

SOUTH BEACHSIDE PUMPING STATION AND PUMP HOUSES ROOF REPLACEMENT

PROJECT MANUAL CONSTRUCTION DOCUMENTS

**PREPARED FOR
UTILITIES COMMISSION
CITY OF NEW SMYRNA BEACH
200 CANAL STREET
NEW SMYRNA BEACH, FL 32168**

SEPTEMBER 22, 2016



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SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section outlines the general scope of work included in the roof replacement projects at the South Beachside Pumping Station and at Pump Houses 1, 5, 6, 7 and 8 (located at Paige Avenue Water Treatment Plant), and at the Samsula Area Pump Houses 9 – 14 for the Utilities Commission, City of New Smyrna Beach, Florida. Refer to the appropriate specification section for further information about installation methods and components to be provided. In general, the work includes, but is not limited to, the following items:
1. South Beachside Pumping Station:
 - a. Remove and dispose of existing gravel ballasted EDPM roofing system and accessories, lightweight cellular concrete substrate and steel deck down to the existing steel joist framing on the main roof and canopy roofs.
 - b. Remove existing rooftop generator exhaust flue and associated flashings down to the existing interior generator. Coordinate with owner for installation of owner provided generator exhaust flue components, and install new roof curb and flashings at roof penetration.
 - c. Demolish existing overhang (soffit) areas and framing along the north/south edges of the building back to the existing concrete masonry wall substrate, cut back overhanging steel roof joists, and repair exterior stucco finishes as indicated.
 - d. Install new steel roof deck, roof insulation and 2-ply modified bituminous membrane roofing system on the main roof and canopy roofs as indicated.
 - e. Install new overhead support canopy over the generator fuel tank where indicated.
 - f. Install new gutters and downspouts where indicated.
 2. Pump Houses:
 - a. Remove and dispose of existing modified bitumen roofing (shingle roofing on Pump House #5) and accessories, plywood roof decking and 2x wood roof framing or rafters down to the existing concrete masonry walls.
 - b. Remove existing interior light fixtures and associated electrical conduit from the bottom of the roof framing members and reinstall with new roof framing and decking.
 - c. Install new wood roof framing, plywood decking, thermal barrier (board) and 2-ply modified bituminous membrane roofing system on all roof areas. Roof slope to be built into the new roof deck/framing as indicated.
 - d. Install new roof curb and removable vent cover centered over the pump house well head as indicated to allow for future maintenance access to well head below, as indicated on the drawings.
 - e. Install new exterior (painted) plywood wall sheathing and aluminum soffit vents where indicated around roof overhangs or Pump Houses 1, 5 and 6.

- B. The Contract Documents showing the existing construction of the facility were developed from historic documents or from limited field observations by the Architect and its consultants. Actual conditions may vary from those shown. Hidden conditions may be discovered over the course of the work. Further investigations may uncover conditions which may require remedial attention prior to proceeding with demolition or construction. Contractor shall be aware of the need to proceed with diligence and care and shall notify Architect of conditions which do not reflect those indicated or which require further testing and repair prior to proceeding. Contractor shall correct conditions that are detrimental to timely and proper execution of the Work. Contractor shall not proceed until unsatisfactory conditions have been corrected. Commencement or continuation of work constitutes acceptance of conditions and responsibility for satisfactory performance.

1.2 PROJECT CONDITIONS

- A. The building will be occupied and/or in use during construction. Take necessary precautions to create as little disturbance or disruption to the building and its occupants as possible during the work.
- B. Supply, install, and maintain barriers, protection, warning lines, lighting, and personnel required to segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the building, its occupants, and the surrounding landscaped and paved areas. The Contractor shall observe all applicable OSHA requirements.
- C. Schedule and execute work without exposing the building interior to the effects of inclement weather. Protect the building and its occupants against such risks and repair/replace work-related damage to the Owner's satisfaction.
- D. Supply labor, equipment, tools and appliances necessary for the proper completion of the work.
- E. Do not install roofing systems or sealants during precipitation, including fog, or when air temperature is below 40° F (4° C) or is expected to go below 40° F (4° C) during application, or when there is ice, frost, moisture, or visible dampness on the roof.
- F. Phased or temporary construction will only be permitted as specified. Schedule, execute, and coordinate work on a daily basis so that components are installed completely and permanently as specified.
- G. Schedule, coordinate, and execute work to avoid traffic on completed roof areas. Coordinate work to prevent this situation by working away from completed roof areas, toward roof edges and access ways.
- H. Roofing that is removed shall be made 100% weathertight in the same day's operations.
- I. Supply shoring, supports, and other items or materials necessary to brace and support the structure, fixtures, and facilities affected by the work. This includes, but is not limited to, heating and air handling ducts, lighting, rooftop equipment and other items presently supported by or suspended from the roof decks to be removed, and associated structural members. Supply temporary walkways and ramps necessary to remove existing decking systems and install the replacement deck materials.

- J. Roof construction and materials shall comply with these specifications and the latest editions of the following:
1. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 2. The National Roofing Contractors Association (NRCA) "Roofing and Waterproofing Manual"
 3. Factory Mutual Global (FMG) publications "Loss Prevention Data for Roofing Contractors" and "Building Materials Approval Guide"
 4. Underwriters Laboratories, Inc. "Roofing Materials and Systems Directory"
 5. Copper Development Association (CDA) publication "Copper in Architecture" Handbook.
 6. Brick Industry Association (BIA) "Technical Notes in Brick Construction".
 7. All work shall be performed in accordance with the Florida Building Code in effect at the time of Bid and applicable Federal, State, and local code amendments, requirements, and publications.
- K. All workmanship and materials shall be of the best construction practice. Should a conflict arise between the specification requirements and those of the referenced publications, the better quality or more stringent requirement will prevail. Specification requirements that exceed the minimum requirements of the manufacturer shall be complied with by the Contractor.
- L. Coordinate the work in this Section with other Sections, including preparatory work, building protection, daily clean-up, and protection of building, and occupants.
- M. Supply labor, vacuums, tools and appliances necessary to keep the interior and exterior building and site areas below and around the construction clean, with as little accumulation of dust and debris as possible on a daily basis.

1.3 REFERENCES

- A. Applicable publications: Publications listed herein form a part of this Specification to the extent referenced and are indicated in the text by basic designation only. Applicable publications referenced shall be those that were issued and in use at the time of the Bid Submission.

1.4 PRECONSTRUCTION CONFERENCE

- A. A preconstruction conference will be held with the Owner, Owner's Representatives, Contractor, and involved trades to discuss all aspects of the project. The Contractor's foreman or field representative will attend this conference. The foreman must be English-speaking and shall be on site at all times that work is performed.
- B. The Owner shall reserve the right to require an alternate superintendent and/or foreman.
- C. The preconstruction conference shall not be held until all specified submittals have been received, reviewed and accepted as to form by the Owner and Owner's Representative.

- D. Delivery of materials and commencement of construction shall not proceed until the preconstruction conference is held. Delays in obtaining a complete set of submittals shall not extend the contracted completion date.

1.5 EMERGENCY RESPONSE

- A. The Contractor shall provide the Owner with after-hours (24 hour) emergency telephone numbers of the Contractor's superintendent and foreman.
- B. The Contractor must respond to emergency situations or calls within two (2) hours.

1.6 CONSTRUCTION SCHEDULE

- A. It is the intent of the Owner to have portions of the existing roof assembly removed and replaced in a completed, watertight condition on a daily basis.
- B. Proper coordination of all aspects of the work by the Contractor and any sub-trades is critical to ensure proper installation and performance of the work. The Contractor's Construction Schedule shall clearly outline the coordination between job tasks of all involved disciplines. Subject to review and acceptance by the Owner, this Schedule will be strictly adhered to by the Contractor and sub-trades.
- C. The Contractor's Construction Schedule shall clearly identify the on-site crew foreman and the size of the crew to be utilized. The crew size shall remain consistent and work shall be continuous throughout the project, from start-up to completion.
- D. The Owner shall review the Contractor's Construction Schedule prior to the start of any work. After defining the location(s) of the work progress, the Owner shall arrange to control occupancy in the building to the greatest extent possible. It shall be the responsibility of the Contractor to supply the Owner with written notice, 72 hours in advance, if his work location(s) for a workday is different from the schedule. The Contractor shall update his Construction Schedule weekly and submit a copy to the Owner for review.
- E. The Contractor shall schedule periodic site visits by the Membrane Manufacturer providing the warranty during the construction period. Announce the Manufacturer's site visit (inspection) to the Owner 72 hours prior to its occurrence. Visits by the Manufacturer's Representative shall be made prior to project start-up, one week into the start of construction, with inspections prior to the installation of the membrane surfacing, at project completion, and as requested by the Owner. The Contractor shall provide the Owner a copy of the Manufacturer's written report for each inspection, indicating Manufacturer's comments pertaining to installation of materials and any corrective recommendations. In addition, the Contractor is responsible to notify and obtain acceptance from the Membrane Manufacturer on detail changes that may affect the roof system warranty.

1.7 SCHEDULE OF VALUES

- A. Provide a line item breakdown of construction labor and materials costs for each Specification Section included in these Contract Documents. Additionally, provide line item values for Unit Price, Alternate, and Allowance Work included in these Specifications. Utilize AIA Forms G702 and G703 to prepare and submit the Schedule of Values.

1.8 WORK HOURS

- A. The Contractor will be allowed to work on the roof between the hours of 7:00 am and 5:00 pm, local time, Monday through Friday. Work outside these hours may be allowed with 72 hours minimum written notice to the Owner. Work on Saturday or Sunday may be performed from 8:00 am to 4:30 pm, with prior approval from the Owner. The Owners reserves the right to disapprove or suspend a request to work outside of normal working hours. If interior access is required after hours, weekend, or holidays, Contractor must give 72 hours notice for coordination of coverage.

1.9 PROGRESS MEETINGS

- A. Progress meetings shall be scheduled by the Owner or as deemed necessary.

1.10 DIMENSIONS AND QUANTITIES

- A. Verify dimensions and quantities in the field prior to bid submission. The Project Plans and Drawings have been compiled from various sources and may not reflect the actual field conditions at the time of construction.
- B. The Contractor is solely responsible for means and methods of construction. Make necessary investigations to become familiar with the project conditions.
- C. Additional compensation due to unfamiliarity with project conditions will not be considered.
- D. In case of inconsistency between Drawings and Specifications or within either document, the better quality and/or greater quantity of work shall be provided, as determined by the Owner.

1.11 MATERIAL AND SAFETY DATA SHEETS

- A. Material safety data sheets (MSDS) shall be submitted in complete sets for all products to be used prior to any work being performed.

1.12 GUARANTEES AND WARRANTIES

- A. Refer to specific Sections of this specification for systems and product warranty requirements. Verify with Manufacturer of proposed systems and products that specified warranty

requirements are acceptable, without exception, prior to selecting materials for use on this project.

1.13 CLEAN-UP

- A. Restore property of the Owner to its original condition prior to the start of construction. Refer to Division 01 Section "Temporary Facilities and Controls." General clean-up of the site shall be performed on a daily basis.
- B. Clean, restore, and/or replace items stained, dirtied, discolored, or otherwise damaged due to the Work, as required by the Owner.
- C. Clean roof, building (interior and exterior), landscaped areas, and parking areas so they are free of trash, debris and dirt caused by or associated with the Work.
- D. Clean out drain leaders and piping to the point where it exits the building. Demonstrate roof drainage systems are operating by running water from a hose for 30 minutes into each drain in the presence of the Owner.
- E. Sweep paved areas clean.

1.14 PERMITS

- A. The Contractor will obtain and pay for any and all permits required to perform the work.

1.15 OWNER OCCUPANCY

- A. Owner will occupy premises during entire construction period. Cooperate with Owner in scheduling operations to minimize conflict with Owner's use of facility.
- B. Predetermine and obtain approval, in advance from Owner, for vertical and horizontal transportation of labor and construction materials onto and off of the building roof.
- C. Do not transport labor or construction materials to the roof via the interior of the facility.
- D. Utility Shutdowns: Obtain written approval from the Owner for any required shutdown or outage of any utility. Schedule any outages to minimize impact on existing operations. Comply with all applicable codes and ordinances.

1.16 PRE-JOB DAMAGE SURVEY OF FACILITY

- A. Perform a thorough pre-job survey of property and all affected and adjacent areas of the building with Owner prior to starting the work in order to document existing damage. Contractor shall document the survey on video tape and provide a copy to the Owner prior to commencing work. Damaged items identified during the survey will not be the responsibility of Contractor unless further damaged by Contractor during execution of project.

1.17 CORRECTION OF DAMAGE TO PROPERTY

- A. Consider any damage to building or property not identified in the pre-job damage survey as having resulted from execution of this Contract and correct at no additional expense to Owner.
- B. The Contractor will include in the Base Bid the cost to perform any roof related repair that is due to Contractor's faulty workmanship and/or materials.
- C. Repair, immediately, damages to facility or site that present a safety hazard or danger to the public.

1.18 SUMMARY OF PROJECT REQUIREMENTS

- A. The Work requirements of the Contract are summarized by reference to the Bidding Requirements, the Contract forms, the Conditions of the Contract, the Specification, the Drawings, and Addenda and Contract Modifications, including, but not limited to, the printed matter referenced in these requirements. It is recognized that the Work is affected or influenced by governing regulations, natural phenomenon (including weather conditions), unforeseen conditions uncovered by the Work, and other forces outside of the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011100

SECTION 012200 - UNIT PRICES

1.1 SUMMARY

- A. The Owner may elect certain aspects of the work, whose quantity cannot be determined at this time, to be performed or deleted by the Contractor. If such work items are elected or are not performed, the Contract price will be adjusted accordingly by the Unit Price established in the contract.

1.2 GENERAL CONDITIONS

- A. A Unit price is an amount proposed by bidders as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.
- B. By submitting a bid, the Contractor acknowledges acceptance of the established Unit Prices for their use in determining the value of change work. Prices as stated will remain in effect until final completion of the Contract.
- C. Performance of Work not authorized by a Change Order or Field Order, whether or not such work is set forth hereunder as a Unit Price item, shall not be considered cause for extra payment beyond the Contract Sum.

