

REROOFING  
BANK OF AMERICA BUILDING  
LEON COUNTY, FLORIDA

FOR  
LEON COUNTY BOARD OF COUNTY  
COMMISSIONERS

TECHNICAL SPECIFICATIONS MANUAL

September 16, 2013



REROOFING  
BANK OF AMERICA BUILDING  
LEON COUNTY, FLORIDA

TECHNICAL SPECIFICATIONS

NONTECHNICAL SPECIFICATIONS – TO BE PROVIDED BY LEON COUNTY

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## SECTION 01010 - SUMMARY OF THE WORK

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### PROJECT/WORK IDENTIFICATION:

General: Project name, architect, and consultant are as shown on the Contract Documents.

Contract Documents Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

Existing site conditions and restrictions on use of the site.

Summary of References: Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, Specification Sections, Drawings, addenda and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

Abbreviated Written Summary: Briefly and without force and effect upon the contract documents, the work of the Contract can be summarized as follows:

The work includes reroofing of the Bank of America Building, Leon County, Florida

Reroofing work at the Bank of America Building includes removing and disposing of the existing roofing systems down to the structural concrete deck; installing new roof drains as required, installing a temporary membrane / vapor barrier, tapered rigid isocyanurate insulation and high density coverboard, interply and mineral surface two ply modified bitumen membrane roofing and flashing systems. The work also includes installation of a metal coping around the perimeter parapet wall, counterflashing around the penthouse and coating the existing penthouse exterior walls with elastomeric coating. Roofing manufacturer is to provide specified 25 year warranty, with non-prorated, no penal sum, and no dollar limit warranty to include the roof system. Install complete lightning protection system and provide UL Masters label.

Alternate 1: Includes installing lightweight insulating concrete system on the Main Roof "B" in lieu of tapered isocyanurate rigid board insulation system.

#### CONTRACTOR USE OF PREMISES:

General: The Contractor shall limit his use of the premises to the work indicated, so as to allow for full Owner occupancy and use by the public.

Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.

Keep existing driveways and entrances serving the premises clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas agreed upon. If additional storage is necessary obtain and pay for such storage off site.

Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

#### IDENTIFICATION OF CONTRACTOR'S EMPLOYEES:

All employees of the Contractor, Subcontractors, Sub-Subcontractors and other personnel on the project site shall wear an identifiable company work shirt or have a laminated badge with the following information:

Worker's name.

Employer's name.

Company shirt or identification badge shall be worn and visible at all times when on the project site.

#### OWNER OCCUPANCY:

Owner Occupancy: Cooperate fully with the Owner or his representative during construction operations to minimize conflicts, maintain safe conditions and to facilitate Owner usage. Perform the work so as not to interfere with the Owner's operations.

#### ALTERATIONS AND COORDINATION:

General: The work of this Contract includes coordination of the work activities of this project, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through the end of this project.

All work shall comply with the 2010 Florida Building Code.

#### MISCELLANEOUS PROVISIONS:

##### Mechanical/Electrical Requirements of General Work:

General: Except as otherwise indicated, comply with applicable requirements of the Standard Plumbing Code and Standard Mechanical Code (Division 2-14) Work. Except as otherwise indicated, comply with applicable requirements of the National Electrical Codes for electrical provisions within units of general (Division 2-14) Work.

Performance Requirements for Completed Work:

General: The Contract Documents indicated the intended scope of work and future utilization of the building and its individual systems and facilities, where applicable to the scope of work. Compliance with governing regulations is intended and required for the work and for the Owner's occupancy and utilization.

END OF SECTION 01010

## SECTION 01012 - MATERIALS AND EQUIPMENT

### GENERAL:

### STANDARDS:

Reference to standards, codes specifications, recommendations and regulations: refer to the latest edition of printing in effect at the date of issue shown in the Documents, unless other date is implied by the suffix number of the standard.

Applicable portions of the standards listed that are not in conflict with the Contract Documents shall be constructed as Specifications for this work.

Specified variations from the standards listed shall be constructed as amendments and the unaltered portions of the Standards shall remain in full effect.

In cases of discrepancies or variations between the listed Standards, the more stringent requirements shall govern.

Keep at the site not less than one copy, in good condition, of the standards specifically indicated as the methods for applying, installing, connecting and erecting. Inform involved personnel as to the requirements and availability of the standards.

### DELIVERY AND STORAGE:

Schedule deliveries and unloading to prevent traffic congestion, blocking of access and interference with work. Arrange deliveries to avoid larger accumulations than can be suitably stored at site.

Pack and handle material to prevent damage during loading, delivering and storing.

Deliver packaged materials to site in manufacturer's original, unopened, labeled containers. Do not open containers until approximate time for use.

Store materials at locations that will not interfere with progress of work. Arrange locations of storage areas in approximate order of intended use.

Do not store materials on the roof.

Store materials in a manner that will prevent damage to materials or structure, and that will prevent injury to persons.

STORING AREAS:

The Owner will make available limited storage areas on the building site. At the start of the operation, make arrangements with the Owner's representative for the assignment of the areas. During construction maintain the areas in a neat condition.

Parking of private cars is not permitted on the property of the Owner. Notify employees and Subcontractors of this requirement at the beginning of work.

MANUFACTURER'S DIRECTIONS:

Prepare and apply products and materials according to the recommendations of the manufacturer when such recommendations are not in conflict with the Contract Documents.

Furnish to the Architect copies of the manufacturer's recommendations. Secure approval of recommendations before proceeding with work.

Keep at site not less than one copy, in good condition, of manufacturer's recommendations or directions pertaining to work at the site and MSDS sheets on all products and materials being used. Inform involved personnel of requirements and availability of manufacturer's recommendations.

END OF SECTION 01012

## SECTION 01040 - PROJECT COORDINATION

### PART 1 - GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

- Coordination.
- Administrative and supervisory personnel.
- General installation provisions.
- Cleaning and protection.

Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

#### COORDINATION AND MEETINGS

General: Prepare a written memorandum on required coordination activities. Include such items as required notices, reports and attendance at meetings. Distribute this memorandum to each entity performing work at the project site.

Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

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.

Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

Make adequate provisions to accommodate items scheduled for later installation.

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.

Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

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:

- Preparation of schedules.
- Delivery and processing of submittals.
- Progress meetings.
- Project Closeout activities.

Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

Salvage materials and equipment involved in performance of, but not actually incorporated in, the work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

## SUBMITTALS

Schedule/Coordination Drawings: Prepare and submit schedule coordination Drawings.

Staff Names: Within 15 days of Notice to Proceed, 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.

PART 2 - PRODUCTS (Not Applicable).

## PART 3 - EXECUTION

### GENERAL INSTALLATION PROVISIONS

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.

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.

Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

Recheck measurements and dimensions, before starting each installation.

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.

Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

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 for final decision.

#### CLEANING AND PROTECTION

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.

Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

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.

END OF SECTION 01040

## SECTION 01300 - SUBMITTALS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 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 and drawings.
  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. Special prequalification requirements.
  2. Applications for payment.
  3. Performance and payment bonds.
  4. Insurance certificates.
  5. List of Subcontractors.
- C. Inspection and test reports are included in Section "Quality Control Services."

#### 1.3 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.
  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.
- 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. Project name, and building reference.
  2. Date.
  3. Name and address of Architect.
  4. Name and address of Contractor.
  5. Name and address of subcontractor.
  6. Name and address of supplier.
  7. Name of manufacturer.
  8. Number and title of appropriate Specification Section.
  9. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. 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 limitations. Include Contractor's certification that information complies with Contract Document requirements.

#### 1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar- chart type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".
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, or series of sheets, of 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 requests 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. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.

- C. 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.
- D. 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 of the dates used for preparation of payment requests.
- E. 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 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.
- F. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

#### 1.5 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.

#### 1.6 DAILY CONSTRUCTION REPORTS

- A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Architect at weekly intervals:
  - 1. Work completed this date
  - 2. Area of work (graphically indicate on reduced plaza deck drawing sheet attached this section).
  - 3. Products used, number of gallons, square feet covered, coverage rate, etc.
  - 4. Approximate count of personnel at the site.
  - 5. High and low temperatures, humidity, general weather conditions.
  - 6. Accidents and unusual events.
  - 7. Meetings and significant decisions.
  - 8. Stoppages, delays, shortages, losses.
  - 9. Emergency procedures.
  - 10. Orders and requests of governing/inspecting authorities.
  - 11. Change Orders received, implemented.
  - 12. Field tests and inspections. Meter readings and similar recordings.
  - 13. Partial Completions.
  - 14. Substantial Completions authorized.

## 1.7 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, and performance curves.
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.
  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 a minimum of five (5) copies of each required submittal. The Architect will retain three, and will return the others 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.
  6. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
  7. Do not permit use of unmarked copies of Product Data in connection with construction.

## 1.8 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. 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.

3. 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. Submittals: Submit three (3) sets; one will be returned marked with the action taken.
1. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
  2. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
  3. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- C. 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.
1. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

#### 1.9 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect 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 will stamp each submittal with a uniform, self-explanatory action stamp.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01300

## SECTION 01400 - QUALITY CONTROL SERVICES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 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 installation procedures.
  - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as installation procedures.
  - 2. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate 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.

#### 1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by material manufacturing except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those specified to be performed by an independent agency provided by the Contractor. Costs for these services shall be included in the Contract Sum.
  - 1. The Contractor shall employ and pay an independent agency, to perform specified quality control services.
  - 2. The Owner may engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.

3. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
  4. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
  5. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
  6. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
    7. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
    8. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
    9. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
    10. Security and protection of samples and test equipment at the Project site.
- B. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid, where possible, the necessity of removing and replacing construction to accommodate inspections and tests.

#### 1.4 SUBMITTALS

- A. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the inspection, test, or similar service, submit a certified written report of each inspection, test or similar service to the Architect and Owner's Representative, in duplicate.
1. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
    - a. Date of issue.
    - b. Project title and number.
    - c. Name, address and telephone number of testing agency.
    - d. Dates and locations/areas of samples and tests or inspections.
    - e. Names of individuals making the inspection or test.
    - f. Designation of the Work and test method.
    - g. Identification of product/material, quantity and Specification Section.
    - h. Complete inspection or test data.

- i. Test results and an interpretations of test results.
- j. Ambient conditions at the time of sample-taking and testing.
- k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
- l. Name and signature of inspector.
- m. Recommendations on retesting, if applicable.

