PROJECT MANUAL

for

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BID, PERMIT AND CONSTRUCTION DOCUMENTS
August 10, 2023

KMF Architects Project No. 2215.03

KMF ARCHITECTS

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DOCUMENT 00 01 10 - INDEX TO PROJECT MANUAL

END OF DOCUMENT

DOCUMENT 000115 - LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

SHEET NUMBER	SHEET NAME
GENERAL	
G.000	COVER SHEET
G.001	PHASE 1 OVERALL ROOF PLAN
G.002	PHASE 2 OVERALL ROOF PLAN
G.004	PHASE 1 - REROOF CONTRACTORS ACCESS SITE PLAN
ARCHITECTURAL	
AD.121	DEMOLITION SECOND FLOOR ROOF PLAN
AD.122	DEMOLITION THIRD FLOOR ROOF PLAN
AD.123	DEMOLITION THIRD FLOOR ROOF PLAN
AD.124	DEMOLITION FIFTH FLOOR ROOF PLAN
AD.125	DEMOLITION FIFTH FLOOR ROOF PLAN
AD.126	DEMOLITION FIFTH FLOOR ROOF PLAN
AD.127	DEMOLITION FIFTH FLOOR ROOF PLAN
AD.128	DEMOLITION THIRD FLOOR ROOF PLAN
AD.129	DEMOLITION THIRD FLOOR ROOF PLAN
AD.130	DEMOLITION FIRST FLOOR ROOF PLAN
AD.350	FIRST AND SECOND FLOOR ROOF PHOTOS
AD.351	THIRD, FOURTH & FIFTH FLOOR ROOF PHOTOS
A121	SECOND FLOOR ROOF PLAN
A122	THIRD FLOOR ROOF PLAN
A123	THIRD FLOOR ROOF PLAN
A124	FIFTH FLOOR ROOF PLAN
A125	FIFTH FLOOR ROOF PLAN
A126	FIFTH FLOOR ROOF PLAN
A127	FIFTH FLOOR ROOF PLAN
A128	THIRD FLOOR ROOF PLAN
A129	THIRD FLOOR BALCONY PLAN
A130	FIRST FLOOR ROOF PLAN
A131	ROOF DETAILS
A132	ROOF DETAILS
A133	ROOF DETAILS
A134	ROOF DETAILS
STRUCTURAL	
S.001	STRUCTURAL ABBREVIATIONS SYMBOLS AND NOTES
S.002	COMPONENTS AND CLADDING WIND LOAD DIAGRAM
S.120	PHASE 1 OVERALL ROOF PLAN
S.121	SECOND FLOOR ROOF PLAN
S.122	THIRD FLOOR ROOF PLAN

S.123	THIRD FLOOR ROOF PLAN
S.124	PHASE 2 OVERALL ROOF PLAN
S.125	FIRST FLOOR ROOF PLAN
S.126	THIRD FLOOR ROOF PLAN
S.127	FIFTH FLOOR ROOF PLAN
S.128	STRUCTURAL DETAILS
PLUMBING	
P.000	PLUMBING SYMBOLS, LEGENDS, NOTES AND INDEX
P.001	OVERALL PLUMBING ROOF PLAN – PHASE 1
P.002	OVERALL PLUMBING ROOF PLAN – PHASE 2
P.121	SECOND FLOOR PLUMBING ROOF PLAN
P.122	THIRD FLOOR PLUMBING ROOF PLAN
P.123	THIRD FLOOR PLUMBING ROOF PLAN
P.124	FIFTH FLOOR PLUMBING ROOF PLAN
P.125	FIFTH FLOOR PLUMBING ROOF PLAN
P.126	FIFTH FLOOR PLUMBING ROOF PLAN
P.127	FIFTH FLOOR PLUMBING ROOF PLAN
P.128	THIRD FLOOR PLUMBING ROOF PLAN
P.129	THIRD FLOOR PLUMBING ROOF PLAN
P.130	FIRST FLOOR PLUMBING ROOF PLAN
MECHANICAL	
M.000	MECHANICAL SYMBOLS, LEGENDS, NOTES AND INDEX
M.001	OVERALL MECHANICAL ROOF PLAN – PHASE 1
M.002	OVERALL MECHANICAL ROOF PLAN – PHASE 1
M.121	SECOND FLOOR MECHANICAL ROOF PLAN
M.122	THIRD FLOOR MECHANICAL ROOF PLAN
M.124	FIFTH FLOOR MECHANICAL ROOF PLAN
M.125	FIFTH FLOOR MECHANICAL ROOF PLAN
ELECTRICAL	
E.001	ELECTRICAL LEGEND AND NOTES
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E.122	THIRD FLOOR ELECTRICAL ROOF PLAN
E.124	FIFTH FLOOR ELECTRICAL ROOF PLAN
E.125	FIFTH FLOOR ELECTRICAL ROOF PLAN

