THE CITY OF DAYTONA BEACH
OFFICE OF THE PURCHASING AGENT

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Daytona Beach, Florida 32115-2451

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ADDENDUM NO. 2

DATE: **October 11, 2019**

PROJECT: **ITB 20043**
JOE'S CRAB SHACK EXTERIOR DECK AND REROOFING PROJECT

OPENING DATE: **October 25, 2019**

This addendum is hereby incorporated into the Bid Documents for the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining, deletions are indicated by ~~strikethrough.~~

1. The attached Technical Provisions for this project are hereby ADDED to the bid documents.

2. A third addendum will be issued to address issues raised at the pre-bid meeting and site visit.

3. All other terms and conditions remain the same.

The Bidder shall acknowledge receipt of this addendum in Section 7 of the Bid Proposal Form.

The City of Daytona Beach

Joanne Flick
Purchasing Agent

C: Joe Piper, Technical Services Project Manager
Jay Ammon, Architect

Table of Contents

DIVISION 1 - GENERAL REQUIREMENTS

Section No	Title
002200	Unit Prices
010100	Summary of Work
010140	Maintenance of Operations
010260	Schedule of Values
010400	Coordination
010910	Reference Standards and Definitions
012000	Project Meetings
013000	Submittals
013100	Construction Schedules
013400	Shop Drawing Procedures
014000	Quality Control
015000	Temporary Facilities and Controls
015410	Protection of the Work and property
016000	Materials and Equipment
016110	Storage of Material
017000	Record Documents & Closeout Procedures

TECHNICAL SPECIFICATIONS

Section No	Title
020700	Selective Demolition
057300	Decorative Metal Railings
061000	Rough Carpentry
062013	Exterior Finish Carpentry
066000	Cellular PVC Fabrications
075216	Styrene Butadiene Styrene Modified Bitumen
075910	Preparation for Reroofing
076200	Sheet Metal Flashing and Trim
077200	Roof Accessories
077616	Pedestal Deck Assembly
079200	Joint Sealants
093013	Ceramic Tiling
131000	Lightning Protection
221423	Storm Drainage Piping Specialties

Drawing Index (See attached 24” x 36” drawings)

AD1.1	Cover Sheet
SP1.1	Site Plan
A1.1	Symbols, Abbreviation and Code Information
A1.2	General Notes
A2.0	Existing Conditions Roof Plan
A2.1	Proposed Roof Plan
A2.2	Wind Uplift Pressure Roof Plan
A2.3	Partial Proposed Roof Plan
A2.4	Wall Sections and Elevations
A2.5	Wall Sections
A3.1	Roofing Replacement Details
A3.2	Roofing Replacement Details
A3.3	Roofing Replacement Details
A3.4	Roofing Replacement Details
A3.5	Roofing Replacement Details
A3.6	Roofing Replacement Details
A5.1	Photographs
A5.2	Photographs
A5.3	Photographs
A7.0	Alternate Proposed Roof Plan
A7.1	Alternate Roof Details
A7.2	Alternate Photographs

SECTION 002200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

1.2 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. 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 surveyor acceptable to Contractor.

C. List of Unit Prices: A schedule of unit prices is included in Part 3. 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 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1.0 Deck Replacement:

1. Description: Replace existing deteriorated structural plywood deck with 3/4 inch exterior marine grade plywood secured in accordance with the Scope of Work.
2. Unit of Measurement: Cost per square foot.
3. Quantity Allowance: Include 100 sf plywood replacement within the Base Bid amount.

B. Unit Price No. 2.0: Wood Blocking Replacement:

1. Description: Remove existing deteriorated wood blocking and replace with new pressure treated wood blocking matching size of existing wood blocking.
2. Unit of Measurement: Cost per board foot.
3. Quantity Allowance: Include 50 bf wood blocking replacement within the Base Bid amount.

C. Unit Price No. 3.0: New tapered Insulation:

1. Description: Install new tapered 2-faced polyisocyanurate insulation as required to maintain a minimum slope of 1/8” per foot over all roof surfaces.
2. Unit of Measurement: Cost per square foot.
3. Quantity Allowance: Include 300 sf of new tapered insulation within the Base Bid amount.

END OF SECTION 002200

SECTION 010100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 PROJECT WORK SCOPE:

A. Scope: The work consists of providing all necessary labor, material, equipment, supervision, and permitting necessary to complete the following work as depicted in the bid documents including drawings and project manual prepared by Jay Ammon Architect, Inc. and dated September 17, 2019, for the project entitled "Joe's Crab Shack - Exterior Deck and Roofing Replacement Project":

1. Base Bid: On all low slope roofing, remove existing roofing assembly from the top surface of the structural wood roof deck, add tapered insulation where required for positive roof slope, install a cementitious cover board, install a 2 ply modified bitumen roof membrane. Where designated, install a pedestal deck system with wood tile over a drainage mat. Where designated, install ceramic tile over mortar over a drainage mat. Install new roof and deck drains where designated.

2. Alternate One: Submit an add alternate price on the bid form for all work associated with the roofing replacement of the deck level restaurant and the deck level bar building.

B. Project Location:

1. 1200 Main Street
Daytona Beach, Florida 32118.

1.2. CONTRACTOR SHALL PROVIDE AND PAY FOR:

A. Labor, Materials, Equipment and Supervision.
B. Tools, Construction Equipment and Machinery.
C. Water, Heat and Utilities Required for Construction.
D. Other Facilities and Services Necessary for Proper Execution and Completion of the Work.

1.3 CONTRACTOR SHALL SECURE AND PAY FOR:

A. Government Fees
B. Licenses
C. All Building Permits

1.4. CONTRACTOR SHALL GIVE REQUIRED NOTICES TO AGENCIES & PUBLIC:

A. Particular care shall be taken to adequately inform the public of scheduled temporary disruption of water and/or sewer services.

1.5. CONTRACTOR SHALL COMPLY WITH:

A. Codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of work.

1.6 SALVAGED MATERIALS:

A. In the absence of special provisions to the Contract, salvaged materials, equipment or supplies that occur are the property of the City and shall be cleaned and stored as directed by the City.

1.7. MAINTAINING TRAFFIC:

A. Traffic shall be maintained on all roads and streets, in compliance with the plans and specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 010100

SECTION 010140 - MAINTENANCE OF OPERATIONS

PART 1 - GENERAL

1.1 GENERAL

A. The intent of these specifications is to have the CONTRACTOR schedule and perform the Work in a manner such that the OWNER can keep all first floor operations of the existing facility in continuous, dependable operation. It is required as a part of this Contract that the CONTRACTOR adhere to the constraints listed in this Section.

B. The CONTRACTOR shall:
   1. Keep existing facilities in operation unless otherwise specifically permitted in these specifications or approved by the OWNER in writing. The schedule is subject to change without notice.
   2. Coordinate any system shutdowns with the OWNER and limit the shutdown periods to acceptable times.

1.2 GENERAL CONSTRAINTS

A. Any temporary work, facilities, roads, walks, protection of existing structures, piping, blind flanges, valves, equipment, etc. that may be required within the CONTRACTOR'S work limits to maintain continuous and dependable operation of existing systems shall be furnished by the CONTRACTOR at no extra cost to the OWNER.

B. The CONTRACTOR shall schedule the Work in such a manner so that all existing systems are maintained in continuous operation. All short-term system or partial system shutdowns shall be approved in writing by the OWNER. If, in the opinion of the ENGINEER or OWNER, a shutdown is not required in order for the CONTRACTOR to perform the Work, the CONTRACTOR shall utilize alternative methods to accomplish the Work. All shutdowns shall be coordinated with and scheduled at times suitable to the OWNER. OWNER shall be provided a minimum of one-week notice of CONTRACTOR'S need for any system shutdown.

C. Required shutdowns shall not begin until all materials are on-hand, pre-assembled, as possible, and ready for installation. At a time approved by the OWNER, the shutdown period will commence and the CONTRACTOR shall proceed with the Work continuously, start to finish, until the Work is completed and the system is tested, cleared for service, and ready for operation. If the CONTRACTOR completes all required Work before the specified shutdown period has ended the OWNER may immediately place the system back in service.

D. The OWNER shall have the authority to order Work stopped or prohibited which would, in his opinion, unreasonably result in stopping or inhibiting the necessary functions of existing utilities.

E. The OWNER reserves the right to cancel scheduled shutdowns if conditions warrant. Delays to the CONTRACTOR caused by cancellations will be considered in evaluating requests for time extension.

G. All facilities shall be tested and in operating condition before final tie-ins are made.

1.4 SUBMITTALS

A. Submit detailed schedule of proposed testing immediately prior to construction.

1.5 WORK SEQUENCE

A. The contractor shall submit a proposed work sequence two weeks prior to the pre-construction meeting. See section 013100, Construction Schedules for detail of the schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 010140

SECTION 010260 – SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural support requirements necessary to prepare an acceptable Schedule of Values assignment, if pertinent for processing Applications for Payment.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets, Submittals Schedule and Contractor's Construction Schedule.
2. Submit the Schedule of Values to OWNER’s Architect and/ or Engineer at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Sub schedules: Where the Work is separated into phases requiring separately phased payments, provide sub schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Bid Form as a guide to establish line items for the Schedule of Values. Provide at least one-line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of OWNER/Architect/Engineer.
c. OWNER's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Submit draft of AIA Document G703 Continuation Sheets.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Bid Form. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Each item in the Schedule of Values and Applications for Payment shall be complete and shall include the total cost for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer / Architect and paid for by OWNER.

    1. Contractor to prepare Pay Application after confirming quantities or percent complete work with OWNER’s Contract Administrator.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between OWNER and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Progress payments shall be submitted to OWNER at a maximum of one per thirty-day period.

D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. OWNER will return incomplete applications without action.

    1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit four (4) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application to include City's Minority and Women Owned Business Enterprise Usage form Page BID -12 with each application.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values including unit price line items.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's principal consultants.
6. Copies of building permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
8. Initial progress report.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for OWNER occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Updated final statement, accounting for final changes to the Contract Sum.
3. Evidence that claims have been settled.
4. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when OWNER took possession of and assumed responsibility for corresponding elements of the Work.
5. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 010260

SECTION 010400 - COORDINATION

PART 1 - GENERAL

1.1 The CONTRACTOR shall provide for the complete coordination of the construction efforts. This shall include, but not necessarily be limited to coordination of the following:

1. The work of subcontractors
2. The flow of material and equipment from suppliers
3. The effort of equipment manufacturers during test and checkout
4. Interrelated work with public utilities companies
5. The interrelated work with the OWNER where tie-ins to existing facilities are required
6. The effort of independent testing agencies.

1.2 The CONTRACTOR shall be allowed the widest practicable latitude in establishing his plan of work. CONTRACTOR shall submit a plan of work to OWNER and ARCHITECT.

PART 2 - MATERIALS AND EQUIPMENT (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 010400

SECTION 010910 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic contract definitions are included in the Conditions of the Contract.

B. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.

D. "Approved": The term "approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at the Project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "installer," means having successfully

completed a sufficient number of previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

2. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

    a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

J. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the 16-division format and CSI/CSC's "MasterFormat" numbering system.

B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Section Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Construction Standards: All Work shall conform to the standards described in this project manual and shall not be less stringent than the following standards:

1. Florida Building Code, Building: 2014
2. Florida Building Code Plumbing: 2014
3. Florida Building Code Mechanical: 2014
4. NFPA 101: 2012

C. Publication Dates: Comply with standards in effect as of the date of the Contract Documents.

D. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

E. Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following abbreviations and acronyms, as referenced in the Contract Documents, mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association 900 19th St., NW, Suite 300 Washington, DC 20006 www.aluminum.org	(202) 862-5100
AABC	Associated Air Balance Council	(202) 737-0202

	1518 K St., NW, Suite 503 Washington, DC 20005 www.aabchq.com	
AAMA	American Architectural Manufacturers Association 1827 Walden Office Sq., Suite 104 Schaumburg, IL 60173-4268 www.aamanet.org	(847) 303-5664
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 One Davis Dr. Research Triangle Park, NC 27709-2215 www.aatcc.org	(919) 549-8141
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 www.aci-int.org	(248) 848-3700
ACIL	ACIL: The Association of Independent Scientific, Engineering, and Testing Firms 1629 K St., NW, Suite 400 Washington, DC 20006 www.acil.org	(202) 887-5872
ADC	Air Diffusion Council 11 South LaSalle St., Suite 1400 Chicago, IL 60603	(312) 201-0101
AFPA	American Forest and Paper Association (Formerly: National Forest Products Association) 1111 19th St., NW, Suite 800 Washington, DC 20036	(800) 878-8878 (202) 463-2700
AI	Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052 www.asphaltinstitute.org	(606) 288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	(202) 626-7300

AISC	American Institute of Steel Construction One East Wacker Dr., Suite 3100 Chicago, IL 60601-2001	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute 1101 17th St., NW Washington, DC 20036-4700 www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction 7012 S. Revere Pkwy, Suite 140 Englewood, CO 80112 www.aitc-glulam.org	(303) 792-9559
ALA	American Laminators Association (See LMA)	
ALSC	American Lumber Standards Committee P.O. Box 210 Germantown, MD 20875	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Dr. Arlington Heights, IL 60004-1893 www.amca.org	(847) 394-0150
ANLA	American Nursery and Landscape Association (Formerly: American Association of Nurserymen) 1250 Eye St., NW, Suite 500 Washington, DC 20005	(202) 789-2900
ANSI	American National Standards Institute 11 West 42nd St., 13th Floor New York, NY 10036-8002 www.ansi.org	(212) 642-4900
APA	APA-The Engineered Wood Association (Formerly: American Plywood Association) P.O. Box 11700 Tacoma, WA 98411-0700 www.apawood.org	(206) 565-6600
ARI	Air-Conditioning and Refrigeration	(703) 524-8800

