4. End Bearing: Provide a minimum end bearing of 2" over supports.
5. End Joints: End joints of sheets shall be (i) butted or lapped 2" minimum over supports. Decks that slope 1/4 inch or more in 12 inches in the long direction shall be erected beginning at the low side to insure that end laps are shingle fashion.
  - a. 5/8" diameter puddle welds
  - b. Powder-Actuated or Compressed-air Actuated pins, by Hilti, Inc.
  - c. BX 12 or BX 14 pins, by ITWBuildex, Inc.
  - d. K-series or SDK-series pins by Pneutek, Inc.
  - e. # 12 ICHTraxx self-drilling fasteners, by ITWBuildex, Inc.
6. Attachment to Girders: At locations where the deck flutes are parallel to the span of the steel framing and the top of the framing is at the bottom of the deck elevation, the deck shall be attached to the girder using one of the specified fastening methods at 18 inches on center. See the drawings for attachment details when the deck flute does not engage the top of the steel framing.

- C. Side Laps: Unless required otherwise by provisions of a more stringent attachment requirement is specified elsewhere the drawings, Factory Mutual, or Underwriters Laboratories, side laps of adjacent units shall be fastened by welding (on 20 gauge or heavier deck only) or #12 (min.) TEK screws such that there are a minimum of two fasteners between supports. Nest side laps one-half corrugation. Button punching is not allowable as a side-lap fastener.

- D. End Bearing: Provide a minimum end bearing of 2" over supports.

- E. End Joints: End joints of sheets shall be butted or lapped 2" minimum over supports unless a more stringent requirement is specified by Factory Mutual or Underwriters Laboratory. Decks that slope 1/4 inch or more in 12 inches in the long direction shall be erected beginning at the low side to insure that end laps are shingle fashion.

- F. Welding Requirements: Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.
- G. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking.
- H. Reinforcement at Roof Openings: Roof openings less than 6" square or in diameter require no reinforcement. Openings 6" to 10" inclusive shall be reinforced with a 20 gauge galvanized plate welded to the deck at each corner and 6" maximum centers with a 5/8" diameter puddle weld or sheet metal screws. For openings greater than 10" in diameter or width, refer to the drawings and structural steel specifications for additional framing to support the deck around the opening.
- I. Hanger Slots or Clips: Provide UL approved punched hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.
- J. Hanger clips designed to clip over male side lap joints of floor deck units may be used instead of hanger slots.
- K. Locate slots or clips at not more than 14" o.c. in both directions, not over 9" from walls at ends, and not more than 12" from walls at sides, unless otherwise shown.
- L. Provide manufacturer's standard hanger attachment devices.
- M. Loads hanging from steel deck slabs shall not exceed 100 pounds unless specifically detailed otherwise on the drawings.
- N. Joint Covers and Cell Closures: Weld steel sheet joint covers at abutting ends, except where taped joints are specified. Weld steel sheet column closures, cell closures and Z-closures to deck with 1" long weld at 12" maximum centers to provide tight-fitting closures at open ends of ribs, unless shown otherwise on the drawings.
- O. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated. Provide minimum 2" bearing over steel support.

### 3.03 TOUCH-UP PAINTING

- A. After deck installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.
- B. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.
- C. Touch-up painted surfaces with same type of shop paint used on adjacent surfaces.
- D. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

- E. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

3.04 INSPECTION

- A. Welded decking in place is subject to inspection and testing by the Owner's Testing Laboratory. Expense of removing and replacing portions of decking for testing purposes will be borne by Owner if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work. Cost of such removal and replacement shall be borne by the Contractor.

END OF SECTION

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1.00 - GENERAL

1.01 SECTION INCLUDES

- A. Wood blocking and backing.
- B. Rough hardware such as nails, screws, and lag bolts, as required.

1.02 RELATED A SPECIFIED ELSEWHERE

- A. Sheet Metal Flashing: Section 076200.

1.03 QUALITY ASSURANCE

- A. Requirements of regulatory agencies:
  - 1. In addition to complying with other legal requirements, comply with:
    - a. UL procedures for fire-rated construction.
    - b. Fire-retardant wood: In accord with UL FRS Fire Hazard Classification *FL-* and EPCOT Standard 1010.
- B. Referenced specifications and standards:
  - 1. ASTM: A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM: D2898 Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing.
  - 3. ASTM: E84 Surface Burning Characteristics of Building Materials.
  - 4. AWPA: C1 All Timber Products - Preservative Treatment By Pressure Processes.
  - 5. AWPA: C2 Lumber, Timbers, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes.
  - 6. AWPA: C20 Structural Lumber - Fire Retardant Treatment By Pressure Processes.
  - 7. AWPA: C27 Plywood - Fire Retardant Treatment By Pressure Processes.
  - 8. AWPA: M2 Standard for Inspection of Treated Timber Products.
  - 9. FM: Loss Prevention Data Sheet 1-49 Perimeter Flashing.
  - 10. NIST: PS 1 For Construction and Industrial Plywood.
  - 11. NIST: PS 20 American Softwood Lumber Standard.
- C. Grading rules: Identify lumber and plywood with grade mark and inspecting agency symbol showing mill name or number, lumber grade, species or species grouping or combination designation, rules under which graded, where applicable, and condition of seasoning at time of manufacture.
  - 1. Except as modified in this Section, comply with NIST PS 20.
  - 2. Plywood: APA trademarked, NIST PS 1.

#### 1.04 SUBMITTALS

- A. Product data: Manufacturer's literature for pressure treatment materials.
- B. Certificates: Certification from pressure treatment processor that materials and treatment comply with specified requirements.

#### 1.05 PRODUCT HANDLING

- A. Procedures: In accord with Section 011010.
- B. Secure delivery of *FL*-lumber and plywood at latest possible date to protect *FL*-lumber and plywood from acquiring increased moisture content.  
Stack lumber and plywood using blocking to allow free circulation of air.  
Protect lumber and plywood at all times from direct wetting and moisture.

### PART 2.00 - PRODUCTS

#### 2.01 MATERIALS

- A. General: Manufacture lumber and plywood in accord with specified grading rules.
- B. Random length lumber: 2 in. to 4 in. thick, No. 2 or better, kiln-dried (maximum *FL*-15% moisture content), *FL*-Southern Yellow Pine, or Owner-approved equivalent. Mixed species are not permitted.
- C. Plywood: Conventional veneer construction in accord with NIST PS 1, and as indicated on Drawings, APA trademarked. Do not use composite, oriented strand, and similar type panels.
  - 1. Unless indicated otherwise on Drawings, provide APA A-C Exterior.
- D. Nails, screws, bolts, nuts, washers - all locations: Stainless steel.

#### 2.02 FIRE-RETARDANT TREATMENT

- A. Location: Provide fire-retardant treated (FRT) wood for all use conditions unless specifically indicated otherwise on Drawings.
- B. Standards:
  - 1. Lumber: AWPA C1 and C20 (except listing in AWPA P17 is not required).
  - 2. Plywood: AWPA C1 and C27 (except listing in AWPA P17 is not required).
  - 3. Provide fire-retardant treated lumber and plywood with treater's brand, designation of treatment, and UL classification mark indicating:
    - a. Flame spread of 25 or less when tested in accord with ASTM E84, 30-min. duration. The UL designation FR-S will be accepted in lieu of numerical ratings.
    - b. No increase in fire hazard classification following exposure to Standard Rain Test (ASTM D2898, Method A).



4. Provide inspection and inspector's report for fire-retardant treated products in accord with AWPA M2.
- C. Treatment types: Pressure-type treatments only. Do not use surface-applied, nonpressure, and similar type treatments.
1. Preservatives that can provide clean, paintable/stainable, odorless dry surfaces, especially where exposed to view. AWPA C20 and/or C27, Exterior type:
    - a. Exterior Fire-X by Hoover Treated Wood Products.
  2. After treatment, kiln dry to maximum moisture content as follows:
    - a. Dimensional lumber: 19%.
    - b. Plywood: 15%.