## 1.5 QUALITY ASSURANCE

- A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
  - 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 2 - PRODUCTS (Not Applicable).

## PART 3 - EXECUTION

### 3.1 REPAIR AND PROTECTION

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

END OF SECTION 01400

SECTION 03521 - LIGHTWEIGHT INSULATING CONCRETE – PART OF ALTERNATE ONE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes cast-in-place cellular-type lightweight insulating concrete for roof decks.
- B. Related Sections include the following:
  - 1. Division 7 Section "SBS Modified Bituminous Membrane Roofing" for roofing and flashing membrane.

1.3 DEFINITIONS

- A. Lightweight Insulating Concrete: Low-density concrete, with an oven-dry unit weight not exceeding 50 lb/cu. ft. (800 kg/cu. m), placed with or without embedded rigid insulation board.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include mixing and application instructions for each type of lightweight insulating concrete.
- B. Shop Drawings: Include plans, sections, and details showing roof slopes, lightweight insulating concrete thicknesses, embedded insulation board, roof penetrations, roof perimeter terminations and curbs, control and expansion joints, and roof drains.
- C. Design Mixtures: For each lightweight insulating concrete mix.
- D. Qualification Data: For installer and testing agency.
- E. Material Test Reports: For lightweight aggregates, from a qualified testing agency, indicating compliance with requirements.
- F. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Foaming agents.
  - 3. Admixtures.
  - 4. Molded-polystyrene insulation board.

- G. Field quality-control test reports.
- H. Research/Evaluation Reports: For lightweight insulating concrete.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that is approved by lightweight insulating concrete manufacturer.
- B. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Fire-Test-Response Characteristics: Where lightweight insulating concrete is part of a fire-resistance-rated roof-deck assembly, provide lightweight insulating concrete identical to that used in assemblies tested for fire resistance per ASTM E 119 by a testing agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory," from ITS's "Directory of Listed Products," or from the listings of another testing and inspecting agency.
- D. FMG Listing: Provide lightweight insulating concrete evaluated by FMG as part of a roof assembly and listed in FMG's "Approval Guide" for Class 1 fire and noncombustible rating.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original undamaged packages or acceptable bulk containers.
- B. Store packaged materials to protect them from elements or physical damage.
- C. Do not use cement that shows indications of moisture damage, caking, or other deterioration.

## 1.7 PROJECT CONDITIONS

- A. Do not place lightweight insulating concrete unless ambient temperature is 40 deg F (4.4 deg C) and rising.
  - 1. When air temperature has fallen or is expected to fall below 40 deg F (4.4 deg C), heat water to a maximum 120 deg F (49 deg C) before mixing so lightweight insulating concrete, at point of placement, reaches a temperature of 50 deg F (10 deg C) minimum and 80 deg F (27 deg C) maximum.
- B. Do not place lightweight insulating concrete during rain or snow or on surfaces covered with standing water, snow, or ice.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cementitious Material: Portland cement, ASTM C 150, Type I/II.
- B. Foaming Agent: ASTM C 869.
- C. Water: Clean, potable.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Joint Filler: ASTM C 612, Class 2, glass-fiber type; compressing to one-half thickness under a load of 25 psi (172 kPa).
- F. Molded-Polystyrene Insulation Board: ASTM C 578, Type I, 0.90-lb/cu. ft. (14.4-kg/cu. m) minimum density.
  - 1. Provide units with keying slots of approximately 3 percent of board's gross surface area.

### 2.2 DESIGN MIXTURES

- A. Prepare design mixtures for each type and strength of lightweight insulating concrete by laboratory trial batch method or by field-test data method. For trial batch method, use a qualified independent testing agency for preparing and reporting proposed mixture designs.
  - 1. Limit use of fly ash to not exceed 25 percent of Portland cement by weight.
- B. Limit water-soluble chloride ions to the maximum percentage by weight of cement or cementitious material permitted by ACI 301.

### 2.3 CELLULAR LIGHTWEIGHT INSULATING CONCRETE

- A. Produce cellular lightweight insulating concrete with the following minimum physical properties using cementitious materials, air-producing liquid-foaming agents, and the minimum amount of water necessary to produce a workable mix.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Celcore Incorporated.
    - b. Concrecel USA, Inc.
    - c. Elastizell Corporation of America.
    - d. Lite-Crete Inc.
    - e. Siplast.

3. As-Cast Unit Weight: 36 to 42 lb/cu. ft. (578 to 673 kg/cu. m) at point of placement, when tested according to ASTM C 138/C 138M.
4. Oven-Dry Unit Weight: 26 to 32 lb/cu. ft. (416 to 513 kg/cu. m), when tested according to ASTM C 495.
5. Compressive Strength: Minimum 300 psi (2070 kPa), when tested according to ASTM C 495.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Control Joints: Install control joints at perimeter of roof deck and at junctures with vertical surfaces, including curbs, walls, and vents, for full depth of lightweight insulating concrete. Fill control joints with joint filler.
  1. Provide 1-inch- (25-mm-) wide control joints for roof dimensions up to 100 feet (30 m) in length; 1-1/2-inch- (38-mm-) wide control joints for roof dimensions exceeding 100 feet (30 m).
- B. Observation Port: Install  $\pm 30''$  vertical PVC pipe anchored above the concrete deck at low area of temporary membrane to monitor water on roofing system.
- C. Raise all existing mechanical curbs and VTRs to remain, install new curbs, perimeter nailers, and blocking.
- D. Plug/seal roof drains: Temporarily plug stop roof drains during lightweight concrete installation and 24 hour cure.

### 3.2 MIXING AND PLACING

- A. Mix and place lightweight insulating concrete according to manufacturer's written instructions, using equipment and procedures to avoid segregation of mixture and loss of air content.
- B. Install insulation board according to lightweight insulating concrete manufacturer's written instructions. Place insulation board in wet, lightweight insulating concrete slurry poured a minimum of 1/8 inch (3 mm) over the structural substrate. Ensure full contact of insulation board with slurry. Stagger joints and tightly butt insulation boards.
  1. Install insulation board in a stair-step configuration with a maximum step-down of 1 inch (25 mm).
- C. Deposit and screed lightweight insulating concrete in a continuous operation until an entire panel or section of roof area is completed. Do not vibrate or work mix except for screeding or floating. Place to depths and slopes indicated.
- D. Finish top surface smooth, free of ridges and depressions, and maintain surface in condition to receive subsequent roofing system.

- E. Begin curing operations immediately after placement, and air cure for not less than three days according to manufacturer's written instructions.
- F. If ambient temperature falls below 32 deg F (0 deg C), protect lightweight insulating concrete from freezing and maintain temperature recommended by manufacturer for 72 hours after placement.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform field tests and inspections, and prepare test reports.
- B. Testing of samples of lightweight insulating concrete obtained according to ASTM C 172, except as modified by ASTM C 495, shall be performed according to the following requirements:
  - 1. Determine as-cast unit weight during each hour of placement, according to ASTM C 138/C 138M.
  - 2. Determine oven-dry unit weight and compressive strength according to ASTM C 495. Make a set of at least 6 molds for each day's placement, but not less than 1 set of molds for each 5000 sq. ft. (465 sq. m) of roof area.
  - 3. Perform additional tests when test results indicate as-cast unit weight, oven-dry unit weight, compressive strength, or other requirements have not been met.
    - a. Retest cast-in-place lightweight insulating concrete according to ASTM C 513 for oven-dry unit weight and compressive strength.

### 3.4 DEFECTIVE WORK

- A. Refinish, or remove and replace, lightweight insulating concrete if surfaces pond more than 3/8" water or are excessively scaled or too rough to receive roofing according to roofing membrane manufacturer's written requirements.
- B. Remove and replace lightweight insulating concrete that fails to comply with requirements.

END OF SECTION 03521

## SECTION 05500 - METAL FABRICATIONS AND WELDING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  1. Support angles and clips for steel equipment stands.
  2. Steel pipe for pipe stand legs and support.
  3. Steel shelf angle and bearing plates for masonry.
  4. Steel stairs and rails
  5. Equipment curbs and support.

#### 1.3 SUBMITTALS

- A. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1. Provide templates for anchors and bolts specified for installation under other Sections.

- B. Welding Certificates: Copies of certificates for welding procedures and personnel.

#### 1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to the following:
  1. AWS D1.1, "Structural Welding Code--Steel."
  2. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

#### 1.5 PROJECT CONDITIONS

- A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication.

### PART 2 - PRODUCTS

#### 2.1 METALS, GENERAL

- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

## 2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
- C. Galvanized steel sheet: ASTM A 446, of grade required for design loading, coating designation G90 or as indicated.
- D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

## 2.3 PAINT

- A. Shop Primers: Provide primers that comply with Division 9 Section "Painting."
- B. Shop Primer for Ferrous Metal: Organic, lead- and chromate- free, zinc-rich primer, complying with SSPC-Paint 20 and compatible with topcoat.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. Carboline 621; Carboline Company.
    - b. Aquapon Zinc-Rich Primer 97-670; PPG Industries, Inc.
    - c. Tneme-Zinc 90-97; Tnemec Company, Inc.

## 2.4 FASTENERS

- A. Fasteners: Provide bolts, nuts, lag bolts, machine screws, wood screws, toggle bolts, masonry anchorage devices, lock washers as required for application indicated and complying with applicable Federal standards. Hot dip galvanized fasteners for exterior applications to comply with ASTM A 153.
- B. Bolts and Nuts: Regular hexagon-head, high strength bolts, ASTM A 325-N; with hex nuts, and where indicated, flat washers.

## 2.5 FABRICATION, GENERAL

- A. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

- B. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- C. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- D. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects.
  1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- E. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- F. Remove sharp or rough areas on exposed traffic surfaces.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

## 2.6 LOOSE BEARING AND LEVELING PLATES

- A. Provide bearing and leveling plates for steel deck bearing on steel structure. Drill plates to receive anchor bolts.