	Institute 4301 Fairfax Dr., Suite 425 Arlington, VA 22203 www.ari.org	
ARMA	Asphalt Roofing Manufacturers Association Center Park 4041 Powder Mill Rd., Suite 404 Calverton, MD 20705	(301) 231-9050
ASC	Adhesive and Sealant Council 1627 K St., NW, Suite 1000 Washington, DC 20006-1707	(202) 452-1500
ASCA	Architectural Spray Coaters Association 230 W. Wells St., Suite 311 Milwaukee, WI 53203	(414) 273-3430
ASCE	American Society of Civil Engineers-World Headquarters 1801 Alexander Bell Dr. Reston, VA 20191-4400 www.asce.org	(800) 548-2723 (703) 295-6000
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017-2392 www.asme.org	(800) 434-2763 (212) 705-7722
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake Village, CA 91362-3649	(805) 495-7120
ASSE	American Society of Sanitary Engineering 28901 Clemens Rd. Westlake, OH 44145 www.asse-plumbing.org	(216) 835-3040

ASTM	American Society for Testing and Materials 100 Barr Harbor Dr. West Conshohocken, PA 19428-2959 www.astm.org	(610) 832-9500
FM	Factory Mutual System 1151 Boston-Providence Tnpk. P.O. Box 9102 Norwood, MA 02062-9102 www.factorymutual.com	(781) 762-4300
GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002 www.usg.com	(202) 289-5440
MIA	Masonry Institute of America 2550 Beverly Blvd. Los Angeles, CA 90057 www.masonryinstitute.org	(213) 388-0472
ML/SFA	Metal Lath/Steel Framing Association (A Division of the NAAMM) 8 South Michigan Ave., Suite 1000 Chicago, IL 60603	(312) 456-5590
MRCA	Midwest Roofing Contractors Association 4840 W. 15th St., Suite 1000 Lawrence, KS 66049	(800) 879-4448 (913) 843-4888
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park St., NE Vienna, VA 22180-4602	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers 8 South Michigan Ave., Suite 1000 Chicago, IL 60603 www.gss.net/naamm	(312) 456-5590
NCMA	National Concrete Masonry Association 2302 Horse Pen Rd. Herndon, VA 20171-3499 www.ncma.org	(703) 713-1900
NFPA	National Fire Protection Association	(800) 344-3555 (617) 770-3000

	One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 www.nfpa.org	
NFPA	National Forest Products Association (See AFPA)	
NRCA	National Roofing Contractors Association O'Hare International Center 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607 www.roofonline.org	(800) 323-9545 (847) 299-9070
PCA	Portland Cement Association 5420 Old Orchard Rd. Skokie, IL 60077-1083 www.portcement.org	(847) 966-6200
RCMA	Roof Coatings Manufacturers Association Center Park 4041 Powder Mill Rd., Suite 404 Calverton, MD 20705	(301) 230-2501
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60021 www.sdi.org	(847) 462-1930
SJI	Steel Joist Institute 3127 10th Ave., North Ext. Myrtle Beach, SC 29577-6760	(803) 626-1995
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc. 4201 Lafayette Center Dr. P.O. Box 221230 Chantilly, VA 20151-1209 www.smacna.org	(703) 803-2980
SWRI	Sealant, Waterproofing and Restoration Institute 2841 Main Kansas City, MO 64108	(816) 472-7974
TIMA	Thermal Insulation Manufacturers Association	

(See NAIMA)

UL	Underwriters Laboratories Inc. 333 Pfingsten Rd. Northbrook, IL 60062 www.ul.com	(800) 704-4050 (847) 272-8800
WWPA	Western Wood Products Association Yeon Building 522 SW 5th Ave. Portland, OR 97204-2122	(503) 224-3930

G. Federal Government Agencies: Names and titles of Federal Government standards- or specification-producing agencies are often abbreviated. The following abbreviations and acronyms referenced in the Contract Documents indicate names of standards- or specification-producing agencies of the Federal Government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

CE	Corps of Engineers (U.S. Department of the Army) 20 Massachusetts Ave., NW Washington, DC 20314 CRD standards are available from: U.S. Army Corps of Engineers Waterways Experiment Station Technical Report Distribution Section Services Branch, TIC 3909 Halls Ferry Rd. Vicksburg, MS 39180-6199	(202) 761-0660 (601) 634-2696
CFR	Code of Federal Regulations (Available from the Government Printing Office) Washington, DC 20401 (Material is usually published first in the "Federal Register.") www.access.gpo.gov	(202) 512-0000
CPSC	Consumer Product Safety Commission East West Towers 4330 East-West Hwy Bethesda, MD 20814	(800) 638-2772
CS	Commercial Standard (U.S. Department of Commerce) Government Printing Office Washington, DC 20402 For Commercial standards, contact: Ms. Brenda Umberger	(202) 512-1800 (301) 975-4036

	CS & PS Specialist c/o NIST Gaithersburg, MD 20899	
DOC	Department of Commerce 14th St. and Constitution Ave., NW Washington, DC 20230	(202) 482-2000
DOT	Department of Transportation 400 Seventh St., SW Washington, DC 20590	(202) 366-4000
EPA	Environmental Protection Agency 401 M St., SW Washington, DC 20460	(202) 260-2090
FSU	Federal Specification Unit (Available from GSA) 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407	(202) 619-8925
GSA	General Services Administration F St. and 18th St., NW Washington, DC 20405	(202) 708-5082
MIL	Military Standardization Documents (U.S. Department of Defense) Defense Printing Service 700 Robbins Ave., Building 4D Philadelphia, PA 19111	(215) 697-2179
NIST	National Institute of Standards and Technology (U.S. Department of Commerce) Building 101, #A1134, Rte. I-270 and Quince Orchard Rd. Gaithersburg, MD 20899	(301) 975-2000
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) 200 Constitution Ave., NW Washington, DC 20210	(202) 219-8148
PS	Product Standard of NBS (U.S. Department of Commerce) Government Printing Office Washington, DC 20402 For Product standards, contact:	(202) 512-1800

Ms. Brenda Umberger (301) 975-4036
CS & PS Specialist
c/o NIST
Gaithersburg, MD 20899

1.5 SUBMITTALS

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 010910

SECTION 012000 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

Project meetings shall be scheduled as needed throughout the progress of the work. ARCHITECT shall be responsible for scheduling the meetings, preparing the agenda, distributing written notice of each meeting not less than four days in advance of the meeting date, making physical arrangements for the meeting, presiding at the meeting, recording the minutes (including all significant proceedings and decisions), and reproducing and distributing copies of the minutes to all participants and all parties affected by decisions made.

Representatives attending the meetings shall be qualified and authorized to act on behalf of the entity that they represent.

1.02 PRE-CONSTRUCTION CONFERENCE

A pre-construction conference will be held prior to beginning any work under the Contract. ARCHITECT will schedule the conference in consultation with OWNER and CONTRACTOR.

CONTRACTOR shall be ready to submit his anticipated progress schedule, a preliminary schedule of shop drawing submissions, and a preliminary schedule of values of work.

The pre-construction conference will be attended by representatives of OWNER, ARCHITECT, utility companies who will be affected by the work, and such of CONTRACTOR'S subcontractors as he wishes to attend.

1.03 PROGRESS MEETINGS

Regular progress meetings shall be held during the construction period. At these meetings the CONTRACTOR shall submit any updated progress schedules, advise OWNER and ARCHITECT of any anticipated delays or problems in the progress of the work, and discuss any problems or events which affect the progress.

PART 2 - MATERIALS AND EQUIPMENT (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 012000

SECTION 013000 - SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. The type of submittal requirements specified in this section include but are not limited to the following:

1. Progress Schedules and Reports
2. Material and Equipment
    a. Shop Drawings
    b. Manufacturer's Data
    c. Samples
3. General Submittal Requirements
    a. Shop Drawings Required
    b. Certificate of Compliance
4. Bar Chart Schedule

B. Submittals shall be clear and legible, printed or typed. Submittals received that are not so, shall be returned to be resubmitted when in legible form.

1.02 PROGRESS SCHEDULES AND REPORTS

A. Progress schedules shall be prepared in the form of a horizontal bar chart unless other format or use of a network analysis system is required. A separate horizontal bar shall be provided for each trade or operation. The first work day of each week shall be identified on the horizontal time scale. Scale and spacing will be such as to allow space for notations and revisions.

B. Schedules shall show the complete sequence of construction by activity with dates for the beginning and completion of each major element of construction. Projected percentage of completion for each item as of the first day of each month shall be shown.

C. Revised schedules shall be submitted periodically as changes become apparent.

D. Progress Reports. The CONTRACTOR shall prepare and submit a monthly progress report. The report shall indicate the progress at the date of submission of each activity shown on his progress schedule. It shall show changes occurring since previous submissions, activities modified since previous submissions, and revised projections of progress and completion. The submittal shall include a narrative report to define problem areas, anticipated delays, and the impact on the schedule, and corrective action recommended and its effect.

1.03 MATERIALS AND EQUIPMENT DATA (Shop Drawings, Manufacturer's Data and Samples)

A. Schedules of Shop Drawing submittals shall note any items which require critical timing for maintaining delivery or construction schedules.

B. Definitions. Work related submittals of this section are categorized for convenience as follows:

1. Shop drawings include specially prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to several projects.
2 Material and Equipment data includes standard printed information on materials, equipment and systems; not specially-prepared for this project, other than the designation of selections from among available choices printed in the information.
3. Samples include both fabricated and unfabricated physical examples of materials, equipment and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or, where indicated, for more detailed testing and analysis.
4. Mock-ups are a special form of samples, which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals.
5. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standard, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the work and not processed as shop drawings, product data or samples.

1.04 GENERAL SUBMITTAL REQUIREMENTS

A. Where stated in individual sections, CONTRACTOR shall submit one electronic copy of Shop Drawings which are to be reviewed by ARCHITECT. Upon completion of ARCHITECT’s review, one electronic copy will be returned to CONTRACTOR.

B. In all other Sections where Shop Drawings are requested, CONTRACTOR shall submit one electronic copy of Shop Drawings which are to be used by ARCHITECT in observing installation of materials or equipment and for Record purposes.

C. Certificates of compliance shall be provided with Shop Drawing submittal where requested.

1.05 Shop Drawings Required.

A. Shop Drawings shall be submitted for only those items listed in the individual Sections of the Specifications. Shop Drawings not required by the Specifications or not having been completely reviewed and corrected by CONTRACTOR will be returned without review or comment.

B. Certificates of Compliance. Certificate of Compliance required to be furnished by CONTRACTOR or Supplier shall be in the form of an affidavit attesting that the materials, equipment or Work covered by the Certificate conform to the specified requirements, that all

tests specified or required have been performed and that all test requirements have been met. Certificates shall be subscribed to and executed before a person authorized to administer oaths.

1.06 BAR CHART SCHEDULE

A. Submit a bar chart construction schedule which includes a list of activities, specifies the start date of the activity, duration of the activity and completion date of each activity, each plotted into the project time scale.

B. During the project, the effect of any change orders shall be evaluated and compared with the original plan and schedule to establish the effect of such changes on the scheduled project completion time.

C. No later than 30 days after the Notice to Proceed is issued, the CONTRACTOR shall submit one electronic copy his bar chart schedule covering the entire project for review by the ARCHITECT.

PART 2 - MATERIALS AND EQUIPMENT (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 013000

SECTION 013100 - CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 GENERAL

A. Provide construction schedule which conforms to the requirements below, unless otherwise approved by ARCHITECT.

B. Update schedules every month unless otherwise specified or directed by ARCHITECT.

1.2 CONTENT

A. Shop Drawing submittal dates and required approval dates.

B. Product delivery dates.

C. Factory and field testing dates.

D. Dates for beginning and completing each phase of the Work by activity and by trades.

1.3 FORMAT

A. Type: Horizontal bar chart.

B. Sheet Size: 81/2-inches by 11-inches.

C. Time Scale: Indicate first date in each work week.

D. Organization:
   1. Group Shop Drawing submittals and reviews into a separate sub-schedule.
   2. Group product deliveries into a separate subschedule.
   3. Group construction work into a separate subschedule by activity.
   4. Group critical activities which dictate the rate of progress into a separate sub-schedule.
   5. Organize each sub-schedule by Specification Section number.

E. Activity Designations: Show title and related Specification Section number.

1.4 SUBMITTALS

A. Submit initial schedule at least 20 days prior to submitting first application for a progress payment but no later than 30 days after date of execution of Agreement.

B. Submit updated schedules at progress meetings. If a schedule remains unchanged from one period to the next, submit a written notice to that effect.

C. Make submittals to ARCHITECT.

D. Unless otherwise specified, submit two copies of each schedule. One copy will be reviewed by the ARCHITECT and returned. The other copy will be retained by the ARCHITECT.

E. Attach a letter of transmittal to each submittal and include the following information in the letter:
   1. A listing of items which have changed since the last submittal.
   2. Discussion of problems causing delays, anticipated length of delays, and proposed countermeasures.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 013100

SECTION 013400 - SHOP DRAWING PROCEDURES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Shop Drawing procedures shall conform to requirements of General Conditions, Section 013000, and as described in this Section.

1.2 PROCEDURE

A. Submit Shop Drawings to: Engineer or Architect of Record as indicated on the Plans.

B. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.

C. At the beginning of each letter of transmittal provide a reference heading indicating the following:
   1. OWNER'S Name
   2. Project Name
   3. Contract Number
   4. Transmittal Number
   5. Section Number

D. If a Shop Drawing deviates from the requirements of the Contract Documents, CONTRACTOR shall specifically note each variation in his letter of transmittal.

E. All Shop Drawings submitted for approval shall have a title block with complete identifying information satisfactory to ARCHITECT.