### PART 3.00 - EXECUTION

#### 3.01 BACKING and blocking

- A. Provide solid blocking where indicated on drawings.

#### 3.02 NAILERS AT ROOF EDGE

- A. Secure wood blocking where noted in accordance with recommendations of FM Global Loss Prevention Data Sheet 1-49 for the specified wind zone.

END OF SECTION

## SECTION 07 01 50 - PREPARATION FOR REROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Full tear-off of entire roofing system.
2. Re-cover preparation of entire roof area.
3. Removal of flashings and counterflashings.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
1. Submit before Work begins.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

#### 1.5 FIELD CONDITIONS

- A. Existing Roofing System: See drawings.
- B. Owner will occupy portions of building immediately below reroofing area.
1. Conduct reroofing so Owner's operations are not disrupted.
  2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
  3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.

- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
  - 1. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.
- F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to 20 PSF for uniformly distributed loads.
- G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
  - 1. Remove only as much roofing in one day as can be made watertight in the same day.

## PART 2 - PRODUCTS

### 2.1 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- B. Shut off rooftop utilities and service piping before beginning the Work.
- C. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
  - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- D. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

### 3.2 ROOF TEAR-OFF

- A. Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Full Roof Tear-off: Remove existing roofing and other roofing system components down to the existing concrete roof deck.
  - 1. Remove perimeter edge flashing.
  - 2. Remove transition metal.
  - 3. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
  - 4. Remove wood blocking, curbs, and nailers.
  - 5. Remove gutter and downspouts.
  - 6. Remove skylights.
  - 7. Remove roof hatch.
  - 8. Remove fasteners from deck.

### 3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
  - 1. Do not proceed with installation until directed by in writing from the manufacturer of the roofing assembly. Submit a copy of the letter to the Architect.

### 3.4 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
  - 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

END OF SECTION 07 01 50

## SECTION 07 52 16 - SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING

### PART 1.00 - GENERAL

#### 1.01 SECTION INCLUDES

- A. **Revision 1: Torch-applied modified bituminous roof membrane system and accessories integral to roofing application. Basis of design is Siplast fully adhered roof system. Other similar systems meeting project design criteria including wind uplift requirements be submitted for Owner approval.**

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Rough Carpentry: Section 061000.
- B. Flashing and sheet metal: Section 076200.

#### 1.03 QUALITY ASSURANCE

- A. Coordinated installation: Except as otherwise indicated, perform roofing and flashing work as a single integrated unit of work, without division of responsibility between separate installers (single installer responsibility required).
- B. Manufacturer qualifications: Provide primary products, including insulation (where indicated), each type of roofing sheet (felt), bitumen, and composition flashings produced by a single manufacturer, which has produced that type product successfully for not less than 5 years. Provide secondary products only as recommended by manufacturer of primary products for use with roofing system specified.
- C. Installer qualifications:
  - 1. A single installer (roofer) must perform the work of this Section and have not less than 5 years of successful experience in installation of roofing systems similar to those specified for this project and which is acceptable to, and approved and/or licensed by manufacturer of primary roofing materials.
  - 2. Obtain written certification from manufacturer of roofing system certifying that installer is approved by manufacturer for installation of specified roofing system and approved at a level capable of providing the specified warranty. Provide copy of certification to Owner prior to pre-application roofing conference.
  - 3. Installer must maintain full-time supervisor/foreman on job site during times that roofing is in progress. Supervisor must have minimum of 5 years of experience in roofing work of similar nature and scope as specified roofing.
- D. Manufacturer's inspections: Provide manufacturer's inspection services of roofing application. Manufacturer's inspection services shall include inspection of installation, 1) within 2-days of start of system installation and during system installation at that time, 2) immediately after completion, for deficiencies in workmanship and application of materials, and 3) after work of other trades, requiring access/traffic on finished roofing, has been completed, for damage resulting from the work of other trades subsequent to the "completion of installation" inspection.

- E. Requirements of regulatory agencies: In addition to pertinent regulations of governmental agencies having jurisdiction, comply with:
1. UL: Class A fire rating.
  2. Florida Product Approval
- F. Reference specifications and standards:
1. ASTM D41 Asphalt Primer Used in Roofing and Waterproofing.
  2. ASTM D1970 Self Adhering Polymer-Modified Bituminous Sheet Material used as Underlayment
  3. ASTM D4586 Asphalt or Modified Bitumen Roof Cement, Asbestos-Free.
  4. ASTM D6163 Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Fiberglass Reinforcements
  5. ASTM E108 Fire Tests of Roof Coverings
  6. National Roofing Contractors Association (NRCA): The NRCA Roofing and Waterproofing Manual.
  7. Sheet Metal & Air Conditioning Contractors' National Association, Inc. (SMACNA): Architectural Sheet Metal Manual.
- G. Pre-application roofing conference.
1. Approximately two weeks prior to scheduled commencement of roofing installation and associated work, arrange a meeting at project site with installers of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of roof-top units and other work in and around roofing which must precede or follow roofing work (including mechanical and electrical work if any), Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the work. Record discussions of conference and decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending.
  2. Review methods and procedures related to roofing work, including, but not necessarily limited to, the following:
    - a. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations, and other preparatory work performed by other trades.
    - b. Review roofing system requirements (Drawings, Specifications, and other Contract Documents) for possible conflicts and resolve.
    - c. Review required submittals, both completed and yet to be completed.
    - d. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - e. Review required inspection, testing, certifying, and materials usage accounting procedures.
    - f. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
    - g. Review work safety requirements.

1.04 SUBMITTALS

- A. Procedures: In accord with Division 1 requirements.
- B. Samples:
  - 1. Three samples of each fastener type.
  - 2. Three strips of full roll width samples of each sheet material.
  - 3. Three 6 in. strip by full roll width samples of rigid and/or flexible flashing, including side/end-lap seam.
  - 4. Three 6 inch X 6 inch or larger samples of each type of insulation board.
- C. Shop drawings: Drawings of typical roof insulation layout, fastening patterns and flashing details.
  - 1. Shop drawings shall diagram required insulation fastening pattern to include field of roof, corners, and perimeter.
- D. Product data: Manufacturer's latest edition of technical product data, installation instructions, and recommendations for each type of insulation and roofing product specified and required to include, but not limited to insulation, membrane, flashing, asphaltic cements and mastics, primer, and fasteners. Include data substantiating that materials comply with requirements, including certification of modified bitumen sheet minimum polymer content. Provide certified assembly letter from the manufacturer listing full warranted assembly.
- E. Manufacturer's Instructions:
  - 1. Detailed application instructions for the roof system being installed, to include general and specific recommendations, product storage and handling, weather restrictions and parameters, and application requirements.
- F. Certificates:
  - 1. Submit evidence satisfactory to Owner that the proposed applicator is currently approved by the manufacturer of the roofing materials. Submit copies of "Certificate of License" issued to roofing applicator by manufacturer.
  - 2. Submit evidence satisfactory to Owner that the proposed mechanical fasteners are approved by Factory Mutual for use under the specified conditions.
  - 3. A Manufacturer's Notice of Intent to Issue Roof Warranty, in accord with Attachment A, prior to the use of any of the manufacturer's materials on the project.
- G. Reports:
  - 1. Prior to start of installing work of this Section, and as part of the required written report on the Pre-Application Roofing Conference, submit a written and detailed step-by-step description of the methods of installation as agreed to in the Pre-Application Roofing Conference.
  - 2. Submit copies of UL and FPA test reports verifying materials and systems compliance with specified requirements.
  - 3. Roof deck securement for existing building:
    - a. When existing roof is removed down to structural deck, roof deck securement is to be inspected by owner's representative compliance for roof deck securement prior to installing new roof assembly.