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Prior to commencing removal or replacement of materials set forth in the schedule of Unit Prices, the Contractor shall notify the Owner in sufficient time to permit proper inspection and measurements to be taken. Only quantities that have been approved in writing by the Owner will be considered in determination of adjustments to the Contract Amount.
- C. Unit Prices and quantities are provided to adjust the specific work items because quantity of work is unknown. Work of similar scope as those unit price items contained in and defined by the Construction Documents shall not be considered as Unit Price Work.
- D. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent inspector acceptable to Contractor.
- E. List of Unit Prices: A list of unit prices and quantities to be provided in the Base Bid is included in Part 3. The quantities shown in the list of unit prices shall be inclusive of the quantities shown on the drawings. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 UNIT PRICE SCHEDULE

- A. For sealing or patching cracks in existing stucco wall cladding, more/less than the twenty (20) linear feet carried in the Base Bid as outlined in Division 09 Section "Portland Cement Plaster", provide a Unit Price per linear foot more/less than the Base Bid amount.
- B. For spot painting stucco crack repairs, more/less than the forty (40) square feet carried in the Base Bid as outlined in Division 09 Section "Painting", provide a Unit Price per square foot more/less than the Base Bid.
- C. For removal and replacement of more/less galvanized steel electric conduit (damaged during work) to match existing, than the twenty (20) linear feet carried in the Base Bid, provide a Unit Price per linear foot more/less than the Base Bid amount.

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Provide an Add alternate price for painting full exterior of existing stucco wall surfaces on the South Beachside Pumping Station, as outlined in Division 09 Section "Painting".

END OF SECTION 012300

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

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

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- C. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- D. Deviations: Deviations from specifications are considered substitutions. Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals as proposed substitutions. Further identify deviations by providing a written description for each deviation or variation from the contract documents.
- E. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- F. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked "Approved or approved as noted."
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating "Approved or approved as noted" taken by Architect.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Compliance with specified referenced standards.
 - 4. Number of Copies: Submit four copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect's CAD Drawings is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Shopwork manufacturing instructions.
 - f. Templates and patterns.
 - g. Schedules.
 - h. Notation of coordination requirements.
 - i. Notation of dimensions established by field measurement.
 - j. Relationship to adjoining construction clearly indicated.
 - k. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 - 3. Number of Copies: Submit two opaque (bond) copies of each submittal. Architect will return one copy.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.
1. Number of Copies: Submit one copies of product schedule or list, unless otherwise indicated. Architect will return one copy.
- F. Construction Schedule: Construction schedule showing sequence and duration of activities.
- G. Schedule of Values: Itemize separately labor and materials for each technical section within the Specification as they will be shown on the Application for Payment (use AIA form G703).
- H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return one copy.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- D. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- E. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- F. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- I. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

- J. **Manufacturer's Instructions:** Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- K. **Manufacturer's Field Reports:** Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - 1. Statement on condition of substrates and their acceptability for installation of product.
 - 2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
- L. **Insurance Certificates and Bonds:** Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- M. **Material Safety Data Sheets (MSDSs):** Submit information directly to Owner; do not submit to Architect.
 - 1. Architect will not review submittals that include MSDSs and will return them for resubmittal.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

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

3.2 ARCHITECT'S ACTION

- A. **General:** Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. **Action Submittals:** Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.3 OWNER'S ACTION

- A. Owner will provide initial review of submittals. Following the Owner's input, the submittals will be forwarded to the Architect for review. After Architect's review, the submittals will go to the Contractor for implementation.

END OF SECTION 013300

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for the provision and utilization of temporary facilities to protect the Owner's property, the site, and construction materials, and for daily maintenance and cleanup of the site during the project.

1.2 CONTRACTOR'S USE OF EXISTING FACILITIES

- A. Limit use of the premises to the work indicated, so as to allow for the Owner's uninterrupted occupancy and use. Confine operations to the areas indicated under the Contract. Conformance to the regulations set forth by the Owner regarding use of existing facilities is mandatory.
- B. Sanitary facilities shall be provided by the Contractor. Use of the building's sanitary facilities is not permitted.
- C. Owner will assist in controlling occupancy. Contractor shall provide and place portable barricades, as coordinated with the Owner, under work areas inside the building.
- D. Clean interior and exterior areas affected by the construction on a daily basis. Do not allow construction debris, waste materials, tools, excess packaging materials or other construction related materials to accumulate on the roof, in the facility, or on the exterior grounds and pavements.
- E. See Division 01 Section "Product Delivery Requirements" for product storage facilities and requirements.

1.3 UTILITIES

- A. Electrical service will be provided to the Contractor free of charge by the Owner through exterior electrical outlets if available and operable. Use shall be limited to construction hours. The Owner reserves the right to charge the Contractor for excessive electrical service usage (i.e., wasteful usage). Should charges be considered, the Owner will notify the Contractor in writing of his intent, 48 hours in advance.
- B. Water for construction purposes will be provided to the Contractor free of charge by the Owner through exterior water spigots if operable. The Owner reserves the right to charge the Contractor for excessive or wasteful use. Should charges be considered, the Owner will notify the Contractor in writing of his intent, 48 hours in advance. Drinking water shall be provided by the Contractor.
- C. All other utilities required will be provided by the Contractor.

- D. Plumbing, heating, and electrical work, including reinstallation of equipment and other work to be performed by the Contractor, shall be carried out without interference to the building's normal operation. Where work requires interruption of service, the Contractor shall make advance arrangements with the Owner for dealing with such interruption.
- E. Ensure proper and safe operation and maintenance of utility systems within the construction limits, whether these are supplied by the Owner's distribution system or otherwise, until the work is accepted by the Owner. Maintain and operate appurtenances within the construction area that serve the distribution system, subject to periodic inspection by the Owner's operating personnel. Inspection by any representative or personnel of the Owner shall not relieve the Contractor of his responsibilities in connection with operation and maintenance of these facilities and equipment.

1.4 ACCESS

- A. Provide ladders, scaffolding and staging as required to access the project area(s) in accordance with OSHA guidelines. Should damage to the building occur, restore damaged areas to their original condition, clean up debris, and provide other access to the roof for the duration of the project.
- B. Do not interfere with normal building operations. Coordinate activities with the Owner and building occupants.

1.5 BARRIERS

- A. Install temporary fencing, warning lines, barriers and guards, as required, to segregate the construction areas from adjacent operational facilities, occupants and the public. In the event that access cannot be interrupted in the construction area, provide protection above doorways and walks in the construction area. Provide guard lights on barriers and lighting as necessary to prevent vandalism of work and storage areas. The Owner is not responsible for Contractor's losses due to damage or theft by vandals.
- B. Install protective coverings at paving and building walls adjacent to hoist prior to starting work. Lap protective coverings at least 1 foot, secure against wind, and vent to prevent condensation of moisture on covered surfaces. Maintain the protective coverings in place for the duration of the project. Cover windows adjacent to Contractor operation areas with plywood.

1.6 TEMPORARY PROTECTION

- A. Provide suitable Owner approved temporary protection to prevent the entrance of debris and obstructions into the building. Provide warning signs to reroute personnel around areas of dangerous work. Place warning barriers at roof perimeters and at deck openings. Clearly label temporary covers over deck openings. Do not permit openings to remain unprotected overnight. Schedule operations to allow for completion of new roofing over a predetermined area of roof within a day's work. Use special care to avoid damaging roofing and flashing when working on the roof of the building.
- B. Provide temporary tie-ins between existing and new roof systems as specified and detailed. Tie-in construction shall completely prevent interior leaks, migration of moisture from existing to new

construction and damage of any type to the facility. Provide necessary quality control at tie-ins on a daily basis to prevent leaks.

- C. Avoid traffic on completed roof areas. Coordinate work to prevent this situation. Should temporary access be required, provide temporary substrate protection for trafficked areas.
- D. Protect drainage systems from debris accumulation during construction. Ensure roof drains and leader pipes are not restricted when Contractor is not on site.
- E. Protect materials scheduled to be reused from damage by placing them in labeled containers or wrappings stored in a weathertight trailer.
- F. Provide temporary protection such as plywood and tarps for streets, drives, curbs, sidewalks, landscaping and existing exterior improvements during all phases of the project.

1.7 ROOFTOP PROTECTION

- A. Provide plywood walkways, with 1/2-inch thick rubber walkway pad or 1-inch thick high density insulation protection beneath, for protection of new or existing roof areas which must be trafficked, and for roof membrane protection below demolition work which occurs above new or existing roof areas.

1.8 DEBRIS REMOVAL

- A. The Owner shall designate crane and refuse container locations. These areas shall be sectioned off with proper warning lines.
- B. Removed materials shall not be thrown freely from the roof but shall be lowered to the ground by crane in suitable containers or in an enclosed chute, in order to reduce the spread of dust and other debris.
- C. Supply adequate covered receptacles for waste, debris and rubbish. One receptacle will be allowed on site at a time, and must be immediately removed from the site when full. Clean the project area daily and prior to moving the receptacle to another location on the site. Locations shall be as permitted by the Owner. Disposal shall be off-site in a legal dump authorized to accept construction demolition solid wastes.

1.9 WEATHER PROTECTION

- A. Weather protection includes temporary protection of components adversely affected by moisture, wind, heat and cold by covering, patching, sealing, enclosing, ventilating, cooling and/or heating. Provide protection for locations within the project area as necessary, to protect the building and its contents, trafficked adjacent areas, new construction materials and accessories. The cost of heat, fuel and power necessary for proper weather protection shall be the responsibility of the Contractor. Installed weather protection shall comply with safety regulations, and provisions for adequate ventilation and fire protection.

1.10 VOLATILE MATERIALS

- A. The Contractor is reminded that adhesives, solvents, bitumens, etc., are highly volatile and flammable materials. These materials, along with tools and applicators and rags, shall not be stored on or within the building. No overnight storage on the roof will be allowed. Do not transport materials through the building. Take precautions and closely follow the Specification requirements for fire protection on site during construction.
- B. Locate and use flame-heated equipment so as not to endanger the structure, other materials on site, or adjacent property. Do not place flame-heated equipment on the roof. Locate and use flame-heated equipment in specific areas approved by the Owner. Do not relocate flame-heated equipment without prior approval from the Owner.
- C. The use of flame-heated equipment or torches on the roof is prohibited unless specifically approved in writing by the Owner.

1.11 FIRE PROTECTION

- A. Provide necessary temporary fire protection for the building, its contents and materials during construction. Do not store combustibles inside the building or on the roof. Store adhesives, caulks and cleaning solvents away from the building using a method approved by local fire officials. Should cutting, burning or welding be necessary, provide a fire watch during operations and for four hours minimum after completion of the operations.
- B. Do not use open flames near adhesives, caulks or cleaning solvents as they will readily ignite. Rags soaked with cleaning solvent shall not be discarded in the dumpsters, but shall be stored in a separate metal receptacle and removed from the site daily.
- C. Comply with local fire codes and obtain permits necessary from the local fire department. Provide a copy to the Owner. Provide recently tested, fully charged fire extinguishers around the storage area, rubbish receptacle and two fire extinguishers on the roof within 50 feet of the Work.

1.12 INTERIOR PROTECTION AND RESTORATION

- A. Protect and cover fixed items, furniture, equipment, appliances, fixtures, bookcases, etc. within the building below the work areas.
- B. At the Owner's direction, remove portable furniture, equipment, appliances, fixtures, materials, stock, etc. within the building below the work area to an adjacent area for protection.
- C. Remove, temporarily support, suspend and protect existing items requiring removal during the installation of the new work and properly replace these items to their original condition and to the Owner's satisfaction. These items include but are not limited to suspended ceilings, lighting fixtures, heating and air handling ductwork, electrical conduit, etc.

1.13 CLEAN-UP

- A. Clean and restore interior building spaces beneath the work areas to original condition prior to the construction.
- B. Debris, dust and dirt shall be swept completely clean at the joists, beams, overhead accessories and similar items. Those items soiled or stained from the work shall be cleaned and refinished.
- C. Electrical fixtures damaged by the construction shall be replaced with an equal in shape, color, manufacturer, and capacity at no added expense to the Owner.
- D. Interior ceiling finishes which are damaged by the construction shall be repaired or replaced with a system equal in color, texture, and finish at no added expense to the Owner.
- E. Floors shall be swept and vacuumed completely clean of dust, dirt and debris. The Owner will wash and re wax floors, but only as part of a normal or routine maintenance procedure. Heavily soiled, stained or damaged floor areas will be cleaned, repaired and/or replaced by the Contractor at no additional cost to the Owner.
- F. Open ducts, grills, thermostats, electric boxes or similar fixtures and items which can be soiled or affected by the work or which might conduct dust to other areas shall be masked, protected and cleaned by the Contractor.
- G. Windows, blinds, curtains, shelving, edges, lighting, etc. shall be cleaned to their original condition prior to the start of the roof renovation, and to the satisfaction of the Owner.
- H. Remove completely temporary protection materials and facilities from the site upon completion of the work and demobilization of the project.
- I. Restore streets, drives, curbs, sidewalks, landscaping and existing improvements disturbed by the construction operations to their condition at the start of the work.

1.14 NOTIFICATION

- A. Notify the Owner's Representative at least 72 hours in advance of the desire to extend, connect, disconnect, turn on or off HVAC, steam, electric, water or other service from the Owner's supply systems. The actual operation shall be witnessed by authorized representatives of the Owner. Plumbing, heating and electrical work, including installation of equipment and any other work to be performed by the Contractor, shall be carried out without interference with the Owner's normal operation. Where work requires interruption of a service, make advance arrangements with the Owner for dealing with such interruption.

1.15 VEHICLES

- A. Acceptable areas for the locations of the Contractor's vehicles shall be as designated by the Owner. No other areas may be utilized without the Owner's permission.