F. All Shop Drawings submitted shall bear the stamp of approval and signature of CONTRACTOR as evidence that they have been reviewed by CONTRACTOR. Submittals without this stamp of approval will not be reviewed by ARCHITECT and will be returned to CONTRACTOR. CONTRACTOR'S stamp shall contain the following minimum information:

Project Name/ CODB Contract No.: _____

CONTRACTOR'S Name: _____

Date: _____

----------Reference----------

Item: _____
Specifications: _____

Section: _____

Page No.: _____

Paragraph No.: _____

Drawing No.: _____ of _____

Location: _____

Submittal No.: _____

Approved By: _____

G. A number shall be assigned to each submittal by CONTRACTOR starting with No. 1 and thence numbered consecutively. Re-submittals shall be identified by the original submittal number followed by the suffix "A" for the first re-submittal, the suffix "B" for the second re-submittal, etc.

H. CONTRACTOR shall initially submit to ARCHITECT a minimum of six (6) copies of all submittals that are on 11-inch by 17-inch or smaller sheets (no less than 8 1/2-inch x 11-inch), and one unfolded sepia and 2 prints made from that sepia for all submittals on sheets larger than 11-inch by 17-inch.

I. After ARCHITECT completes his review, Shop Drawings will be marked with one of the following notations:
   1. Approved
   2. Approved as Corrected
   3. Revise and Resubmit
   4. Not Approved

J. If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected". Three (3) prints or copies of the submittal will be returned to CONTRACTOR.

K. Upon return of a submittal marked "Approved" or "Approved as Corrected", CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.

L. If a Shop Drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other drawings or Work, ARCHITECT may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such drawings will have the notation, "Approved as Corrected - Resubmit."

M. If a submittal is unacceptable, three (3) copies will be returned to CONTRACTOR with one of the following notations:
   1. "Revise and Resubmit"
   2. "Not Approved"

N. Upon return of a submittal marked "Revise and Resubmit", CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.

O. Any related Work performed or equipment installed without an "Approved" or "Approved as Corrected" Shop Drawing will be at the sole responsibility of the CONTRACTOR.

P. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment

after data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.

Q. ARCHITECT will review and process all submittals promptly, but a reasonable time should be allowed for this, for the Shop Drawings being revised and resubmitted, and for time required to return the approved Shop Drawings to CONTRACTOR.

R. It is CONTRACTOR'S responsibility to review submittals made by his suppliers and SUBCONTRACTORs before transmitting them to ARCHITECT to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for ENGINEER to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.

S. CONTRACTOR shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within three submittals. All costs to ARCHITECT involved with subsequent submittals of Shop Drawings, Samples or other items requiring approval, will be backcharged to CONTRACTOR, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due CONTRACTOR for Work completed. In the event that CONTRACTOR requests a substitution for a previously approved item, all of ARCHITECT 'S costs in the reviewing and approval of the substitution will be backcharged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

T. Close Out Submittals: Refer to Section 017000 for specific general requirements on the submittal of closeout information, materials, tools, and similar items.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 013400

SECTION 014000 - QUALITY CONTROL

PART 1 - GENERAL

1.01 TESTING LABORATORY SERVICES

A. Arrangements for testing laboratory services will be made by CONTRACTOR. Payment for testing to show compliance with specified requirements will be paid for by CONTRACTOR.

1.02 LABORATORY STANDARDS

A. Testing laboratories shall conform to the applicable requirements of ASTM E329-77 (1983) STANDARD RECOMMENDED PRACTICE FOR INSPECTION AND TESTING AGENCIES FOR CONCRETE, STEEL AND BITUMINOUS MATERIALS AS USED IN CONSTRUCTION and shall be inspected and approved by the ELF/FC&PA Joint Technical Committee, Inc., or by an equivalent recognized national authority.

B. Agents of testing laboratories performing field sampling and field testing of concrete shall be certified by the American Concrete Institute as Concrete Field Testing Technicians Grade 1 or by an equivalent recognized national authority for an equivalent level of competence, or shall be licensed Professional Engineers.

1.03 ACCESS FOR INSPECTION

A. OWNER, ARCHITECT and their authorized representatives shall be permitted free access and every reasonable facility for the inspection of all Work, materials and equipment. OWNER and his authorized representatives shall also be permitted to inspect payrolls, invoices for materials and equipment. OWNER and his authorized representatives shall also be permitted to inspect payrolls, invoices for materials and equipment and other relevant data and records.

B. Authorized representatives of Federal, State or local agencies shall be permitted access to inspect for compliance with applicable laws, regulations and permit requirements.

C. On projects where Federal or State agency funding is used, authorized representatives of those agencies shall be permitted to inspect all work, materials, equipment, payrolls, records of personnel, invoices for materials and equipment and other relevant data and records.

1.04 INSPECTION OF WORK AWAY FROM SITE

A. When work to be done away from the construction site is to be inspected on behalf of OWNER during its fabrication, manufacture or testing or before shipment, CONTRACTOR shall give notice to ARCHITECT of the time and place where such fabrication, manufacturing, testing or shipping is to be done. Such notice shall be in writing and delivered to ARCHITECT in ample time so that the necessary arrangements for the inspection can be made.

PART 2 - MATERIALS AND EQUIPMENT
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 014000

SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. This section specifies the minimum requirements for temporary facilities, utilities to be brought to the site, and control required to enable the construction of the project to progress adequately. The providing of adequate facilities at every stage of performing the work is the CONTRACTOR'S sole responsibility, and is not limited by the requirements of this section.

B. Except as otherwise indicated, the CONTRACTOR may, at his option, provide stand-alone utility plants to provide needed services, in lieu of connected services from available public utilities, provided such stand-alone plant facilities comply with governing regulations. Prior to availability of temporary utility services, provide trucked-in/trucked-out containerized or unitized services for start-up of construction operations at the site.

C. Except as otherwise indicated, the costs of providing and using temporary utility services shall be included in the Contract Sum.

1.2 TEMPORARY FACILITIES

A. The types of utility services required for general temporary use at the project site include the following (other specific services may be required for specific construction methods or operations):

1. Electrical Power Service
2. Water Service (potable for certain uses)
3. Sanitary
4. Storm Sewer or Open Drainage/Run-off Control
5. Gas (fuel) Service
6. Telephone Service

B. Temporary Electricity. The CONTRACTOR shall provide for a temporary power source for his use during construction and arrange for modification of the permanent power supply by the power company as required. The permanent power supply service will remain as the OWNER's account throughout the project.

C. Temporary Water. The CONTRACTOR shall make all necessary application and arrangements, and pay all fees and charges for water necessary for the proper completion of the project up to the time of final acceptance. The CONTRACTOR shall provide and pay for any temporary piping and connections.

D. Temporary Sanitary Facilities. The CONTRACTOR shall provide adequate sanitary facilities for the use of those employed on the work. Such facilities shall be made available when the first employees arrive on the site of the work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the work in suitable numbers and at such points and in such manner as may be required or approved.

E. The CONTRACTOR shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the work, on the lands of the OWNER, or on adjacent property.

F. Termination and Removal. At the time the need for temporary utility service or a substantial portion thereof has ended, or when its service has been replaced by use of permanent services, or not later than the time of substantial completion, promptly remove the installation unless requested by the ARCHITECT to retain it for a longer period. Complete and restore work, which may have been delayed or affected by the installation and use of the temporary utility, including repairs to construction and grades and restoration and cleaning of exposed surfaces. Replace work damaged beyond acceptable restoration.

1.3 TEMPORARY CONTROLS

A. Noise Control. The CONTRACTOR shall provide adequate protection against objectionable noise levels caused by the operation of construction equipment.

B. Dust Control. The CONTRACTOR shall provide for adequate protection against raising objectionable dust clouds caused by moving construction equipment, high winds or any other cause.

C. Water Control. The CONTRACTOR shall provide for satisfactory disposal of surplus water and shall submit a plan to the ENGINEER for his review prior to initiation and implementation of the plan. Prior approval shall be obtained from the proper authorities for the use of public or private lands or facilities for such disposal. CONTRACTOR shall be responsible for obtaining and complying with the requirements of any dewatering or consumptive use permits required by regulatory authorities.

D. Pollution Control. The CONTRACTOR shall provide for adequate protection against polluting any public or private lands, lakes, ponds, rivers, streams, creeks, and other such areas, by the disposal of surplus material in the form of solids, liquids, or gases or from any other cause.

E. The CONTRACTOR shall evaluate and assess the impact of any adverse effects on the natural environment which may result from construction operations and shall operate to minimize pollution of air, ground or surface waters vegetation, and afford the neighboring community the maximum protection during and up to completion of the construction project.

F. The CONTRACTOR shall take sufficient precautions to prevent pollution of streams, lakes and reservoirs with fuels, oils, bitumens, calcium chloride or other harmful materials. He shall conduct and schedule his operations so as to avoid or otherwise prevent pollution of siltation of streams, lakes and reservoirs and to avoid interference with movement of migratory fish.

G. All chemicals used during project construction or furnished for project operation, whether , pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

H. Erosion Control. The CONTRACTOR shall not expose, by construction operations, a larger area of erosive land at any one time than the minimum necessary for efficient construction operations, and

the duration of exposure of the uncompleted construction to the elements shall be as short as practicable. Erosion control features shall be constructed concurrently with other work and at the earliest practicable time.

I. Paint Splatter Control. The CONTRACTOR shall take precautions necessary to prevent paint splatter and wind-blown splatter from falling on adjacent buildings, vehicles and vehicular traffic and shall be solely responsible for any damage resulting from the work.

J. Sandblasting, Dust & Debris Control. The CONTRACTOR shall provide for adequate protection of the work area to prevent nuisance and damage to adjacent properties and vehicular traffic from cleaning and sandblasting debris and shall be solely responsible for any damage therefrom.

1.4 STORAGE FACILITIES

A. All products, materials and equipment shall be stored in accordance with the manufacturer's instructions, with seals and labels intact and legible. Products subject to damage by the elements shall be stored in weathertight enclosures. Temperature and humidity shall be maintained within the ranges required by the manufacturer's instructions. Fabricated products shall be stored above the ground on blocking or skids. Products, which are subject to deterioration, shall be covered with impervious coatings with adequate ventilation to avoid condensation. Loose granular materials shall be stored in a well-drained area on solid surfaces to prevent mixing with foreign matter. Any products, which will come in contact with potable water, shall be stored off the ground so as to prevent contamination.

B. The City will refuse to accept, or sample for testing, materials, supplies or equipment that have been improperly stored, as determined by the City. Materials found unfit for use shall not be incorporated in the work and shall immediately be removed from the construction or storage site. Delivered materials shall be stored in a manner acceptable to the City before any payment for same will be made.

C. Storage shall be arranged in such a manner to provide easy access for inspection. Periodic inspections shall be made of all stored products to assure that they are maintained under specified conditions, and free from damage or deterioration.

D. After installation, CONTRACTOR shall provide substantial coverings as necessary to installed to protect from damage from traffic and subsequent construction operations. Coverings shall be removed when no longer needed.

1.5 QUALITY ASSURANCE:

A. Regulations: Comply with governing regulations and utility company regulations and recommendations for the construction of temporary utility services; including (but not necessarily limited to) code compliance, permits, inspections, testing, and health and safety compliance.

B. Comply with pollution and environmental protection regulations for the use of water and other services, and for the discharge of wastes and stormwater drainage from the project site. Comply with whatever "Environmental Impact" commitments may have been made by the OWNER or previous OWNERs of the site in securing approval to proceed with the construction of the project.

C. Contractor must control turbidity in rivers or canals so that it does not exceed established background turbidity by more than 50 Jackson Units at a distance greater than 100 feet from the point of

work. This shall be done by the use of a "diaper" or screen suspended by floats or other methods approved by the Project Representative.

D. Standards: Comply with the "Manual of Accident Prevention in Construction" by AGC. Comply with NFPA Code 241 "Building Construction and Demolition Operations".

1.6 OPERATIONS AND TERMINATIONS:

A. Inspections: Prior to placing temporary utility services into use, inspect and test each service and arrange for governing authorities required inspection and tests, and obtain required certifications and permits for use thereof.

B. Supervision: Enforce strict discipline in the use of utility services. Limit availability to essential uses, so as to minimize wastes. Do not allow the installations to be abused or endangered.

C. Protection: Prevent water-filled piping from freezing, by ground cover or insulation or by keeping drained, or by temporary heating. Maintain distinct markers for underground lines, and protect from damage during excavating operations.

D. The Contractor shall provide adequate signs, barricades, flashing lights, flagmen and watchmen and take all necessary precautions for the protection of the work and the safety of the public. Traffic control warning signs and barricades shall be in strict accordance with the provisions of the Florida Department of Transportation, Manual on Traffic Controls and Safe Practices for

E. Street and Highway Construction, Maintenance and Utility operations, latest revision. All barricades and obstructions shall be protected at night by flashing signal lights which shall be kept burning from sunset to sunrise. Barricades shall be of substantial construction and suitable for night visibility. Suitable warning signs shall be so placed and illuminated at night as to show in advance where construction, barricades, or detours exist.

F. The Contractor shall at all times so conduct his work as to insure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to insure the protection of persons and property, in a manner satisfactory to the City. No road or street shall be closed to the public, except with the permission of the City and proper governmental authority. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to insure the use of sidewalks and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches.

G. Preservation: Preserve from damage all property along the line of the work, or which is in the vicinity of or is in any way affected by the work, the removal or destruction of which is not called for by the plans. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the OWNER.

H. In case of failure on the part of the Contractor to restore such property, or make good such damage or injury, the OWNER may, after 48 hours notice to the Contractor, proceed to repair, rebuild or otherwise restore such property as may be deemed necessary, and the cost thereof will be deducted from any moneys due or which may become due the Contractor under this Contract.