#### 1.05 PRODUCT HANDLING

- A. Procedures: In accord with Division 1 requirements.
- B. Delivery:
  - 1. Deliver materials in manufacturer's original, unopened containers with manufacturer's labels intact and legible.
  - 2. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.
  - 3. Deliver enough materials to allow continuous work.
- C. Storage:
  - 1. Store rolls of felt on end; cartons and drums of asphalt; and cans or drums of cements, primers, and coatings.
  - 2. Store materials on clean, raised platforms.
  - 3. Unless otherwise recommended by the manufacturer, store and handle materials to protect them from:
    - a. Moisture, whether due to rain, other situations or condensation.
    - b. Damage by construction traffic.
    - c. Temperatures over 110°F.
    - d. Temperatures below 50°F.
    - e. Direct sunlight.
    - f. Mud, dust, sand, oil, grease, and dirt.
- D. Handling:
  - 1. Select and operate materials handling equipment and store materials to keep from damaging existing construction or applied roofing.
  - 2. Immediately remove and dispose of wet materials.
  - 3. Comply with fire, safety, and environmental protection regulations.
  - 4. Do not store materials on roof decks, nor position roofing installation equipment on roof decks in concentrations exceeding design live loads.
  - 5. Take special precautions against traffic damage when ambient temperature is above 80°F. Avoid heavy traffic atop the work during all phases of installation.
  - 6. Damaged materials shall not be installed.

#### 1.06 PROJECT CONDITIONS

- A. Existing conditions:
  - 1. Along with the roofing applicator and sheet metal installer, verify existing conditions, including:
    - a. Roof deck conditions.
    - b. Varying deck and wall thickness for length of anchoring devices required.



2. Replace or restore to original condition all materials or work damaged during construction of work of this Section.
  3. Protect paving and building walls.
    - a. Lap protective materials at least 6 in.
    - b. Vent plastic sheets, if used, to keep moisture from condensing and collecting on covered surfaces.
    - c. Secure protective coverings against wind.
    - d. Leave protective coverings in place until roofing work has been completed.
- B. Environmental requirements:
1. Do not install roofing during rain or start roofing if rain is probable during installation.
  2. Do not install roofing when there is ice, frost, surface moisture, or dampness visible on the surface to which roofing is to be applied. The relative humidity shall not be higher than 90%.
  3. Do not install roofing if temperatures are 45°F or lower, unless approved otherwise by the owner.
- C. Protection:
1. Protect surfaces not intended to receive roofing materials from spillage, dripping, spotting and damage during application of the roofing. Should protection not be effective, or not be provided, restore the respective surfaces to their proper conditions by cleaning, repairing, or replacing, as applicable for the circumstances and as directed by Owner.
  2. Immediately protect completed portions of roofing from damage of subsequent construction activities in accord with contract requirements. Repair, replace, or as otherwise required to remedy any damage to roofing resulting from construction activities, for the entire duration of construction.
- D. Torch Safety
1. Take all precautions necessary to prevent ignition of combustible materials during torch application of roofing. Flammable liquids shall not be stored on the roof. Provide two fully charged minimum 6.5 kg (15 pound) CO<sub>2</sub> fire extinguishers in separate, easily accessible locations on the roof and within 9 meters (30 feet) of torch work area at all times. Seal off voids or openings in the substrate with non-combustible materials prior to installing torch-applied materials in the area. When working around intakes and openings, temporarily disconnect and block to prevent flame of torch from being drawn into the opening. Provide non-combustible shielding or flame guard protection where gaps or voids occur in the construction in area of torch work.
- E. Fire Watch
1. Provide a fire watch for a minimum of one hour after completion of all torch work at the end of each work shift. Maintain the fire watch for additional time required to ensure no potential ignition conditions exist. Utilize heat sensing meters to scan for hot spots in the work. Do not leave the rooftop unattended during breaks in work during a work shift. Walk and scan all areas of application checking for hot spots, fumes, or smoldering, especially at wall and curb areas, prior to departure at the end of each work shift. Ensure any and all suspect conditions are eliminated prior to leaving the site each work shift.

F. Sequencing

1. Coordinate the work with other trades to ensure that components which are to be secured to or stripped into the roofing system are available and that permanent flashing and counterflashing are installed as the work progresses. Ensure temporary protection measures are in place to preclude moisture intrusion or damage to installed materials. [Application of roofing shall immediately follow application of insulation as a continuous operation. Roofing operations shall be coordinated with insulation work so that all roof insulation applied each day is covered with roof membrane installation the same day.]

1.07 WARRANTY AND GUARANTY

- A. Responsibility: It is the sole responsibility of Contractor to review Contract Documents and field conditions and to coordinate all requirements and conditions with roofing applicator and manufacturer for issuance of warranties and guaranties. Changes required for warranty and guaranty issuance shall be performed at no additional cost to Owner.
- B. Warranty and guaranty: Upon completion of the work of this Section, and as a condition of its acceptance, deliver to Owner the following:
  1. Applicator's warranty: Written warranty, as provided at the end of this Section, signed by Contractor and an officer of roofing subcontractor's firm, agreeing to maintain the work of this Section, and its associated flashings and accessories, free from blistering and the penetration of water for a period of 5 years following the Date of Substantial Completion.
  2. Manufacturer's guaranty:
    - a. Written guaranty, full systems warranty to include flashing endorsement signed by an officer of roofing materials manufacturer's company, agreeing to repair or replace the roofing system and damaged roof materials, from penetration of water through the roof membrane for a period of 25 years following the Date of Substantial Completion, without additional cost to Owner (25 year NDL). Roofing manufacturer should include perimeter edge metal as a part of warranted roof system.

1.08 DESIGN AND PERFORMANCE CRITERIA

A. Uniform Wind Uplift Load Capacity

1. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria. Attachment shall be installed exactly as given in Part 3.
  - a. Design Code: Florida Building Code 2017
  - b. Category III Building
  - c. Ultimate Wind Speed: 150 mph
  - d. Exposure Category: C
  - e. Design Roof Height: See Sheet A-2.3 for Roof Areas

- g. Roof Pitch: 1/4" per foot
  - h. Topographic Factor: C.
  - k. Design Uplift Pressure: ASCE 7-10  
See Sheet A-2.3 for Wind Uplift Pressures.
  - l. Roof System FPA: FL10342-r12 System S-A-4
- B. Perimeter Edge Flashing including Wood Blocking to be fastened per ASCE 7-10 data and to meet ES-1 certified metal.

## PART 2.00 – PRODUCTS

### 2.01 MEMBRANE MATERIALS

- A. All materials shall be approved by and as recommended by the modified bitumen roof membrane manufacturer for the application and conditions required, except that the following minimum requirements apply.
- B. Modified Bitumen Roof Membrane
  - 1. Base, inner and cap sheet styrene-butadiene-styrene (SBS) modified bitumen membrane system complying with ASTM D6163, and compatible with torch application.
  - 2. Modified bitumen base ply shall be minimum 90 mils thick, inner ply sheet minimum 90 mils, and granule surfaced cap sheet shall be minimum 135 mils thick at selvage edge and surfaced with factory applied granules.
  - 3. Cap sheet shall be fire rated.
  - 4. Cap sheet membrane shall have fiberglass reinforcement, unless otherwise approved by Owner.
  - 5. Membrane shall be manufacturer standard product and contain minimum 10% polymer content by weight. Manufacturer's certification required..
  - 6. Energy Performance: Roofing system shall have three-year-aged solar reflectance index of not less than 64 and three-year aged thermal emittance of .74 when tested according to CRRC-1.
  - 7. Minimum Peak Load at 0 degrees F of 75 lbf/inch as per ASTM D 5147.
  - 8. Three Ply Modified Bitumen Membrane shall be manufactured by one of the following, unless approved otherwise by the Owner.
    - a. Siplast, Inc. (Basis of Design)
    - b. Johns Manville International, Inc.
    - c. Soprema, Inc.

C. Membrane Flashing

1. Membrane manufacturer's PMMA reinforced flashing system with base-ply below per manufacturer's specifications and approved details. Flashing membranes shall meet or exceed the properties of the material standards specified for the modified bitumen interply and liquid applied flashing, except that flashing membrane thickness shall be as recommended by the membrane manufacturer.