1.16 WALKWAY COVERING

- A. Install walkway coverings where designated on the drawings or above entrances which must remain accessible. The framework supporting the walkway covering shall be free-standing and well braced. The roof covering and support framing shall be designed to support a live load of at least 150 psf. The roof coverings shall be of width sufficient to cover the entire walkway or sidewalk. A minimum height clearance of 6-feet, 8-inches, or as required to allow building doors to open, shall be maintained below coverings. Should coverings obscure the building's address, a temporary address shall be installed so as to be visible from the street. Lettering shall be approved by the Owner. Protection shall be in accordance with all applicable OSHA standards.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link (Site Enclosure) Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 8-foot high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide concrete bases for supporting posts.
- B. Lumber and Plywood: Unless noted otherwise, comply with requirements in Division 06 Section "Rough Carpentry."
- C. Paint: Comply with requirements in Division 09 Section "Painting."

2.2 TEMPORARY FACILITIES

- A. General: Maintain all temporary facilities and controls necessary for the performance of the Work. Comply with all applicable codes and regulations of authorities having jurisdiction; obtain permits as required. Locate and install all facilities and controls where acceptable to the local authorities having jurisdiction, utility, and Owner and remove same and terminate, in a manner suitable to the utility owner, at completion of the Work or when otherwise directed. Pay all costs associated with the provision and maintenance of temporary facilities and controls including power, water, and fuel (if any) consumed until Substantial Completion.
- B. Storage and Staging Areas: The Contractor shall be responsible for coordination, protection, and safekeeping of products stored on site under this Contract including soil cut and fill. Refer to Contract Documents for any defined staging areas.
 - 1. Move stored products that interfere with construction of the Work, or operations of the Owner or separate contractors.
 - 2. Obtain any pay for use of additional storage or staging areas as needed for the Work.
 - 3. Provide storage areas sized to storage requirements for products of individual Sections, allowing for access and orderly maintenance and inspection of products.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide UL Listed or FM approved vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 3 - EXECUTION (Not Used)

END OF SECTION 015000

SECTION 016500 - PRODUCT DELIVERY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section contains instructions and requirements for the provision and maintenance of adequate delivery, storage, and handling on site of products and materials to be utilized in the Work.

1.2 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Store cementitious products and materials on elevated platforms.
 - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 7. Protect stored products from damage and liquids from freezing.
- D. Deliver materials in sufficient quantity to allow continuity of work. Deliver materials to the site in original sealed containers bearing manufacturer's name and brand designation. Where materials are designated by a referenced specification, containers or packages shall bear specification number,

type, and class as applicable. Do not deliver materials that are not approved for use. Remove such materials from the site immediately.

- E. Store roofing materials on site in areas designated by the Owner. Materials are to be stored in box trailers or in elevated piles completely wrapped in waterproof tarps. Tilt stock piles for effective drainage and utilize tie-downs to protect tarps against wind blow-offs. Store flammable materials such as adhesives in storage containers suitable for flammable substances. Mark materials that are exposed to the elements for removal from site. Do not incorporate defective or rejected materials in the Work.
- F. Handle materials with equipment selected and operated so as not to damage the materials or the roofing. Handle roll materials in a manner to prevent damage to the edges or ends. Seal containers when their contents are not being used to prevent premature curing or damage to materials. Damaged or improperly stored materials shall be marked and removed from the site immediately.
- G. No more materials shall be stored on the roof than can be installed in one day. Distribute materials brought to the roof so that the uniform load shall be less than 20 PSF. Evenly distribute materials for daily operations to prevent concentrated loads. The weight of workmen, equipment and materials shall not exceed the capacity of the structure.
- H. Misshapen, oval, creased, and/or damaged roll goods shall not be used in the new roof system. The Contractor shall handle and store roll materials to prevent such conditions. The Contractor shall also ensure that roll goods accepted from the manufacturer are in good condition. The Owner will not be responsible for, nor accept, roll goods that are defective.

1.3 TOOLS AND EQUIPMENT

- A. Contractor is responsible for delivery, storage, maintenance, and security of tools and equipment.

1.4 INSPECTION AND NOTIFICATION

- A. Materials stored on site and subject to damage from wind, precipitation, hail, or other potential climactic conditions will be subject to inspection on a daily basis by the Owner or Owner's Representative. Absorptive materials such as lumber, insulation and felts will be tested periodically for moisture content.
- B. Upon notification by the Owner or Owner's Representative of insufficient protection of or damage to materials on site, the Contractor shall, within 24 hours, properly restore protection and replace or repair damaged materials and systems. Should the Contractor not accomplish immediate repair or replacement when notified, the Owner shall have the proper protection installed at the Contractor's expense.

1.5 MANUFACTURER'S INFORMATION

- A. Submit the roofing system materials manufacturer's written instructions concerning storage and handling of materials, including adhesives, cements, sealants, and accessories. Provide the following information:
 - 1. Manufacturer's "shelf-life" of materials including the date of manufacture of perishables such as volatiles, caulking, and mastics.
 - 2. Acceptable latent moisture content for absorptive materials such as lumber, insulation and felts.
 - 3. Manufacturer's requirements for storage facilities concerning temperature, humidity, and ventilation.
- B. Provide and maintain on site manufacturer's information concerning storage and handling of flammable or volatile materials, such as Material Safety Data Sheets, for the duration of the project.
- C. Comply with the manufacturer's recommendations and these Specifications for on site storage of materials.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 016500

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 4. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 6. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
 7. Submit certificate of manufacturer's inspection.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit a final Application for Payment.
 - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1.5 CORE SAMPLES

- A. The Owner reserves the right to have core sampling performed by the Contractor where moisture contamination is suspected within the new roof system until the expiration of the Contractor's warranty. Core sample locations shall be chosen by the Owner and be performed at no cost to the Owner.

1.6 WARRANTIES

- A. Submittal Time: Submit manufacturer's warranties and contractor's guarantees on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

1.7 PROJECT CLOSEOUT SUBMITTALS

- A. When both the Owner or Owner's Representative and the Manufacturer's Representative agree that the Contractor has performed according to the Specifications and has installed the materials to the satisfaction of the Manufacturer, submit the following:
 - 1. Specified Contractor's and Manufacturer's Warranties and Guarantees.
 - 2. Lien Releases from Contractor, subcontractor, and suppliers (AIA Forms G706, G706A).
 - 3. Consent of Surety to Final Payment (AIA Form G707).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for the following Scope of Work:
1. South Beachside Pumping Station:
 - a. Remove and dispose of existing gravel ballasted EDPM roofing system and accessories, lightweight cellular concrete substrate and steel deck down to the existing steel joist framing on the main roof and canopy roofs.
 - b. Remove existing rooftop generator exhaust flue and associated flashings down to the existing interior generator. Coordinate with owner for installation of owner provided generator exhaust flue components, and install new roof curb and flashings at roof penetration.
 - c. Demolish existing overhang (soffit) areas and framing along the north/south edges of the building back to the existing concrete masonry wall substrate, cut back overhanging steel roof joists, and repair exterior stucco finishes as indicated.
 2. Pump Houses:
 - a. Remove and dispose of existing modified bitumen roofing (shingle roofing on Pump House #5) and accessories, plywood roof decking and 2x wood roof framing or rafters down to the existing concrete masonry walls.
 - b. Remove existing interior light fixtures and associated electrical conduit from the bottom of the roof framing members and reinstall with new roof framing and decking.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, and locations of temporary set up areas.
- B. Predemolition Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- C. Proposed locations of chutes, dumpsters, cranes, hoists, and other temporary equipment or facilities required for demolition work.
- D. Proposed methods for interior and exterior protection and clean-up during removal and re-roofing operations.
- E. Provide schedule, updated weekly, indicating areas of roof where demolition will occur. Notify Owner of schedule changes.
- F. Shop Drawings: Provide signed and sealed Shop Drawings for mechanical, electrical and structural augmentations.

1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241; OSHA, 29 CFR 1926.1101; EPA, NESHAP 40 CFR, Part 60, DOT 49 CFR, Parts 171 and 172.
- E. Comply with State and Local requirements.

1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately below and adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Storage or sale of removed items or materials on-site is not permitted.

- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.
 - 2. Maintain water pumping facilities in service during selective demolition operations.

1.6 WARRANTY

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

1.7 DEMOLITION AND TRANSPORT

- A. Conveyances: Buggies or wheelbarrows used on roofs to transport removed debris to chutes or crane apparatus location shall be of size and design to prevent damage to deck and structure.
- B. Chutes: Provide enclosed chutes for debris transfer from roof areas at height of 10-feet or more. Do not allow debris to spill from bottom of chute directly onto ground. Direct chutes into approved construction debris container (dumpster). Control and contain dust and noise from falling debris by use of breaks in vertical alignment of chute or tarps covering dumpster. Provide hose with nozzle near chute outlet to wet debris, as necessary, for dust control.
- C. Hoists/Cranes: Provide hoists or cranes to remove debris and transport materials to and from roof. Secure materials to prevent loss during lifting. Place debris transported from roof directly in approved construction debris containers. Provide proper protection of wall areas for entire height directly adjacent to or under area of hoisting.
- D. Use of "bobcat" type removal equipment on roof is prohibited.
- E. Mechanical cutting equipment: Roof cutting equipment shall be equipped with operable blade depth setting mechanisms to control cutting depth of blade and prevent damage to structural deck during cutting operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 GENERAL

- A. During removal of existing roofing and related materials, report to Owner areas of damaged, deteriorated, or otherwise unsuitable structural deck or framing materials exposed during work. Do not cover or remove unacceptable deck or framing areas until reviewed by Owner. Provide temporary protection to areas in question. Use care in removal of membrane flashings and decking to prevent damage to substrates.
- B. Do not remove more material than can be replaced in one day with the new specified roof system.
- C. Take precautions to prevent water on or within existing roof system from migrating into building or new roof system.
- D. Review available prints and/or inspect interior of structure to ascertain if electrical or other service has been placed above roof deck or in contact with underside of deck.
- E. Set cutting blades of mechanical cutting equipment to proper depth to prevent scoring or damage to structural deck. Use care in removal of membrane flashing to prevent damage to substrates. Follow guidelines as specified herein for removal of non-friable asbestos (ACM) materials.
- F. Control visible emissions during roof removal and at dumpster level.
- G. Remove roof materials down to structural deck. Sweep, clean, and vacuum debris from deck surfaces, including flutes of steel deck.

3.3 SELECTIVE DEMOLITION

- A. Demolish and remove existing materials as expressly indicated or implied on the drawings.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.5 CLEANING

- A. Clean demolition materials and debris from roof daily.
- B. Clean debris that has fallen into building, including material on top surface of ceiling. If deemed necessary by the Owner the Contractor shall remove and reinstall ceiling tiles suspected of harboring construction debris and clean the affected areas.
- C. Repair damage to building by replacing damaged material or component in-kind.
- D. Clean site daily to satisfaction of Owner.
- E. Dispose of debris and demolition materials at landfill in accordance with applicable regulations.
- F. Remove construction related debris that accumulates on top of ceiling tiles.

END OF SECTION 024119

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. This section specifies requirements for the following Scope of Work:
 - 1. Provide wood blocking framing, supports, shims, and other miscellaneous products as indicated.
 - 2. Provide plywood decking as indicated.
 - 3. Provide exterior plywood sheathing as indicated.

1.2 SUBMITTALS

- A. Product Data: For each item specified in Part 2 of this Section.

1.3 PROJECT CONDITIONS

- A. Wood blocking shown on Drawings may be greater or less than quantities required to match insulation thickness. Include required quantities in Base Bid.
- B. Maintain constant perimeter heights to provide equal edge metal and fascia reveals.
- C. Store wood to prevent distortion and to protect from atmospheric moisture.
- D. Dimensional lumber and plywood shall be kiln dried unless otherwise indicated. If pressure treated lumber is required by the roof membrane manufacturer, additional compensation will not be considered. Additionally, if pressure treated wood is used, wood shall be separated from all metal components to avoid galvanic corrosion.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by ALSC.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Maximum moisture content at time of dressing: 19 percent, maximum, for 2-inch nominal thickness or less, unless otherwise indicated.

2.2 WOOD ROOF FRAMING

- A. Preservative treated wood, as indicated on the Structural Drawings.

2.3 EXTERIOR PLYWOOD SHEATHING

- A. APA PS 1 sheathing, 5/8-inch thick.
 - 1. Rated for exterior exposure, smooth finish to receive painting.
- B. Oriented strand board not acceptable.

2.4 DIMENSION LUMBER/BLOCKING

- A. General: Of grades indicated according to ALSC National Grading Rule provisions of grading agency indicated.
- B. Framing, rooftop equipment bases and support curbs, blocking, structural cants, nailers, furring, grounds: Construction or No. 2 grade and any of following species:
 - 1. Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; NLGA, WCLIB, or WWPA.
 - 2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
 - 3. Southern pine; SPIB.
 - 4. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

2.5 DECKING AND SHEATHING

- A. Plywood Roof Deck Sheathing: APA PS 1 Exposure 1, Structural I 48/24 span rating, 3/4-inch thick.
- B. Plywood Sheathing: APA PS 1 Exposure 1 sheathing, 5/8-inch thick unless otherwise indicated on the drawings.
- C. Oriented-Strand-Board Sheathing: Not acceptable.

2.6 FASTENERS

- A. Fasteners, washers, and accessories: Stainless steel or galvanized steel.
 - 1. Galvanized: ASTM A 153, hot-dip method. Electrogalvanized items unacceptable.
 - 2. Stainless steel, 300 series, for use in attaching exterior (exposed) plywood sheathing.
- B. Wood-to-wood connections: Galvanized, annular-threaded, ring-shank common nails, 3-inches long. Use stainless steel for exterior exposed conditions.
- C. Termination bar to wood: Number 12, self-drilling, self-tapping screws of sufficient length to penetrate substrate 1-1/2-inches minimum.
- D. Wood blocking to steel deck and steel framing: Number 14, self-drilling, self-tapping screws, factory treated with fluorocarbon coating or stainless steel, of sufficient length to penetrate upper flutes of steel deck or steel framing 1-inch minimum and 1-1/4-inches maximum.