## 2.7 MISCELLANEOUS SUPPORTS

- A. General: Provide steel supports that are not a part of structural-steel framework as necessary to complete the Work.
- B. General: Provide steel supports indicated and as necessary to complete the Work.
- C. Fabricate units from structural-steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

## 2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

## 2.9 STEEL AND IRON FINISHES

- A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:
  - 1. Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- B. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

### 3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

### 3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section "Painting."

END OF SECTION 05500

## SECTION 07552 - SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. SBS-modified bituminous membrane roofing and flashing system with granule surface modified bitumen cap sheet for torched and cold adhesive application.
  - 2. Vapor retarder/temporary membrane.
  - 3. Roof insulation and coverboard.
- B. Related Sections include the following:
  - 1. Division 6 Section "Rough Carpentry" for wood nailers, cants, curbs, and blocking.
  - 2. Division 7 Section "Sheet Metal Flashing" for metal roof penetration flashings, flashings, and counterflashings
  - 3. Division 7 Section "Roofing Accessories" for roof drains, pipe supports, and specialty flashing assemblies.

#### 1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," before multiplication by a safety factor.
- C. Factored Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," after multiplication by a safety factor.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

- C. Roofing System Design: Provide a roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist 110 mph wind uplift pressure calculated according to ASCE 7.
- D. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
  - 1. Fire/Windstorm Classification: Class 1A 110
  - 2. Hail Resistance: MH

## 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
  - 1. Base flashings, cants, and membrane terminations.
  - 2. Tapered insulation system layout, indicate slopes and average R-value.
  - 3. Crickets, saddles, and tapered edge strips, including slopes.
- C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  - 1. Submit evidence of meeting performance requirements.
- E. Qualification Data: For Installer and manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- G. Research/Evaluation Reports: For components of roofing system.
- H. Maintenance Data: For roofing system to include in maintenance manuals.
- I. Warranties: Special warranties specified in this Section.
- J. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

- B. **Manufacturer Qualifications:** A qualified manufacturer that has UL listing and FMG approval for roofing system identical to that used for this Project.
- C. **Testing Agency Qualifications:** An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. **Source Limitations:** Obtain components for roofing system from or approved by roofing system manufacturer.
- E. **Fire-Test-Response Characteristics:** Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. **Exterior Fire-Test Exposure:** Class A; ASTM E 108, for application and roof slopes indicated.
- F. **Preliminary Roofing Conference:** Before starting project construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
  - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  - 5. Review structural loading limitations of roof deck during and after roofing.
  - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
  - 7. Review governing regulations and requirements for insurance and certificates if applicable.
  - 8. Review temporary protection requirements for roofing system during and after installation.
  - 9. Review roof observation and repair procedures after roofing installation.
- G. **Preinstallation Conference:** Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
  - 1. Meet with Owner, Architect, Owner, Roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
  - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

#### 1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

#### 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
  1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, vapor retarder, walkway products, and other components of roofing system.
  2. Warranty Period 25 years from date of Substantial Completion, with no dollar limit and no penal sum.

\*\* 3. Warranty shall not exclude damages caused by windstorms or gale winds less than 72 mph.\*\*

- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, substrate boards, vapor retarders, and walkway products, for the following warranty period:
1. Warranty Period: Three years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. SBS-Modified Bituminous Membrane Roofing:
    - a. Johns Manville International, Inc.
    - b. Siplast, Inc.
    - c. Soprema
- B. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
1. Products: Subject to compliance with requirements, provide one of the products specified.
  2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
  3. Basis of Design:
    - Base sheet: Glass Ply Premier
    - Manufacturer: Johns Manville (2FID)
    - Interply Sheet: DynaBase
    - Finish Ply: DynaWeld Cap FR (torch applied).
    - Flashing: DynaWeld Base and DynaWeld Cap FR
  4. Subject to compliance with specific requirements (including below items) and confirmation by manufacturer, the following roof systems may be used in lieu of the roof system basis of design: Siplast Paradiene 20 HV/30 FR (cold adhesive interply and High SRI cap sheet installation); or 20HV/30FR TG (torched cap sheet installation) Flashing: Veral 4040 IT.  
  
Or Soprema Base sheet: Parabase; or Soprema Elastophene HD (cold applied) or Soprema Elastophene Flam (torch applied) and (cold applied) or Sopra Star Flam (torch applied) Finish Ply; Flashing: Sopralene Flam 250 and Sopra Last 50 TV Alum. Siplast and Soprema membrane systems shall be installed over minimum ½" Densdeck Duraguard coverboard.
- C. Filler content in elastomeric blend to be less than 35% by weight. Submit certificate of analysis for production run of materials supplied for this project from test lab of the roofing manufacturer in accordance with ASTM D5147.

## 2.2 SBS-MODIFIED ASPHALT-SHEET MATERIALS

- A. Roofing Membrane Sheet: ASTM D 6163, Grade S, Type II, glass-fiber reinforced; ASTM D 6164, Grade S, Type I or II, polyester reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified.
- B. Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I or II, glass-fiber reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified, and as follows:
  - 1. Granule Color: White

## 2.3 TEMPORARY MEMBRANE/ VAPOR BARRIER MATERIALS

- A. Vapor Barrier and Temporary Roofing Membrane: Primary roofing manufacturer's self adhesive or torch adhered reinforced modified bitumen sheet (lap seams to be head welded immediately following installation).

## 2.4 BASE FLASHING SHEET MATERIALS

- A. Backer Sheet: ASTM D 6164, Grade S, Type I or II, polyester-reinforced; ASTM D 6163, Grade S, Type I or II, glass-fiber-reinforced; ASTM D 6162, Grade S, Type I or II, composite polyester- and glass-fiber-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified.
- B. Flashing Sheet: ASTM D 6298, glass-fiber-reinforced, SBS-modified asphalt sheet; metal-foil surfaced, as indicated; suitable for application method specified, and as follows:
  - 1. Foil Surfacing: Aluminum, as indicated in drawings.
  - 2. Mineral granule surfacing: Where indicated in drawings.
- C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

## 2.5 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
- B. Asphalt Primer: ASTM D 41.
- C. Cold Process Adhesive manufactured and recommended by roofing manufacturer.
- D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- E. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- G. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."
- H. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve, color to match roofing membrane.
- I. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

## 2.6 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated. New insulation to provide average overall aged insulation value of R-38. Provide 1/4" tapered insulation board and 1/2" tapered cricket board where indicated, rigid insulation board system manufactured or endorsed in writing by BUR manufacturer and included in manufacturer's special 25 year roofing warranty.
  - 1. A minimum of 1/2" thick high density perlite or fiberboard insulation shall be installed over the top surface of polyisocyanurate foam insulation, staggering the joints from the layer below in compliance with NRCA recommendations.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 1 glass-fiber mat facer on both major surfaces. Rigid boards of minimum 2.0 lb/cu.ft. density polyisocyanurate based foam core, permanently bonded to roofing felt facer sheets. Provide in thickness indicated, with minimum aged K-value of 0.17 (when conditioned per RIC/TIMA Bulletin No. 281-1) – maximum board size 4'x4'.
  - 1. Manufacturers:
    - a. Apache Products Company.
    - b. Atlas Roofing Corporation.
    - c. Celotex Corporation.
    - d. GAF Materials Corporation.
    - e. Honeywell Commercial Roofing Systems.
    - f. Johns Manville International, Inc.
    - g. Koppers Industries.
    - h. RMAX.
- C. High Density Perlite Board Insulation: ASTM C 728; composed of expanded perlite, cellulosic fibers, binders, and waterproofing agents with top surface seal-coated.
  - 1. Manufacturers:
    - a. Celotex Corporation.
    - b. GAF Materials Corporation.
    - c. Johns Manville International, Inc.
    - d. Koppers Industries.

- D Glass Reinforced Gypsum Board/Recovery Board: ASTM C 1177/C 1177M glass fiber mat and water resistant binders, impregnated, treated for deterioration, gypsum substrate.
  - 1. Products:
    - a. DensDeck DuraGuard roof board, or DensDeck Prime, Georgia-Pacific Corporation.
- E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes at roof curbs and where indicated for sloping to drain. Fabricate to slopes indicated.
  - 1. Tapered Cricket Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/2 inch per 12 inches.

## 2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Cold Fluid-Applied Adhesive: Manufacturer's standard cold fluid-applied adhesive formulated to adhere roof insulation to substrate.
- D. Insulation Cant Strips: ASTM C 728, perlite insulation board.
- E. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- F. Wood Nailer Strips: Comply with requirements in Division 6 Section "Rough Carpentry"
- G. High Density Cover Board: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.
- H. High Density Cover Board: ASTM C 728, perlite insulation board, 3/4 inch (19 mm) thick, with top surface seal-coated.
- I. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass-fiber joint tape.

## 2.8 WALKWAYS

- A. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition; Polymer-modified, reconstituted solid-rubber, surface-textured, slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 1/2 inch (13 mm) thick, minimum. Surface color to contrast with finish roof surface.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
  - 2. Verify that wood, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
    - a. Test for moisture by pouring 1 pint (0.5 L.) of hot roofing asphalt on deck at start of each day's work and at start of each roof area or plane. Do not proceed with roofing work if test sample foams or can be easily and cleanly stripped after cooling.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal./100 sq. ft. (0.3 L./sq. m) and allow primer to dry.

### 3.3 TEMPORARY MEMBRANE/VAPOR-RETARDER INSTALLATION

- A. Install self adhesive or torch installed reinforced modified bitumen membrane with sanded surface over a primed concrete substrate or nailed base sheet.
- B. Install reinforced modified bitumen plies lapping each sheet 3 inches over preceding sheet on primed concrete substrate or nailed base sheet.
- C. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

### 3.4 INSULATION INSTALLATION

- A. Comply with roofing system manufacturer's written instructions for installing roof insulation.
- B. Install rigid insulation board and crickets over area of roofing to provide minimum 1/4" per foot slopes over all roof areas.

- C. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
  - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- D. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2 inches (50 mm) or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water. Taper insulation board at roof drains to slope 1/2" per foot in a 4' x 4' sump.
- F. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
  - 1. Set each layer of insulation in a solid bed/film of cold adhesive or foam adhesive to meet wind uplift requirements.
- G. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Stagger joints from joints in insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing system manufacturer.
  - 1. Fasten according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
  - 2. Fasten to resist uplift pressure at corners, perimeter, and field of roof.
- H. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.
- I. Provide 4' x 4' sump with 1/2" per foot slope at roof drains and active scuppers as indicated in drawings.

### 3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
  - 1. Install roofing system MBS 2-I-(T or L)-G, according to specification-plate classifications in NRCA's "The NRCA Roofing and Waterproofing Manual" and requirements in this Section.
- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Where roof slope exceeds 3/4 inch per 12 inches (1:18) install roofing membrane sheets parallel with slope.