D. Liquid Flashing System:

1. Roof membrane manufacturer's two-part PMMA curing resin with low solvent content, consisting of a primer and scrim.

## 2.02 INSULATION

A. Tapered Polyisocyanurate Insulation:

1. ASTM C 1289, Type II, minimum 20 psi compressive strength, slope necessary to provide min 1/4" per foot slope to drain or edge as required by Epcot Building Code. Layout new tapered insulation as outlined on roof plan drawings.

B. Flat Polyisocyanurate Insulation:

1. ASTM C 1289, Type II, minimum 20 psi compressive strength, thickness to provide minimum R-25 value as required by EPCOT Building Code requirements when used in combination with cover board insulation specified below.

C. Cover Board: "Securock Gypsum Fiber Roof Board" manufactured by USG.

1. Securock shall comply with ASTM C 1278 minimum 1/2" thick and compatible with specified membrane application.
2. Top surface treatment shall be compatible with torched modified bitumen membrane application.
  - a. Primed treatment of surface prior to direct torch application.

D. Tapered Insulation: Crickets, Gussets, Sumps.

1. Rigid polyisocyanurate, ASTM C 1289, tapered minimum 1/2 inch per foot taper for new cricket application as outlined on roof plan drawings and on upslope side of curbs and penetrations wider than 18".
2. Top surface treatment shall be compatible with torched modified bitumen membrane application.

## 2.03 ACCESSORIES

A. Asphalt Primer

1. ASTM D 41, compatible with the membrane application and as approved by the membrane manufacturer.

B. Asphaltic Cement / Adhesive

1. Modified bitumen cement complying with ASTM D 4586.

C. Cant Strip:

1. No. 4, unless otherwise approved or indicated, 45 degree face, preformed units. Fiber cants shall be asphalt-impregnated perlite or mineral fiber, minimum 1-1/2 inches thick.
  2. Wood cants shall be preservative treated material.
- D. Pitch Pan Fill: N/A
1. Existing pitch pans to be removed and penetrations flashed with liquid applied flashings.
- E. Walkpads:
1. Roof walkpads shall be polyester reinforced, granule-surfaced modified bitumen membrane material, minimum 200 mils thick, compatible with the modified bitumen sheet roofing and as recommended by the modified bitumen sheet roofing manufacturer. Panels shall not exceed 1.2 meters (4 feet) in length. Other walkpad materials require approval of the Owner prior to installation.
- F. Wood Products:
1. Specified in Section 061000.
- G. Metal Termination Bars:
1. Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 x 1/8" thick; with anchors.
- H. Fasteners:
1. Factory-coated steel fasteners and metal or plastic plates complying with corrosion resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- I. Roofing Granules:
1. Roof Granules to match cap sheet granules.
- J. Miscellaneous Accessories:
1. Provide those recommended by roofing system manufacturer.

## PART 3.00 - EXECUTION

### 3.01 INSPECTION AND PREPARATION

#### A. Inspection:

1. Installer shall examine substrates and conditions under which roofing work is to be performed and shall notify Owner in writing of unsatisfactory conditions.
2. Do not proceed with roofing work until unsatisfactory conditions have been corrected in a manner acceptable to Owner.

3. Inspect surfaces over which roofing and flashing is to be applied. Do not install roofing over any surfaces until they are clean, dry, and free of all dirt and debris and in acceptable condition to receive new roofing materials. Voids greater than 1/4 in. are not permitted in surface to receive roofing membrane and flashing.

B. Protrusions:

1. Install and secure items which pass through roof prior to application of roofing. Extend all protrusions and penetrations as required to accommodate thickness of insulation. Ensure that curbs and pipes are a minimum of 8 inches higher than the surface of the roof.

### 3.02 GENERAL INSTALLATION

A. Total installation concept:

1. A total and new roofing system has been specified. A patched up, chopped up, spliced, or added-to/on roofing system will not be acceptable under any circumstances.
2. If a section of roof requires reworking and/or patching, the entire area or section of roofing shall be replaced. This shall mean from edge and/or expansion joint to edge and/or expansion joint in both directions.

B. Watertight imperative:

1. The work specified herein shall not preclude the use of procedures that will maintain the building watertight. Therefore, Contractor, while conforming to Contract Documents, shall utilize skill and all necessary procedures to keep unwanted water out of the building while construction is in progress.
2. At the end of each day's roofing installation and/or prior to the onset of inclement weather, the new section of roofing shall be temporarily sealed with cut-offs to unfinished substrates, projections through the roof, and to surrounding intersections so that no moisture may enter roofing or into structure before work resumes. Remove cut-offs before work resumes.

- C. Coordination: Coordinate work such that insulation and interplies can be totally covered with complete roofing assembly (including cap sheet) to a waterproof condition at the end of a day's working session and/or prior to the onset of inclement weather. "Phased" application of roofing membrane plies is not permitted.

### 3.03 INSTALLING RIGID INSULATION

A. General:

1. Provide new wood nailers, of thickness to match new insulation, firmly anchored into position as required to form curbs, blocking substrate, support cant strips and other items as recommended by the roofing materials manufacturer.
2. Verify that provision has been made for installing metal flashings as required for proper installation.

B. Polyisocyanurate and Cover Board Installation:

1. Apply top layer of cover board over total roof area mechanically attached to tapered and/or flat polyisocyanurate insulation in accordance with manufacturer's specifications in compliance with Florida Product Approval requirements to include increased securement frequency at corners and perimeters as applicable. Apply cover board with joints offset and staggered from joints in insulation layer below, no less than 12 inches.

2. Install net 1/4" per foot tapered polyisocyanurate insulation over flat polyisocyanurate insulation with manufacturer's specifications in compliance with Florida Product Approval requirements to include increased attachment frequency at corners and perimeters as applicable. Apply tapered polyisocyanurate insulation with joints offset and staggered from joints in insulation layer below, no less than 12 inches.
3. Install flat polyisocyanurate insulation (maximum board size 4'-0" X 4'-0") in all field locations mechanically attached in accordance with manufacturer's specifications in compliance with Florida Product Approval requirements to include increased securement frequency at corners and perimeters as applicable. Apply flat polyisocyanurate in two layers with joints offset and staggered from joints in insulation layer below, no less than 12 inches.
4. Install 1/4" per foot net tapered insulation crickets as outlined on roof plan drawings. Apply tapered polyisocyanurate insulation with joints offset and staggered from joints in insulation layer below.
5. Apply 1/4" per foot net tapered insulation on the upslope side of all curbs and penetrations greater than 24 inches wide.
6. Do not leave insulation or cover board exposed to weather. Do not install more insulation or cover board than can be covered with the finished roofing on the same day.
7. Install insulation board at right angles to flutes of deck and locate end joints over crests of steel roof deck.
8. Tightly butt substrate boards together.
9. Cut insulation and cover board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
10. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches. Trim insulation, so that water flow is unrestricted.
11. Fill gaps exceeding 1/4 inch with insulation.

#### 3.04 BASE PLY INSTALLATION

- A. Apply modified bitumen base ply over insulation substrate.
  1. Mechanically attach base ply over coverboard and polyisocyanurate insulation into the metal deck or wood deck in accordance with manufacturer's specifications in compliance with Florida Product Approval for the roof system being installed.

#### 3.05 MODIFIED BITUMEN MEMBRANE INSTALLATION

- A. Apply in accordance with detailed application instructions of the roof membrane manufacturer and the requirements specified herein.
- B. Unroll modified bitumen membrane sheets and allow to relax minimum of 30 minutes prior to installing sheets. Ensure sheet is dry prior to installation.
- C. Fully adhere membrane sheets by torch application such that fluid bituminous material flows full width of roll as material is being rolled or set in place.