- E. Plywood to concrete masonry or concrete walls: 1/4-inch diameter, 2-inch long drive pin anchors, with zinc sheath and stainless steel pin.
- F. Dimension lumber to masonry or concrete: Masonry screws with high-low threads for tapping concrete and corrosion resistant coating; 1/4-inch diameter; Tapcon, by ITW Buildex, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Selection of lumber pieces:
 - 1. Select members so that knots and obvious defects will not interfere with proper fastening and will allow making of proper connections. Cut out and discard defects that render piece unable to serve intended function.
 - 2. Lumber may be rejected for excessive warp, twist, bow, crook, mildew, fungus, mold, or moisture content, as well as for improper cutting and fitting.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Comply with Factory Mutual (FM) Data Sheet 1-49 for anchoring perimeter blocking. Reduce fastener spacing by half within 8-feet of exterior corners.
- D. Cut butt joints in woodwork to provide smooth, uniform line without irregularities. Stagger butt joints at multiple layers of blocking, layer to layer. Gap joints 1/8-inch. Minimum length of any individual piece of woodwork at perimeter edge shall be 3-feet, with minimum of 2 fasteners per piece.
- E. Overlap wood blocking joints at corners from layer to layer.
- F. Protect installed wood from moisture and weather. Wood degraded by exposure shall be rejected.
- G. For exterior plywood sheathing exposed to weather, prime all concealed surfaces (back sides, edges, cut edges) prior to installation.

3.2 FASTENING OF WOODWORK

- A. Wood roof framing and decking: as indicated on the structural drawings.
- B. Wood blocking/nailers:
 - 1. To wood blocking: With annular-threaded, ring-shank nails, 12-inches on center, maximum, and staggered slightly off centerline of member being installed.
 - 2. To concrete/masonry substrates: With screws spaced 16-inches on center maximum and staggered slightly off centerline of member being secured.

3. To steel framing and steel decking: With self-drilling, self-tapping screws spaced at 12-inches on center maximum in staggered pattern along roof edges, and 16-inches on center all other locations.
4. Countersink fasteners below top plane of nailers.
5. Through-drill material being attached to substrate 1/16-inch larger than fastener threads.
6. Achieve 1-1/4-inch minimum penetration into substrate when fastening 2x lumber to brick, structural concrete, or 2x lumber. Achieve 1-inch penetration past top flute of metal deck.
7. For nailer to nailer connections, penetrate member being fastened to 3/4 thickness of member. Fasten 16-inches on center, staggered.

C. Plywood sheathing:

1. To concrete/masonry walls: With drive pins spaced at 8-inches on center vertically and 16-inches on center horizontally staggered from row to row. Predrill pilot holes in accordance with fastener manufacturer's printed instructions.
2. To wood blocking or framing: With nails spaced at 6-inches max on center along each framing member.
 - a. Countersink fasteners below top plane of plywood.
 - b. Provide 1/8-inch gap between successive sections of plywood. Align finished surfaces to vary not more than 1/16-inch from plane of surfaces of adjacent units.
 - c. Place panels with long dimension perpendicular to support.
 - d. Install sheathing with staggered ends (stagger ends of vertical and horizontal sheathing at roof overhangs minimum 12"). Minimum panel placement size shall be 48-inches in length. Each panel shall span minimum of 3 supports.
 - e. Center joints accurately over support.

3.3 PERIMETER WOOD BLOCKING

- A. Cut new wood blocking to size and configuration as indicated. Provide minimum length of 4-feet for new wood blocking. Secure new wood blocking with nails spaced at 12-inches on center, staggered off centerline.
- B. Re-secure wood blocking with screws spaced at 48-inches on center, staggered off centerline, min., or as indicated in the Drawings.

3.4 PLYWOOD DECK

- A. Install plywood decking as indicated in the Drawings.

END OF SECTION 061000

SECTION 075216 - MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for the following Scope of Work: Provide new 2-ply SBS modified bitumen roof membrane, 2-ply SBS modified flashing system, and associated roof system components. In general, roof work shall consist of the following:
1. Preparation of roof deck and substrates to receive roofing and flashings. Installation of wood blocking at perimeters and as indicated in Section 061000 "Rough Carpentry".
 2. Insulation materials, thermal barriers and cover board.
 3. SBS-modified bitumen anchor/base sheet, mechanically fastened through insulation/cover board substrates to deck substrate (preferred), heat welded laps.
 4. SBS-modified bitumen cap sheet membrane, fire rated with granule surfacing, torch applied (heat welded), fully adhered to anchor/base sheet.
 5. SBS-modified bitumen membrane flashings as indicated.
 6. Sheet metal flashings as indicated in Section 076000 "Flashing and Sheet Metal".

1.2 SUBMITTALS

- A. Certificates:
1. Roof membrane manufacturer's certification that materials are chemically and physically compatible with each other and suitable for inclusion in roof system and are acceptable for warranty specified. Do not submit materials without obtaining membrane manufacturer's written certification. Explicitly identify in writing, difference between manufacturer's written requirements and these specifications.
 2. Roof membrane manufacturer's certification that the proposed applicator is currently approved by the manufacturer of the roofing materials, and that the applicator is authorized by the manufacturer to install the specified materials and roof system.
 3. Manufacturer's Notice of Intent to Issue Roof Warranty, prior to the use of any of the manufacturer's materials on the project. Identify in writing specific contract requirements that are not approved or warrantable by manufacturer.
 4. For additional requirements, refer to Part 1.3 of this Section, Quality Assurance.
- B. Manufacturer's Instructions: Provide letter from roof system manufacturer with detailed application instructions for each roof assembly being installed, to include the proposed roof assembly product information, attachment methods, fastening patterns for each zone and deck substrate, and verification that attachment methods meet the design wind uplift rating.
- C. Product data: For each product specified in Part 2.

1. Provide manufacturer's latest edition of technical product data, installation instructions and recommendations for each type of roofing product specified or included in the manufacturer's warranty, including but not limited to insulation, membrane, flashing, cements and mastics, adhesives, primers and fasteners.
- D. Shop Drawings:
1. Drawings shall depict roof plans, and typical roof system cross section for each proposed roof assembly, showing all layers or materials to be used.
 2. Diagram required insulation fastening and/or adhesive patterns to include field of roof, corners and perimeter zones for each proposed roof assembly.
 3. Show specific roof manufacturer's flashing details including but not limited to edge systems, perimeter areas, terminations and penetrations.
- E. Warranty:
1. Sample copy of roof membrane manufacturer's warranty.
 2. Sample copy of applicator's installation warranty.
- F. Contractor's letter certifying a minimum of 5-years commercial modified bitumen roofing experience, with list of five (5) project references similar in size and scope performed within the last 5 years.
- G. Research/Evaluation Reports: Provide evidence that the roofing system is in compliance with Florida Building Code requirements and design wind load pressures as shown on the drawings.

1.3 QUALITY ASSURANCE

- A. Manufacturer Approval:
1. Installer Qualifications: Approved by manufacturer to install manufacturer's products.
 2. Source Limitations: To greatest extent possible, obtain auxiliary materials for roofing system from roofing membrane manufacturer. Provide letter of acceptance from manufacturer for auxiliary materials from other sources.
 3. Comply with manufacturer's written instruction and these Specifications for roofing and associated work. Provide skilled tradesmen experienced in installation of 2-ply SBS modified bitumen roofing systems. Foreman shall have a minimum of 5 years of previous SBS membrane installation experience.
1. Manufacturer's Inspections: Provide manufacturer's inspection services of roofing application. Manufacturer's inspection services shall include inspection of the following:
 - a. At least one (1) inspection during the progress of roofing installation.
 - b. Upon "substantial completion" of the roofing systems.
 - c. Upon "final completion" of the roofing systems.
 - d. A copy of each manufacturer's inspection report shall be provided to the Architect.
- A. Provide a roof system with Florida Product Approval that meets or exceeds the wind load requirements as indicated.
- B. Minimum quality standards: Comply with NRCA/ARMA publications "Quality Control Guidelines for the Application of Built-up Roofing" and "Quality Control Guidelines for

Polymer Modified Bitumen Roofing". Standards within these specifications that exceed NRCA/ARMA shall prevail.

- C. Project construction will be monitored and evaluated by the Owner or Owner's Representative for compliance with the Contract Documents.
- D. Notify Owner or Owner's Representative at least 72 hours prior to the installation of modified bitumen cap sheet, so that the Owner or Owner's Representative has the opportunity to perform an evaluation of the base-ply or "dry-in" membrane. Do not proceed with the installation of modified bitumen cap sheet without written approval from Owner or Owner's Representative.
- E. Roof system attachment shall meet or exceed that which would be necessary to satisfy the requirements of a Factory Mutual FM 1-90 rated assembly. Factory Mutual approval of the roof assembly is not required.

1.4 PRODUCT HANDLING

A. Delivery:

- 1. Deliver materials in manufacturer's original, unopened containers with manufacturer's labels intact and legible.
- 2. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.
- 3. Deliver enough materials to allow continuous work.

B. Storage:

- 1. Store rolled membrane goods on end (not horizontally).
- 2. Store materials on clean, raised platforms.
- 3. Unless otherwise recommended by the manufacturer, store and handle materials to protect them from:
 - a. Moisture, whether due to rain, or other situations or condensation.
 - b. Damage by construction traffic.
 - c. Temperatures over 110°F, or below 40°F.
 - d. Direct sunlight.
 - e. Mud, dust, sand, oil, grease, and dirt.
- 4. Cover roofing materials with appropriate weather protection as indicated above. Manufacturer's plastic packaging or wrapping shall not be considered sufficient protection.

1.5 PROJECT CONDITIONS

A. Existing Conditions:

1. Along with the roofing applicator and sheet metal installer, verify existing or substrate conditions, including:
 - a. Roof deck and perimeter wall conditions.
 - b. Varying deck and wall thickness for length of anchoring devices required.
2. Replace or restore to original condition all materials or work damaged during construction of work of this Section.
3. Protect paving and building walls.
 - a. Lap protective materials at least 6 inches.
 - b. Vent plastic sheets, if used, to keep moisture from condensing and collecting on covered surfaces.
 - c. Secure protective coverings against wind.
 - d. Leave protective coverings in place until roofing work has been completed.

B. Environmental Requirements:

1. Do not install roofing during rain or start roofing if rain is probable during installation.
2. Do not install roofing when there is ice, frost, surface moisture, or dampness visible on the surface to which roofing is to be applied. The relative humidity shall not be higher than 90%.
3. Do not install roofing if temperatures are 45°F or lower, unless approved otherwise by the Owner.

C. Protection:

1. Protect surfaces not intended to receive roofing materials from spillage, dripping, spotting and damage during application of the roofing. Should protection not be effective, or not be provided, restore the respective surfaces to their proper conditions by cleaning, repairing, or replacing, as applicable for the circumstances and as directed by Owner.
2. Immediately protect completed portions of roofing from damage of subsequent construction activities in accordance with contract requirements. Repair, replace, or as otherwise required to remedy any damage to roofing resulting from construction activities, for the entire duration of construction.

D. Torch Safety:

1. Take all precautions necessary to prevent ignition of combustible materials during torch application of roofing. Flammable liquids shall not be stored on the roof. Provide two fully charged minimum 6.5 kg (15 pound) CO₂ fire extinguishers in separate, easily accessible locations on the roof and within 9 meters (30 feet) of torch work area at all times. Seal off voids or openings in the substrate with non-combustible materials prior to installing torch-applied materials in the area. When working around intakes and

openings, temporarily disconnect and block to prevent flame of torch from being drawn into the opening. Provide non-combustible shielding or flame guard protection where gaps or voids occur in the construction in area of torch work.

2. Comply with OSHA standards and Midwest Roofing Contractors Association [MRCA] publication "Safety in Torch Welded Roofing" specified to operation of liquefied petroleum gas (propane) hand torches.

E. Fire Watch:

1. Provide a fire watch for a minimum of one hour after completion of all torch work at the end of each work shift. Maintain the fire watch for additional time required to ensure no potential ignition conditions exist. Utilize heat sensing meters to scan for hot spots in the work. Do not leave the rooftop unattended during breaks in work during a work shift. Walk and scan all areas of application checking for hot spots, fumes, or smoldering, especially at wall and curb areas, prior to departure at the end of each work shift. Ensure any and all suspect conditions are eliminated prior to leaving the site each work shift.

F. Sequencing:

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

1.6 GUARANTEES AND WARRANTIES

- A. Responsibility: It is the sole responsibility of Contractor to review Contract Documents and field conditions and to coordinate all requirements and conditions with roofing applicator and manufacturer for issuance of warranties and guaranties. Changes required for warranty and guaranty issuance shall be performed at no additional cost to Owner.

1. Provide complete roof system, including temporary roof membrane and insulation, to be covered by roof membrane manufacturer's system warranty. Provide materials not included in Specifications where required by manufacturer to obtain requested warranty, without additional charge to Owner.

- B. Roof membrane manufacturer's system warranty meeting following minimum criteria:

1. Coverage to repair damage to system components resulting from leaks due to failure of materials or workmanship.
2. Non-prorated, non-penal sum (no dollar limit), 20-year warranty period, following date of substantial completion.
3. Coverage of cost of removal and replacement of wet or damaged insulation due to failure of materials or workmanship.
4. No exclusion from coverage for damage to roof system from wind gusts less than 55 miles per hour.

- C. Contractor's Guarantee: Submit a full Contractor's Guarantee of the Work to be free from defect in materials and workmanship upon Substantial Completion, and prior to final payment. This Guarantee shall be for a period of five (5) years from the date of Substantial Completion, and shall be signed by a Principal of the Contractor's firm, and sealed if a corporation.
 - 1. Warranty shall agree to maintain the work of this Section, and its associated flashings and accessories, free from blistering and the penetration of water for the period indicated.