I. The Contractor shall be responsible for the protection of property, in the areas in the vicinity of the project; and for the protection of his equipment, supplies, materials and work, against any damage resulting from the elements, such as flooding, by rainstorm, wind damage, or other elemental cause resulting from the project configuration. The Contractor shall take all precautions against any such damage occurrence, and shall be responsible for damage resulting from same. The Contractor shall provide adequate drainage facilities, tie-downs, or other protection, throughout the Contract period, for the protection of his, the OWNER's and other properties from such damage.

J. Termination and Removal: At the time the need for a temporary utility service or a substantial portion thereof has ended, or when its service has been replaced by use of permanent services, or not later than the time of substantial completion, promptly remove the installation unless requested by the City to retain it for a longer period. Complete and restore work, which may have been delayed or affected by the installation and use of the temporary utility, including repairs to construction and grades and restoration and cleaning of exposed surfaces. Replace work damaged beyond acceptable restoration.

1.7 PRESERVATION OF PROPERTY

A. Preserve from damage all property along the line of the work, or which is in the vicinity of or in any wise affected by the work, the removal or destruction of which is not called for by the plans. Wherever such property is damaged due to the activities of the CONTRACTOR, it shall be immediately restored to its original condition by the CONTRACTOR at no cost to the OWNER.

B. In case of failure on the part of the CONTRACTOR to restore such property, or make good such damage or injury, the OWNER may, after 48 hours notice to the CONTRACTOR, proceed to repair, rebuild or otherwise restore such property as may be deemed necessary and the cost thereof will be deducted from any monies due or which may become due the CONTRACTOR under this Contract.

C. The CONTRACTOR shall be responsible for the protection of property, in the areas in the vicinity of the project; and for the protection of his equipment, supplies, materials and work, against any damage resulting from the elements, such as flooding, by rainstorm, wind damage, or other elemental cause resulting from the project configuration. The CONTRACTOR shall take all precautions against any such damage occurrence, and shall be responsible for damage resulting from same. The CONTRACTOR shall provide adequate drainage facilities, tie-downs, or other protection, throughout the Contract period, for the protection of his, the OWNER's, and other properties from such damage.

1.8 TRAFFIC REGULATION

A. Signs, marking barricades and procedures shall conform to the requirements of the Florida Department of Transportation Manual on Traffic Controls and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations.

B. The CONTRACTOR shall provide and maintain adequate barricades, construction signs, torches, flashers, guards and flagmen as required in pedestrian and vehicular traffic areas. Regulations of local authorities shall be complied with.

C. The CONTRACTOR shall provide suitable crossings at street intersections and driveways, and supply such aid as may be required for pedestrians and motorists, including delivery vehicles, to safely

negotiate the construction areas. "Street Closed to Through Traffic" signs and "Detour" routes shall be indicated and maintained by the CONTRACTOR when the job is located in a public or private street or way.

D. The CONTRACTOR shall carry on the work in a manner that will cause the least interruption in traffic. Closing to through travel of more than two consecutive blocks, including the cross street intersected will not be permitted without specific authorization of the local street department. Where traffic must cross open trenches, the CONTRACTOR shall provide suitable bridges at street intersections and driveways and provide adequate ingress and egress to dwellings, business facilities, utilities and services. At any time that streets are required to be closed, the CONTRACTOR shall notify law enforcement agencies, fire departments, and parties operating emergency vehicles before the street is closed and again as soon as it is opened. Access to fire hydrants and other fire extinguishing equipment shall be provided and maintained at all times.

E. On completion of work, the CONTRACTOR shall remove all debris, excess materials, barricades and temporary work leaving walkways and road clear of obstructions.

F. Detour routes for the diverting of traffic from the Work Area are limited in the Project Area. The Project Area may be marked "ROAD CLOSED AHEAD - LOCAL TRAFFIC ONLY" to discourage through traffic from using the route. Short areas where work is underway may be closed to traffic, provided detour routes are marked to guide the public around the work area. Where detour routes are not available, flagmen shall be provided to direct one-way traffic through the construction area.

PART 2 - MATERIALS AND EQUIPMENT (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 015000

SECTION 015410-PROTECTION OF THE WORK AND PROPERTY

PART 1 - GENERAL

A. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.

B. In order to prevent damage, injury or loss, CONTRACTOR'S actions shall include, but not be limited to, the following:
   1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other CONTRACTOR or utility service company.
   2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
   3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
   4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
   5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.

C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy privately-owned land with men, tools, materials or equipment, except on easements provided herein.

D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.

1.2 BARRICADES AND WARNING SIGNALS

A. Where Work is performed on or adjacent to any roadway, right-of- way, or public place, CONTRACTOR shall provide barricades, fences, lights, warning signs, danger signals, watchmen, and shall take other precautionary measures for the protection of persons or property and of the Work. Barricades shall be painted to be visible at night. From sunset to sunrise, CONTRACTOR shall furnish and maintain at least one light at each barricade. Sufficient barricades shall be erected to keep vehicles from being driven on or into Work under construction. CONTRACTOR
shall furnish watchmen in sufficient numbers to protect the Work. CONTRACTOR'S responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by OWNER.

1.3 TREE AND PLANT PROTECTION

A. CONTRACTOR shall protect existing trees, shrubs and plants on or adjacent to the site that are shown or designated to remain in place against unnecessary cutting, breaking or skinning of trunk, branches, bark or roots.

B. Materials or equipment shall not be stored or parked within the drip line.

C. Temporary fences or barricades shall be installed to protect trees and plants in areas subject to traffic.

D. Fires shall not be permitted under or adjacent to trees and plants.

E. Within the limits of the Work, water trees and plants that are to remain, in order to maintain their health during construction operations.

F. Cover all exposed roots with burlap that shall be kept continuously wet. Cover all exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.

G. If branches or trunks are damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the ARCHITECT.

H. All damaged trees and plants that die or suffer permanent injury shall be removed when ordered by the ARCHITECT and replaced by a specimen of equal or better quality.

I. Coordinate Work in this Section with requirements of other sections herein.

1.4 PROTECTION OF EXISTING STRUCTURES

A. Underground Structures:
   1. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.
   2. All underground structures known to ARCHITECT except water, sewer, electric, and telephone service connections are shown. This information is shown for the assistance of CONTRACTOR in accordance with the best information available, but is not guaranteed to be correct or complete.
   3. CONTRACTOR shall explore ahead of his trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If CONTRACTOR damages an underground structure, he shall restore it to original condition at his expense.
   4. Necessary changes in the location of the Work may be made by ARCHITECT, to avoid unanticipated underground structures.
   5. If permanent relocation of an underground structure or other subsurface facility is required and is not otherwise provided for in the Contract Documents, ARCHITECT will direct CONTRACTOR in writing to perform the Work, which shall be paid for under the provisions of Article 11 of the General Conditions.

B. Surface Structures:

1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

C. Protection of Underground and Surface Structures:
   1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the ARCHITECT that the methods and procedures to be used have been approved by the party owning same.
   2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. CONTRACTOR shall repair immediately all damage caused by his work, to the satisfaction of the OWNER of the damaged structure.

D. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at CONTRACTOR'S expense.

1.5 PROTECTION OF FLOORS AND ROOFS

A. CONTRACTOR shall protect floors and roofs during entire construction period.

B. Proper protective covering shall be used when moving heavy equipment, handling materials or other loads, when painting, handling mortar and grout and when cleaning walls and ceilings.

C. Use metal pans to collect all oil and cuttings from pipe, conduit, or rod threading machines and under all metal cutting machines.

D. Concrete floors less than 28 days old shall not be loaded without written permission of the ARCHITECT. No floor, roof or slab shall be loaded in excess of its design loading.

E. Roofs shall not be loaded without written permission of the ARCHITECT.

F. CONTRACTOR shall restrict access to roofs and keep clear of existing roofs except as required by the new Work.

G. If access to roofs is required, roofing, parapets, openings and all other construction on or adjacent to roof shall be protected with suitable plywood or other approved means.

1.6 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.

B. Control traffic to prevent damage to equipment, materials and surfaces.

C. Provide coverings to protect equipment and materials from damage.
   1. Cover projections, wall corners, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 015410

SECTION 016000-MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Materials and equipment furnished by CONTRACTOR shall be new and shall not have been in service at any other installation unless otherwise provided. Materials and equipment shall conform to applicable specifications and standards and comply with the size, make, type and quality specified, or as specifically approved in writing by ARCHITECT.

B. Manufactured and fabricated items shall be designed, fabricated and assembled in accordance with the best ARCHITECTURE and shop practices. Like parts of duplicate units shall be manufactured to standard sizes and gages to be interchangeable.

C. Two or more things of the same kind shall be identical, by the same manufacturer.

D. Materials and equipment shall be suitable for service conditions shown or specified.

E. Equipment which requires auxiliary devices or equipment in order to operate properly shall have such auxiliary devices or equipment included as a part of its system.

F. Equipment sizes, capacities and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

G. Materials and equipment shall not be used for any purpose other than that for which it is designed or is specified.

H. Where existing materials or equipment is specifically shown or specified to be reused in the work, special care shall be used in removal, handling, storage, and reinstallation, to assure proper function in the completed work.

I. CONTRACTOR shall arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation.

J. Salvaged Materials. In the absence of special provisions to the contrary, salvaged materials, equipment or supplies are the property of OWNER and shall be cleaned and stored as directed by ARCHITECT.

K. Manufacturer's Instructions. The installation of all work shall comply with manufacturer's written instructions. CONTRACTOR shall obtain and distribute copies of such instructions to parties involved in the installation including two copies to ARCHITECT. One complete set of instructions shall be maintained at the job site during installation and until completion. All products and equipment shall be handled, installed, connected, cleaned, conditioned and adjusted in accordance with the manufacturer's instructions and specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, such conflicts shall be called to ARCHITECT'S attention for resolution and revised instructions.

L. Equipment Guarantee. All mechanical and electrical equipment, together with devices of whatever nature and all components, which are furnished and/or installed by CONTRACTOR shall be guaranteed. The guarantee shall be against manufacturing and/or design inadequacies, materials and workmanship, improper assembly, hidden damage, failure of devices and/or components, excessive leakage or other circumstances which would cause the equipment to fail under normal design and/or specific operating conditions for a period of one year or such longer period as may be shown and/or specified from and after the date of acceptance of the equipment by OWNER. Each piece of equipment, device or component which shall fail within the above specified term shall be replaced with reasonable promptness by CONTRACTOR without cost to OWNER.

M. Operating Characteristics. Rotating machinery shall be designed and fabricated to provide satisfactory operation without excessive wear and without excessive maintenance during its operating life. Rotating parts shall be statically and dynamically balanced and shall operate without excessive vibration.

N. Lubrication System. The minimum design criteria for lubrication of moving parts of the equipment shall include one week of continuous operation during which no lubricants shall be added to the system. The system shall also be designed to receive lubricants whether in operation or shut down, and shall not leak or waste lubricants under either condition. The manufacturer's recommendations of grade and quality and a supply of the lubricants so recommended in quantities sufficient to conduct startup and testing operations shall be furnished with the equipment.

O. Safety Requirements. Screens, guards or cages shall be provided for all exposed, rotating or moving parts in accordance with accepted practices of applicable governmental agencies.

P. Nameplates. Each major component of equipment shall have the manufacturer's name, catalog and/or model number, serial number and applicable performance requirements and characteristics embossed, stamped, or engraved on a stainless steel plate securely attached to the item of equipment.

Q. Anchor Bolts. The manufacturer shall provide stainless steel anchor bolts for each piece of equipment furnished.

1.02 TRANSPORTATION AND HANDLING

A. Materials and equipment shall be loaded and unloaded by methods affording adequate protection against damage. Every precaution shall be taken to prevent injury to the materials or equipment during transportation and handling. Suitable power equipment will be used and the materials or equipment shall be under control at all times. Under no condition shall the materials or equipment be dropped, bumped or dragged. When a crane is used, a suitable hook or lift sling shall be used. The crane shall be so placed that all lifting is done in a vertical plane. Materials or equipment skid loaded, palletized or handled on skidways shall not be skidded or rolled against materials or equipment already unloaded.

B. Materials and equipment shall be delivered to the job site by means that will adequately support it and not subject it to undue stresses. Contractor shall promptly inspect the products for damage and defects and conformance with the specification. Materials and equipment damaged

or injured in the process of transportation, unloading or handling will be rejected and shall be immediately removed from the site.

PART 2 - MATERIALS AND EQUIPMENT (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 016000

SECTION 016110-STORAGE OF MATERIAL

PART 1 - GENERAL

1.1 GENERAL

A. Store and protect materials in accordance with manufacturer recommendations and requirements of Specifications.

B. Contractor shall make all arrangements and provisions necessary for the storage of materials and equipment. All excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Materials and equipment shall be kept neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining OWNERs, tenants and occupants. Arrange storage in a manner to provide easy access for inspection.

C. Areas available on the construction site for storage of material and equipment shall be as shown or approved by the Engineer.

D. Materials and equipment which are to become the property of the OWNER shall be stored to facilitate their inspection and insure preservation of the quality and fitness of the Work, including proper protection against damage by freezing and moisture. They shall be placed in inside storage areas unless otherwise acceptable to OWNER.

E. Lawns, grass plots or other private property shall not be used for storage purposes without written permission of the OWNER or other person in possession or control of such premises.

F. Contractor shall be fully responsible for loss or damage to stored materials and equipment.

G. Do not open manufacturers containers until time of installation unless recommended by the manufacturer or otherwise specified.

H. Do not store products in the structures being constructed unless approved in writing by the ARCHITECT.

1.2 UNCOVERED STORAGE:

A. The following types of materials may be stored out-of-doors without cover; masonry units, reinforcing steel, structural steel, piping, precast concrete items, castings, hand railing.