END OF DOCUMENT

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Multiple Work Packages.
5. Future work not part of this Project.
6. Contractor's use of site and premises.
7. Coordination with occupants.
8. Work restrictions.
9. Specification and Drawing conventions.
10. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Construction Facilities and Temporary Controls" for limitations and procedures governing temporary use of Owner's facilities.

C. Description:

1. The Work includes the provision of all labor, material, equipment, management, coordination, supervision and administration to complete the Work as outlined.
2. The Contractor shall complete the following Work. The following outline of Work is noted by System. The Work includes, but is not limited to the following:

a. SYSTEM #1 (Roofing) – Main Roof Areas:

1) Tear off to existing lightweight insulating concrete and preparation of existing lightweight insulating concrete over concrete roof deck, and all flashing substrates.
2) SBS-modified vapor barrier cold adhesive applied with ColPly EF ribbon applied adhesive.
3) Sopra-ISO 20psi coated glass facer to match existing thickness, 2 layers, adhered with insulation adhesive (BOD: Duotack)
4) ¼” asphaltic coverboard adhered (BOD: 1/4” Sopraboard) with insulation adhesive (BOD: Duotack).
5) SBS-modified bitumen base ply heat-welded (BOD: Sopralene Flam 180).

6) SBS-modified bitumen inter ply heat-welded (BOD: Sopralene Flam 180).
7) SBS-modified bitumen cap sheet heat-welded (BOD: Sopralene Flam 180 FR GR SG).
8) SBS-modified bitumen membrane flashings.
9) Liquid-applied, reinforced flashings.

b. SYSTEM #1 – (Roofing) - Wet Area Repair Areas:
1) Preparation of concrete roof deck, and all flashing substrates.
2) At areas designated as too wet to adhere roofing material, remove LWIC down to the concrete roof deck. Area to be approved by manufacturer prior to installation of materials. Areas designated on plans are general areas considered high in moisture from thermal scan. All areas of concrete to be tested by contractor.
3) Clean, prepare and prime concrete deck with asphalt primer (BOD: Elastocol 500).
4) Install heat welded vapor barrier to primed concrete roof deck substrate (BOD: Sopralene 180 SP 3.0).
5) Install polyiso rigid insulation (BOD: Sopra-ISO), thickness to match height of existing and surrounding LWIC by adhering to vapor barrier with insulation adhesive (BOD: Duotack).
6) Coverboard adhered with insulation adhesive (BOD: 1/4” Sopraboard).
7) SBS-modified bitumen base ply heat-welded (BOD: Sopralene Flam 180).
8) SBS-modified bitumen inter ply heat-welded (BOD: Sopralene Flam 180).
9) SBS-modified bitumen cap sheet heat-welded (BOD: Sopralene Flam 180 FR GR SG).
10) SBS-modified bitumen membrane flashings.
11) Liquid-applied, reinforced flashings.