PART 2 - PRODUCTS

2.1 ROOF SYSTEM

- A. Provide SBS-modified bitumen roof system as described herein. Roofing products shall be fully compatible with substrates and other assembly components. Materials shall be approved for UL Class A fire rating service and meet or exceed the wind uplift requirements.
- B. Membrane shall be manufactured by one of the following, unless approved otherwise by the Architect or Owner.
 - 1. Johns Manville International, Inc.
 - 2. Soprema, Inc.
 - 3. Siplast
 - 4. GAF

2.2 MODIFIED BITUMEN SHEETS

- A. Roofing Membrane Base Sheet: ASTM D 6164, Grade S, Type I or II, polyester-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application by torching. Minimum 157 mils thick sheet.
 - 1. Option 1: Provide base sheet suitable for mechanically fastening through insulation substrates into the structural roof deck, with heat welded overlaps.
 - 2. Option 2: Provide base sheet suitable for full adhesion to cover board by torch application. If fully torch adhering membrane to cover board in lieu of Option 1 (mechanically attached base sheet), provide additional layer of ASTM D 4601, Type II fiberglass reinforced base sheet membrane beneath roof insulation material, directly over combustible deck substrates (typ. at Pump Houses).
- B. Roofing Membrane Cap Sheet: ASTM D 6164, Grade G, Type I or II, polyester-reinforced, SBS-modified asphalt sheet; granular surfaced; fire rated; suitable for application by torching; white granules.
- C. Reinforcing Sheet: As specified in Paragraph 2.2A of this Section, suitable for application by torching.
- D. Flashings:
 - 1. Bottom Ply: As specified in Paragraph 2.2A of this Section, suitable for application by torching.

2. Top Ply: As specified in Paragraph 2.2B of this Section, suitable for application by torching.

2.3 AUXILIARY ROOFING 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. Sealant: One-part polyurethane, gunnable grade, high performance elastomeric sealant: ASTM C 920, Type S, Grade NS, Class 25, use NT.
- D. Self-adhering Flashing Sheet: membrane with a butyl rubber-based adhesive, backed by a layer of high density polyethylene laminate, with release-paper backing, 30 mils thick, such as Grace Ultra by W. R. Grace, or approved equal.
- E. Lap Bleed Finish Granules: Ceramic granules sized and colored to match flashing sheet surfacing as supplied by membrane manufacturer.
- F. Flashing adhesive: ASTM D 4586 Type II, SBS-modified, asbestos free, vertical grade.
- G. Insulation Adhesive: dual component polyurethane adhesive used to adhere board stocks to roofing substrates, and as recommended by the modified bitumen sheet manufacturer's printed instructions and meeting the wind uplift resistance specified.

2.4 FASTENERS

- A. For wood substrates: Hot-dipped galvanized, annular-threaded roofing nails with 1-inch wide cap-type head and of sufficient length to penetrate wood a minimum of 5/8-inch.
- B. For masonry substrates: 1/4-inch x 2-inch long drive pin anchors with lead sheath and stainless steel pin and 1-inch diameter flat galvanized steel washer.
- C. Fasteners for securing base sheets to steel roof deck or plywood roof deck substrates: Coated, corrosion-resistant fasteners as recommended by the modified bitumen sheet manufacturer's printed instructions and meeting the requirements of FM A/S4470 and FM P/7825c for Class I roof deck construction and the wind uplift resistance specified.
 1. Fastener Plates: Flat corrosion-resistant round stress plates as recommended by the modified bitumen sheet manufacturer's printed instructions and meeting the requirements of FM A/S4470; not less than 50 mm (2 inches) in diameter. Discs shall be formed to prevent dishing or cupping.

2.5 ROOF INSULATION

- A. Cover Board Overlayment: DensDeck or Securock.
 1. Cover Board for use as roofing substrate shall comply with ASTM C 1177 minimum 1/2" thick and compatible with specified membrane application.

2. Top surface treatment shall be compatible with torched modified bitumen membrane application.
 - a. Primed treatment of surface prior to direct torch application.
- B. Polyisocyanurate Insulation:
 1. ASTM C 1289, Type II, minimum 20 psi compressive strength,
 2. Provide tapered insulation where indicated on the drawings, with slope necessary to provide minimum 1/4" per foot slope to drain. Thickness of bottom layer to be min. 1.5" unless otherwise indicated.
- C. Thermal Barrier: DesnDeck or Securock
 1. For roofing over combustible decks (at Pump Houses), provide fiberglass-faced gypsum board, ASTM C 1177 Type X fire-rated, with moisture resistant core, thickness 5/8". DensDeck by Georgia Pacific, or approved equal.
 2. Top surface treatment shall be compatible with torched modified bitumen membrane application.
 - a. Primed treatment of surface prior to direct torch application.
- D. Cant Strips: low profile, factory fabricated from perlite insulation board, 1" nominal thick, low 3" wide face.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify insulation boards are installed smoothly and evenly, and are not broken, cracked, or curled. Insulation shall be roofed over on same day as it is installed.
- B. Verify that curbs, cants, perimeter blocking, wall flashing substrates, roof penetrating elements and other items necessary to begin installation of membrane are installed.
- C. Do not cut or modify bituminous products with solvent or dilutant.
- D. Prime metal, masonry, and wood surfaces specified or detailed to have direct application contact with asphalt, adhesive, or cement, with a uniform coating of asphalt primer at minimum coverage rate of 150 square feet per gallon. Allow primer to dry prior to application of roof membrane or flashing components.
- E. Do not deliver to site or install a material or system that has not been approved. Remove materials installed without prior approval upon Owner's request.
- F. Surfaces to receive new membrane and flashings shall be clean and thoroughly dry. Should surface moisture such as dew exist, provide necessary equipment to dry surface prior to application. Do not dry with open flames.
- G. Ensure that SBS modified bitumen products are sufficiently warmed prior to use when ambient overnight temperatures are below 40° F.

- H. All reinforcing plies, self adhering membrane envelopes, and base flashings must be installed concurrently with roof membrane installation work, and must be complete and up to date by end of each work week (i.e. Friday or next working day).

3.2 INSTALLING RIGID INSULATION

A. General:

1. Provide new wood nailers, of thickness to match new insulation, firmly anchored into position as required to form curbs, blocking substrate, support cant strips and other items as recommended by the roofing materials manufacturer.
2. Verify that provision has been made for installing metal flashings as required for proper installation.
3. Minimum insulation thickness to be field verified based on height of new roof system. Verify height of insulation at roof perimeters and base flashing locations prior to installation, so as to maintain adequate flashing heights.

B. Installation:

1. Apply Thermal Barrier board over combustible substrates as outlined on the drawings.
 - a. Provide fiberglass base sheet between thermal barrier and combustible decks (on Pump Houses) if roof membrane base sheet is to be fully torch adhered to the thermal barrier, as specified herein. Fiberglass base sheet not required if roof membrane base sheet is mechanically attached.
2. Apply new rigid or tapered insulation as outlined on roof plan drawings. Stagger roof insulation joints between layers, offset minimum 12".
 - a. Coordinate installation so roof insulation boards are staggered at nightly tie-ins.
3. Apply top layer of cover board over roof insulation and mechanically fasten cover board (or roof membrane base sheet) to deck substrates to meet wind uplift requirements, to include increased attachment frequency at corners and perimeters as applicable.
4. Apply cover board with joints offset and staggered from joints in insulation layer below.
5. Do not leave insulation or cover board exposed to weather. Do not install more insulation or cover board than can be covered with the finished roofing on the same day.

3.3 BASE PLY SHEET INSTALLATION

- A. Apply modified bitumen base sheets in accordance with manufacturer's written instructions.
- B. Application shall start at low point of area working to high point. Laps shall be parallel to slope of short dimension of area, unless otherwise indicated by the roof system manufacturer, and in no case shall laps buck flow of water.
- C. Unroll dry membrane on substrate and align with adjacent sheet, providing 3-inch side laps and 6-inch end laps. Stagger end laps of adjacent sheets by 12-inches minimum. Reroll approximately one-half of dry membrane sheet while maintaining alignment.
- D. Membrane sheets shall be applied free of wrinkles, creases, fishmouths, or voids. Maintain alignment of sheets utilizing marked lap lines. Should lap lines become misaligned while unrolling, cut sheet and establish a new end lap. Do not attempt to realign a partially adhered membrane roll.

3.4 MODIFIED CAP SHEET INSTALLATION

- A. Apply cap sheet in accordance with manufacturer's written instructions.
- B. Verify that all repairs have been made to the base ply membrane and reinforcing plies or flashing base plies have been properly installed. Surfaces should be free of sawdust, dirt, insulation debris, and other contaminants prior to starting installation.
- C. Cap sheets shall be laid perpendicular to the flow of water starting at the low point of the area and working to the high point. Unroll dry membrane and allow it to relax. Provide 3-inch side laps and 6-inch end laps, and stagger end laps of adjacent cap sheets by 24-inches. Align the granulated side of the sheet over the selvage side of the adjacent sheet. While maintaining alignment, reroll approximately one-half of the dry membrane sheet.
- D. Membrane cap sheets shall be applied free of wrinkles, creases, fishmouths, or voids. Maintain alignment of sheets utilizing marked lap lines. Should the lap lines become misaligned while unrolling, cut the sheet and establish a new end lap. Do not attempt to realign a partially adhered membrane roll.
- E. Fully adhere cap sheet to previously applied base sheet or interplay sheets.
- F. Inspect cap sheet application for defects. Repair wrinkles, creases, blisters, fishmouths or unadhered membranes as directed by the roof system manufacturer. Reapply granules to repairs as needed.

3.5 SELF-ADHERING MODIFIED BITUMEN MEMBRANE INSTALLATION

- A. Condition surfaces with primer at walls and perimeter elements to receive membrane as recommended by membrane manufacturer. Do not prime more than can be covered by sheet installation in one day.
- B. Install self-adhering modified bitumen membrane as detailed.
- C. Cut modified bitumen into lengths not to exceed 8-feet.
- D. Remove release paper backing, set membrane into place, provide minimum 3-inch head laps, and roll down smooth with metal roller.
- E. Lap membrane over vertical base flashings and substrate surfaces 3-inches minimum or as indicated in Drawings.

3.6 FLASHING AND STRIPPING SHEET INSTALLATION - TORCH APPLIED

- A. Apply flashing sheets using detail torch manufactured specifically for roofing membrane applications.
- B. Ensure that other wood, woodfiber, and other combustible components are enveloped with base sheet or ply sheet material. Maintain fire watch during and after torch applications.

- C. Verify repairs have been made to field membrane in areas adjacent to cant to receive flashing sheet. Snap chalk line to ensure straight edges.
- D. Cut flashing sheet across width of roll to provide full coverage to top of vertical element and minimum of 3-inches beyond edge of reinforcing ply on horizontal membrane surface. Heat bitumen side of flashing sheet with torch just until bitumen begins to melt. Unroll sheet while maintaining flow of hot bitumen at leading edge. Apply pressure starting at top of cant and working toward top of wall or curb. Apply sufficient pressure to ensure full and continuous adhesion of membrane.
- E. Utilize corner membrane flashings, such as “bow ties” for outside corners and “footballs” for inside corners or similar style torch-adhered reinforcements as required to ensure that base flashing corners are sealed at cant areas.
 - 1. Roofing mastic and fabric coursing is NOT an acceptable alternate for proper flashing at these detail conditions.

3.7 APPLYING ACCESSORY MATERIALS

- A. General:
 - 1. Coordinate installation of accessory materials integral with the roofing assembly.
 - 2. Conform to NRCA Roofing and Waterproofing Manual unless otherwise specified or recommended by the roofing material manufacturer.
 - 3. Review details for special installation requirements.
 - 4. Do not use any type cutback asphalt mastics under any modified bitumen products.
- B. Set-on accessories: Where pipe or conduit blocking and similar roof accessories are set on the membrane, adhere additional layer of roofing material or traffic pad material to bottom of pre-manufactured pipe/conduit stand and the underside of other set-on accessories prior to setting on roofing membrane. Specific method of installing set-on accessories must permit normal movement due to expansion, contraction, vibration, and similar occurrences without damaging roofing membrane. Do not mechanically secure set-on accessories through roofing membrane into roof deck substrate.
- C. Penetration flashing:
 - 1. For small, single element penetrations, install manufacturer’s premium reinforced liquid-applied flashings or metal flashings and metal counterflashings, as applicable.
 - a. Clean and prime both sides of metal to be embedded in roof membrane system.
 - b. Set metal base flashings in a full, thick, uniform and continuous bed of flashing cement and secure to roof deck or wood nailers as applicable.
 - c. Use of pitch pans or pitch pockets is not permitted unless specifically indicated or otherwise approved by Owner.

3.8 INSTALLATION OF FLASHING AT SHEET METAL

- A. Metal flashing shall be coordinated by the roofer, and installed by the sheet metal trade. Review the flashing details for additional roofing installation.
- B. Metal flashings: Set primed metal flashings in a full bed of compatible modified bitumen roofing cement and securely fasten to roof deck or wood nailers. Prime flanges of metal flashing on the roof surface and strip-in with trowelings of cement and flexible flashing strips so that strip extends not less than 8 inches beyond outer edge of flange.
- C. Install metal flashings in accordance with Section 076000.

3.9 TEMPORARY PROTECTION

- A. Unfinished perimeter and penetration components: Provide temporary waterstops adequate to prevent moisture intrusion into newly installed work around exposed edges and incomplete flashing locations. Remove temporary materials completely prior to continuing with subsequent work.
- B. Tie-ins: Provide temporary waterstops at deck and tie-ins between newly installed and existing membrane as detailed. Inspect tie-ins thoroughly and repair as needed to provide watertight assembly prior to leaving site.

END OF SECTION 075216

SECTION 076000 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for the following Scope of Work:
 - 1. Provide perimeter and penetration sheet metal flashings and components at locations indicated on the drawings and as required to properly terminate the roof system.

1.2 SUBMITTALS

- A. Product Data:
 - 1. For each item specified in Part 2 of this Section.
 - 2. Color charts for coated metals.
- B. Shop Drawings: Show layouts, profiles, shapes, seams, dimensions, and details for fastening, joining, supporting, and anchoring sheet metal flashing and trim.
- C. Certifications: Perimeter sheet metal assembly must be in compliance with Florida Building Code requirements, specifically ANSI/SPRI ES-1 protocol.