B. Store the above materials on wood blocking so there is no contact with the ground.

1.3 COVERED STORAGE:

A. The following types of materials may be stored out-of-doors if covered with material impervious to water; rough lumber, filter media.

B. Tie down covers with rope and slope to prevent accumulation of water on covers.

C Store materials on wood blocking.

1.4 FULLY PROTECTED STORAGE:

A. Store all products not named above in buildings or trailers that have concrete or wooden floor, a roof, and fully closed walls on all sides.

B. Provide heated storage space for materials that would be damaged by freezing.

C. Protect mechanical and electrical equipment from being contaminated by dust, dirt and moisture.

D. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

1.5 MAINTENANCE OF STORAGE:

A. Maintain periodic system of inspection of stored products on scheduled basis to assure that; state of storage facilities is adequate to provide required conditions, required environmental conditions are maintained on continuing basis, products exposed to elements are not adversely affected.

B. Mechanical and electrical equipment which requires long term storage shall have complete manufacturer's instructions for servicing, accompanying each item, with notice of enclosed instructions shown on exterior of package. Comply with manufacturer's instructions on scheduled basis. Space heaters that are part of electrical equipment shall be connected and operated continuously until equipment is placed in service.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 016110

SECTION 017000 - RECORD DOCUMENTS & CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Definition. Closeout is defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by OWNER and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Divisions 2 through 16. Time of closeout is directly related to "Substantial Completion", and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work that have been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section.

1.2 CLOSEOUT SUBMITTALS

A. When the ARCHITECT finds that the work is acceptable under the Contract Documents, he shall request the CONTRACTOR to make closeout submittals.

B. The Contractor's closeout submittals shall include:

1. Evidence of compliance with requirements of governing authorities.
2. Project Record Documents. The documents shall be submitted as one set of Autocad drawing files.
3. Tests and Balance Reports
4. Operating and Maintenance Data, Instructions to OWNER's Personnel.
5. Warranties and Bonds.
6. Keys and Keying Schedule.
7. Spare Parts and Maintenance Materials.
8. Evidence of Payment and Release of Liens.
9. Certificate of Insurance for Products and Completed Operations.

1.3 RECORD DOCUMENTS

A. General: The general submittal requirements are indicated in Section 013000. Do not use record documents for construction purposes; protect from deterioration and loss in a secure fire-resistive location; provide access to record documents for the City's inspection during normal working hours.

B. Record Drawings: Final record drawings are to be prepared by the CONTRACTOR. The contractor is to maintain a record of new information which is recognized to be of importance to the OWNER, but was for some reason not shown on either the contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. This information is to be provided to the ARCHITECT for incorporation into the final set of as-built drawings. Record drawings shall be provided in their final form in AutoCad format version deemed acceptable by The City.

C. Documents and samples shall be stored in the Contractor's field office apart from documents used for construction. The CONTRACTOR shall provide files and racks for storage of documents, and a locked cabinet or secure storage space for storage of samples.

D. Documents shall be maintained in a clean, dry, legible condition and in good order. Record documents shall not be used for construction purposes.

E. Each document shall be labeled "PROJECT RECORD" in neat, large printed letters.

F. Information shall be recorded concurrently with construction progress.

G. No work shall be concealed until required information is recorded.

H. Specifications and Addenda shall have each section legibly marked to record: manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed; and changes made by Field Order or by Change Order.

I. At contract closeout Record Documents shall be delivered to the ARCHITECT for the OWNER. The submittal shall be accompanied with a transmittal letter in duplicate, containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each Record Document
5. Signature of CONTRACTOR or his authorized representative

1.4 OPERATION AND MAINTENANCE

A. Operating and Maintenance Data. The CONTRACTOR shall compile product data and related information appropriate for OWNER's maintenance and operation of items furnished under the Contract. He shall instruct OWNER's personnel in the maintenance and operation of equipment and systems.

B. Prior to the installation of any item of equipment, operation and maintenance data shall be submitted. Submittal shall be in seven copies in addition to any copies the CONTRACTOR desires returned to him and shall be in addition to the shop drawing submittals.

C. The submittals shall include but not necessarily be limited to:

1. Manufacturer's specifications.
2. Directions and instructions relating to assembly, installation, operation and maintenance.
3. Control and instrumentation system schematic drawings.
4. Parts list with catalog numbers and other data necessary for ordering replacements.

D. Operation and maintenance data shall be submitted for each item of equipment, instrumentation and controls for which shop drawing submittals are required.

E. Spare Parts and Maintenance Materials. The CONTRACTOR shall submit as specified in the individual sections all spare parts and maintenance materials. Such items shall be neatly and safely packaged and conspicuously labeled, in neat, large printed letters as to each packages' content.

F. In specification sections where various equipment components require different or multiple spare parts, these spare parts shall be packaged separately and labeled accordingly.

1.5 WARRANTIES AND BONDS

A. The CONTRACTOR shall compile and submit to the ARCHITECT in duplicate, for review and transmittal to the OWNER, warranties, bonds, service and maintenance contracts as specified in the respective sections of Specifications. Submittal shall be made within ten days after Substantial Completion and prior to final request for payment.

1.6 FINAL STATEMENT OF ACCOUNTING

A. The CONTRACTOR shall submit a final statement of accounting to the ARCHITECT. The statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum
2. Additions and deductions resulting from:
    a. Previous Change Orders
    b. Allowances
    c. Unit Prices
    d. Deductions for uncorrected work
    e. Penalties and Bonuses
    f. Deductions for liquidated damages
    g. Deductions for reinspection payments
    h. Other adjustments
3. Total Contract Sum, as adjusted
4. Previous payments
5. Sum remaining due

1.7 FINAL CHANGE ORDER

A. The ARCHITECT will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.8 FINAL APPLICATION FOR PAYMENT

A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

1.9 FINAL CLEANING:

A. General: Provide final cleaning of the work, at the time indicated, consisting of cleaning each surface or unit of work to the normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturers' instructions for cleaning operations. The following are examples, but not by way of limitation, of the cleaning levels required.

B. Remove labels which are not required as permanent labels.

C. Wipe surfaces of mechanical and electrical equipment clean, remove excess lubrication and other substances.

D. Clean concrete floors in non-occupied spaces broom clean.

E. Clean project site (yard and grounds), including landscape, development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petrochemical spills and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.

1.10 REMOVAL OF PROTECTION:

A. Except as otherwise indicated or requested by the OWNER, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period.

1.11 COMPLIANCY:

A. Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site, or bury debris or excess materials on the OWNER's property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from the site and dispose of in a lawful manner.

B. Where extra materials of value remaining after completion of the associated work have become the OWNER's property, dispose or store at the site as directed by the OWNER.

PART 2 - MATERIALS AND EQUIPMENT (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 017000

SECTION 020700 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Salvage of existing items to be reused or recycled.

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: Carefully detach from existing construction, in a manner to prevent damage, and deliver to OWNER ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PREINSTALLATION MEETINGS

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

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Pre-demolition Photographs or Video: Submit before Work begins.

C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of any hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

A. OWNER will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so OWNER's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by OWNER as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and OWNER. Hazardous materials will be removed by OWNER under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

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.

D. Perform a survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 010140 “Maintenance of Operations".

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to OWNER.

f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.[

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 on-site.
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.
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.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be 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.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off OWNER's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 020700

SECTION 057300 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum decorative railings.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of railings assembled from standard components.
2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples: For each type of exposed finish required.

D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups for each form and finish of railing consisting of two posts, top rail, infill area, and anchorage system components.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Architectural Metal Works.
2. Blum, Julius & Co., Inc.
3. Superior Aluminum Products, Inc.

B. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

2.3 METALS, GENERAL

A. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.4 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.

B. Extruded Bars and Shapes, Including Extruded Tubing: ASTM B221 (ASTM B221M), Alloy 6063-T5/T52.

C. Extruded Structural Pipe: ASTM B429/B429M, Alloy 6063-T6.

D. Plate and Sheet: ASTM B209 (ASTM B209M), Alloy 5005-H32.

2.5 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:

1. Aluminum Components: Type 316 stainless steel fasteners.

B. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Connections: Fabricate railings with welded connections unless otherwise indicated.

C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds; no evidence of a welded joint.

D. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

E. Form changes in direction by inserting prefabricated elbow fittings.

F. Close exposed ends of hollow railing members with prefabricated end fittings.

G. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

H. Brackets, Flanges, Fittings, and Anchors: Provide Type 316 stainless steel wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.7 ALUMINUM FINISHES

A. High-Performance Organic Two-Coat Fluoropolymer Finish: Complying with AAMA 2604 and containing not less than 50 percent polyvinylidene fluoride (PVDF) resin by weight in color coat.

1. Color and Gloss: Match existing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout.

E. Anchor posts to wood structure with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members.

F. Anchor railing ends to exterior walls with flanges connected to brackets on underside of rails connected to railing ends and anchored to wall construction with anchors and bolts.

G. Attach handrails to walls with wall brackets except where end flanges are used.

1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

H. Secure wall brackets and railing end flanges to building construction as follows:

1. For wood stud partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.

I. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 057300

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rooftop equipment bases and support curbs.
   2. Wood blocking.
   3. Plywood panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

   1. Wood-preservative-treated wood.
   2. Marine grade wood.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Rooftop equipment bases and support curbs.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.
2. Eastern softwoods; No. 2 Common grade; NeLMA.
3. Northern species; No. 2 Common grade; NLGA.
4. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

2.4 PLYWOOD PANELS

A. APA 3/4" B-B Marine Grade, 4x8 pieces.

2.5 FASTENERS See Drawings

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

B. Power-Driven Fasteners: NES NER-272.

C. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. 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.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Install fire-retardant treated plywood panels with classification marking of testing agency exposed to view.

D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

E. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

3.2 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. IPE wood siding.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

B. Samples: For each exposed product and for each color and texture specified.

1.3 WARRANTY

A. Manufacturer's Warranty for Wood Siding: Manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.
1. Warranty Period for Siding and Trim (Excluding Finish): 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. IPE wood siding.

2.2 WOOD SIDING

A. Finish - Exposed IPE.
1. Type: ¾” thick, shiplap-edge panels
2. Texture: Smooth.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.

1. For face-fastening siding, provide ringed-shank Type 316 stainless steel nails:.

B. Flashing: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

1. Horizontal Joint Flashing for Panel Siding: Preformed, prefinished-aluminum, Z-shaped flashing.

C. Sealants: Latex, complying with ASTM C834 Type OP, Grade NF and applicable requirements in Section 079200 "Joint Sealants," and recommended by sealant and substrate manufacturers for intended application.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Bostik, Inc.
b. Pecora Corporation.
c. Tremco, Inc.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.2 INSTALLATION, GENERAL

A. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut exterior finish carpentry to fit adjoining work.
3. Refinish and seal cuts as recommended by manufacturer.
4. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
5. Coordinate exterior finish carpentry with materials and systems in or adjacent to it.
6. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.3 INSTALLATION OF STANDING AND RUNNING TRIM

A. Install flat-grain lumber with bark side exposed to weather.

B. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary.

1. Use scarf joints for end-to-end joints.
2. Stagger end joints in adjacent and related members.

C. Fit exterior joints to exclude water.

1. Cope at returns and miter at corners to produce tight-fitting joints, with full-surface contact throughout length of joint.
2. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

D. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3.4 INSTALLATION OF SIDING

A. Install siding to comply with manufacturer's written instructions and warranty requirements.

B. Horizontal Lumber Siding:

1. Apply starter strip along bottom edge of sheathing or sill.
2. Install first course of siding, with lower edge at least 1/8 inch (3 mm) below starter strip and subsequent courses lapped 1 inch (25 mm) over course below.

    a. Nail at each stud.
    b. Do not allow nails to penetrate more than one thickness of siding.

3. Leave 1/8-inch (3-mm) gap at trim and corners unless otherwise recommended by manufacturer, and apply sealant.
4. Butt joints only over framing or blocking, nailing top and bottom on each side and staggering joints in subsequent courses.

C. Flashing: Install metal flashing as indicated on Drawings and as recommended by siding manufacturer.

END OF SECTION 062013

SECTION 066000 - CELLULAR PVC FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cellular PVC fabrications including the following:
   1. Trim.
   2. Moldings.

1.2 RELATED SECTIONS

A. Section 061000 - Rough Carpentry.

B. Section 062013 - Finish Carpentry.

1.3 REFERENCES

A. ASTM International (ASTM): ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Submittals.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with requirements of authorities having jurisdiction and applicable codes at the location of the project.

B. Manufacturer Qualifications: Minimum 5 years experience manufacturing similar products.

C. Installer Qualifications: Minimum 2 years experience installing similar products.

D. Mock-Ups: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Construct area designated by Architect.
   2. Do not proceed with remaining work until workmanship is accepted by Architect.
   3. Remodel mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Comply with manufacturer's recommendations. Handle materials to avoid damage.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

A. Provide manufacturer's standard limited warranty for products, stating that components will be free from defects in material that occur as a direct result of the manufacturing process, occur under normal use and service, occur during the warranty period and result in blistering, peeling, flaking, cracking, splitting, cupping, rotting or structural defects from termites or fungal decay.