- D. Provide minimum 3 inch side laps and minimum 6 inch end laps and as otherwise required by membrane manufacturer.
  - 1. Stagger end laps minimum 36 inches.
  - 2. Offset laps between base and cap sheets a minimum of 12 inches.
- E. Modified bitumen base ply, inner ply sheet and cap sheet shall be installed the same work day, unless supported otherwise by published roof membrane manufacturer application instructions and approved by the owner.
- F. Delay in cap sheet installation shall result in thorough cleaning of the applied base sheet surface and priming of the base sheet with asphalt primer prior to cap sheet installation.
- G. Provide tight smooth laminations of each membrane layer without wrinkles, ridges, buckles, kinks, fishmouths, or voids.
- H. Ensure substrate and membrane surfaces are warmed either naturally or by torch during the installation. Apply heat evenly to underside of roll membrane being installed and exposed side lap area of previously installed sheet. Provide for slight, uniform flow of bitumen in front of roll and full width of roll as the material is being rolled or set into place. Apply uniform positive pressure to ensure membrane is fully adhered and all laps are sealed. Prior to forming lap over granulated surfaces, embed granules of the receiving sheet by heating and troweling-in the granules to form a uniform black compound surface. Roll all lap areas with a weighted roller immediately after forming lap. Provide for visual bleed out of compound in lap areas. Avoid overheating the membrane or burning through to membrane reinforcement. Inspect and ensure all lap areas are fully sealed.
- I. Ensure full lap seal in all lap areas.
- J. The completed membrane application shall be free of surface abrasions, air pockets, blisters, ridges, wrinkles, buckles, kinks, fishmouths, voids, or open seams.

### 3.06 MIXING OF RESIN PRODUCTS

- A. Preparation/Mixing/Catalyzing Resin Products: Pour the desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir the liquid from the time period specified by the resin manufacturer. Calculate the amount of catalyst powder or liquid component. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before pot life expires.
- B. Preparation/Mixing/Catalyzing Aggregate-Filled Resin Products: Pour the entire desired quantity of resin into a clean container and slowly add the pre-measured quantity of aggregate using a spiral mixer or mixing paddle, stirring the mixture for the time period specified by the resin manufacturer. Calculate the amount of catalyst powder or liquid needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin/aggregate mixture. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before pot life expires.

### 3.07 PREPARATION PASTE AND PRIMER APPLICATION SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING



- A. Primer Application: Apply catalyzed primer resin using a roller or brush at the rate specified by the primer manufacturer over qualified and prepared substrates. Apply primer resin at the increased rate specified by the primer manufacturer over DensDeck Prime or other porous substrates. Do not let resin pool or pond. Do not under-apply or over-apply primers as this may interfere with proper primer catalyzation. Make allowances for waste, including saturation of roller covers and application equipment.
- B. Paste Application: Apply catalyzed preparation paste using a trowel over prepared and primed substrates. Before application of any resin product over cured paste, wipe the surface of the paste using the specified cleaner/solvent and allow to dry. Treat the surface again if not followed up by resin application within 60 minutes.

### 3.08 MEMBRANE FLASHING

- A. Apply in accordance with detailed application instructions of the roof membrane manufacturer and the minimum reference detail indications and requirements specified herein. Vertical base flashing application to be completed with the use of a flameless torch per Owner guidelines.
- B. Ensure full lap seal in all lap areas.
- C. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to cure.
- D. Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.
- E. Apply an even, generous base coat of flashing resin to prepared surfaces using a roller at the rate specified by the resin manufacturer. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin immediately following embedment of the fleece at the rate specified by the resin manufacturer, ensuring that the fleece is fully saturated. Ensure that the flashing resin is applied to extend beyond the fleece (maximum ¼"). Remove the tape before the catalyzed resin cures. Make allowances for waste, including saturation of roller covers and application equipment.
- F. Should work be interrupted for more than 12 hours or the surface of the cured resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum of 60 minutes before continuing work.

### 3.07 APPLYING ACCESSORY MATERIALS

- A. General:
  - 1. Coordinate installation of accessory materials integral with the roofing assembly.
  - 2. Conform to NRCA Roofing and Waterproofing Manual unless otherwise specified or recommended by the roofing material manufacturer.
  - 3. Review details for special installation requirements.
  - 4. Do not use any type cutback asphalt mastics under any modified bitumen products.

- B. Set-on accessories: Where pipe or conduit blocking and similar roof accessories are set on the membrane, adhere additional layer of cap sheet material or traffic pad material to bottom of premanufactured pipe/conduit stand and the underside of other set-on accessories prior to setting on roofing membrane. Specific method of installing set-on accessories must permit normal movement due to expansion, contraction, vibration, and similar occurrences without damaging roofing membrane. Do not mechanically secure set-on accessories through roofing membrane into roof deck substrate.
- C. Penetration flashing:
  - 1. For small, single element penetrations, install liquid applied flashing per manufacturer's written instructions.
    - a. Substrate to be prepped to receive liquid applied flashing.
    - b. Extend liquid flashing not less 4 inches in all directions from edges of all items being flashed and min. 8" vertically.
    - c. Embed granules, matching color of roof membrane, into wet compound.
    - d. Use of pitch pans or pitch pockets is not permitted unless specifically indicated or otherwise approved by owner.

### 3.08 INSTALLATION OF FLASHING AT SHEET METAL

- A. Metal flashing shall be coordinated by the roofer, and installed by the sheet metal trade. Review the flashing details for additional roofing installation.
- B. Metal flashings: Set primed metal flashings in a full bed of compatible modified bitumen roofing cement and securely fasten to roof deck or wood nailers. Prime flanges of metal flashing on the roof surface and strip-in with trowelings of cement and flexible flashing strips so that strip extends not less than 8 in. beyond outer edge of flange.
- C. Install metal flashings in accordance with Section 076200.

### 3.09 PROTECTION OF APPLIED ROOFING AGAINST MOISTURE ABSORPTION:

- A. At the end of the days work and whenever inclement weather is imminent, use all means required to protect applied roofing system from water intrusion or moisture exposure.
  - 1. Water Cut-offs:
    - a. The insulation line shall be straightened using loose-laid cut insulation sheets and the terminated edge of the roofing system shall be sealed watertight.
    - b. Temporary seals shall be removed prior to commencing work.
  - 2. Temporary Flashing for Permanent Roofing:
    - a. Provide temporary flashing at drain curbs, walls and other penetrations and terminations of roofing membrane until the roofing system installation is complete and the permanent flashings are applied.
    - b. Remove temporary flashing before applying permanent flashing.

3. Temporary Walkways, Runways and Platforms:
  - a. Do not permit storing, walking, wheeling and trucking directly on applied roofing materials.
  - b. Provide temporary walkways, runways and platforms of smooth clean insulation boards or planks as necessary to avoid damage to applied roofing materials and to distribute weight to avoid overloading the roof structure.
4. Use clean rubber-tired equipment for roofing work.
5. Wet or damaged materials shall be removed and replaced at no additional cost to the owner.

### 3.10 FIELD QUALITY CONTROL

- A. During progress of the work of this Section, make visual inspections as necessary, and verify that:
  1. All materials of this Section comply with the specified requirements.
  2. All materials are properly stored and handled.
  3. Membrane heating is provided uniformly for full melt and even flow of bitumen on underside of roll.
  4. The proper number and types of plies are installed, with the specified overlaps.
  5. The proper number, type, and spacing of fasteners are installed.
  6. Associated flashings and sheet metal are installed in a timely manner in accord with the specified requirements.
  7. Membrane is fully adhered without ridges, wrinkles, kinks, fishmouths, or other voids or delaminations.
  8. Insulation is properly secured to the substrate and nailers are provided where and as needed.
  9. Submit the "Roofing Contractor Production and Quality Control Report" to the owner at the end of each day's work in accordance with section 010100.