c. SYSTEM #2 (Roofing) – Upper Roof Areas:
1) Tear off to and preparation of existing lightweight insulating concrete over concrete roof deck, and all flashing substrates.
2) Coverboard adhered (BOD: 1/4” Sopraboard) with insulation adhesive (BOD: Duotack).
3) SBS-modified bitumen base ply heat-welded (BOD: Sopralene Flam 180).
4) SBS-modified bitumen inter ply heat-welded (BOD: Sopralene Flam 180).
5) SBS-modified bitumen cap sheet heat-welded (BOD: Sopralene Flam 180 FR GR SG).
6) SBS-modified bitumen membrane flashings.
7) Liquid-applied, reinforced flashings.

d. SYSTEM #3 (Roofing/Concrete Protection) – Exposed concrete areas POLYMETHYL METHACRYLATE (PMMA) MEMBRANE ROOFING:
1) Preparation of existing concrete roof deck, and all flashing substrates.
2) Liquid-applied, reinforced membrane.
3) Liquid-applied, reinforced flashings.

e. SYSTEM #4 (Balcony walkway areas) - POLYURETHANE (PU) PEDESTRIAN TRAFFICABLE SURFACE COATING:
1) Preparation of existing concrete roof deck, and all flashing substrates.
2) Liquid-applied membrane.

1.3 DEFINITIONS

A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.4 PROJECT INFORMATION

A. Project Identification: Downtown Library Reroof.

1. Project Location: 101 E Central Boulevard.

B. Owner: Orange County Library System

1. Owner's Representative: Brian Dornbush.

C. Architect: KMF Architects

1. Architect's Representative: Joe Morgan.

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. Plumbing: TLC Engineering Solutions

2. Mechanical: TLC Engineering Solutions

3. Electrical: TLC Engineering Solutions

a. Representative: Contact Architect’s Representative.

E. Architect’s Testing Consultant: Architect has retained the following design professionals who have prepared existing condition reports that are not part of the Contract Documents:

1. NESHAP and Thermal Investigation: Intertek PSI has prepared the following portions of the Contract Documents:

a. Testing and Reporting - Representative: Contact Architect’s Representative.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. Removal and replacement of the existing roofing, metal trims, roof drains, lightning protection systems and other Work indicated in the Contract Documents. See also section 07 56 16 for more details on roofing scope.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.6 PHASED CONSTRUCTION

A. The documents include reroofing the total building. Documents show two phases, schedule shall be reviewed and approved by the Owner per phase.

1. Phase 1 Work: Includes work on the east portion of the building on both the third and fourth floors. This area has the oldest existing roof.

2. Phase 2 Work: Includes work on the remainder of the building's roof and exposed balconies.

3. Commencement of Construction. Work of this phase shall commence within 14 days after the Notice to Proceed.

4. Final Completion. Owner desires for project to be complete and paid out by September 30, 2024.

1.7 WORK PERFORMED BY OWNER

A. There is no current identified work at this point that will be performed by the Owner. If the situation arises, cooperate fully with Owner, so work may be carried out smoothly, without interfering with or delaying Work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Preceding Work: There is no current identified preceding work at this point that will be performed by the Owner. If the situation arises, Owner will make best efforts to be substantially complete before Work under this Contract begins.

C. Concurrent Work: There is no planned concurrent work at this point that will be performed by the Owner. If the situation arises, Owner will perform the operations simultaneously with Work under this Contract.

1.8 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits on Use of Site: Confine construction operations to the areas indicated on the site plan.

2. Contractor shall arrange and pay for sidewalk and lane closures for loading and off loading materials from the roof and for exterior access to the roof via a scaffold stair

3. Note that access to the roof is via a scaffold type exterior stair shown in the NE corner of the building. This fenced in area shall also include and material handling equipment required to perform the work.
4. Driveways, Walkways and Entrances: Keep driveways, undergroung **parking garage access, building's loading loading dock areas,** book drop lane, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
    c. Deliveries longer than 30 minutes shall be done at night after the library closes.
    d. Deliveries that cause loud noise generation shall not occur simultaneous with events at the bandshell at Lake Eola park.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.9 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy Project site and building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than seventy two 72 hours in advance of activities that will affect Owner's operations.