- D. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- E. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
  1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
  2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
  3. Remove and discard temporary seals before beginning work on adjoining roofing.
- F. Add adhesive application: Polyurethane foam adhesive, or other UL or FM approved adhesive for specified application and wind up-lift.
- G. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

### 3.6 BASE-SHEET INSTALLATION

- A. Install lapped base sheet course (as required by manufacturer), extending sheet over and terminating beyond cants. Attach base sheet as follows:
  1. Adhere to substrate in a uniform coating of cold-applied adhesive.
  2. Torch apply over approved coverboard or primed concrete substrate.
- B. Install a second lapped base sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:
  1. Adhere to substrate in a uniform coating of cold-applied adhesive.
  2. Torch apply over approved coverboard or primed concrete substrate.

### 3.7 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
  1. Adhere intermediate and base ply sheet to substrate in a solid film of roofing manufacturer's cold adhesive product.
  2. All cap sheet (and base sheet) at restricted roof areas torch apply to substrate, or cold adhesive.
  3. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
- B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
  1. Repair tears and voids in laps and lapped seams not completely sealed.
  2. Apply roofing granules to cover exuded bead at laps while bead is hot.
- C. Install roofing membrane sheets so side and end laps shed water.

### 3.8 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
  - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
  - 2. Backer Sheet Application: Mechanically fasten backer sheet to walls or parapets. Adhere backer sheet over roofing membrane at cants in a solid film of cold-applied adhesive.
  - 3. Flashing Sheet Application: Torch apply flashing sheet to substrate.
- B. Extend base flashing up walls or parapets a minimum of 10 inches (250 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing with termination bar screw fastened at 8" o.c. unless noted otherwise.
  - 1. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
- D. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.
- E. Roof Drains: Set 30-by-30-inch (760-by-760-mm) metal flashing in bed of asphalt roofing cement on completed roofing interply membrane. Cover metal flashing with modified bitumen flashing interply sheet, and modified bitumen roofing/flashing membrane cap-sheet stripping and extend a minimum of 6 inches (150 mm) beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
  - 1. Install stripping according to roofing system manufacturer's written instructions.

### 3.9 WALKWAY INSTALLATION

- A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
  - 1. Set walkway pads in cold-applied adhesive.

### 3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Test Cuts: Test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
  - 1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
  - 2. Test specimens may be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."

- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
  - 1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.11 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Repair cap sheet with patch or coating and mineral granules as recommended by the manufacturer at completion of all rooftop work.

### 3.12 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
  - 1. Owner: Leon County, Florida
  - 2. Address: 1907 South Monroe Street, Tallahassee, Florida
  - 3. Building Name/Type: Bank of America Building
  - 4. Address: 315 South Calhoun Street, Tallahassee, Florida
  - 5. Area of Work: Reroofing building
  - 6. Acceptance Date: (Substantial Completion Date)
  - 7. Warranty Period: Three Years
  - 8. Expiration Date: <Insert date.>
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his 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 a watertight condition.
- D. 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. peak gust wind speed exceeding 72 mph (m/sec);\*\*
    - c. fire;
    - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - f. vapor condensation on bottom of roofing; and
    - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
  6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
  7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.
1. Authorized Signature: <Insert signature.>
  2. Name: <Insert name.>
  3. Title: <Insert title.>

END OF SECTION 07552

SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING

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## SECTION 07560 - REINFORCED LIQUID MEMBRANE ROOFING AND FLASHING SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This specification is for a three coat reinforced cold-applied liquid membrane system applied over approved substrates. The products listed are single component cold-applied liquid polyurethane/ bitumen resin. The system is reinforced with a fabric/ mesh reinforcement. The finish surfacing is achieved with ceramic granules embedded in the top layer of liquid membrane or by the application of a white finish coat. The system manufacturer shall be the same manufacturer providing the modified bitumen roofing and flashing system and shall be included in the roofing warranty specified.
- B. Related Sections:
  - 1. Section 07600 - Sheet Metal Flashing and Trim
  - 2. Section 07900 – Joint Sealers
  - 3. Section 09900 – Painting
- C. Product Data: For each type of product indicated. Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of roofing.
- D. Shop Drawings: On a roof plan show locations and extent of reinforced liquid membrane roofing and flashing applications. Include typical sections, details, and attachments for substrate joints and cracks, flashing sheets, roof penetrations, vertical intersections, repairs and membrane terminations.
- E. Samples for Verification: For each of the following products:
  - 1. Provide sample of fully cured flashing installation mock-up on 6" x 6" wood substrate.
- F. Qualification Data: Contractor must provide documentation from product manufacturer verifying contractor is an approved applicator.
- G. Material Safety Data Sheets: Provide copies to owner, building maintenance staff, and architect. Contractor to retain a copy of MSDS on site at all time
- H. Field quality-control reports.

- I. Maintenance Data: For roofing/ flashing system, include in maintenance manuals.
- J. Warranties:
  - 1. Submit four (4) copies of the Manufacturer's 25-Year Warranty, included with modified bitumen membrane roofing and flashing labor and material warranty.
  - 2. Submit four (4) copies of Contractor's Guarantee covering all work for defects in workmanship and labor for a period of 3 years.
  - 3. Maintenance Procedures: Four (4) copies of manufacturers' printed instructions for Owner's use regarding care and maintenance of roof.

### 1.3 QUALITY ASSURANCE

- A. Submit certification that the materials to be used in the specification meet these specifications and are acceptable for use with the field membrane system and for the surfaces that they are to be applied.
- B. Installation:
  - 1. Unless otherwise indicated, the materials to be used in the specification are those specified and denote the type, quality, performance, ect. Required. All proposals shall be based upon the use of the specified material.
  - 2. Install materials in accordance with the manufacturer's current published application procedures and the general recommendations of the National Roofing Contractor's Association.
  - 3. It will be the contractor's responsibility to obtain and / or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of the same. Any drawings supplied are for reference only.
  - 4. Contractor shall plan and conduct the operations of the work so that each section started on one day is complete, details installed and thoroughly protected and in watertight condition before the close of work for that day.
  - 5. Materials will be securely fastened in place in a watertight, neat and workmanlike manner. All workmen shall be thoroughly experienced in the particular class of work upon which employed. Work shall be performed in accordance with these specifications and shall meet the approval in the field of the Architect.
  - 6. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust, and shall be deposited at an approved disposal site.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
  - 1. Store all material in a manner, which meets all federal, state, and local requirements.
  - 2. KEEP OUT OF THE REACH OF CHILDREN.
- B. Store roofing/ flashing membrane materials in a cool dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Do not store material in temperatures below

32 degrees or above 85 degrees. Keep away from open fire, flame or any ignition source. Store in a well ventilated area.

## 1.5 WARRANTY

- A. Membrane Flashing Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's ten year material warranty and contractor's five year labor and material warranty. The warranty shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the owner. This guarantee shall not exclude random areas of ponding from coverage.
- B. The contractor is to cover damages to the building resulting from damages from failure to prevent water penetration during construction.
- C. The contractor shall guarantee all work against defects in labor and workmanship for a period of two years from the date of final acceptance.

## PART 2 - PRODUCTS

### 2.1 FLASHING/ ROOFING MEMBRANE

- A. Reinforced Liquid Membrane Roofing and Flashing
  - 1. Products: Subject to compliance with requirements:
    - a. PermaFlash - Johns Manville
    - b. Alsam – Soprema
    - c. Parapro 123 - Siplast
  - B. Reflective White Finish Coating
    - 1. Johns Manville – Top Coat 4000
    - 2. Coating approved and recommended by manufacturer.

### 2.2 PRIMER

- A. Apply primer if required by Flashing/ Roofing Liquid Applied Membrane manufacturer. Use only primers that are approved by the Flashing/ Roofing Liquid Applied Manufacturer.

### 2.3 REINFORCEMENT

- A. A spun-laced non woven high performance polyester fabric reinforcement to form a monolithic, reinforced roofing membrane at all change of plane junctures, penetrations, curbs, projections, repairs, and seams as required by flashing/ roofing membrane manufacturers.

## 2.4 FINISH COAT

- A. Ready to use single component high-performance resin in available colors that can be used as a wearing/dress coat over the finished liquid applied flashing and to provide a desired color finish.
- B. Mineral Granule Surfacing. While coating is wet sprinkle on ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve, color to match adjacent roofing membrane.

## PART 3 - EXECUTION

### 3.1 SURFACE/ SUBSTRATE EXAMINATION/ PREPARATION

- A. Surfaces must be structurally sound, dry, and clean; free from moisture, dirt, grease, oil, paint, or any other loose or existing waterproof coating. Remove all previous coatings, laitance on any other contamination which may affect the bond of the Fluid Applied Protected Membrane Roofing and Flashing. Gravel or debris between the substrate and plies is not acceptable.
- B. Mechanically remove all loose gravel, dirt, etc. by vacuum, mechanical broom, power washing, etc. For best results when power washing spray pressure should be in the range of 2500 - 3500 psi.
- C. If any existing coating or prior contaminants cannot be removed perform an adhesion test prior to the application of Fluid Applied Protected Membrane Roofing and Flashing to insure compatibility and the proper bond.
- D. Any deteriorated roofing membrane being coated should first be repaired using like membrane to the existing roof system. Any roof system with excess moisture in the insulation must have the wet areas removed and replaced. Consult Manufacturer regarding any moisture issue.
- E. All rust and contaminants need to be removed from metal to be flashed. Clean all metal to bright. Mechanical abrasion may be necessary to remove contaminants. Perform an adhesion test if there are any doubts. For application to Kynar or metals with similar finishes contact the manufacturer's technical department.
- F. Substrate shall have a moisture content as required to provide adhesion of the membrane to substrate. Determinations of bond strength and moisture content are the responsibility of the contractor and shall be performed periodically by the contractor throughout the course of work.
- G. For PVC piping use sandpaper or similar to rough up the surface before flashing. Priming may be necessary.

### 3.2 PRIMING

- A. Priming is not normally required on clean SBS modified bitumen, smooth BUR and most metals.