1. Trim Warranty Period: 25 years.
2. Molding Warranty Period: 25 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Azek Building Products, Inc., which is located at: 894 Prairie Ave.; Wilmington, OH 45177; Toll Free Tel: 877-ASK-AZEK; Email: request info (raymond.bielawski@cpgbp.com); Web: http://www.azek.com|http://timbertech.com

B. Substitutions: Not permitted, the existing material is from Azek.

2.2 TRIM

A. Fire Performance Characteristics: Provide products complying with the following:

1. Flame Spread Index: Less than 25, ASTM E 84.

B. PVC Trim: Material shall have the following characteristics:

1. Material: Solid Cellular PVC.
2. Style: Match existing trim.
3. Trim Size, matching existing:

C. PVC Corner boards: Material shall have the following characteristics:

1. Material: Solid Cellular PVC.

D. PVC Sheet: Material shall have the following characteristics:

1. Material: Solid Cellular PVC.
2. Style: Traditional.
3. Sheet Size:
    a. 3/4 inches x 4 feet x 8 feet actual dimension.

2.3 MOLDINGS

A. Detail Profiles: Material shall have the following characteristics:
    1. Material: Solid Cellular PVC.
    2. Detail Profile: See drawings.

2.4 ACCESSORIES

A. Fasteners: Stainless steel or hot-dip galvanized, with thin shank, blunt point, full round head as recommended by the manufacturer.

B. Adhesives: Azek Adhesive, a non-toxic, odorless, UV stable, water-based PVC cement.

C. Sealants: Urethane, polyurethane or acrylic based sealants without silicone.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions that may be detrimental to proper or timely completion.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install products in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
    1. Use manufacturer's recommended fasteners, not more than 2 inches from ends.
    2. Glue joints to eliminate joint separation.
    3. Allow for expansion and contraction at ends of the runs.

3.3 CLEANING AND PROTECTION

A. Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.

B. Clean products, prior to Substantial Completion, using materials recommended by the manufacturer to remove stains, dirt and debris prior to final acceptance.

END OF SECTION 066000

SECTION 075216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
2. Roof insulation.
3. Cover board.
4. Walkways.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Insert location.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For insulation and roof system component fasteners, include copy of Florida Product Approval.

B. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.
2. Base flashings and membrane terminations.
3. Flashing details at penetrations.
4. Tapered insulation, including slopes.
5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
6. Crickets, saddles, and tapered edge strips, including slopes.
7. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
8. Tie-in with adjoining air barrier.

C. Wind Uplift Resistance Submittal: For roofing system indicating compliance with wind uplift performance requirements.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates:
   1. Performance Requirement Certificate: Signed by roof membrane manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

      a. Submit evidence of complying with performance requirements.

   2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

B. Field Test Reports:
   1. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.

C. Field quality-control reports.

D. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.6 QUALITY ASSURANCE

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

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 20 years from date of Substantial Completion.

B. Installer’s Warranty: Installer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.

B. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:

1. See drawings.

D. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

E. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency.

1. Identify products with appropriate markings of applicable testing agency.

F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated.

1. Identify products with appropriate markings of applicable testing agency.

2.2 MANUFACTURERS

A. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturer approved by roof membrane manufacturer.

2.3 BASE PLY

A. SBS-Modified Bitumen Fiberglass Mat Base Sheet and Base Flashing Inner Ply: ASTM D6163/D6163M, Type I, Grade S, SBS-modified asphalt sheet, reinforced with fiberglass fabric, smooth surfaced, suitable for self-adhered application method.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Johns Manville; a Berkshire Hathaway company.
b. Siplast - BASIS OF DESIGN
c. Soprema, Inc.

2.4 STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS CAP SHEET

A. Cap Sheet Type 1: Granule-Surfaced Roofing Cap Sheet and Base Flashing Outer Ply: ASTM D6162/D6162M, Type II, Grade G, SBS-modified asphalt sheet, reinforced with a combination of polyester and fiberglass fabric, suitable for torch application method.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Johns Manville; a Berkshire Hathaway company.
b. Siplast - BASIS OF DESIGN
c. Soprema, Inc.

2. Granule Color: White.

B. Cap Sheet Type 2: Sanded-Surfaced Roofing Cap Sheet: ASTM D6162/D6162M, Type II, Grade S, SBS-modified asphalt sheet, reinforced with a combination of polyester and fiberglass fabric, suitable for torched application method.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Johns Manville; a Berkshire Hathaway company.
b. Siplast - BASIS OF DESIGN
c. Soprema, Inc.

C. Liquid Flashing System: Roof membrane manufacturer's standard three part curing resin with low solvent content, consisting of a base coat, scrim, and top coat.

2.5 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.

1. Adhesives and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

C. Metal Termination Bars: Manufacturer's standard, predrilled aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.

D. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required by roofing system manufacturer for application.

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

G. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve; color to match roof membrane.

H. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.6 ROOF INSULATION

A. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Atlas Roofing Corporation.
    b. Hunter Panels.
    c. Johns Manville; a Berkshire Hathaway company.
2. Size: 48 by 48 inches (1219 by 1219 mm).
3. Thickness:

    a. Base Layer: 1-1/2 inches (38 mm).
    b. Upper Layer: Tapered Insulation.

B. Tapered Insulation: Provide factory-tapered insulation boards.

1. Material: Match roof insulation.
2. Minimum Thickness: 1/4 inch (6 mm).
3. Slope: As required to achieve a minimum positive slope of 1/8 inch per foot at all roof and deck surfaces.

2.7 INSULATION ACCESSORIES

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

B. Cover Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum board or ASTM C1278/C1278M, fiber-reinforced gypsum board.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Georgia-Pacific Gypsum LLC.
    b. National Gypsum Company.
    c. USG Corporation.

2. Thickness: 1/2 inch (13 mm).
3. Surface Finish: Factory primed.

2.8 ASPHALT MATERIALS

A. Roofing Asphalt: ASTM D6152/D6152M, SEBS modified.

2.9 WALKWAYS

A. Walkway with contrasting color to cap sheet: Granulated-Surfaced Roofing Walkway: ASTM D6162/D6162M, Type II, Grade S, SBS-modified asphalt sheet, reinforced with a combination of polyester and fiberglass fabric, suitable for torched application method.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Johns Manville; a Berkshire Hathaway company.
    b. Siplast - BASIS OF DESIGN
    c. Soprema, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

3.2 PREPARATION

A. Perform fastener-pullout tests according to roof system manufacturer’s recommendations.

1. Submit test result within 24 hours of performing tests.

    a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.

3.3 INSTALLATION OF ROOFING, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions and Florida Product Approval requirements.

B. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast.

1. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Install roof membrane and auxiliary materials to tie into existing roofing to maintain weathertightness of transition during construction.

D. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSTALLATION OF INSULATION

A. Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Installation Over Wood Panel Decking:

1. Where required to achieve a minimum slope of 1/8 inch per foot over all roof surfaces, install tapered insulation and mechanically attach under and with the cover board.
   a. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
   b. Make joints between adjacent insulation boards not more than 1/4 inch (6 mm) in width.
   c. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches (600 mm).

      1) Trim insulation, so that water flow is unrestricted.

   d. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
   e. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
   f. Mechanically attach tapered insulation and cover board using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to wood panel decks.

1) Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof in accordance with the Florida Product Approval.

3.5 INSTALLATION OF COVER BOARDS

A. Install cover boards over existing wood deck and over new tapered insulation with long joints in continuous straight lines, with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction.

1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
2. At internal roof drains, conform to slope of drain sump.

    a. Trim cover board, so that water flow is unrestricted.

3. Cut and fit cover board tight to nailers, projections, and penetrations.

4. Fasten cover board to resist specified uplift pressure at corners, perimeter, and field of roof in accordance with the Florida Product Approval.

3.6 INSTALLATION OF ROOFING MEMBRANE, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions and the requirements of the Florida Product Approval.

B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

C. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
2. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.7 INSTALLATION OF BASE SHEET

A. Before installing, unroll base sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature.

B. Installation of SBS-Modified Fiberglass-Mat Base Sheet:

1. Install base sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.
2. Extend roofing sheets over and terminate above cants.
3. Install base sheet in a shingle fashion.
4. Adhere to substrate with the self-adhered surface. Roll all areas with a 20-pound (9-kg) roller
5. Install base sheet without wrinkles, rears, and free from air pockets.
6. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.

    a. Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches (76 mm).
    b. Stagger end laps not less than 18 inches (450 mm).
    c. Completely bond and seal laps, leaving no voids.
    d. Roll laps with a 20-pound (9-kg) roller.

7. Repair tears and voids in laps and lapped seams not completely sealed.
8. Apply pressure to the body of the base sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

3.8 INSTALLATION OF SBS-MODIFIED BITUMINOUS CAP SHEET

A. Before installing, unroll cap sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature at which cap sheet will be installed.

B. Install modified bituminous roofing cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.

1. Extend cap sheet over and terminate above cants.
2. Install cap sheet in a shingle fashion.
3. Install cap sheet as follows:
    a. Torch apply to substrate.

        1) Perform torch application according to NFPA 241, including two-hour fire watch after torches have been extinguished.

4. Install cap sheet without wrinkles or tears, and free from air pockets.
5. Install cap sheet, so side and end laps shed water.

C. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.

1. Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches (76 mm).
2. Stagger end laps not less than 18 inches (450 mm).
3. Heat weld laps, leaving no voids.

4. Roll laps with a 20-pound (9-kg) roller.
5. Repair tears and voids in laps and lapped seams not completely sealed.

D. Apply pressure to the body of the cap sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

E. At all granulated cap sheets, apply roofing granules of same color as roof membrane to cover exuded bead at laps while bead is hot, to provide a continuous color appearance.

3.9 INSTALLATION OF FLASHING AND STRIPPING

A. Install base flashing over all adjacent vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Base Flashing Inner Ply:

    a. Self-adhere to the substrate.
    b. Seal all laps.

3. Base Flashing Outer Ply:

    a. Torch over Base Flashing Inner ply.

    b. Seal all laps.

    c. Perform torch application according to NFPA 241, including two-hour fire watch after torches have been extinguished.

B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

D. Install liquid flashing system according to manufacturer's recommendations.

1. Extend liquid flashing not less than 3 inches (76 mm) in all directions from edges of item being flashed.

E. Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.

F. Roof Drains: Set 30-by-30-inch- (760-by-760-mm-) 4-pound (1.8 kg) lead flashing in bed of asphaltic adhesive on completed roofing membrane.

1. Cover lead flashing with roofing cap-sheet stripping, and extend a minimum of 6 inches (150 mm) beyond edge of metal flashing onto field of roofing membrane.
2. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
3. Install stripping according to roofing system manufacturer's written instructions.

3.10 INSTALLATION OF WALKWAYS

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size, according to walkway pad manufacturer's written instructions.

1. Install walkways at the following locations:

    a. Perimeter of each rooftop unit and roof hatch.

2. Provide 2-inch clearance between adjoining pads.
3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.11 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075216

SECTION 075910 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Reroof preparation of entire deck and roof.

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

B. Roof Re-roof Preparation: Existing roofing system is to be removed, the existing wood deck repaired, a new plywood sheathing installed over the existing wood deck in preparation for a new roofing assembly installed.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

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

1.5 QUALITY ASSURANCE

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

B. Reroofing Conference: Conduct conference at Project site.

1.6 FIELD CONDITIONS

A. OWNER will occupy portions of building immediately below reroofing area. Conduct reroofing so OWNER'S operations are not disrupted. Provide OWNER with not less than 24 hours' notice of activities that may affect OWNER'S operations.

1. Coordinate work activities daily with OWNER so OWNER can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or detection equipment if needed, and evacuate occupants from below work area if needed.
2. Before working over structurally impaired areas of deck, notify OWNER to evacuate occupants from below affected area. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.

B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Limit construction loads on roof to loads that can be safely resisted by the roof structure for rooftop equipment wheel loads and for uniformly distributed loads.

E. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

PART 2 - PRODUCTS

2.1 INFILL AND REPLACEMENT MATERIALS

A. Use infill materials matching existing roofing system materials unless otherwise indicated.

2.2 AUXILIARY REROOFING MATERIALS

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

PART 3 - EXECUTION

3.1 PREPARATION

A. Shut off rooftop utilities and service piping before beginning the Work.

B. Protect existing roofing system that is not to be reroofed.

C. Coordinate with OWNER to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

3.2 ROOF TEAR-OFF

A. General: Notify OWNER each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Roof Tear-Off: Remove existing roofing and immediately check for presence of moisture by visually observing substrate that is to remain.
   1. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. Replace existing deck where deck is deteriorated and where indicated on drawings. Install new deck over existing and replaced existing deck.

C. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.

D. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

3.4 INFILL MATERIALS INSTALLATION

A. Immediately after roof tear-off, and inspection and repair, if needed, of deck, fill in tear-off areas to match existing roofing system construction.

B. Install new roofing patch over roof infill area. If new roofing is installed the same day tear-off is made, roofing patch is not required.

3.5 ROOF RE-COVER PREPARATION

A. Replace any deteriorated deck prior to installation of new plywood sheathing.
   1. Broom clean existing deck.
   2. Coordinate with OWNER'S inspector to schedule times for tests and inspections before proceeding with installation of new sheathing.
   3. Verify that existing deck is dry before proceeding with installation of new sheathing. Spot check substrates with an electrical capacitance moisture-detection meter.
   4. Remove materials that are wet or damp.

3.6 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Transport and legally dispose of demolished materials off OWNER'S property.

END OF SECTION 075910

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.
2. Formed steep-slope roof sheet metal fabrications.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop- and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

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

1. For roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

B. Mockups: Build mockups to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1. Build mockup of typical roof edge eave, including fascia apron flashing rake flashing and all other flashings, approximately 10 feet (3.0 m) long.

1.7 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

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

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping. All materials in this section must be approved by and warranted by the roof membrane manufacturer described in Section 075420 - Thermoplastic-Polyolefin (TPO) Roofing.

B. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 316, dead soft, fully annealed; 2D (dull, cold rolled) finish with all non-moving seams fully soldered.

C. Copings and Metal Edges: See Section 077100 - Roof Specialties.

D. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

2. Color: As selected by Architect from manufacturer's full range.
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Grace Construction Products; W.R. Grace & Co. -- Conn.
b. Henry Company.
c. Polyguard Products, Inc.