1.10 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Work hours shall not be limited to meet Project requirements if approved by Owner and authorities having jurisdiction.
   1. Work in Existing Building: After Library closure for the day and before 8:00 AM.
   2. Hours for Utility Shutdowns: Coodinated with the Owner's Representative on a case ba case basis
   3. Hours for Core Drilling: After Library closure for the day and before 8:00 AM.

C. On-Site Work Day Restrictions: Do not perform work **resulting in utility shutdowns or resulting in noisy activity** on project site during work Owner's designated black-out days."

D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:

   1. Notify Owner not less than two 2 days in advance of proposed utility interruptions.
   2. Obtain Owner's written permission before proceeding with utility interruptions.

E. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

   1. Notify Owner not less than two 2 days in advance of proposed disruptive operations.
   2. Obtain Owner's written permission before proceeding with disruptive operations.
   3. Cooperate with the owner to determine the best course of action for performing odorous work within 20 feet of outdoor air intakes. Potential actions may include performing the work at night when the air handler can be shut down and air intake temporarily covered for the short duration of limited area operation.

F. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on Owner's property is not permitted.

G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to always use identification tags.

H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

   1. Maintain list of approved screened personnel with Owner's representative.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The 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. Imperative mood and streamlined language are generally used in the Specifications. 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.

2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard.
3. Keynoting: Materials and products are identified by reference keynotes referencing notes written on the drawings.

1.12 MISCELLANEOUS PROVISIONS

A. None currently.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Document 002600 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
2. Section 012300 "Alternates" for products selected under an alternate.
3. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to Architect.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.

b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from Florida Building Code.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within Fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

A. Substitutions Not Considered: Bidder is to declare which of the three approved roofing product and metals trims are included in their bid and that will meet the specified no dollar limit edge to edge roof warranty and will meet and Owner's desired schedule date. Once that declaration is made in its bid, no change in manufacturer of the roofing or metals will be considered unless it is determined that the successful roofing manufacturer can no longer meet their assertions when originally approved. Owner may consider what recourse to take (if any) with respect to any misrepresentation by the Bidder or the Vendor.

B. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fourteen one (14) days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not delay Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

C. Substitutions for Convenience: Architect will consider requests for substitution, roofing, insulation, and metals excluded, if received within thirty (30) days the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include

compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:

1. General coordination procedures.
2. RFIs.
3. Digital project management procedures.
4. Web-based Project management software package.
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 011200 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
2. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
3. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
4. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
5. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

A. BIM: Building Information Modeling.

B. RFI: Request for Information. Request from Owner, [**Construction Manager,**]Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Within Ten (10) days, prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within ten (10) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities, list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Provide list to Owner and Architect in PDF form. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.

6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Name of Architect.
5. Architect's Project number.
6. Date.
7. Name of Contractor.
8. RFI number, numbered sequentially.
9. RFI subject.
10. Specification Section number and title and related paragraphs, as appropriate.
11. Drawing number and detail references, as appropriate.
12. Field dimensions and conditions, as appropriate.
13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Contractor’s software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: will review each RFI, determine action required, and respond. Allow three and up to seven business days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for approval of Contractor's means and methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time, or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within five business days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log with each application for payment

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number, including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three days if Contractor disagrees with response.

1.7 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in REVIT.
4. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Architect.

a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Architect.

B. Web-Based Project Management Software: Not applicable

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, **incorporating submittal requirements of a single Specification Section** and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.8 PROJECT MEETINGS

A. General: Schedule regular meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting. Meetings should occur within three business days of submitting each payment application.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Owner’s Representative will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; manufacturer’s representative responsible for executing the warranty and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following as applicable:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Phasing.
d. Critical work sequencing and long lead items.
e. Designation of key personnel and their duties.
f. Lines of communications.
g. Use of web-based Project software.
h. Procedures for processing field decisions and Change Orders.
i. Procedures for RFIs.