- B. Amount of primer needed is affected by surface roughness and porosity. The primer when applied should have a glossy appearance.
- C. Any aged roof, after substrate preparation, will require priming particularly where ponded water or residual dirt has been present.
- D. Primers should be allowed to dry for 6-12 hours depending on environmental conditions prior to the Reinforced Liquid Membrane Roofing and Flashing application. Primed substrates may only be exposed for a period of 24 hours prior to the application of Fluid Applied Protected Membrane Roofing or they must be re primed.

### 3.3 REPAIRS

- A. Before application of the roofing membrane do all repairs using Reinforced Liquid Membrane Roofing and Flashing. Make sure that area to be repaired is clean, dry, and free of debris and is built up to the same level as the surrounding roof surface. As necessary prime area with Reinforced Liquid Membrane Roofing and Flashing primer and an even coat of Reinforced Liquid Membrane Roofing and Flashing. Place fabric reinforcement in wet liquid and immediately apply a top coat of Reinforced Liquid Membrane Roofing and Flashing to ensure complete saturation of the fabric. Remove all voids, wrinkles, fish mouths, trapped air, etc. Base and top coats must extend a minimum of 2" past the perimeter of the repaired area. If the repair is to crack, split or similar a minimum reinforcement must be 4" wide.

### 3.4 FLASHING/ ROOFING MEMBRANE APPLICATION

- A. For all flashings, penetrations, drains, metal edges, etc. Apply an even base coat of Reinforced Liquid Membrane Roofing and Flashing with a brush or roller. Embed fabric reinforcement in this layer and immediately apply a top coat to saturate the fabric. Cut the fabric reinforcement 4" wider than the split, seam, or transition in each direction. Ensure that polyester reinforcement is fully saturated and does not have voids, fish mouths, trapped air, or wrinkles. To the cured base coat apply the finish coat. Broadcast to excess ceramic granules into the finish coat. As an option in place of the granules, allow the finish coat of Reinforced Liquid Membrane Roofing and Flashing to cure 9 - 12 hours and then apply a coat of colored top coat.

### 3.5 FIELD APPLICATION

- A. Apply and even base coat of Reinforced Liquid Membrane Roofing and Flashing resin with a squeegee or roller over the entire roof surface. Allow this coat to cure 9 - 12 hours and then apply a finish coat on Reinforced Liquid Membrane Roofing and Flashing. Broadcast to excess ceramic granules into the finish coat. As an option in the place of the granules, allow the finish coat to cure 9 - 12 hours and then apply a coat of colored top coat. Allow colored top coat to cure 24 hours before trafficking.
- B. If the Reinforced Liquid Membrane Roofing and Flashing base coat is left exposed to the elements for more than seven days prior to the next application of the Reinforced Liquid Membrane Roofing and Flashing it must be primed at a rate approved by the manufacturer.

### 3.6 CLEANING AND PROTECTION

- A. Remove all used containers and wrapping from the site.
- B. Dispose in approved location and manor.
- C. Remove markings from any finished area.
- D. Repair any finished areas damaged by this application.
- E. All waste materials, rubbish, etc., shall be removed from the owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust, and shall be deposited at an approved disposal site. At completion, all work areas shall be left broom clean and all contractor's equipment and materials removed from the site.

### 3.7 COMPLETION

- A. Upon completion of new installation (including all associated work), institute appropriate procedures for surveillance and protection of finished work during remainder of construction period. Protect all areas where coating has been installed.
- B. Notify the owner and the manufacturer when finished. Coordinate final inspection by Manufacturer. Complete all repairs or requests promptly. Comply with all paperwork and payment requirements necessary to acquire the specified warranty.

END OF SECTION 07560

## SECTION 07600 - FLASHING AND SHEET METAL

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

The Types of work specified in this section include the following:

Metal counterflashing; and base flashing.

Exposed metal trim.

Coping.

Miscellaneous sheet metal accessories.

Plastic flashing.

#### JOB CONDITIONS:

Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

### PART 2 - PRODUCTS

#### FLASHING AND SHEET METAL MATERIALS:

Stainless Steel: AISI Type 302/304, complying with ASTM A 167, 2D annealed finish, soft, except where harder temper required for forming or performance; 0.0156-inch thick (28 gauge) except as otherwise indicated.

Aluminum: ASTM B 209, alloy 3003, temper H14, unless harder temper required for forming and performance, 0.032 thick (20 gage) except as otherwise indicated. Mil finish prepared for coating system as noted below. Color to be selected by Architect from manufacturer's standard selection.

Fluoropolymer coating: Full strength 70% "Kynar 500" coating baked on for 15 minutes at 450 degrees F (232 degrees C), in a dry film thickness of 1.0 mil, 30% reflective gloss (ASTM D 523), over 0.2 mil baked on modified epoxy primer.

Durability: Provide coating which has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack or check in finish, and without chalking in excess of 8 (ASTM D 659), and without fading in excess of five NBS units.

Elastic Sheet Flashing:

Provide only flashings compatible with and acceptable to roofing system manufacturer.

Copper: ASTM B 370, cold-rolled except where soft temper is required for forming; 16 oz (0.0216" thick) except as otherwise indicated.

Lead Flashing: 2-1/2 pound to 4 pound sheet of common desilverized pig lead.

Miscellaneous Materials and Accessories:

Solder: For use with stainless steel, provide 60 - 40 tin/lead solder (ASTM B 32), with acid-chloride type flux, except use rosin flux over tinned surfaces.

Fasteners: Same metal as flashing/sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.

Paper Slip Sheet: 5-lb rosin-sized building paper.

Polyethylene Underlayment: 6-mil carbonated polyethylene film; FS L-P-512.

Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncorrosive.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

Roofing Cement: ASTM D 2822, asphaltic.

FABRICATED UNITS:

General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion

provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).

Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

Form section square, true and accurate in size, in maximum possible lengths and free of distortions and defects detrimental to appearance or performance. Hem exposed edges. (Allow for expansion at joints.)

Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

### PART 3 - EXECUTION

#### INSTALLATION REQUIREMENTS:

General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams, which will be permanently watertight and weatherproof.

Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.

Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

Install reglets to receive counter-flashing in manner and by methods required.

Install counterflashing in reglets, either by snap-in seal arrangement, or by wedging in place for anchorage and filling reglet with mastic or elastomeric sealant.

Install elastic flashing without stretching. Install elastic flashing filler strips to provide for movement by forming loops or bellows in width of flashing. Locate filler strips to facilitate complete drainage of water from flashing. Seam flashing sheets with adhesive, and anchor edges as required by manufacturer.

CLEANING AND PROTECTION:

Clean exposed metal surfaces, removing substances, which might cause corrosion of metal or deterioration of finishes.

Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07600

## SECTION 07700 - ROOF SPECIALTIES AND ACCESSORIES

Standards: Comply with SMACNA "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated. Comply with "NRCA Roofing and Waterproofing Manual" details for installation of units.

### Roof Accessory Materials: Miscellaneous Units:

Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.

Roofing Cement: FS SS-C-153, type which is compatible with roofing, containing no asbestos and normally free of sulfur.

Mastic Sealant: Polyisobutylene, nonhardening, nonskinning, nondrying, nonmigrating sealant.

### Roof Drains:

General purpose type, cast iron with aluminum dome strainer, flashing collar, deck clamp.

Wade W-3220; Jay R. Smith 1310; Josam 22010; Zurn 121 for sizes 2" through 4".

Pipe Penetration Flashings: Liquid applied reinforced polyurethane or epoxy modified bituminous flashing by roofing manufacturer; to be included in 25 year manufacturer's warranty.

Pillow Block Pipestand: Model 24-R by Miro Industries, Inc.

Flange Seals: Except as otherwise indicated, set flanges of accessory units in a thick bed of roofing cement or mastic sealant, to form a seal.

Anchor units securely to supporting structure, except for small accessory items which are bedded and stripped into roofing support.

Coordinate installation with deck construction, vapor barrier (if any), insulation, roofing and flashing work, to provide waterproof and weatherproof installations, in accordance with Construction Details of NRCA Roofing and Waterproofing Manual.

Separate dissimilar metals by coating surfaces with bituminous coating or other permanent separation.

END OF SECTION 07700

## SECTION 09830 - SPECIAL COATINGS AND PAINTING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes applying special coating systems to items and surfaces scheduled, including surface preparation, prime coats, and topcoats.
- B. Coating or painting all exterior exposed surfaces is required whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be coated or painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
- C. Painting is not required on prefinished items, finished metal surfaces, inaccessible, concealed surfaces, operating parts, and labels.
- D. Types of special coating and painting systems required for the Project include the following:
1. Painting and finishing of exposed exterior doors, frames and trim, previous painted metal, stucco walls and coping as indicated in the drawings.
  2. Special coatings and painting for exterior use in this project include the following:
    - a. Heavy bodied emulsion type elastomeric high build waterproof coating.
    - b. Premium acrylic architectural coating.
- E. Related Sections: The following Sections contain requirements that relate to this Section:
1. Joint Sealers are specified in Division 7.

#### 1.3 SUBMITTALS

- A. The Contractor shall submit sample 10 year elastomeric coating warranty from manufacturer for this project, evidence of the elastomeric coating manufacturer's approval of the coating applicator for this specific project on the manufacturer's letterhead, applicator's previous experience and qualifications within four days of bid opening.
- B. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- C. Product data for each coating system specified, including patching compound and primers.
1. Provide the manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material proposed for use.
  2. List each material and cross-reference the specific coating, finish system, and

- application. Identify each material by the manufacturer's catalog number and general classification.
3. Application instructions including mixing, surface preparation, compatible primers and topcoats, recommended wet and dry film thickness, recommended application methods.
  4. Certification of volatile organic compounds (VOCs) by the manufacturer for the products supplied.
- D. Samples for initial color selection in the form of manufacturer's color charts.
1. After color selection, the Architect will furnish color chips for surfaces to be coated.
- E. Samples for Verification Purposes: Provide samples of each color and material to be applied with texture to simulate actual conditions on representative samples of the actual substrate.
1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until the required sheen, color, and texture are achieved.
  2. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
  3. Submit samples on the following substrates for the Architect's review of color and texture only.
    - a. Stucco: Provide two 8-inch-square samples of stucco for each finish and color.
    - b. Ferrous Metal: Provide two 4-inch-square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.