2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

2.4 MISCELLANEOUS MATERIALS

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

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel.

C. Solder:
1. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

C. Sealant Joints: Where movable, non-expansion type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

D. Fabricate cleats and attachment devices from same material as accessory being anchored.

E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

F. Aluminum Seams: Fully weld all aluminum non-moving seams and repaint all welded components to match the original paint finish.

G. Stainless Steel Seams: Fully solder all non-moving seams.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. 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.
3. All cleats to be continuous.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Stainless Steel Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
   1. Do not use torches for soldering.
   2. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
   3. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with butyl sealant and clamp flashing to pipes that penetrate roof.

3.4 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roof hatches.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.

B. Shop Drawings: For roof accessories.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 ROOF HATCHES

A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or preapproved equal:

      a. BILCO Company (The) “Type S-50 TB” - BASIS OF DESIGN.
      b. Pate Company (The).

   2. Type and Size: Single-leaf lid, Match existing size.
   3. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 30-lbf/sq. ft. (1.4-kPa) internal uplift load.

a. When release is actuated, lid shall open against 10-lbf/sq. ft. (0.5-kPa) wind load and lock in position.

4. Curb, Framing, and Lid Material: Aluminum sheet.

a. Thickness: Manufacturer's standard thickness for hatch size indicated.
b. Finish: Mill.

5. Construction:

a. Insulation: 2-inch- (50-mm-) thick, polyisocyanurate board.

1) R-Value: 12.0 according to ASTM C1363.

b. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
c. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
d. Exterior Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
e. Fabricate curbs to minimum height of 12 inches (305 mm) above roofing surface unless otherwise indicated.
f. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is constant. Equip hatch with water diverter or cricket on side that obstructs water flow.

6. Hardware: Manufacturer's standard stainless steel; with hinges, hold-open devices, and independent manual-release devices for outside operation of lids.

2.2 METAL MATERIALS

A. Aluminum Sheet: ASTM B209 (ASTM B209M), manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.

1. Mill Finish: As manufactured.

B. Aluminum Extrusions and Tubes: ASTM B221 (ASTM B221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.

2.3 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Polyisocyanurate Board Insulation: ASTM C1289, thickness and thermal resistivity as indicated.

C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.

D. Underlayment:

1. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

E. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:

F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

G. Elastomeric Sealant: ASTM C920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

H. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

I. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces

with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.

C. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

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

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

END OF SECTION 077200

SECTION 077616 ADJUSTABLE PEDESTALS FOR TERRACES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof decking pedestals as shown on Drawings and specified herein. Include related attachments, and accessories.

1.2 RELATED SECTIONS

A. Section 075216 - Styrene Butadiene Styrene Modified Bitumen

1.3 REFERENCES

A. ASTM E 108/UL 790 - Standard Test Methods for Fire Tests of Roof Coverings

B. Belgium (CRIF) Centre De Recherches Scientifiques ET Techniques Del Industrie Des Fabrications: Test Report No. GT 7660/01.

1.4 SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: Manufacturer's data sheets for each assembly specified, including but not limited to:
   1. Performance characteristics.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation Instructions.

C. Method Statement: Prior to the installation of adjustable pedestal decking systems, Contractor shall submit an installation ' method statement' setting out the installation procedure for approval.

D. Engineering Calculations:
   1. Structural Analysis: Provide test report indicating the structural capability and adequacy of the roof decking pedestal assembly to carry the dead and live loads imposed by the roof decking.
   2. Density of Insulation: Sufficient to resist crushing and damaging waterproofing membrane.

E. Laboratory Test Reports: Exterior fire-test exposure reports performed by independent testing agency indicating that roof decking pedestals comply with specified fire resistance classification.

F. Shop Drawings: Provide shop drawings showing details including but not limited to plans, elevations, sections, fabrication, installation, anchorage, interface of the work of this section with the work of adjacent trades and indicating dimensions, tolerances and finishes.

G. Selection Samples: For each assembly type, two complete sets of samples representing manufacturer's full range of available product assembly types.

H. Verification Samples: For each finish product specified, two samples representing actual product assembly types specified.

1.5 QUALITY ASSURANCE

A. Single Source Requirements: To the greatest extent possible, provide pedestals and ancillary products specified in this section from a single manufacturer.

B. Manufacturer's Qualifications: Successfully engaged in the manufacture of adjustable pedestals for terraces for at least 20 years.

C. Installer Qualifications: Successfully engaged in installation of adjustable decking systems for at least 5 years; capable of estimating, building from working CAD details or plans, determining elevations and properly handling materials in pedestal decking assembly.
   1. Method Statement Submission: Prior to the installation of the adjustable pedestal decking systems, the installer shall submit an installation ' method statement' setting out the installation procedure for approval.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship is approved by Architect.
   3. Rework mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inspect delivered materials upon arrival to ensure they are undamaged, in good condition and as specified.

B. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.

C. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Pedestals are delivered boxed in cardboard cartons. These cartons should be stored in dry conditions and should not come into contact with rain or damp conditions. Protect from damage.

1.7 PROJECT CONDITIONS

A. Surfaces to receive roof decking pedestals shall be broom clean, frost free, and free of dirt, oil or any rough foreign matter, which may impair the proper installation of the roof decking pedestals.

B. Confirm that substrates have positive slope and provide adequate drainage in accordance with applicable building codes.

C. Do not install roof decking pedestals over any roofing insulation with a density of less than 414 kPa (60 psi).

1.8 SEQUENCING AND SCHEDULING

A. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.9 WARRANTY

A. Manufacturer's Warranty: Pedestal system shall remain free from manufacturing defects for a period of ten years from date of Substantial Completion.

B. Contractor's Warranty: Contractor shall warrant that their work will remain free from defects of labor and materials for a period of two years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Pedestals: Buzon USA East:16 W. 56th St.; New York, NY 10019; Contact: Mufdi Siraji; Tel: 646-929- 4318; Fax: 212-243-2868; Email: fz@buzonusaeast.com; Web: HYPERLINK "http://www.buzonusa.us/" www.buzonusa.us

B. Wood Tiles: Bison Innovative Products, which is located at: 701 Osage St. Unit 120; Denver, CO 80204; Toll Free Tel: 800-333-4234; Tel: 303-892-0400; Fax: 303-825-5988; Email: request info (matt@bisonip.com); Web: http://bisonip.com

2.2 PERFORMANCE REQUIREMENTS

A. Exterior Fire-Test Exposure: Provide roof decking pedestal system listed as Class A fire resistance rating when tested in accordance with ASTM E 108 or UL 790 by an independent testing agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

B. Compression Resistance: Compression Resistance: Roof decking pedestal system shall be capable of withstanding minimal breaking loads up to 1000kg (2204 lbs.).

2.3 ADJUSTABLE PEDESTALS (DPH SERIES)

A. Fix /Adjustable Screwjack Pedestal System:
   1. DPH-Series as manufactured by Buzon Pedestal International.
   2. Compliance:
      a. Test Method: Universal testing machine, Instron type.
      b. Test Report: No. GT 7660/01.
      c. Safety Factor for Pedestrian Terraces: Divide the following values by 2.
      d. Safety Factor for Raised False Floors: Divide the following values 4.

B. Fix / Adjustable Height Pedestal:
   1. Composition: Five piece, interlocking, multi-threaded unit consisting of slope corrector, mounting head, height extension coupler, adjustment ring clamp

coupler, and support base.

a. Slope Corrector: Slope compensation system, adjustable in increments of 0.5% up to a maximum 5% slope. Slope corrector is mounted to the pedestal head with fixing clips, and is formed from two cylindrical parts that allows compensating for 1 to 5% slopes to provide a level mounting head; 255mm (10 inch) diameter; 12mm (1/2 inch) thickness to be added to the adjustable height of the pedestal.
b. Pedestal Head: Large support surface with reinforcement ribs; screwed directly into the coupler or adjustment ring clamp; fitted with slots to receive cylindrical plate with 4 paver positioning blades of various thicknesses to achieve an open gap between pavers. Including locking safety clips to prevent total unscrewing of the pedestal head.
c. Height Extension Coupler: One-piece extension coupler with upper part threaded to receive additional extension couplers or the pedestal head, and lower part threaded to screw into the adjustment ring clamp coupler. Including safety clips to prevent total unscrewing of the pedestal head or ring clamp. Lock keys keep the pedestal height in place after height adjustment.
d. Adjustment Ring Clamp Coupler: Factory assembled ring clamp coupler, factory fitted onto the support base; ring clamp consists of reverse threading cylinders with multiple inner and outer threads, and fitted with safety locks to prevent total unscrewing of the components.
e. Support Base: Cylindrical support base with reinforcement ribs, threaded to receive ring clamp coupler. Support base can be placed or fixed to a solid substrate, or partially cut away for positioning against a wall. Includes holes at bottom for drainage.

2. Height Range: Fix (17 mm; 21/32 inch) and (28mm;1 3/32 inch) or infinitely adjustable by rotation of each pedestal component, using variable height support bases ranging from 17 to 175mm (5/8 to 6- 7/8 inch), and multiple height extension couplers up to a maximum height of 1073 mm (42 1/8 inch).
3. Material: Ultraviolet (UV) stabilized, talc-filled, high density, copolymer polypropylene, weather, sea salt, and chemical resistant; 3 to 4.5mm (1/8 to 3/16 inch) thickness.
4. Temperature Range: Resistant from -30 degrees C to 90 degrees C (-22 degrees F to 194 degrees F).

C. Mounting Head Accessories: Spacer tabs, rubber shims and mounting plates with paver positioning blades, support pins, and joist supports that can be clipped to the head of the pedestal to accommodate the selected roof decking material.

D. Perimeter Containment and Support

1. The complete assembly of roof decking pedestals and pavers shall be restrained at the perimeter of the walk deck area to resist lateral movement. 3mm standard allowed at all edges, total 6mm allowed max.
2. Cumulative movement in excess of 6 mm (1/4 inch) will void the manufacturer's warranty.
3. Attachment of Materials to Pedestals: As scheduled and indicated on Drawings.
4. Attachment of Materials to Pedestals: Gravity laid.
5. Attachment of Materials to Pedestals: Fixed to pedestal head.

E. Accessories: Including but not limited to separation blades/spacer tabs, shims (2 mm), slab supporting heads, slope correctors, height adjusters/couplers, ring clamps for adjustment, locking and unlocking keys to fix pedestal position and supporting bases/stands as follows.
    1. Supporting Head Surfaces: Adjustable angle from 0 to 5 percent (0 to 5 cm/m).
        a. Diameter: 155 mm (190 cm2).
        b. Thickness: 4 mm thick, with reinforcement veins.
        c. Features: Screw on head with a safety clip and 10 mm hole in the centre of the head in order to receive the slab separation bladed plate or a rawplug and fixing screw for mechanical attachment.
    2. Slope Correctors: Patented PH5 slope corrector; adjustable at head with click-rotation.
        a. Diameter: 170 mm.
        b. Range: From 0 to 5 percent gradient; with 0.5 percent intervals.
        c. Top Surfaces: Can be calibrated for slope compensation, with clear directional arrows indicating orientation of pedestal once adjustment is set using a pin.
    3. Spacer Tabs: Clip-fixed into top of pedestal, to obtain open joints.
    4. Couplers: Height adjusters provide additional height.
    5. Adjustment Ring Clamps:
        a. Diameter: 115 mm.
        b. Description: High to low, to allow height adjustment with decking in place; screw pitch reversed with 3 inner threads and 8 threads factory screwed onto pedestal stand as required for specified designs.
    6. Supporting Bases:
        a. Base Diameter: 200 mm.
        b. Thickness: 3 mm thickness with 8 reinforcement veins of 5 mm thickness.
        c. Cylinder Diameter: 125 mm.
        d. Fixing Holes: 8 fixing holes aligned with the 8 reinforcement veins.
        e. Weep Holes: 2.
        f. Reversibility: Reversible supporting base can function as head, with ability to have spacer tabs installed on supporting base in reversed configuration; view of slope correction calibration not affected by reversed configuration.
    7. Locking and Unlocking Keys: Once desired height achieved individual keys used at bases, ring adjusters, extender couplers and tops; prevent rotational movement caused by traffic or vibration.
    8. Joist Cradles: Supports joists for timber-style decking.
        a. Description: Compatible with timber battens/joists, composite battens/joists, aluminum or steel support sections; with fixing holes on both sides of support for mechanical fixing
        b. Width of Support: Up to 65 mm.

2.4 PAVER TILES AND TRAYS

A. Bison Wood Tiles - Or Preapproved Equal: Weight Bearing Capacity 1,250 lbs./ per tile (FS:3)
   1. Model: WT-FSC-MAS -24 Massaranduba Wood Tile Ribbed (FSC Certified SCS-COC-002585)
      a. Dimensions: 23-7/8 inches by 23-7/8 inches by 1.69 inches. nominal
      b. Weight per tile: 24 lbs.
      c. Fire Rating: Class A. Meets and exceeds ASTM E 108 Flame Spread Test.
      d. Slip Resistance: Exceeds ASTM C 1028.
      e. Janka Hardness: 3,540 lbf
      f. Color: Reddish Brown (Note: Tiles are a natural product and have variations in color and grain.)
      g. Surface: Ribbed

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Verify elevations, pedestal heights and layouts. Establish accurate and level lines and patterns
   1. Substrate Requirements: Laid at ground or roof level over roofing systems, or directly over insulation materials, dependent on insulation densities and overall loadings.

B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

A. Install roof decking pedestals in accordance with manufacturer's recommendations. Securely place base supports at locations shown on shop drawings.