END OF SECTION

MANUFACTURER'S NOTICE OF INTENT TO ISSUE ROOF WARRANTY

Whereas \_\_\_\_\_  
herein called the "Roofing System Manufacturer" hereby gives notice to:

Owner: \_\_\_\_\_

Address: \_\_\_\_\_

of its Notice of Intent to issue its Roof Warranty, in accord with the attached pages to Owner for the Project.

Project: \_\_\_\_\_

Address: \_\_\_\_\_

incorporating the Manufacturer's \_\_\_\_\_

\_\_\_\_\_

roofing system or product is installed in accord with the Contract Documents.

By signing the above, the Authorized Representative of said Manufacturer certifies and represents that he is an Officer of the Roofing System Manufacturer with the authority to contract and make the above representations to Owner.

By: \_\_\_\_\_  
Signature of Authorized Representative / Date

SEAL

Witness: \_\_\_\_\_  
Signature / Date

END OF ATTACHMENT A

FIVE (5) YEAR APPLICATOR WARRANTY  
FOR ROOFING, FLASHING AND SHEET METAL, ROOF ACCESSORIES

Whereas \_\_\_\_\_

of (Address) \_\_\_\_\_

herein called the "Roofing Contractor", has performed the roofing, flashing, sheet metal, and roofing accessories on the following project:

Owner: \_\_\_\_\_

Address: \_\_\_\_\_

Name and Type of Building: \_\_\_\_\_

Address: \_\_\_\_\_

Area of Work: \_\_\_\_\_

Date of Acceptance: \_\_\_\_\_

Warranty Period: \_\_\_\_\_

Date of Expiration: \_\_\_\_\_

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship, to include membrane blistering, for designated Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to the terms and conditions herein set forth, that during Warranty Period it will at its own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by: a) lightning; b) windstorm; c) fire; d) failure of roofing system substrate including cracking, settlement, excessive deflection, deterioration, and decomposition. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Contractor, and until cost expense thereof has been paid by Owner or by another responsible party so designated.
2. Roofing Contractor is responsible for damage to work covered by this Warranty.
3. Owner will promptly notify Roofing Contractor of observed, known or suspected leaks, defects, and deterioration. Roofing Contractor shall guarantee to respond to all notifications within 24 hours and to make all such repairs as deemed necessary to correct said leaks and/or defects to a condition satisfactory to Owner. Repairs shall be made by workman in the employment of Roofing Contractor. Subcontracting of repair work is not permitted.

4. This Warranty is recognized to be the only warranty of Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to it in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accord with requirements for the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

BY: \_\_\_\_\_  
Signature of Authorized Representative

Subscribed and sworn to before me this \_\_\_\_\_

\_\_\_\_\_ Day of \_\_\_\_\_, 20 \_\_\_\_\_

Notary Public: \_\_\_\_

My Commission Expires: \_\_\_\_\_

## SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Formed roof-drainage sheet metal fabrications.
  2. Formed low-slope roof sheet metal fabrications.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each of the following
1. Underlayment materials.
  2. Elastomeric sealant.
  3. Butyl sealant.
- B. Shop Drawings: For sheet metal flashing and trim.
1. Include plans, elevations, sections, and attachment details.
  2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
  3. Include identification of material, thickness, weight, and finish for each item and location in Project.
  4. Include details for forming, including profiles, shapes, seams, and dimensions.
  5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  6. Include details of termination points and assemblies.
  7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
  8. Include details of roof-penetration flashing.
  9. Include details of edge conditions.
  10. Include details of special conditions.
  11. Include details of connections to adjoining work.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of coping and roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested.

- B. Sample warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Special warranty.

#### 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

#### 1.7 WARRANTY (Included in Roof Membrane Warranty)

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - a. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
- 2. Finish Warranty Period: 20 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:
  - 1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint



sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

## 2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Stainless Steel Sheet: ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.
  1. Finish: ASTM A480/A480M, No. 2D (dull, cold rolled).
- C. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance with ASTM A653/A653M, G90 (Z275) coating designation.
  1. Surface: Smooth, flat and mill phosphatized for field painting.

## 2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer in accordance with underlayment manufacturer's written instructions.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. GCP Applied Technologies Inc.
    - b. Henry Company.
  2. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F (29 deg C) or lower.
  3. Standard Testing method for linear dimensional changes of nonrigid thermoplastic sheeting or film at elevated temperature: ASTM D1204 – above 280 degrees F service temp.

## 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

- B. Fasteners: Self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
  - 2. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
  - 3. Fasteners for Steel Sheet: Series 300 stainless steel
- C. Solder:
  - 1. For Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.
  - 2. For Zinc-Coated (Galvanized) Steel: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- H. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

## 2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
  - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 2. 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.
  - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
  - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
  2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams:
1. Tin edges to be seamed, form seams, and solder.

## 2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters:
1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
  2. Fabricate in minimum 96-inch- (2400-mm-) long sections.
  3. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
- B. Downspouts: .040 Aluminum, .060 Aluminum at bottom 6', primed and painted to match the wall color.
- C. Bend Metal Plate: 16 Gauge, Galvanized Steel G90.
- D. Downspout Strap: 22 Gauge Stainless Steel, Type 304.
- E. Expansion Joint Cover: 22 Gauge Stainless Steel, Type 316.
- F. Expansion Joint Cleat: 20 Gauge Stainless Steel, Type 316.
- G. Gutter: 16 Gauge Stainless Steel, Type 316.
- H. Gutter Bracket: 1/8" x 1" Bent Stainless Steel, Type 316.

- I. Gutter Strap: 22 Gauge Stainless Steel, Type 304.
- J. Gutter Throat: 16 Gauge Stainless Steel, Type 316.
- K. Metal Cleat: 20 Gauge Stainless Steel, Type 316
- L. Metal Counter-flashing: 22 Gauge Stainless Steel, Type 316.
- M. Metal Edge: 22 Gauge Stainless Steel, Type 316.
- N. Metal Skirt Flashing: 22 Gauge Stainless Steel, Type 316.
- O. Metal Trim Flashing: 22 Gauge Stainless Steel, Type 316.
- P. One-Piece Transition Flashing: 22 Gauge Stainless Steel, Type 304.
- Q. Termination Bar: 1/8" x 1" Stainless Steel, Type 304.

## 2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long sections. Furnish with 6-inch- (150-mm-) wide, joint cover plates. Shop fabricate interior and exterior corners.
  - 1. Fabricate from the following materials:
    - a. Stainless Steel:
- B. Copings: Pre-manufactured in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections. Fabricate joint plates of same thickness as copings.
  - 1. Fabricate from the following materials: See Section 07 71 00.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF UNDERLAYMENT

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.
  - 1. Install in shingle fashion to shed water.
  - 2. Lap joints not less than 2 inches (50 mm).
- B. Self-Adhering, High-Temperature Sheet Underlayment:
  - 1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
  - 2. Prime substrate if recommended by underlayment manufacturer.
  - 3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.

4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses.
5. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller.
6. Roll laps and edges with roller.
7. Cover underlayment within 14 days.

### 3.2 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
  1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder and sealant.
  3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
  4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
  5. Install continuous cleats with fasteners spaced not more than 12 inches (300 mm) o.c.
  6. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
  7. Do not field cut sheet metal flashing and trim by torch.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
  1. Coat concealed side of stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
  1. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
  2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated.
    - a. Form joints to completely conceal sealant.
    - b. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way.
    - c. Adjust setting proportionately for installation at higher ambient temperatures.
      - 1) 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 Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.
1. Pretin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pretinning where pretinned surface would show in completed Work.
  2. Do not use torches for soldering.
  3. Heat surfaces to receive solder, and flow solder into joint.
    - a. Fill joint completely.
    - b. Completely remove flux and spatter from exposed surfaces.
  4. Stainless Steel Soldering:
    - a. Tin edges of uncoated sheets, using solder for stainless steel and acid flux.
    - b. Promptly remove acid-flux residue from metal after tinning and soldering.
    - c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

### 3.3 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters:
1. Join sections with riveted and soldered joints.
  2. Provide for thermal expansion.
  3. Attach gutters at eave or fascia to firmly anchor them in position.
  4. Provide soldered end closures.
  5. Slope to downspouts.
  6. Install gutter with expansion joints at locations indicated on Drawings, but not exceeding, 40 feet (15.2 m) apart. Install expansion-joint caps.