#### 1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has not less than five years of experience in application of elastomeric coating systems similar to those required for this project, and who has successfully completed a minimum of four coating system applications similar in material to those indicated for the Project, and who is acceptable to, and approved by, the manufacturer of primary coating materials. Submit approval of applicator from manufacturer (on manufacturer's letterhead) for this project within four days of bid opening.
- B. Single-Source Responsibility: Provide primers and undercoat material produced by the same manufacturer as the finish coats for each type of coating. Use only thinners recommended by the manufacturer and only within recommended limits.
- C. Field Samples: On wall surfaces and exterior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 200 sq. ft. of surface until the required sheen, color, and texture are obtained; simulate finished lighting conditions for reviewing in-place work.
1. Final acceptance of colors will be from job-applied samples.
  2. The Architect will select one area, or surface to represent surfaces and conditions for each type of coating and substrate to be coated. Apply coatings on this surface according to the schedule, or as specified. After finishes are accepted, this area or

surface will be used for evaluation of coating systems of a similar nature.

- D. The Contractor shall be responsible for application of the products in accordance with the manufacturer's instructions using the following tools at intervals indicated to ensure quality:
  - 1. Wet film thickness gage.
  - 2. Caliper mil gage.
  - 3. Sling psychrometer.
  - 4. Temperature gages.
- E. The Contractor shall be responsible to keep a daily construction log containing readings from the use of the above listed instruments.
- F. The Contractor shall submit a copy of the daily construction log, tests, and reports to the Architect weekly.
- G. The Coating or Painting Manufacturer's Technical Representative shall make periodic coating and painting application inspections during the work, to be coordinated with the Architect. The Manufacturer's Technical Representative shall provide written inspection reports to the Architect.

#### 1.5 SPECIAL COATING AND PAINTING PROJECT WARRANTIES

- A. Special Coating and Painting Project Warranty: Provide written warranties by the Contractor and Installer agreeing to replace/repair defective materials. Provide written warranty by the Manufacturer of special coating and painting materials agreeing to replace defective materials and coatings (cracked, chipped, flaked, or peeling). Warranty repairs to defective materials include labor and material. Repairs and replacements required because of events beyond Contractor's/Installer's/Manufacturer's control (and which exceed performance requirements) shall be completed by Contractor/Installer and paid for by Owner.
  - 1. The Contractor's and Installer's/Applicator's warranty period is two year and the Manufacturer's warranty period for elastomeric coating is ten years after date of substantial project completion, and warranty period for acrylic architectural coating is two years.
  - 2. Manufacturer's ten year elastomeric coating warranty to include urethane sealants specified in Division 7.
  - 3. Warranties are not prorated, with no penal sum.
- B. References: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
  - 1. ASTM D 4258-83 (1988) Standard Practice for Surface Cleaning Concrete for Coating.
  - 2. ASTM D 4261-83 (1988) Practice for Surface Cleaning Concrete Masonry for Coating.
  - 3. ASTM D 4262-83 (1988) Test Method for pH of Chemically Cleaned Concrete Surfaces.
  - 4. ASTM D 1653-93 Water Vapor Transmission of Organic Coatings Films.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, new, unopened packages, and containers bearing manufacturer's name and label, and the following information:
1. Name or title of material.
  2. Product description (generic classification or binder type).
  3. Manufacturer's name, stock number and date of manufacture.
  4. Contents by volume, for major pigment and vehicle constituents.
  5. Thinning instructions.
  6. Application instructions.
  7. Color name and number.
  8. Handling instructions and precautions.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
1. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying the coatings.

## 1.7 PROJECT CONDITIONS

- A. Apply coatings only when the temperature of surfaces to be coated and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C) (unless otherwise specified by coating manufacturer or printed technical data sheet for product specified).
- B. Do not apply coatings in snow, rain, fog, or mist; when the relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
1. Allow wet surfaces to dry thoroughly and attain the temperature and conditions specified before proceeding with or continuing the coating operation.
  2. Work may continue during inclement weather only if areas and surfaces to be coated are enclosed and the temperature within the area can be maintained within limits specified by the manufacturer during application and drying periods.
  3. Provide temporary lighting to achieve a well-lit surface with a level of not less than 80 foot candles measured mid-height.
  4. Maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and for 48 hours after application of finishes, or longer if required to obtain full cure as indicated by manufacturer's instructions.
- C. Maintenance Stock
1. At time of completing application, deliver stock of maintenance material to the Owner.
  2. Furnish not less than one properly labeled and sealed container of each type of finish coat of each color, taken from batch mix furnished for the work. Furnish the following amounts for each coating system:
    - a. Elastomeric coating: 1 gallon.
    - b. Premium Acrylic Architectural Coating: 1 gallon

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Heavy Bodied Emulsion Type Elastomeric High Build Waterproofing Coating

1. BASF Chemical Co.
2. Sika

B. Premium Acrylic Architectural Coating

1. BASF Chemical Co.
2. Sherwin Williams Company
3. Benjamin Moore & Company
4. PPG

### 2.2 SPECIAL COATING AND PAINTING MATERIALS, GENERAL

- A. Material Compatibility: Provide conditioners, primers, finish coat material, and related materials that are compatible with one another and the substrates indicated under conditions of service and application as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide the highest grade of the various coatings as regularly manufactured by acceptable coating manufacturers. Materials not displaying manufacturer's identification as a best-grade product will not be acceptable.
- C. Colors: Provide custom colors of the finished coating systems if required to match colors indicated by reference to existing colors indicated in drawings.
- D. Conditioner/Primer/Sealers: Provide products listed in the Coating and Painting Schedule or, with Architect's approval, provide the manufacturer's better quality recommended factory-formulated conditioner/primer/sealers that are compatible with the substrate and finish materials indicated.
- E. Intermediate Coat Materials: Provide products listed in Coating and Painting Schedule or, with Architect's approval, provide the manufacturer's better quality recommended factory-formulated, intermediate coat materials that are compatible with the substrate, primers or base coat materials, and the finish materials indicated.
- F. Finish-Coat Materials: Provide products listed in the Coating and Painting Schedule or, with Architect's approval, provide the manufacturer's better quality recommended factory-formulated, finish-coat materials.
- G. Special Coatings and Painting Schedule: Special Coating and Painting Schedule found at the end of this section lists the coating and painting product name and number of each manufacturer for each coating system and area.

## 2.3 ELASTOMERIC COATING SYSTEM

A. An internally plasticized, elastomeric high-build waterproof emulsion coating made with terpolymer acrylic resins.

B. Minimum Performance Criteria:

Flash Point	Lab Value	Non-combustible 200°F
Elongation	ASTM D412-87	@ 77°F = 262%
		@ 0°F = 115%
Tensile Strength	ASTM D2370	@ 77°F = 232psi
		@ 0°F = 887 psi
Water Vapor Transmission	ASTM E96	Perms = 12
	ASTM D1653	WVT=9.9/grams/hr/ft <sup>2</sup> Perms=2
Sand Abrasion Resistance	ASTM D968, A	3000 L sand = 0 mils abraded
Midew Resistance	TT-P-29	21 days = Resistance
% Recovery at 24 hrs.	ASTM D-2370	96% after 100% Requirement
Impact Resistance	ASTM D2794	20 lbs. = Passed Meets Requirement
Fungus Resistance	TT-C-555B	Meets Requirement
Accelerated Weathering	ASTM G26-77	5000 hrs. = No defects
	(Xenon Arc)	
	TT-C-555B Para 4.4.6	400 hrs. = Meets Requirement
	(Carbon Arc)	
Surface Burning Characteristics	ASTM E84-86	Flame Spread = 5 Smoke = 15
Salt Fog Resistance	ASTM B 117-64	300 hrs. = No defects
Low Temperature Flexibility	TT-C-555B	-15°F Passes 1/8" mandrel
Lead Content	ASTM D-2088	0.075% Meets Requirement
Water Wind Driven Rain	TT-C-555B, para. 4.4.7.1	No Water Penetration
Min. Dry Film Thickness	Minimum 18 mils. (2 coats)	
	Manufacturer may recommend higher dry mil thickness	

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine substrates and conditions under which coatings will be applied for compliance with requirements on applying coatings and painting in accordance with the Contract Documents and manufacturer's recommendations. Surfaces to receive coatings must be thoroughly dry before coatings are applied.

1. Report any unsatisfactory conditions in writing.
2. Do not proceed with coating application until unsatisfactory conditions have been corrected.
3. Start of application will be construed as the Applicator's acceptance of surfaces within that particular area.

B. Coordinating Work: Review existing painted surface preparation procedures and surface residue to ensure compatibility of the systems for substrates. On request, furnish information on the characteristics of specified finish materials to ensure compatible primers.

1. Notify the Architect of problems anticipated using the coatings specified over substrates where existing paint coatings remain.

### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already in place that are not to be coated, or provide surface-applied protection prior to surface preparation and coating. Remove these items, if necessary, to completely coat the items and adjacent surfaces. Following the coating operations in each space or area, have removed items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying coatings or other surface treatments, clean the substrates of substances that could impair bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and coating application so dust and other contaminants from the cleaning process will not fall on wet, newly coated surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be coated according to the manufacturer's instructions for each particular substrate condition and as specified. Provide barrier coats over incompatible existing paint coatings, or remove and reprime.
  1. Notify the Architect in writing of problems anticipated when using the specified finish-coat material with substrates where existing paint coatings are allowed to remain.
- D. Cementitious Surfaces: Prepare concrete, concrete masonry block, cement plaster, and similar surfaces to receive special coatings. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents in accordance with ASTM D 4258 and ASTM D 4261. Roughen, as required, to remove glaze in accordance with ASTM D 4259. If hardeners or sealers have been used to improve concrete curing, use mechanical methods to prepare surface.
  1. Use abrasive blast-cleaning methods if recommended by the coating system manufacturer.
  2. Determine alkalinity and moisture content of surfaces to be coated by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish coats to blister and burn, correct this condition before application. Do not apply coatings over surfaces where the moisture content exceeds that permitted in the manufacturer's printed directions.
- E. Wood: Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dried.
- F. Ferrous Metal: Clean ungalvanized ferrous metal surfaces; remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with the recommendations of the Steel Structures Painting Council.
  1. Clean and prepare surface profile in accordance with applicable SSPC specifications: SSPC-SP 2 Hand Tool Cleaning, SSPC-SP 3 Power Tool Cleaning, SSPC-SP 6

SSPC-SP 6 Commercial Blast Cleaning, SSPC-SP 7 Brush off Blast Cleaning, SSPC-SP 10 Near-White Blast Cleaning, and SSPC-SP 11 Power Tool Cleaning to Bare Metal.