1.3 QUALITY ASSURANCE

- A. Installation procedures shall be in accordance with the industry standards and codes indicated in Division 01 Section "Summary of Work" and those indicated in this Section.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- C. Sheet Metal Standard: Comply with NRCA "Roofing and Waterproofing Manual, Fifth Edition." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. Stainless-Steel Sheet: ASTM A 240, Type 304, No. 2D finish.
- B. Galvanized (Zinc-Coated) Steel Sheet: ASTM A 653, G90 coating designation; structural quality, mill phosphatized for field painting, only if indicated for use in the drawings.

2.2 ACCESSORIES

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Self-Adhering Membrane: High temperature self-adhering, butyl-based adhesive membrane with poly-surface and release-paper backing, minimum 30-mil thickness, designed for a minimum melting temperature of 220 deg F such as Grace Ultra by W.R. Grace, or accepted substitute.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- D. Exposed elastomeric Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use A. Use an elastomeric polyurethane polymer sealant.
- E. Concealed sealant for metal-to-metal connections: ASTM C 1085, single-component, butyl (polyisobutylene) rubber sealant, heavy bodied for hooked-type expansion joints with limited movement. Not for use in exposed locations.
- F. Band Clamps: Stainless steel, including screw-adjustable clamps; 1/2-inch wide.
- G. Flux: muriatic acid based with zinc.
- H. Solder: ASTM B 32, 50% block tin and 50% pig lead; manufactured for use with stainless steel or copper.
- I. Wire Ball Strainer: Prefabricated aluminum or stainless steel wire strainers.
- J. Termination Bar: Manufacturer's standard, predrilled aluminum bars, approximately 1 by 1/8-inch thick with sealant edge. Holes shall be predrilled at 6-inches on center.

2.3 FASTENERS

- A. Sheet metal to wood blocking connections (concealed securement): No. 12 annular threaded Series 300 stainless steel nails minimum 1-1/2-inches long.
- B. Sheet metal to wood blocking connections and mechanical unit securement (exposed securement): Self-drilling, self-tapping, Number 10, stainless steel hex-washer-head screws, 1-1/2-inch long, with metal-capped EPDM washers.
- C. Sheet metal to masonry wall connections: 1/4-inch diameter, concrete/masonry screws of sufficient length to penetrate substrate 1-1/2-inch minimum. Provide metal capped EPDM washers at exposed locations.
- D. Sheet metal fascia to wood connections: 1-inch long, #10, Series 300 stainless steel pan head screws.

- E. Fasteners for downspout to downspout outlet connections: #10 Series 300 stainless steel screws, 1/2-inch long or stainless steel pop rivets.
- F. Nuts and bolts for gutter assembly: Series 300 stainless steel, #12-24, 1-inch to 1-1/2-inch long.
- G. Gutter Bracket: 3-inches long, #12 or #14, Series 300 stainless steel screws with metal capped EPDM washers.

2.4 FABRICATION – GENERAL

- A. General: Fabricate sheet metal flashing and trim to comply with IBC and recommendations in SMACNA and NRCA that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- D. Expansion Provisions: Where lapped expansion provisions in Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with butyl sealant concealed within joints.
- E. Provide concealed fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- F. Provide cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal, and in thickness not less than that of metal being secured.

2.5 FABRICATION SCHEDULE

- A. Stainless Steel (26 gauge)
 - 1. Metal fascia closures
 - 2. Horizontal Flashing at stucco transition (Pumping Station)
 - 3. Strip flashing at exterior plywood sheathing joints
- B. Stainless Steel (24 gauge)
 - 1. Edge Metal
 - 2. Fascia Metal
 - 3. Splice Joint Backer Plates (for edge metal, fascias, etc.)
 - 4. Parapet Cap

5. Hood Flashing
 6. Corner Flashing (at wall)
 7. Penetration Sleeves
 8. Surface Mounted Counterflashing
 9. Gutter
 10. Downspout
- C. Stainless Steel (22 gauge)
1. Flashing Cleats
 2. Head Flashing (over Pumping Station louvers)
 3. Exhaust Flue Cap
 4. Exhaust Flue Liner
- D. Stainless Steel Bar (1-1/2-inch by 1/8-inch bar)
1. Gutter Bracket
 2. Downspout straps
- E. Stainless Steel Bar (3/4-inch by 1/8-inch bar)
1. Continuous gutter edge stiffening bar

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that substrate and anchorage materials to receive sheet metal flashings are properly secured and aligned, without gaps, lumps, or offsets that may distort metal.
- B. Install underlayment at roof edges, parapets, curbs, and similar transitions, and as shown on Drawings.

3.2 INSTALLATION, GENERAL

- A. Comply with these specifications and applicable industry standards to include the IBC, NRCA, and SMACNA, whichever is more stringent.
- B. General: Anchor sheet metal flashing and trim and other components of Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 1. Torch cutting of sheet metal flashing and trim is not permitted.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

- D. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- E. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and butyl sealant.
- F. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- G. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10-feet, with no joints allowed within 18-inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with butyl sealant concealed within joints.
- H. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4-inches for nails and not less than 3/4-inch for wood screws.
- I. Non-moving seams and joints on non-solderable metal shall be interlocked, filled with sealant, and riveted, unless otherwise indicated.
- J. Seal joints as required for watertight construction. Use elastomeric sealant for exposed conditions. Use butyl sealant for hidden conditions.
- K. Provide sheet metal closure components at transitions to rising walls and similar changes in plane for edge metal, parapet caps, expansion joint covers, and other termination flashings. Fully crimp and seal closures to continuous blind nailed cleats.
- L. Soldered Joints: Comply with SMACNA and CDA requirements. Use conduction soldering methods.
 - 1. Clean surfaces to be soldered, removing oils and foreign matter. Smooth irregularities and round edges. Pre-tem edges of sheets to be soldered to width of 1-1/2-inches except where pre-tinned surface would show in finished Work.
 - 2. Apply flux to surfaces to receive solder. Remove oxides and other impurities from joint.
 - 3. Position and immobilize parts to be soldered. Heat parts above fluid temperature of solder. Draw solder into joint, creating 1-inch wide lap. Allow to cool before moving parts.
 - 4. Remove flux and acid by cleaning with neutralizing agent.
- M. Fabricate sheet metal components to the dimensions and shapes shown on the Drawings.

3.3 METAL COMPONENT INSTALLATION

- A. Deck Flanges
 - 1. Fabricate deck flanges 4-inches wide with hemmed edges unless otherwise indicated.
 - 2. Prime deck flanges and set in bed of adhesive.

3. Secure deck flanges at 3-inches on center in staggered pattern. Hold fasteners back 2-inches minimum from edge metal dam.
4. Flash flanges in accordance with membrane requirements and Drawings.

B. Cleats

1. Form cleats with 3/4-inch kicks, bent out at 30 degree angle to vertical surface. Height of cleat shall be as indicated on Drawings.
2. Secure continuous cleats to wood blocking with fasteners spaced at 6-inches on center.
3. Provide 1/4-inch gap between cleat sections. Offset from joints in cover metal being secured.

C. Backer Splice Plates

1. Fabricate backer splice plates 6-inches wide, formed to the same profile as the edge metal or fascia metal. Center backer splice plate behind joint in edge metal or fascia metal for which it serves.
2. Install 2 continuous beads of sealant on each side of edge metal or fascia metal joint.
3. Secure backer splice plates with 2 fasteners driven through metal on either side of joint, as indicated in the drawings.
4. Secure edge metal or fascia metal overtop the backer splice plate, with joint centered.
5. Hook edge metal or fascia metal over bottom drip edge of backer splice plate, and secure as specified.

D. Sheet Metal Transition Closures

1. Form sheet metal closures as indicated in the drawings. Provide one-piece, fully soldered assemblies.
2. Set sheet metal in full bed of butyl mastic and secure using appropriate screws with EPDM washers spaced at 4-inches along centerline of vertical portions.
3. Strip transition closures into the roof system as indicated.

E. Parapet Caps

1. Provide self-adhering membrane over parapet beneath metal as indicated.
2. Fabricate parapet cap to dimensions and shapes shown on Drawings and to fit snugly over parapet and membrane flashings.
3. Secure continuous cleat at interior and exterior face.
4. Provide 1-1/4-inch high standing seams. Hook cap on cleats and crimp. Provide butyl mastic in each standing seam. Fold seams over to form standing seam and fold corners. Provide shop fabricated end and corner sections minimum 18-inches long.

F. Fascia

1. Secure fascia cleat. Hook fascia onto cleat and provide backer splice plates as joints as indicated.
2. Stagger joints in fascia with edge metal minimum 12".
3. Fasten top edge of fascia (behind overhanging edge metal) with nails spaced 6" o.c. max.

G. Edge Metal

1. Secure continuous cleats as specified. Where fascia metal is provided, secure cleats above the top edge of the fascia. Do not fasten cleat through fascia.
2. Provide offset metal section joints with fascia section joints, 12" min.
3. Stagger butt joints between cleat and edge metal sections minimum 24-inches.
4. Crimp edge metal onto cleat.
5. Provide splice joint backer plates as previously specified.
6. Fabricate deck flanges 4-inches wide with hemmed edges unless otherwise indicated.
7. Prime deck flanges and set in bed of adhesive.
8. Secure deck flanges at 3-inches on center in staggered pattern. Hold fasteners back 2-inches minimum from edge metal dam.
9. Flash flanges in accordance with membrane requirements and Drawings.

H. Counterflashing

1. Provide counterflashing with 4-inch minimum sealant-filled section laps. Insert counterflashing into receiver.
2. Secure counterflashings into receivers with stainless steel screws spaced 12-inches on center, minimum 3 screws per length of counterflashing.
3. Secure counterflashings with clips.

I. Reglet Counterflashing

1. Sawcut reglet into brick masonry mortar joints to depth of 1-1/2-inches and width of 3/8-inch. Clean loose particles from reglet and fill reglet with butyl sealant.
2. Form horizontal flange of counterflashing with "V" bend up at 45 degree angle and not less than 3/4-inch long. Provide bend with spring action within reglet.
3. Insert counterflashing into reglet and secure with lead wedges spaced at 8-inches on center. Provide minimum of 3 wedges per length of counterflashing. Ensure that counterflashing and wedges are driven in sufficiently to provide proper sealant coverage. Install sealant above exterior edge of counterflashing.

J. Pipe Sleeves, Caps, and Hoods

1. Form pipe sleeves with integral flanges with locked and soldered seams. Provide hemmed edges of deck flanges as indicated on Drawings.
2. Prior to installing sheet metal sleeves on vent pipes, verify that vent pipes have been extended to 12-inches minimum above finished roof surfaces.
3. Prime flanges and set in bed of adhesive.
4. Secure deck flanges to substrate as specified.
5. Flash flanges in accordance with membrane requirements and Drawings.
6. Install vent caps in full beds of sealant to fit snugly over existing vent pipes and new vent pipe sleeves as indicated on Drawings.
7. Fabricate and install sheet metal hoods on conduit and pipe penetrations to cover sleeve flashings. Clamp tops of sleeves prior to installing hoods. Set hoods in bed of sealant and clamp to penetration.

K. Skirt Flashing

1. Insert skirt flashing beneath existing and new equipment covers. Lap skirt flashing sections 3-inches minimum.
2. Secure skirt flashing with sheet metal clips spaced 12-inches on center and minimum of 2 per side of curb.

L. Gutter, Downspout, and Outlets

1. Extend self-adhering membrane down behind gutter as indicated.
2. Provide sheet metal fascia where shown and secure to wood blocking.
3. Secure gutter brackets to substrate with fasteners, spacing as indicated on the drawings.
4. Slope gutters to drain. Drip edge fascias shall provide minimum 2-1/2-inch lap over back of gutter box.
5. Provide minimum 2-inch-wide section laps. Provide 2 rows of stainless steel pop rivets spaced 4-inches on center along gutter section laps and at downspouts. Provide fully soldered gutter laps (fully solder over rivets to make laps watertight).
6. Provide expansion joints at high points of gutter as indicated.
7. Secure continuous stiffening bar and gutter brackets to outer edge of gutter box with bolt and nut connections, as indicated in the drawings.
8. Space downspouts where indicated on the drawings but in no case greater than 40-feet on center. Extend horizontal flange of downspout outlet 1-inch onto floor of gutter box. Set outlet and pop rivet with stainless steel rivets, 4 per outlet, and fully solder watertight to floor of gutter. Extend outlet down vertically 4-inches, for downspout securement. Secure downspout to outlet with stainless steel sheet metal screws, 4 per downspout.
9. Secure downspout to masonry wall with downspout straps, spaced at 4-feet on center maximum. Secure with appropriate stainless steel fasteners, 4 per strap.
10. Provide splash blocks below each downspout.
11. Install wire ball strainers within gutter at downspout outlet locations.

3.4 CLEANING

- A. Remove scrap metal, burrs, fasteners, and related debris from roof daily. Take precautions to prevent damage to roof membrane and flashings.

END OF SECTION 076000

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for the following Scope of Work:
 - 1. Provide roof accessory components as indicated on the Drawings, including but not limited to:
 - a. Roof Curbs
 - b. Rooftop Ventilator/Cover (for well head access at Pump Houses)
 - c. Soffit Vents (Pump Houses)
 - d. Overhead Support Canopy (South Beachside Pumping Station)
 - e. Splash Block at downspouts

1.2 SUBMITTALS

- A. Product Data: For each type of roof accessory indicated.
- B. Shop Drawings: Show fabrication and installation details for roof accessories.
- C. Manufacturer Installation Instructions: For each product in Part 2.

1.3 QUALITY ASSURANCE

- A. Comply with manufacturer's recommendations and requirements.
- B. Verify locations, dimensions, and substrate conditions before installation.