### 3.4 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.
  - 1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
  - 2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing:
  - 1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
  - 2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.
- C. Copings: See Section 07 71 00.

### 3.5 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

### 3.6 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

### 3.7 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. 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, as determined by Architect.

END OF SECTION 07 62 00

## SECTION 07 72 00 - ROOF ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Roof hatches.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
- B. Shop Drawings: For roof accessories.
- C. Samples: For each exposed product and for each color and texture specified.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer: A minimum of 5 years experience manufacturing similar products.
- B. Installer: A minimum of 2 years experience installing similar products.
- C. Manufacture's Quality System: Registered to ISO 9001:2008 Quality Standards including in-house engineering for product design activities.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and not such damage on the carrier's freight bill of lading.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.



## 1.7 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.
- B. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

## PART 2 - PRODUCTS

### 2.1 ROOF HATCH

- A. Roof Hatch: Furnish and install pre-assembled roof hatch where indicated on plans for metal roof hatch.
  - 1. Basis of Design: The Bilco Company: Type S Roof Hatch
    - a. Size: 36" x 30"
    - b. Single Leaf
    - c. Live Load: 40 PSF
    - d. Max Deflection: 1/150<sup>th</sup> the span
    - e. Wind Uplift: 70 PSF
    - f. Material: Aluminum.
    - g. Finishes: Factory finish shall be milled finish aluminum.
    - h. Hardware
      - 1) Material: Stainless Steel
      - 2) Heavy pintle hinges shall be provided
      - 3) Cover shall be equipped with a spring latch with interior and exterior turn handles
      - 4) Roof hatch shall be equipped with interior and exterior padlock hasps.
      - 5) The latch strike shall be a stamped component bolted to the curb assembly.
      - 6) Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" (25mm) diameter red vinyl grip handle to permit easy release for closing.
      - 7) Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed. [For installation in highly corrosive environments or when prolonged exposure to hot water or steam is anticipated, specify Type 316 stainless steel hardware].
      - 8) Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
    - i. Cover: Shall be [select: 14 gauge (1.9mm) paint bond G-90 galvanized steel or 11 gauge (2.3mm) aluminum] with a 3" (76mm) beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
    - j. Cover insulation: Shall be fiberglass of 1" (25mm) thickness, fully covered and protected by a metal liner [select: 22 gauge (.8mm) paint bond G-90 galvanized steel or 18 gauge (1mm) aluminum].

- k. Curb: Shall be 12" (305mm) in height and of [select: 14 gauge (1.9mm) paint bond G-90 galvanized steel or 11 gauge (2.3mm) aluminum]. The curb shall be formed with a 3-1/2" (89mm) flange with 7/16" (11.1mm) holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6" (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.
- l. Curb insulation: Shall be rigid, high-density fiberboard of 1" (25mm) thickness on outside of curb.
- m. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe for aluminum construction: welded to the curb assembly.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
  - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
  - 1. Test units for proper function and adjust until proper operation is achieved.
  - 2. Repair finishes damaged during installation.
  - 3. Restore finishes so no evidence remains of corrective work.
- C. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Coat concealed side of stainless steel roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
- D. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

#### 3.3 REPAIR AND CLEANING

- A. Clean exposed surfaces according to manufacturer's written instructions.

- B. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 72 00

## SECTION 07 92 00 - JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Butyl joint sealants.

#### 1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- ##### A. Product Data: For each joint-sealant product.

- ##### B. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

#### 1.4 INFORMATIONAL SUBMITTALS

- ##### A. Product test reports.
- ##### B. Preconstruction laboratory test reports.
- ##### C. Preconstruction field-adhesion-test reports.
- ##### D. Field-adhesion-test reports.
- ##### E. Sample warranties.

#### 1.5 PRECONSTRUCTION TESTING

- ##### A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint

Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

## 1.6 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: five years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 JOINT SEALANTS, GENERAL

- A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### 2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dow Corning Corporation.
    - b. Pecora Corporation.
    - c. Sika Corporation; Joint Sealants.

### 2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Pecora Corporation.

- b. Sika Corporation; Joint Sealants.
- c. Tremco Incorporated.

#### 2.4 SOLVENT-RELEASE-CURING JOINT SEALANTS (Butyl)

- A. Butyl-Rubber-Based Joint Sealant: ASTM C 1311
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.; Chem-Calk 300.
    - b. Pecora Corporation; BC-158.
    - c. Tremco Incorporated; Tremco Butyl Sealant.

#### 2.5 JOINT-SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Adfast.
    - b. Alcot Plastics Ltd.
    - c. BASF Corporation.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

#### 2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove laitance and form-release agents from concrete.
  2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

### 3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
  2. Completely fill recesses in each joint configuration.
  3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
1. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

### 3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
    - a. Perform one test for each 1000 feet (300 m) of joint length thereafter or one test per each floor per elevation.
  2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

END OF SECTION 07 92 00



## SECTION 09 91 23 - INTERIOR PAINTING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
  - 1. Gypsum board.

#### 1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

#### 1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
  - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
  - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
  - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Benjamin Moore & Co.
  2. Glidden Professional.
  3. PPG Architectural Coatings.
  4. Or BayCare selected local manufacturer
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

### 2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
  1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: Selected from the full range of Manufacture's colors.
  1. Ten percent of surface area will be painted with deep tones.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. Fiber-Cement Board: 12 percent.
  - 3. Masonry (Clay and CMUs): 12 percent.
  - 4. Wood: 15 percent.
  - 5. Gypsum Board: 12 percent.
  - 6. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 INTERIOR PAINTING SCHEDULE

A. Gypsum Board Substrates:

1. Latex over Latex Sealer System MPI INT 9.2A:
  - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
  - b. Intermediate Coat: Latex, interior, matching topcoat.
  - c. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54.

END OF SECTION 099123

## SECTION 13 10 00 - LIGHTNING PROTECTION

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Provide all labor, materials, necessary equipment and services to complete the Lightning Protection System work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS". The existing lightning protection system will be temporarily removed and reinstalled. All deteriorated and damaged components will be replaced. All new and existing components must comply with the General, Products, and Execution requirements of this specification section. Where the existing lightning protection does not exist, install a new lightning protection system and tie in with the existing lightning protection system.
- B. The system: installed by a Lightning Protection Contractor actively engaged in the installation of Underwriters' Master Label lightning protection systems or LPI-IP Certified Lightning Protection Systems and be so listed by the LPI or UL.
- C. The system, as installed: comply with the latest issue of the "Installation Requirements for a UL Master Labeled Lightning Protection System or an LPI-IP Master Certification.
- D. Lightning Protection Contractor: Upon completion of this work, deliver to the Owner, the Master Label issued by Under-writers' Lab, Inc. or an LPI Master Certification issued by the LPI-IP Inspection Program.

#### 1.2 SUBMITTALS

- A. Conform under provisions of Section 01300, "Submittal Procedures"
- B. Submit complete shop drawings showing the type, size, and locations of all equipment, grounds and cable routings for approval prior to start of work.
- C. Certification: secure and deliver a U.L. Master Label or an LPI Master Certification from the LPI-IP upon completion of the installation.
- D. Record of actual location of all terminals, grounding electrodes, bonding connections, and routing of system conductors in Project Record Documents.

#### 1.3 QUALITY ASSURANCE

- A. Conform under provisions of Section 01430, "Quality Assurance".
- B. The Lightning Protection Contractor: submit to the Project Consultant all evidence to establish that materials are manufactured, furnished and recommended for their intended use by a reputable lightning protection manufacturer who is a Manufacturer

Member of the Lightning Protection Inst. All materials used in this installation will bear the inspection label of Underwriters' Lab., Inc.