- a. Minimum degree of surface preparation for each coating system shall be as indicated in the schedule by the applicable SSPC specifications number, the lead based paint abatement specification Section 09800, and in the drawings.
  - b. Where no SSPC specification number is indicated, prepare surfaces in accordance with SSPC-SP 2 Hand Tool Cleaning or SSPC-SP 3 Power Tool Cleaning.
2. Before hand or power tool cleaning, remove visible oil, grease, soluble welding residue, and salts by SSPC-SP 1 Solvent Cleaning. After hand or power tool cleaning, reclean surfaces if necessary.
- G. Nonferrous Metal Surfaces: High pressure wash/water blast clean previously painted galvanized surfaces according to the manufacturer's instructions for the application required.

### 3.3 MIXING AND THINNING

- A. Remove and discard any skin formed on surface of coatings in containers. Discard any containers where skin comprises two percent or more of the remaining material.
- B. Combine multi-component paints in quantities needed for use within the manufacturer's recommended pot life at the anticipated application temperatures. Discard remaining mixed material after pot life has expired.
- C. Do not add thinner except as specifically recommended (not merely permitted) by the coating manufacturer for proper coating application under the circumstances prevailing at the project site when application equipment recommended by the coating manufacturer is employed. Use only the quantities and the types of thinner recommended.
- D. Mix materials using mechanical mixers in accordance with coating manufacture's instructions. Agitate mixed materials during application if recommended by manufacturer.
- E. Strain pigmented coatings after mixing except where mechanical application equipment is provided with effective strainers.
- F. Tinting: Except where coating materials cannot be tinted, tint each successive coat of paint a sufficiently contrasting color to facilitate identification of complete coating coverage.

### 3.4 APPLICATION

- A. General: Apply coatings by brush, roller, spray, squeegee, or other applicators according to the manufacturer's recommendations, and using application method best suited for obtaining full, uniform coverage of surfaces to be coated. Use brushes best suited for the material being applied. Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

1. Do not apply coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
  2. Coating colors, surface treatments, and finishes are indicated in the Schedules.
  3. Provide finish coats compatible with the primers used.
  4. Employ only application equipment that is clean, properly adjusted, in good working order, and of the type recommended by the coating manufacturer.
  5. Apply successive coats after adequate cure of the preceding coat and within the recommended recoating time.
  6. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Where sanding is required, according to the manufacturer's directions, sand between applications to produce a smooth, even surface.
  7. When undercoats or other conditions show through the final coat, apply additional coats until the cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.
  8. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
    - a. Coat surfaces behind movable equipment and furniture the same as similar exposed surfaces.
    - b. Coat the back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  9. Mechanical and Electrical Items:
    - a. Paint electrical items exposed to view.
    - b. Paint mechanical items exposed to view.
    - c. Paint the following mechanical items:
      - 1) Piping and supports.
      - 2) Ducts and insulation.
      - 3) Others as indicated on drawings.
    - d. Paint the following electrical items:
      - 1) Conduit and fittings.
      - 2) Panel enclosures.
      - 3) Others as indicated on drawings.
- B. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration. Minimum recoating time shall comply with coating manufacturer's environmental cure chart for specific product.
1. Allow sufficient drying time between successive coats. Do not recoat until the coating has dried so it feels firm and does not deform or feel sticky under moderate thumb pressure and where applying another coat does not cause the undercoat to lift or lose adhesion.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.

1. Brushes: Use brushes best suited for the material applied.
  2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
  3. Spray Equipment: Use spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. Film Thickness: Apply each coat to achieve the dry film mil (DFM) thickness per coat recommended by manufacturer or indicated in the schedule at the end of this section, which ever is thicker. Application rates of excess thickness and fewer numbers of coats than specified will not be accepted.
1. The dry film mil thickness shown in the schedule are per each coat, unless otherwise specified.
  2. Where a single thickness is specified, the dry film thickness actually applied, when measured at any point, shall be equal to the specified value plus or minus 10 percent.
- E. Prime, First or Bottom Coats:
1. Either before or after applying prime coat or first coat, but before applying successive coats, stripe paint edges, corners, mechanical fasteners, and welds using specified primer or first coat material.
  2. Before applying successive coats, touch up connections, fasteners, and damaged areas using specified primer.
  3. Where first coat shows signs of suction spots or poorly sealed areas, reapply first coat material to adequately seal surface before proceeding with intermediate and top coats.
- F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to the material required to be coated or finished that has not been prime-coated by others.
- G. Brush Application: Brush-out and work brush coats into surfaces in an even film. Eliminate cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Neatly draw glass lines and color breaks.
1. Apply primers and first coats by brush unless the manufacturer's instructions permit using mechanical applicators.
- H. Mechanical Applications: Use mechanical methods to apply coating when permitted by the manufacturer's recommendations and governing regulations.
1. Wherever using spray application, apply each coat to provide the equivalent hiding of brush-applied coats. Do not double-back with spray equipment building-up film thickness of two coats in one pass, unless recommended by the manufacturer.
- I. Miscellaneous:
1. Completed coatings shall be free of defects such as runs, sags, lap or brush marks, holidays and skips.
  2. Apply coatings according to the schedule at the end of this section and as otherwise indicated. Coat all similar surfaces not specifically mentioned unless specifically exempted.
  3. Apply coatings to match approved mockups.

- J. Completed Work: Match approved samples for color, texture and coverage.
1. Remove coatings not in compliance with this specification, reclean and reprepare surfaces as specified, and apply coatings to comply with the contract documents.

### 3.5 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke product testing procedures at any time and as often as the Owner deems necessary during coating operations.
1. If results show materials being used do not comply with requirements, the Contractor may be directed to stop work and remove noncomplying materials, pay for testing, recoat surfaces coated with rejected materials, or remove rejected materials from previously coated surfaces if, upon recoating with specified materials, the two coatings are not compatible.

### 3.6 CLEANING

- A. Cleanup: At the end of each work day, remove rubbish, empty cans, rags, and other discarded materials from the site.
1. After completing work, clean glass and spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

### 3.7 PROTECTION

- A. Protect work against damage until fully cured from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as acceptable to the Architect. Leave in an undamaged condition.
1. Provide "Wet Paint" signs to protect newly coated finishes until surfaces are adequately cured.
  2. Shortly before final completion of the project, examine surfaces for damage to coatings and restore coatings to new, undamaged condition. Touch up of minor damage will be acceptable where, in the opinion of the Architect, result is not visibly different from surrounding surfaces. Recoat entire surface where result is different either in color, sheen, or texture.

### 3.8 SPECIAL COATING AND PAINTING SCHEDULE FOR EXTERIOR SURFACES

Provide the following coating systems for areas and substrates indicated (subject to specified performance criteria).

- A. **Coating System Number One: Heavy bodied emulsion type elastomeric high build waterproof coating (ten year material warranty)**
1. Area: Previously painted exterior stucco and top of coping, as indicated in drawings.
  2. Surface Preparation:
    - a. High pressure power wash (3,000 psi). Cut out cracks and repair with butter grade sealant and patching compound. Detail with sealant and patching compound. Comply with manufacturer's recommendations.

3. Conditioner/Primer/Sealer:
  - a. As required by elastomeric coating manufacturer for specified warranty and existing substrate condition. Inspection and recommendation letter required by manufacturer's representative.
    - 1) BASF: Thoro Primer 1000
    - 2) Sika: Sikaguard 552 W Primer
  
4. Coat 1 - HEAVY BODIED EMULSION TYPE HIGH BUILD ELASTOMERIC WATERPROOF COATING:
  - a. System dry film thickness and coats to provide coverage rate at rate required by manufacturer for specified warranty. (Minimum 18 mils DFT – 2 coats)
    - 1) BASF: ThoroLastic A+
    - 2) Sika: Sikaguard Elasto Color

**B. Coating System Number Two: Premium Acrylic Architectural Coating**

1. Area: Previously painted steel, grills, rooftop equipment, support stands, hollow metal doors and door frames, and exposed steel surfaces on rooftop (unless otherwise noted).
  
2. Surface Preparation:
  - a. NACE RP-01-72 Water blasting and hand sanding SSPC-SP 2 hand tool cleaning
  - b. SSPC-SP 1 Solvent cleaning or power wash
  - c. SSPC-SP2 Hand tool cleaning/hand sanding
  - d. SSPC-SP3 Power tool cleaning rusted areas
  
3. Rusty Metal Treatment: Rust eliminator/treatment applied at concealed rust condition, surface rust unable to be cleaned and inaccessible conditions to be applied at spreading rate recommended by manufacturer (minimum 250 sf/gal.).  
Quick Tann II – Lektro – Tech, Inc. (813/254-1380).
  
3. Metal Primer, Industrial Rust Inhibitive: Mod Alkyd Primer (spot prime rusted areas, then completely prime exposed surfaces): Minimum DFT 3, Maximum DFT 5
  - a. ICI: 4160–7100 Devguard Tank and Structural Primer 5205/5206/5207
  - b. Sherwin Williams: KEM Kromik Universal Metal Primer - B50Z Series
  - c. Benjamin Moore: Quick Dry Industrial Rust Inhibitive Primer 168
  - d. Porter Paints: 282 Universal Primer
  
4. Aluminum Primer: Provide the following primer over exterior aluminum surfaces: Two finish coats over a primer. Surface preparation as recommended by paint manufacturer.
  - a. Porter: Alumi Prep #33
  - b. Primer: Alkyd based, metal primer, as recommended by the manufacturer for use over aluminum, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils (0.038 mm).
    - 1) Porter: 282 Universal Primer

5. Finish Coat 1 - Waterborne Acrylic: Minimum DFT 3, Maximum DFT 5
  - a. ICI: 2406-XXXX Decra Shield Exterior Semigloss Acrylic
  - b. Sherwin Williams: DTM Acrylic Primer/Finish B66W1
  - c. Benjamin Moore: Moor Glo Latex House and Trim Paint 096
  - d. PPG Industries: 6-900 Speedhide Exterior Acrylic Semi Gloss Paint
6. Finish Coat 2 - Waterborne Acrylic: Minimum DFT 3, Maximum DFT 5
  - a. ICI: 2406-XXXX Decra Shield Exterior Semigloss Acrylic
  - b. Sherwin Williams: DTM Acrylic Gloss Coating B66 Series
  - c. Benjamin Moore: Moor Glo Latex House and Trim Paint 096
  - d. PPG Industries: 6-900 Speedhide Exterior Acrylic Semi Gloss Paint

END OF SECTION 09830

## SECTION 15010 - MECHANICAL GENERAL

### PART 1 - GENERAL

#### 1.1 REQUIREMENTS

- A. The Contractor shall read carefully the General and Special Conditions, which are considered a portion of the specifications applying to Contractor's work and all Bid Forms.
- B. The drawings and specifications are complementary and any work required by one and not the other shall be considered to be required by both.
- C. If equipment and/or materials are furnished or required under this division and installed under another division, it is the responsibility of the General Contractor to see that all such work is included in the contract bid amount and completed during construction and prior to acceptance by Owner.