PART 2 - PRODUCTS

2.1 ROOF CURBS

- A. Roof Curbs: Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Fabricate with welded or sealed mechanical corner joints, with integral formed mounting flange at perimeter bottom. Coordinate dimensions with roof openings.
 - 1. Material: Galvanized steel sheet, 18 gauge construction.
 - 2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
 - 3. Factory installed wood nailers at tops of curbs.
 - 4. Factory insulation with 1-1/2-inch thick, glass-fiber board insulation.
 - 5. Curb height 12".

- B. Provide roof curbs to the dimensions necessary to secure the required equipment, taking into account the thickness of roof membrane flashings and other accessories.
 - 1. Curb dimensions: 48" x 48" nominal.

2.2 VENTILATOR COVER

- A. Low-Profile Gravity Ventilators (Relief/Exhaust Hood)
 - 1. Material: Aluminum mill finish.
 - 2. Bird Screens: 1/2-inch square mesh with 0.062-inch diameter, stainless-steel or aluminum wire.
 - 3. Insect Screens: 14-by-18 mesh with 0.0123-inch diameter, anodized aluminum wire in removable, rewirable frames.
 - 4. Size to fit 48" x 48" nominal roof curb: Loren Cook model PR-36 or approved equivalent.
 - 5. Support curb as specified above.

2.3 SOFFIT VENTS

- A. Soffit vent fabricated from aluminum alloy sheet, conforming to ASTM B209, from 0.019" aluminum coiled sheet.
- B. Factory applied baked on paint coating, color: white.
- C. Continuous strip vent with integral mounting flange, model 105 Soffit Vent as manufactured by Lomanco Vents or approved equal.

2.4 OVERHEAD SUPPORT CANOPY

- A. Aluminum overhead support canopy as indicated in the drawings, for attachment to concrete masonry wall assembly, as manufactured by Mitchell Metals or approved equal.

2.5 SPLASH BLOCK

- A. For downspout outlets at grade: high-density concrete, natural color; 12-inches by 30-inches; to divert water in one direction.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

1. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction to ensure that combined elements are weatherproof and watertight.
2. Install roof accessory items according to construction details in NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated,
3. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.

B. Roof Curb Installation

1. Verify that structural bracing has been added below roof deck, and curb attachment points are centered over bracing. Provide additional bracing if necessary for attachment of curbs to structure.
2. Set flange on deck and secure with minimum 3" long, 3/8" diameter galvanized lag screws, installed at a rate of 6" maximum on center, minimum 2 fasteners per side of curb.
3. Install fiber cant strip and roofing membrane and flashings as specified in Section 075216 "Modified Bituminous Membrane Roofing". Prime metal surfaces prior to application of adhered roofing and flashings.
4. Install self-adhered membrane over the top of the roof curb/nailer as indicated in the drawings.

C. Vent Cover Installation

1. Place ventilator cover over the prepared roof curb.
2. Fasten the ventilator cover to the roof curb as specified by the ventilator manufacturer, and as indicated on the drawings, with type 300 series stainless steel, #12 x 2" long, 1/4"-hex-washer-head, self-drilling screws with metal-capped epdm washers, at a rate of 8" on center maximum, minimum 2 per side.
3. Provide pre-drilled holes in the ventilator cover attachment points for screw attachment to the roof curb.

D. Soffit Vent Installation

1. Install vents in the longest length sections available (minimum 4-ft long sections, attached to minimum 3 framing members).
2. Overlap sections of vent minimum 1/2".
3. If necessary to cut a section of vent to install the final section, measure and cut final section so that the factory edge butts against the fascia board at the end, and place the cut end at the adjoining section (lapped minimum 1/2").
4. Attach soffit vent flanges to each roof framing member (1 nail on each side of vent), using Type 300 series stainless steel nails.
5. Install exterior plywood sheathing and soffit boards as indicated on the drawings, and in accordance with the soffit vent manufacturer's instructions.

E. Overhead Support Canopy

1. Install the canopy at the Pumping Station as indicated on the Drawings. Provide brackets spaced as recommended by the manufacturer, attached to the existing concrete masonry wall.
2. Completely seal around brackets at wall to make watertight.

3.2 REINSTALLATION

- A. Reinstall any existing equipment disturbed or disconnected by work of this section. Extend and reconnect electrical and mechanical connections. Restore normal operation of equipment.

3.3 CLEANING

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 077200

SECTION 092400 - PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Exterior Portland cement plaster (“Stucco”) for exterior wall surfaces where indicated.
 - 2. Repairs to existing plaster (“stucco”) wall surfaces.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Manufacturer’s written recommendations for mix proportions and application for factory-prepared finish materials.
- C. Shop Drawings showing layout of corner beads, openings, control joints, etc.
- D. Plaster samples to illustrate stucco finish texture for Owner selection:
 - 1. Light Dash Finish
 - 2. Fine Sand Float Finish
 - 3. Similar Fine Texture

1.3 QUALITY ASSURANCE

- A. Provide mock-ups as required by Owner prior to application for exterior work, in an effort to match existing stucco finishes as closely as possible.
- B. Reference specifications and standards:
 - 1. ASTM: C150 Portland Cement
 - 2. ASTM: C206 Finishing Hydrated Lime
 - 3. ASTM: C631 Bonding Compounds for Interior Plastering
 - 4. ASTM: C897 Aggregate for Job-Mixed Portland Cement-Based Plasters
 - 5. ASTM: C926 Application of Portland Cement-Based Plaster
 - 6. ASTM: C932 Surface-Applied Bonding Agents for Exterior Plastering
 - 7. Western Lath/Plaster/Drywall Industries Association: Plaster and Drywall Systems Manual
- C. Slump Tests: Check slump of each batch of scratch coat and brown coat mix using a 2-inch x 4-inch x 6-inch high slump cone. Mix shall be such that slump does not exceed 2-1/2 inches.

- D. Allowable Tolerances: Finish all plaster surfaces to true and even plane within tolerance of 1/8-inch in 5-feet as measured by a straight edge placed at any location on surface.
- E. Application: Plaster may be hand or machine-applied, except machine-applied plaster shall be compacted with hand tools.

PART 2 - PRODUCTS

2.1 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating, weighing 3.4 lbs. per square yard.
 - 1. Diamond-Mesh Lath: Self-furring.

2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required, only as required to match existing components disturbed during roof work.
- B. Zinc and Zinc-Coated (Galvanized) Accessories (if necessary):
 - 1. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
 - 2. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
 - 3. Cornerbeads: Fabricated from zinc.
 - a. Small-nose style; use unless otherwise indicated.
 - 4. Casing Beads: Fabricated from zinc; square-edged style; with expanded flanges.
 - 5. Control Joints: Fabricated from zinc; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
- C. Weather-Resistive Barrier (Underlayment): Tyvek Commercial Wrap D (base layer) and Tyvek Commercial Wrap underlayment as a 2-layer membrane beneath stucco wall cladding as indicated on the drawings. 2-ply Weather Barrier Underlayment shall be primary underlayment for stucco unless indicated otherwise.
 - 1. Utilize weather-resistive barrier manufacturer's standard self-adhered membrane flashing systems as indicated on the drawings, typically at openings and wall system terminations and flashings.
 - a. Provide the appropriate adhesive primers on rough textured or concrete surfaces. Provide adhesion tests for confirmation in accordance with manufacturer's instructions.

- D. Stucco Crack Filler: Flexible acrylic-based, non-sag crack filler specially formulated for use with Portland Cement stucco.

2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in Portland cement plaster.
- C. Bonding Compound: ASTM C 932.
- D. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
 - 1. Utilize power or powder actuated fasteners or hardened concrete stub nails.
 - 2. Fasteners shall be corrosion resistant, not less than 3/4" long, with head diameter not less than 3/8", with galvanized steel washers.
 - a. Fasteners for use in securing stainless steel flashings shall be stainless steel or polymer coated (not galvanized).

2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II, from one source.
 - 1. Color for Finish Coats: White.
- B. Lime: ASTM C 206, Type S
- C. Sand Aggregate: ASTM C 897.
 - 1. Color for Job-Mixed Finish Coats: White.
- D. Ready-Mixed Finish-Coat Plaster: Mill-mixed Portland cement, aggregates, coloring agents, and proprietary ingredients.
 - 1. Products:
 - a. ChemRex; Thoro Stucco.
 - b. Florida Stucco Corp.
 - c. United States Gypsum Co.; Oriental Exterior Finish Stucco.

2.5 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
 - 1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in

mixes, but do not exceed 1 lb. of fiber/cu. ft. of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.

B. Portland Cement Base-Coat Mixes:

1. Over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:

- a. Scratch Coat: For cementitious material, mix 1 part Portland cement and $\frac{3}{4}$ (max) parts lime. Use 2-1/2 to 3-1/2 parts sand per part of cementitious material (sum of separate volumes of each component material).
- b. Brown Coat: For cementitious material, mix 1 part Portland cement and $\frac{3}{4}$ (max) parts lime. Use 3 to 4-1/2 parts sand per part of cementitious material (sum of separate volumes of each component material).

2. Over Brick and Concrete Unit Masonry (direct application, no lath): Single base coats for two-coat plasterwork as follows:

- a. For cementitious material, mix 1 part Portland cement and $\frac{3}{4}$ to 1-1/2 parts lime. Use 2-1/2 to 4 parts sand per part of cementitious material (sum of separate volumes of each component material).

C. Portland Cement Job-Mixed Finish-Coat Mixes: For cementitious materials, mix 1 part Portland cement and $\frac{3}{4}$ to 1-1/2 parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material (sum of separate volumes of each component material).

D. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters, comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine all surfaces for conditions that will adversely affect execution, permanence and quality of work. Report unsatisfactory conditions to Architect and Owner prior to work. Do not proceed until unsatisfactory conditions have been corrected.
- B. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- C. Prepare solid-plaster bases that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.2 INSTALLING METAL LATH

- A. Expanded-Metal Lath: Install according to ASTM C 1063.
 1. On Solid Surfaces, Not Otherwise Furred: Install self-furring diamond-mesh lath.
 2. Install overtop 2-layer weather resistive barrier and flashings as indicated.

3. Fasten lath to concrete masonry using the specified fasteners as follows:
 - a. One fastener attached at each corner of each sheet of lath, and one fastener at a rate of 24" on center max along the long dimension of the lapped edge of the sheet.
 - b. Install remaining fasteners in horizontal rows not more than 16" on center, and vertically spaced rows not more than 6" on center.

3.3 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations only as required to match existing components that are affected by the roof work.
- B. Reinforcement for External Corners:
 1. Install lath-type external-corner reinforcement at exterior locations.
 2. Install cornerbead at locations to match existing.
- C. Control Joints: in general, where indicated on drawings.

3.4 PLASTER APPLICATION

- A. General:
 1. Conform to ASTM C926 and "Plaster and Drywall Systems Manual", except as specified herein.
 2. Provide best workmanship available in accord with best practices of trade.
 3. Lay out plaster work so that stoppages occur only at natural breaks such as expansion joints, corners, and other metal trim conditions. Make joinings flush, smooth and uniform, without visible lap marks.
 4. Do not plaster when temperature is above 95°F or below 45°F. Temperature may be as high as 95°F during drying and curing.
 5. Maintain plaster surface planes within allowable tolerances specified.
 6. Employ application and curing methods that ensure sufficient moisture to continuously and properly hydrate Portland cement component of cement plaster base and finish coats.
 7. Craze or web cracking, chalking, or similar visually-apparent conditions, due to improper application and/or curing methods, shall not be acceptable and shall be patched or re-placed.
- B. Plastering:
 1. First coat (scratch) on metal lath: 1 part cement, 2-1/4 to 3-1/4 parts sand, with not more than 3/4 part hydrated lime.
 - a. Apply 1/2 in. thick, including lath.
 - b. Apply with sufficient pressure to key and fully embed lath. Do not over-trowel. Rod to a relatively even plane, then scratch or score (approximately 1/8 in. deep) in one direction. Scratch vertical surfaces horizontally.
 2. First coat on concrete or masonry: 1 part cement, 1 part sand, apply for greatest suction.
 - a. Apply liquid bonding agent by roller or spray method before plastering.

- b. Do not trowel.
 3. Second coat (brown): 1 part cement, 3 to 4-1/2 parts sand and not more than 3/4 part hydrated lime.
 - a. "Double-back" application: After first coat (scratch) has sufficiently hardened to extent that scratch coat cannot crack under the pressure required to apply brown coat plaster, apply second coat (brown) with sufficient pressure to firmly key with scratch coat and completely fill scoring in scratch coat.
 - b. Rod to even, true plane. After brown coat has sufficiently "stiffened", float, reconsolidate, and densify brown coat, reducing potential for shrinkage cracking.
 4. Finish coat (exterior, non-themed, integral color, painted): Finish with factory prepared stucco mix with integral color.
 - a. Pneumatically apply to 1/8 in. thickness in two separate applications.
 - b. Total thickness:
 - (1) Over metal lath: 7/8 in.
 - (2) Over concrete or masonry: 5/8 in.
 - c. Texture: As selected by Owner from sample panels or mock-up to match existing texture on adjacent stucco walls..
 5. Finish coat (exterior, themed, painted): 1 part cement, 3-1/2 parts sand, medium sand float finish, texture unless directed otherwise by Owner. Adjust aggregate gradations/proportions as necessary to provide other finish textures matching approved samples.
 - a. Apply finish coat plaster with sufficient pressure to firmly key to brown coat.
 - b. Total thickness:
 - (1) Over metal lath: 7/8 in.
 - (2) Over concrete or masonry (directly applied): 5/8 in.
- C. Curing:
1. Do not permit plaster coats to prematurely dry out. Ensure that moisture is not excessively absorbed by substrate or prematurely evaporates prior to hydrating the Portland cement component of cement plaster.
 2. Ensure that moisture absorption by brown coat is controlled by suction equalized immediately prior to application of finish coat plasters.
 3. Integral colored plaster: Cure scratch and brown coat plasters and/or delay application of integral colored plaster finish coats in a manner consistent with minimizing color variations in the finish application and as recommended by integral color plaster manufacturer.
 4. Depending on humidity levels, "fog" finish coat plaster with water, as necessary, to prevent premature drying of finish coat plaster. Do not "fog" integral colored plaster finish coats unless recommended otherwise by integral color plaster manufacturer.
- D. Patching and repairing damaged plaster:
1. Neatly patch or replace damaged plaster surfaces resulting from the work of other trades.
 2. Cut out broken or damaged plaster on straight lines with clean, sharp edges. Cut-out cracks to minimum width of 1 in. Using bonding agents, patch with same materials and methods as original work. Match adjoining work in plane, finish and texture, without perceptible joints.