- C. The installation: accomplished by an experienced installer listed with Underwriter's Lab., as qualified and who is also a Certified Master Installer of the Lightning Protection Institute. The installer shall be authorized by the manufacturer with a minimum of 3 years documented experience.

#### 1.4 REGULATORY REQUIREMENTS

- A. Conform under provisions of Section 01410, "Regulatory Requirements".
- B. Conform under provisions of Lightning Protection Institute Installation Code LPI-175.
- C. Conform under provisions of NFPA 780.
- D. Conform under provisions of U.L. Master Label Code 96A.
- E. Conform under provisions of UL 96 – Lightning Protection Code
- F. Conform under provisions of LPI-176 Lightning Protection System Material and Components Standard.
- G. Conform under LPI-177 Inspection Guide for LPI Certified Systems.
- H. National Electrical Code latest adopted edition by the Florida Building Code.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Thompson Lightning Protection, Inc.
- B. East Coast Lightning Equipment
- C. ERICO (ERITECH) International Corp.
- D. Harger Lightning Protection, Inc.

#### 2.2 MATERIALS

- A. In addition to conformance to U.L. 96 Materials Standard, the system furnished under this specification shall be the standard product of a manufacturer regularly engaged in the production of lightning protection equipment and a member of LPI. Equipment shall be the manufacturer's latest approved design of construction to suit the application where it is to be used in accordance with accepted industry standards

and with NFPA, LPI, and UL requirements. Material should also be the type listed below:

1. Aluminum Lightning Protection System:
  - I. Main Roof Conductors: Aluminum, Class 1, UL Labeled 24 strands, 14 gage minimum, 102 lbs. /1000 feet, 98,640 CM.
  - II. Down Conductors: Electrical grade copper (only) with 29 strands, 17 gage minimum.
  - III. Air terminals: Aluminum not less than ½ inch diameter blunt type air terminals, at least 10 inches high but no more than 36 inches. If over 24 inches high, air terminals shall be suitably braced.
  - IV. Ground Rods: Copper clad steel, not less than ¾-inch diameter by 10 foot long.
  - V. Provide adjustable hinged connector to provide vertical positioning of air terminal on roof slope.
  - VI. Provide miscellaneous bolts, nuts and screws of brass, bronze or stainless steel. Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space under provisions of U.L. code requirements.
  - VII. Provide bonding devices, cable splicers and miscellaneous connectors of cast bronze with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable.
  - VIII. Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space under provisions of U.L. code requirements. Aluminum adhesive type cable holder. Secure in place with an application of M-1 structural sealant.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Installation:
  1. Comply with LPI Code 175, NFPA 780, UL 96A.
  2. Made by or under the supervision of an LPI Certified Master Installer.
- B. All points: Within 2 feet of outside building edge.
  1. Maximum spacing: Do not exceed 20 feet
  2. Minimum projection above object protected: Not less than 10 inches.

- C. Connect lightning protection cables to all metallic projections above roof. Support all exposed cable at 3 feet on center.
- D. Aluminum shall not be used underground, in contact with ground or where air may be laden with corrosive elements, such as ocean air.
- E. When an aluminum system is joined with copper or copper-clad grounds, the union shall be made with approved bimetal connectors.
- F. Precautions be taken at connections with dissimilar metals.
- G. Aluminum shall not be used for down leads or connection to the grounding system.
- H. Down conductors, which are continuations of roof conductors shall be of copper material only.
- I. Aluminum should never be used where it will come in contact with white wash, calcium, alkali-based paint, embedded in concrete or masonry, or installed in a location subject to excessive moisture.
- J. Aluminum should never be placed where leaves or moisture will collect and remain for a long period of time.
- K. Maintain horizontal or downward coursing of main conductor and insure that all bends have at least an 8 inches radius and do not exceed 90 degrees. Down conductors for both copper and aluminum lightning protection systems shall be sleeved copper with approved connectors.
- L. Provide through roof connectors with solid rods or conduit through pitch pockets. Provide ground drops in 1-1/4 inch plastic pipe with supports every second floor and connect to ground rods.
- M. Ground electrodes: no less than 1 foot below grade and 2 feet from foundation wall. Make thermoweld connections between ground rods and connecting conductors.
- N. Interconnect lightning protection ground to electric and other building ground systems as shown or as required by U.L. and LPI Codes.
- O. Bond to water service and other piping systems as shown or as required by U.L. and LPI Codes.
- P. Secure and deliver a U.L. Master Label or an LPI Master Certification from the LPI-IP inspection program to the Owner upon completion of the installation.
- Q. Install conductors and complementary parts in a concealed system so completed work is unobtrusive and does not detract from appearance.
- R. The roofing contractor will be responsible for sealing and flashing all lightning protection roof penetrations as per the roof manufacturer's recommendations. The



lightning protection roof penetrations and/or method of conductor attachment should be addressed in the roofing section of the specifications.

- S. LPI Certification or the UL Certification requires inspection by their third-party field staff and owners representatives at various stages of the installation and after completion of the installation. Upon completion of the lightning protection installation, the installing contractor shall provide to the owner an as-built drawing of the system, along with the LPI or UL Certificates of completion.

### 3.2 AIR TERMINALS

- A. Locate required number of air terminals no less than 10 inches high at no more than 20-foot intervals as indicated on drawings.

### 3.3 GROUNDS

- A. Connect each down conductor to a suitable, properly located ground as determined by soil conditions encountered.
- B. Provide hand hole at all ground rod terminations for future testing and inspection.
- C. Grounding shall comply with NEC (2011) 250.106.

### 3.4 CONDUCTORS

- A. Interconnect conductors to provide at least two (2) electric paths to ground. Avoid an upward direction for lateral conductors interconnecting air terminals. Turn conductors with a radius of at least 8 inches at an included angle not more acute than a right angle. Space down conductors around buildings periphery as evenly as permitted. Conceal down conductors from air terminals to grounds within the reinforced concrete columns. Bond all reinforcing steel within the columns and within a radius no less than 6 feet from the columns to the down conductor.

### 3.5 FASTENERS

- A. Place fasteners amply strong for rigid, permanent support no more than 3 feet on center of vertical on down conductors and horizontal conductors.
- B. Air terminals shall be adhered to all mechanical roof top mounted equipment using M-1 Structural Sealant or approved equal.

### 3.6 CONDUCTOR GUARDS

- A. Protect exposed down conductors to 8 feet above ground with schedule 80 PVC, copper or brass pipe firmly fixed to masonry. Connect top of metal guard electrically to conductor.

### 3.7 GROUNDING METAL ELEMENTS

- A. Bond into protection system all metal caps, breechings, or other metal masses that are a permanent part of the construction, as required by Underwriters' Lab. Code.

### 3.8 GROUNDING OF METAL ELEMENTS

- A. Interconnect and ground to the conductor system all metal ventilators, bent stacks, pipes, roofing or siding, spandrels, ridge rolls, valleys, crickets, eaves, troughs, down-spouts, ducts, clothes chutes, cold water supply piping, and any other metallic object or surface of a size presenting a capacitance hazard. Protection telephone lines, electric service, radio, television or other masts or wires entering the building by establishing a common ground and use of a proper lightning arrester.

### 3.9 METAL USED

- A. All conductor materials: braided copper conductors, copper clad steel conductors or aluminum for roof conductors only (refer to section 2.2.A.2).
- B. Aluminum conductors will be allowed on the roof top only with copper down conductors. Provide proper bimetal fittings as needed for every transition.
- C. Metal flashing will not be allowed to be a substitute for secondary conductors.

### 3.10 COORDINATION WITH OTHER TRADES

- A. Lightning Protection Contractor: coordinate the placement of his work with the General Contractor and Electrical Contractor.

### 3.11 BONDING

- A. It is the responsibility of the lightning protection installer to assure a sound bond to the main water service and to assure interconnection with other building ground systems, including both telephone and electrical and also to insure that proper arresters have been installed on the power service.

END OF SECTION