#### 1.2 WORKMANSHIP

- A. All work shall be done in a neat and professional manner.
- B. All work shall meet accepted standards of good practice.
- C. Any work which the Architect does not deem to present a professional appearance or which is below the accepted standards of practice will be replaced at his direction and at the Contractor's expense.

#### 1.3 SCOPE OF WORK

- A. The Contractor shall furnish and install all labor and materials, scaffolding, tools, equipment, hoists, accessories, etc., required for proper, complete and correct installation systems included here and/or shown on the drawings.
- B. The Contractor shall visit the job site prior to submitting his bid and shall carefully inspect the premises and shall include in his bid such necessary contingencies as might be required by conditions at the site.
- C. Conflicts and/or discrepancies discovered by the Contractor during preparation of his bid shall be promptly reported to the Architect in order that all bidders may be notified by addenda or clarification.
- D. Failure of the Contractor to visit the job site and include contingencies or failure to report conflicts or discrepancies shall not relieve the Contractor from complete and correct installation of all mechanical work.
- E. The Contractor shall carefully coordinate his work and that of others, and shall cooperate in every way with others to prevent delays in construction and avoid conflicts in work.

- F. The Contractor shall patch and restore all finished surfaces to the condition existing prior to entry and to match surrounding work. Surfaces newly exposed in finished spaces as a result of this project shall be upgraded by the Contractor to match surrounding surfaces.
- G. The Contractor shall maintain a neat and orderly job site and shall remove all rubbish caused by his work. At the completion of the job, all tools, equipment and rubbish shall be removed and the job site left in an acceptable condition.
- H. Upon completion of work, the Contractor shall perform the required cleaning, maintenance and adjustments on all equipment he has installed and make certain all items are in proper working order.
- I. The Contractor is responsible for all safety measures required by prudence and common sense, including but not limited to those, which may be spelled out elsewhere in this specification.
- J. The Contractor shall obtain all permits and arrange for all inspections required by state and local authorities, and shall pay all fees and charges associated with same.
- K. The Contractor is responsible for all transportation of materials and equipment to the construction site.

#### 1.4 PAINING, TOUCHUP AND CLEANUP

- A. All steel frames, supports, anchors and hangers shall be cleaned, degreased, have all rust removed and receive one coat of primer before installation. After installation and before substantial completion, the steel shall again be cleaned, degreased have rust spots removed, receive a second coat of primer, and two coats of yellow equipment enamel, unless another color is called out elsewhere or on the plans.
- B. All equipment installed on this job shall be touched up prior to substantial completion. Touchup shall consist of cleaning, degreasing, removal of rust spots, priming and painting with exact match of manufacturer's finish.
- C. The work area and all equipment shall be thoroughly cleaned prior to substantial completion.

#### 1.5 COORDINATION

- A. Both before and after performing work under this specification, the Contractor will examine work done by others which affects, interfaces with, or bears on work of this section and will notify the Architect if conditions exist which prevent satisfactory results. Start of work by the Contractor shall constitute acknowledgement of the suitability of prior work to receive his work.
- B. All work shall be coordinated with the building superintendent or other authority as designated by the Owner. The Contractor shall submit a proposed work schedule seven days in advance, and will cooperate with the Owner to adjust it as necessary.

- C. Work shall be scheduled and performed in a manner to minimize disruption of operations during normal working hours. Noisy work, such as setting cartridge anchors, impact drilling, etc., shall be done outside of normal working hours. Normal working hours shall be deemed to mean 8:00 a.m. to 5:00 p.m. weekdays.

#### 1.6 DRAWINGS

- A. The Contractor is responsible for verifying that no conflicts exist at the job site, which will prevent the successful completion of work under this section.
- B. The Contractor is responsible for installing piping and ducts so that there is adequate clearance from structures and obstructions, so that there is adequate clearance for roofing work, so that openings and passageways are kept clear, and so that there is adequate clearance for service.

#### 1.7 DAMAGE

- A. The Contractor shall exercise due care when working in overhead or finished areas, shall take all necessary protective measures, and shall repair or replace all surfaces which are damaged as a result of his work.
- B. The Contractor shall be bound by the requirements of the general specification paragraph for the security and protection of personnel, materials and equipment on site.

#### 1.8 CODES

- A. All work, materials and equipment provided under this specification shall be in compliance with the applicable sections of the latest editions of the following codes and standards.
  - 1. Occupational Safety and Health Regulation
  - 2. National Fire Codes, in particular, NFPA 24 - 1997, NFPA 13 - 1997.
  - 3. National Electric Codes
  - 4. Standards of the National Board of Fire Underwriters.
  - 5. ASME Boiler and Pressure Vessel Code.
  - 6. Florida Standard Building Code.

#### 1.9 INSPECTIONS

- A. The Contractor is responsible for scheduling and having performed all inspections required by the Owner, or Architect. Work shall not be closed until the required inspections are performed.

#### 1.10 DELIVERY AND STORAGE

- A. Equipment and materials shall be properly stored and adequately protected and carefully handled to prevent damage. Equipment and materials shall be handled, stored and protected in accordance with the manufacturer's recommendations.

## SECTION 16010 - ELECTRICAL GENERAL REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and supplemental Conditions and Division 1 Specifications, apply to this section.

#### 1.2 SCOPE

- A. The specific tasks to be performed under Division 16 of this project shall be as follows:
  - 1. Perform all electrical work incidental to raising, relocating, or temporarily removing mechanical equipment.
  - 2. Perform all electrical work incidental to lowering, relocating or temporarily removing lighting fixtures, communication cable, antenna wire, and emergency lighting.
- B. The Contractor shall furnish all materials, equipment, transportation, tools, scaffolding, services, permits, insurance, supervision and labor required to properly complete all electrical work required for this project.
- C. The electrical design character and scope of the work shall be governed and controlled by the drawings and the specifications together.
- D. It shall be clearly understood that the Contractor shall make the electrical work for this project complete.

#### 1.3 BEFORE PROPOSAL

- A. The Contractor shall examine the entire contract documents and visit the project site before submitting his bid. If discrepancies arise between drawings, specifications and actual on-site conditions, the Architect/Engineer shall immediately be notified for his interpretation by addendum.

#### 1.4 DEFINITIONS

- A. Refer to article 100 of the National Electrical Code (NEC) for definitions of terms peculiar to the electrical trade. Any mandatory requirement of this document will be designated by the word, "shall".

#### 1.5 CODES AND/OR STANDARDS

- A. All work and equipment shall conform to the latest edition of the National Electrical Code (NEC), National Electric Safety Code (NESC), National Fire Protection Association (NFPA), Underwriter's Laboratories (UL), National Electrical Manufacturer's Association (NEMA), American National Standards Institute (ANSI), Occupational Safety and Health Administration (OSHA), and all other State, Municipal and local codes having jurisdiction.

1.6 PROPERTY DAMAGE

- A. Any property damage to the Owner's property by the Contractor shall be repaired or replaced as required. The repair or replacement shall bring the Owner's property back to pre-existing conditions.

1.7 MATERIALS AND EQUIPMENT

- A. All materials and equipment furnished by the Contractor shall be new and free from any defects and be the manufacturer's latest standard design. The materials and equipment shall be approved by one or more of the national testing laboratories listed under CODES and/or STANDARDS above.
- B. Electrical materials and equipment delivered to the jobsite shall be stored so as not to be weather damaged. Damaged or defective equipment shall be replaced or repaired by the Contractor at this expense. The decision to repair or replace shall be the Engineer's.

1.8 MINOR DEVIATIONS

- A. Minor deviations in routing or positioning of equipment are permitted as long as they do not significantly alter the obvious intent of the electrical requirements.

1.9 WORKMANSHIP

- A. Electrical equipment, conduit, mounting of panels, installation of conductors and connections, etc., shall be executed in a neat and workmanlike manner. The Owner's representative shall be the judge of whether work meets this standard and the Contractor shall bear the cost to make the work right.

1.10 SUPERVISION

- A. The Contractor shall have a superintendent responsible for the project at all times during electrical work. Qualifications shall be a person who is a journeyman electrician with not less than three years of experience as an electrician.

1.11 WARRANTY

- A. The Contractor shall guarantee all of his work for one year after job acceptance. The Contractor shall repair any faulty workmanship, replace faulty materials or equipment and pay for any damages that may result from same during the one year period. Guarantee work shall be done promptly and with new materials and/or equipment by a person skilled in the trade.

END OF SECTION 16010

## SECTION 16670 - LIGHTNING PROTECTION SYSTEMS

### PART 1- GENERAL

#### 1.1 SYSTEM DESCRIPTION

- A. Protect building additions and make connections to existing lightning protection system.
  - 1. Building construction: Precast concrete and masonry.
  - 2. Building height: Approximately 130 feet.
  - 3. Roofing system: Low slope modified bitumen roofing and flashing
  - 4. Building occupancy: Business / Office
  - 5. Protect roof features as indicated on drawings.

#### 1.2 SUBMITTALS

- A. Product Data.
- B. Shop Drawings.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Provide products complying with requirements of the contract documents and made by a single manufacturer.

#### 2.2 LIGHTNING PROTECTION SYSTEM COMPONENTS

- A. Furnish products listed by Underwriters Laboratories, Inc., appropriately classified for installation and environmental conditions.
- B. Furnish products listed by testing firm acceptable to authority having jurisdiction, appropriately classified for installation and environmental conditions.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Contractor is to reinstall lightning protection system, recertify the system and provide an UL Masters Label.
- B. Conform to NFPA 780.
- C. Conform to UL 96A.

END OF SECTION 16670