- E. Cleaning: At completion of work, remove excess plaster from beads, screeds, base, trim, and adjoining work, and leave work clean, ready for decorating.

3.5 STUCCO REPAIR

A. Reference Standards

1. ASTM D4258. Standard Practice for Surface Cleaning for Coatings
2. ASTM D4259. Standard Practice for Abrading Concrete.
3. SSPC SP 13 / NACE 6. Standard Requirements for Surface Preparation of Concrete by Mechanical, Chemical, or Thermal Methods, as applicable.

- B. Clean surfaces of oil, grease, dirt, laitance, excess mortar, efflorescence, encrustations, foreign matter, loose non-bonded coatings, and contaminants.

- C. Patch small holes, pits, and other imperfections with epoxy surface/fairing material. Texture the repair area to match surrounding surfaces.

- D. Patch cracks with 100% acrylic flexible patching materials as approved by the Owner. Texture the repair area to match surrounding areas.

1. Small cracks measuring up to 1/32 inch do not need to be cut, chased or routed. Apply elastomer patching compound over the center of the crack at a minimum dry film thickness of 1/16 inch. Feather patching compound a minimum of three (3) inches either side of crack. "Feather" materials to zero thickness using a wet putty knife, trowel or brush.
2. Large cracks and voids that exceed 1/32 inch must be routed out to 1/4 inch wide by 3/16 inch deep. Flush joint with water and checked to see that surface is sound and free of grinding dust. Seal surface with an Exterior Acrylic Masonry Surface Sealer (pigmented) to bind dust to the surface. Once the joint is sound, use bond breaker tape, or approved silicone sealant as release agent at bottom of cut.
 - a. Stage 1: Fill joint with urethane elastomer, Sonneborn 150 VLM or approved equal, and tool.
 - b. Stage 2: After cure, apply elastomeric patching compound along repair area at a minimum dry film thickness of 1/16 inch. Placement should be along center of the filled joint and "feathered" down to zero thickness using a wet putty knife, trowel or brush.
3. All crack repair must be blended to the surrounding substrate to reduce visible repair. Repairs deemed not acceptable by the Owner must be removed and reworked until satisfactory.

E. Delaminated Cementitious Stucco/Plaster:

1. Remove all delaminated materials to sound substrate.
2. Replace missing or corroded lath.
3. Repair using polymer modified cementitious plaster materials per manufacturer's written directions.

3.6 FINISH

- A. Do not apply paint until moisture content is below 19% with pH level less than 9. Refer to Section 09 90 00.
- B. Apply paint coating/finish in accordance with Section 09 90 00 on stucco wall surfaces.
- C. Apply to full coverage to preclude voids or pinholes in the applied coating.

- D. Paint entire wall surfaces, typically from “corner to corner” or other visual cut-offs. Coordinate painting with Owner.

3.7 CUTTING AND PATCHING

- A. Cut, patch, replace, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, crazing (check cracking), dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION 092400

SECTION 099000 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for following Scope of Work.
 - 1. Prepare, prime, and paint exterior Portland cement (stucco) wall surfaces at repair areas where indicated on the Pumping Station.
 - 2. Prepare, prime and paint exterior plywood sheathing where indicated at the Pump Houses.
 - 3. Treat corrosion, prepare and apply rust-inhibiting primer to existing steel surfaces uncovered during work and scheduled to remain in place.

1.2 ALTERNATES

- A. Refer to Section 012300 "Alternates" for add-alternate to the Base Bid for painting existing exterior walls of the Pumping Station.

1.3 SPECIAL JOB CONDITIONS

- A. Coating products shall not contain: asbestos, zinc chromate, strontium chromate, or lead.
- B. New finish color shall be custom selected to match the existing paint finish or color as selected by Owner. Mock-ups shall be performed at locations designated by Owner for approval of color match.
- C. Building will be occupied and/or in use during construction. Contractor shall take all precautions necessary to protect persons and property. Scheduling of work shall be coordinated with Owner's representative.
- D. Provide all necessary temporary protection and barriers to segregate work area and prevent damage to adjacent areas. New roofing shall be protected during painting work.
- E. Do not apply paint over new stucco surfaces until stucco cures and moisture content is below 19% with pH level less than 9. Refer to Section 092400 "Portland Cement Plaster".

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Paints shall be delivered in sealed containers that legibly show designated name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name of manufacturer.

- B. Paints and thinner shall be stored in accordance with manufacturer's written directions and as a minimum stored off ground, under cover, with sufficient ventilation to prevent build-up of flammable vapors and at temperatures between 40 and 95 degrees F.

1.5 ENVIRONMENTAL CONDITIONS

- A. Unless otherwise recommended by paint manufacturer, ambient temperature shall be between 45 and 95 degrees F when applying coatings.

1.6 SUBMITTALS

- A. Manufacturer's Instructions
 1. Paint application instructions.
 2. Patching & sealing material application instructions
 3. Paint color charts for Owner's selection of color, or custom color match
 4. Material Safety Data Sheets (MSDS)
- B. Schedule for Paint application, including color, paint type, procedures for prep and painting each substrate type, drawings to illustrate.
- C. Applicators Qualifications consisting of evidence showing satisfactory application of proposed paint at a minimum of two sites. Give names and contacts at sites.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

2.2 PRIMER AND PAINT

- A. Primer:
 1. Exterior stucco or concrete masonry wall surfaces: Loxon Acrylic Primer by Sherwin Williams or accepted substitute.
 2. Exterior plywood or wood lumber surfaces: Exterior Latex Wood Primer by Sherwin Williams or accepted substitute.
 3. For treating exterior rusted or corroded steel (roof framing at Pumping Station): refer to Structural Drawings.

- B. Finish Paint for exterior stucco, concrete masonry, plywood, wood surfaces: Duration Exterior Acrylic Latex Paint (satin) by Sherwin Williams or accepted substitute.
 - 1. Finish Colors shall be custom-matched to existing painted wall surfaces. Color of undercoats shall vary slightly from color of next coat.
- C. Paints containing lead in excess of 0.06 percent by weight of total nonvolatile content (calculated as lead metal) shall not be used.
- D. Paints shall comply with applicable state and local laws enacted to insure compliance with Federal Clean Air Standards and shall conform to restrictions of local air pollution control authority.

2.3 ACCESSORIES

- A. Sealants and patching material shall be compatible with acrylic latex top coats.
- B. Sealants for repairing small holes or hairlines cracks in stucco surfaces prior to painting: ConSeal Elastomeric Sealant by Sherwin Williams or accepted substitute, smooth or textured as required to match existing wall surface texture.
- C. Masonry/Stucco Patching material for repairing larger cracks and other defects in existing stucco surfaces: ConSeal Elastomeric Patch by Sherwin Williams or accepted substitute, smooth or textured as required to match existing wall surface texture.

2.4 PAINT SCHEDULE

- A. Exterior stucco, concrete CMU, plywood or wood surfaces:
 - 1. Primer
 - a. Number of Coats: One, dry film thickness, 3.2 mils.
 - 2. Acrylic Latex Finish Coat
 - a. Number of Coats: Two, dry film thickness, 2.5 mils per coat.
- B. Exterior moderate-to-heavy corroded steel (steel framing): refer to structural drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Paint application shall be performed by brush or roller only. No spraying shall be permitted unless approved in advance by Owner.
- B. Masking tapes, sheets, and sealants shall be compatible with materials they are applied to and shall not leave stains on adjacent surfaces.

- C. Prior to surface preparation and coating applications, remove mask or otherwise protect all adjacent surfaces. Repair or replace items damaged in course of painting to Owner's satisfaction.
- D. Protect existing roof system, windows and other building components during work.
- E. Before applying succeeding coats, undercoats shall be completely integral and shall perform function for which they are specified. Properly prepare and touch up all scratches, abrasions or other disfigurements and remove any foreign matter before proceeding with following coat. All spot-priming or painting shall be featheredged into adjacent areas to produce smooth monolithic appearance.
- F. Post "Wet Paint" signs as required.

3.2 PREPARATION

- A. Clean all surfaces to be painted as required to remove dust and dirt. Sand as necessary to properly prepare surfaces to receive primer and paint.
- B. Wipe off dust and grit from properly prepared surfaces prior to applying primer.
- C. Remove mildew from surfaces to be painted by washing with a solution of 1-part liquid bleach and 3-parts water. Apply solution and scrub mildew area. Allow solution to remain on surface for 10 minutes and rinse thoroughly with water and allow to dry before application of coatings. Wear protective clothing and eyewear as required during cleaning. Do not add detergents or ammonia to the bleach-water solution.
- D. Ferrous Surfaces: Ferrous surfaces including those that have been shop-coated, shall be solvent-cleaned. Surfaces that contain loose rust, loose mill scale, and other foreign substances shall be cleaned as per SSPC-SP3 Power Tool Cleaning requirements to remove loose scale, rust or paint. Apply rust-inhibiting primer to all exposed ferrous surfaces as indicated.
- E. Damaged (Stucco or Masonry) Surfaces: Damaged areas such as, but not limited to, holes, cracks, chips, and spalls shall be repaired with suitable sealants or patching material to match adjacent undamaged areas. Edges of chipped paint shall be feather edged and sanded smooth.
 - 1. Damaged existing stucco with exposed (rusty) wire lath: clean per SSPC-SP2 Hand Tool Cleaning requirements to remove loose plaster, scale, rust or paint. Spot apply rust-inhibiting primer to exposed lath and allow to dry prior to application of elastomeric patching material.
- F. Previously Painted (Stucco or Masonry) Surfaces: Previously painted surfaces specified to be repainted or damaged during construction shall be thoroughly cleaned of all grease, dirt, dust or other foreign matter. Blistering, cracking, flaking and peeling or other deteriorated coatings shall be removed. Slick surfaces shall be roughened. Pressure clean (minimum 2100 psi) to remove all dirt, dust, grease, oil, loose particles, laitance, foreign material, chalk, peeling and defective coatings, etc. Allow surfaces to dry before proceeding.

3.3 STUCCO AND MASONRY REPAIRS

- A. Small openings and cracks – up to 1/16” wide: Bridge over voids and small cracks in stucco (up to 1/16” wide) using elastomeric sealant as specified. To ensure blending of repair area with surrounding surfaces, provide sufficient crest over the void or crack to allow for shrinkage. Feather sealant to zero at edges using a brush, knife or trowel so as to help prevent telegraphing of patch through finish paint coats as recommended by sealant manufacturer. For applications more than ¼” in depth, apply in multiple applications. Allow to cure prior to application of primer or paint coatings.
- B. Large openings and cracks – from 1/16” to 3/8” wide in stucco wall: Open up cracks to provide a sound surface. Flush out openings as required to remove dust. Fill the opening with elastomeric patching compound. To ensure blending of repair area with surrounding surfaces, provide sufficient crest over the void or crack to allow for shrinkage. Feather patching compound to zero at edges using a brush, knife or trowel so as to help prevent telegraphing of patch through finish paint coats as recommended by patching compound manufacturer. For applications more than ¼” in depth, apply in multiple applications. Allow to cure prior to application of primer or paint coatings.
- C. Damaged Stucco, exposed lath: Repair exposed rusted surfaces of stucco lath as previously specified. Remove loose or damaged stucco around repair area to provide a sound surface. Fill and cover damaged surfaces with elastomeric patching compound. To ensure blending of repair area with surrounding surfaces, provide sufficient crest over the area to allow for shrinkage. Feather patching compound to zero at edges using a brush, knife or trowel so as to help prevent telegraphing of patch through finish paint coats as recommended by patching compound manufacturer. For applications more than ¼” in depth, apply in multiple applications. Allow to cure prior to application of primer or paint coatings.

3.4 APPLICATION

- A. Apply products in accordance with manufacturer’s instructions. Rate of application of coating shall be as specified but shall not exceed that as recommended by paint manufacturer for purpose of surface involved.
- B. Extend new paint on existing painted wall surfaces out to corners or ends of wall as required to provide visual cut-offs to limit difference in appearance from newly applied paints and existing adjacent painted surfaces not scheduled to receive paint.
- C. Allow sufficient drying time between coats as recommended by coating manufacturer.
- D. Lightly sand and dust between each coat to remove defects visible from 10-feet. Finish coats shall be smooth, free from brush marks, streaks, laps, sags, skips, holidays, etc.
- E. Do not apply additional coats until previously installed coat has been reviewed and accepted by Owner or Owner’s Representative. Only accepted coats of paint will be considered in determining number of coats applied.
- F. Refinish entire sections if areas which have been previously repaired are rejected.

3.5 CLEANING

- A. Repair brush marks, scratches, abrasions, and minor surface defects in coatings finish in accordance with manufacturer's printed instructions. Finish of repaired surfaces shall be uniform and free from blemishes and variations in color and surface texture.

END OF SECTION 099000

SECTION 150110 - MECHANICAL/ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for the following Scope of Work:
1. Mechanical disconnection, extension, shortening, and/or reconnection shall be performed in accordance with the Florida Building Code, Mechanical, 2014.
 2. Electrical disconnection, extension, shortening, and/or reconnection shall be performed in accordance with the Florida Building Code, Electrical, 2014.
 3. Plumbing work shall be performed in accordance with the Florida Building Code, Plumbing, 2014.
 4. Details, not shown or specified but necessary for proper installation and operation shall be included within the work as though specified herein.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL

- A. Mechanical, electrical, and associated work shall be performed by licensed tradesman and shall comply with the applicable code requirements
- B. Wherever possible match the existing mechanical and electrical components.
- C. Handle, store, and protect equipment and materials to prevent damage before and during installation.

END OF SECTION 150110