B. Locate pedestals at the proper elevation and placed in position prior to the installation of roof decking pavers.

C. Level Installation: Establish starting point and finished elevation of the roof decking paver surface, and determine the pedestal head support elevation by subtracting the thickness of the paver. Mark around the perimeter using transit, or laser leveling device.

D. Slope Compensation: Mount slope corrector to the pedestal head with fixing clips and set slope by rotating the mechanism through 360 degrees to the desired value. Adjust slope in increments of 0.5% up to a maximum 5% slope. Lock slope corrector as per manufacturer's recommendations to create a level and plumb paver surface.

E. Perimeter Containment: Provide field installed restraint, where roof decking is not constrained by an abutting wall. No movement shall be allowed at the perimeter of the roof decking greater than 3mm (1/8 inch).

F. Make final slight adjustments to pedestals as they are fully loaded by roof decking pavers.

G. Level each succeeding row of pedestals as the roof decking paver installation proceeds.

H. Ensure roof decking pedestals are maintained in a straight and consistent pattern and that installed deck pavers are level and do not rock back-and-forth under loading.

I. At roof deck access points for pedestrians, ensure that pavers are level and that the walking surface does not have randomly raised or uneven joints creating a tripping or safety hazard.

J. Install wood tile with concealed and removable stainless steel clip.

3.3 ADJUSTMENT AND PROTECTION

A. Adjustment: Eliminate rocking and uneven pavers; rotate pedestals for final adjustment after fully loaded.

B. Touch-up, repair or replace damaged products before Substantial Completion.

C. Protection: Protect installed products and finishes from damage during construction.

END OF SECTION 077616

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

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

1.2 SUBMITTALS

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

B. Samples: For each kind and color of joint sealant required.

C. Product test reports.

D. Warranties.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.4 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

2.2 SILICONE JOINT SEALANTS

A. Mildew-Resistant Neutral-Curing Acid-Curing Silicone Joint Sealant: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. BASF Building Systems.
   b. Dow Corning Corporation.
   c. Tremco Commercial Sealants and Waterproofing

2. Type: Single component (S).
3. Grade: nonsag (NS).
4. Class: 100/50.
5. Uses Related to Exposure: Nontraffic (NT).

2.3 URETHANE JOINT SEALANTS

A. Urethane Joint Sealant: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Sika Corporation; Construction Products Division.
   b. Pecora Corporation
   c. BASF Construction Chemicals, LLC, Building Systems

2. Type: Single component (S).
3. Grade: nonsag (NS).
4. Class: 100/50.
5. Uses Related to Exposure: Nontraffic (NT).

2.4 SOLVENT-RELEASE-CURING JOINT SEALANTS (Butyl)

A. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.

1. Products: Subject to compliance with requirements, provide the following:

   a. Bostik, Inc.; Chem-Calk 300.
   b. Pecora Corporation; BC-158.
   c. Tremco Incorporated; Tremco Butyl Sealant.

2.5 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

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

1. Remove laitance and form-release agents from concrete.
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

   a. Perform 3 tests for each type of adhesive and at each material type.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

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

3.4 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. All non-painted joints which are exposed to weather elements:

2. Joint Sealant: Silicone.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. At all painted joints which are exposed to weather elements.

2. Joint Sealant: Urethane.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Sealant Location:
a. At all joints which are concealed and not directly exposed to weather elements.

2. Joint Sealant: Butyl.
3. Joint-Sealant Color: Black.

END OF SECTION 079200

093013 CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Porcelain tile.
   2. Crack isolation membrane.
   3. Mortar and grout.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

   1. Each type and composition of tile and for each color and finish required.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

   1. Tile and Trim Units:[Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.]

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

   1. Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE PRODUCTS

A. Ceramic Tile Type: Factory-mounted unglazed ceramic mosaic tile.

1. Manufacturers: Subject to compliance with requirements, provide products by the following or preapproved equal:

    a. American Olean; a division of Dal-Tile Corporation.
    b. Hanover Architectural Products - BASIS OF DESIGN.
2. Composition: Porcelain.
3. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
4. Module Size: See drawings.
5. Thickness: 1/4 inch (6.4 mm).
6. Face: Plain with cushion edges.
7. Surface: Slip resistant, with abrasive admixture.
8. Dynamic Coefficient of Friction: Not less than 0.42.
9. Finish: Mat, opaque glaze.
10. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
11. Grout Color: As selected by Architect from manufacturer's full range.
12. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

    a. Base Cove: Cove, module size.
    b. External Corners for Thinset Mortar Installations.
    c. Internal Corners: Cove, module size.

2.3 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

2.4 GROUT MATERIALS

A. High-Performance Tile Grout: ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Bostik, Inc.
    b. LATICRETE SUPERCAP, LLC.
    c. MAPEI Corporation - BASIS OF DESIGN
2. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.
3. Polymer Type: Liquid-latex form for addition to prepackaged dry-grout mix.

2.5 MISCELLANEOUS MATERIALS

1.

B. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        a. Custom Building Products.
        b. Jamo Inc.
        c. Southern Grouts & Mortars, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

    1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
    2. Verify that concrete substrates for tile floors installed with bonded mortar bed comply with surface finish requirements in ANSI A108.01 for installations indicated.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:

    a. Exterior tile floors.
    b. Tile floors in wet areas.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
1. Porcelain Tile: 1/4 inch (6.4 mm).

H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where recommended by the TCNA. Form

joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

I. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 EXTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Exterior Roof/Deck Floor Installations:

1. Ceramic Tile Installation; cement mortar bed (thickset) over drainage material on roof membrane.
   a. Bond Coat for Cured-Bed Method: Improved modified dry-set mortar.
   b. Grout: High-performance sanded grout.

END OF SECTION 093013

SECTION 131000 - LIGHTNING PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Lightning Protection System work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS". The existing lightning protection system will be temporarily removed and reinstalled. All deteriorated and damaged components will be replaced. All new and existing components must comply with the General, Products, and Execution requirements of this specification section. Where the existing lightning protection does not exist, install a new lightning protection system and tie in with the existing lightning protection system.

B. The system: installed by a Lightning Protection Contractor actively engaged in the installation of Underwriters' Master Label lightning protection systems or LPI–IP Certified Lightning Protection Systems and be so listed by the LPI or UL.

C. The system, as installed: comply with the latest issue of the "Installation Requirements for a UL Master Labeled Lightning Protection System or an LPI-IP Master Certification.

D. Lightning Protection Contractor: Upon completion of this work, deliver to the Owner, the Master Label issued by Under-writers' Lab, Inc. or an LPI Master Certification issued by the LPI-IP Inspection Program.

1.2 SUBMITTALS

A. Conform under provisions of Section 013000, “Submittal Procedures”

B. Submit complete shop drawings showing the type, size, and locations of all equipment, grounds and cable routings for approval prior to start of work.

C. Certification: secure and deliver a U.L. Master Label or an LPI Master Certification from the LPI-IP upon completion of the installation.

D. Record of actual location of all terminals, grounding electrodes, bonding connections, and routing of system conductors in Project Record Documents.

1.3 QUALITY ASSURANCE

A. Conform under provisions of Section 014300, “Quality Assurance”.

B. The Lightning Protection Contractor: submit to the Project Consultant all evidence to establish that materials are manufactured, furnished and

recommended for their intended use by a reputable lightning protection manufacturer who is a Manufacturer Member of the Lightning Protection Inst. All materials used in this installation will bear the inspection label of Underwriters' Lab., Inc.

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

1.4 REGULATORY REQUIREMENTS

A. Conform under provisions of Lightning Protection Institute Installation Code LPI-175.

B. Conform under provisions of NFPA 780.

C. Conform under provisions of U.L. Master Label Code 96A.

D. Conform under provisions of UL 96 – Lightning Protection Code

E. Conform under provisions of LPI-176 Lightning Protection System Material and Components Standard.

F. Conform under LPI-177 Inspection Guide for LPI Certified Systems.

G. National Electrical Code latest adopted edition by the Florida Building Code.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Thompson Lightning Protection, Inc.

B. East Coast Lightning Equipment

C. ERICO (ERITECH) International Corp.

D. Harger Lightning Protection, Inc.

2.2 MATERIALS

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

1. Aluminum Lightning Protection System:

   I. Main Roof Conductors: Aluminum, Class 1, UL Labeled 24 strands, 14 gage minimum, 102 lbs. /1000 feet, 98,640 CM.

   II. Down Conductors: Electrical grade copper (only) with 29 strands, 17 gauge minimum.

   III. Air terminals: Aluminum not less than ½ inch diameter blunt type air terminals, at least 10 inches high but no more than 36 inches. If over 24 inches high, air terminals shall be suitably braced.

   IV. Ground Rods: Copper clad steel, not less than ¾-inch diameter by 10 foot long.

   V. Provide adjustable hinged connector to provide vertical positioning of air terminal on roof slope.

   VI. Provide miscellaneous bolts, nuts and screws of brass, bronze or stainless steel. Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space under provisions of U.L. code requirements.

   VII. Provide bonding devices, cable splicers and miscellaneous connectors of cast bronze with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable.

   VIII. Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space under provisions of U.L. code requirements. Aluminum adhesive type cable holder. Secure in place with an application of M-1 structural sealant.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation:
   1. Comply with LPI Code 175, NFPA 780, UL 96A.
   2. Made by or under the supervision of an LPI Certified Master Installer.

B. All points: Within 2 feet of outside building edge.
   1. Maximum spacing: Do not exceed 20 feet
   2. Minimum projection above object protected: Not less than 10 inches.

C. Connect lightning protection cables to all metallic projections above roof. Support all exposed cable at 3 feet on center.

D. Aluminum shall not be used underground, in contact with ground or where air may be laden with corrosive elements, such as ocean air.

E. When an aluminum system is joined with copper or copper-clad grounds, the union shall be made with approved bimetal connectors.

F. Precautions be taken at connections with dissimilar metals.

G. Aluminum shall not be used for down leads or connection to the grounding system.

H. Down conductors, which are continuations of roof conductors shall be of copper material only.

I. Aluminum should never be used where it will come in contact with white wash, calcium, alkali-based paint, embedded in concrete or masonry, or installed in a location subject to excessive moisture.

J. Aluminum should never be placed where leaves or moisture will collect and remain for a long period of time.

K. Maintain horizontal or downward coursing of main conductor and insure that all bends have at least an 8 inches radius and do not exceed 90 degrees. Down conductors for both copper and aluminum lightning protection systems shall be sleeved copper with approved connectors.

L. Provide through roof connectors with solid rods or conduit through pitch pockets. Provide ground drops in 1-1/4 inch plastic pipe with supports every second floor and connect to ground rods.

M. Ground electrodes: no less than 1 foot below grade and 2 feet from foundation wall. Make thermoweld connections between ground rods and connecting conductors.

N. Interconnect lightning protection ground to electric and other building ground systems as shown or as required by U.L. and LPI Codes.

O. Bond to water service and other piping systems as shown or as required by U.L. and LPI Codes.

P. Secure and deliver a U.L. Master Label or an LPI Master Certification from the LPI-IP inspection program to the Owner upon completion of the installation.

Q. Install conductors and complementary parts in a concealed system so completed work is unobtrusive and does not detract from appearance.

R. The roofing contractor will be responsible for sealing and flashing all lightning protection roof penetrations as per the roof manufacturer's recommendations. The lightning protection roof penetrations and/or method of conductor attachment should be addressed in the roofing section of the specifications.

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

3.2 AIR TERMINALS

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

3.3 GROUNDS

A. Connect each down conductor to a suitable, properly located ground as determined by soil conditions encountered.

B. Provide hand hole at all ground rod terminations for future testing and inspection.

C. Grounding shall comply with NEC (2011) 250.106.

3.4 CONDUCTORS

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

3.5 FASTENERS

A. Place fasteners amply strong for rigid, permanent support no more than 3 feet on center of vertical on down conductors and horizontal conductors.

B. Air terminals shall be adhered to all mechanical roof top mounted equipment using M-1 Structural Sealant or approved equal.

3.6 CONDUCTOR GUARDS

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

3.7 GROUNDING METAL ELEMENTS

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

3.8 GROUNDING OF METAL ELEMENTS

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

3.9 METAL USED

A. All conductor materials: braided copper conductors, copper clad steel conductors or aluminum for roof conductors only (refer to section 2.2.A.2).

B. Aluminum conductors will be allowed on the roof top only with copper down conductors. Provide proper bimetal fittings as needed for every transition.

C. Metal flashing will not be allowed to be a substitute for secondary conductors.

3.10 COORDINATION WITH OTHER TRADES

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

3.11 BONDING

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

END OF SECTION 131000

SECTION 221423 - STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal roof drains.
2. Miscellaneous storm drainage piping specialties.

B. Related Requirements:

1. Section 076200 "Sheet Metal Flashing and Trim" for penetrations of roofs.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 METAL ROOF DRAINS

A. Cast-Iron, Small-Sump, General-Purpose Roof Drains (See Details C, D, and E on sheet A3.1:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jay R. Smith Mfg Co; a division of Morris Group International.
b. Josam Company.
c. Zurn Industries, LLC. - BASIS OF DESIGN
1) Roof Drain: Zurn Z100-Dp-Fg with Deck Plate Attachment
2) Bar Floor Sink
3) Tile Drain

2. Standard: ASME A112.6.4.
3. Body Material: Cast iron.
4. Dimension of Body: Nominal 4” diameter.

5. Combination Flashing Ring and Gravel Stop: Not required.
6. Outlet: Bottom.
7. Outlet Type: No hub.
8. Extension Collars: Required.
9. Underdeck Clamp: Not required.
10. Expansion Joint: Not required.
11. Sump Receiver Plate: Required.
12. Grate Material: bronze.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.

1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
2. Position roof drains for easy access and maintenance.

3.2 FLASHING INSTALLATION

A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

3.3 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221423