j. Procedures for testing and inspecting.
k. Procedures for processing Applications for Payment.
l. Distribution of the Contract Documents.
m. Submittal procedures.
n. Preparation of Record Documents.
o. Use of the premises and existing building.
p. Work restrictions.
q. Working hours.
r. Owner's occupancy requirements.
s. Responsibility for temporary facilities and controls.
t. Procedures for moisture and mold control.
u. Procedures for disruptions and shutdowns.
v. Construction waste management and recycling.
w. Parking availability.
x. Office, work, and storage areas.
y. Equipment deliveries and priorities.
z. First aid.
aa. Security.
bb. Progress cleaning.

3. Minutes: Owner’s Representative or Architect will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner’s Representative of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility requirements.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.

s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than fifteen (15) days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of Record Documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Procedures for completing and archiving web-based Project software site data files.
d. Submittal of written warranties.
e. Requirements for preparing operations and maintenance data.
f. Requirements for delivery of material samples, attic stock, and spare parts.
g. Requirements for demonstration and training.
h. Preparation of Contractor's punch list.
i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
j. Submittal procedures.
k. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at monthly intervals at the number of days specified in application for payment section.

1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site use.
        8) Temporary facilities and controls.
        9) Progress cleaning.
        10) Quality and work standards.
        11) Status of correction of deficient items.
        12) Field observations.
        13) Status of RFIs.
        14) Status of Proposal Requests.
        15) Pending changes.
        16) Status of Change Orders.
        17) Pending claims and disputes.
        18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

    a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Request informal project coordination meeting when required to maintain progress. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

    1. Attendees: Representatives of Owner, Architect, and any, subcontractor, supplier, and/or other entity concerned with current progress or involved in planning, coordination, or

performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: As appropriate for the issue at hand.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting. Recording may be by email.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's Construction Schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Unusual event reports.

B. Related Requirements:
1. None

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

C. Event: The starting or ending point of an activity.

D. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

E. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file.
2. PDF file.

B. Startup construction schedule.

1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

D. Construction Schedule Updating Reports: Submit with Applications for Payment.

E. Daily Construction Reports: Submit at weekly intervals.

F. Material Location Reports: Submit at **weekly** intervals.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

H. Unusual Event Reports: Submit at time of unusual event.

1.5 QUALITY ASSURANCE

A. Schedule Manager Qualifications: An experienced project manager with capability of producing schedule reports and diagrams intervals required.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the Owner’s construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Discuss constraints, including phasing, work stages, area separations, interim milestones.
2. Review delivery dates for Owner-furnished products, if any.
3. Review schedule for work of Owner's separate contracts, if any.
4. Review submittal requirements and procedures.
5. Review time required for review of submittals and resubmittals.

6. Review requirements for tests and inspections by independent testing and inspecting agencies.
7. Review time required for Project closeout.
8. Review and finalize list of construction activities to be included in schedule.
9. Review procedures and timing for updating schedule.

1.6 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.7 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within ten (10) days of date established for the Notice to Proceed.

1. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each roof level and separated roof areas on the same roof level and any other significant construction activity separately. Schedule shall identify each subcontract separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require thirty (30) or longer to complete, indicate an estimated completion percentage in weekly increments within time bar.

1.8 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.

10. Unusual events.
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction/Work Change Directives received and implemented, as applicable.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one (1) day of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA & SAMPLES

PART 1 - GENERAL

1.01 SUBMITTAL PROCEDURES

A. Submit shop drawings, product data and samples as indicated in the Technical Specification Sections.

B. Submit shop drawings, product data, samples, and other required information in sufficient time to permit proper review before any materials and equipment are delivered to Project.

C. **Except as otherwise specified, submittals shall be submitted before the first application for payment and no later than 30 days from the Notice to Proceed from the Owner. Absolutely no work shall begin with regards to a technical specification section until the submittal for that section has been reviewed, and is not stamped rejected or resubmit. Project schedule delays caused by the Contractor or its subcontractor by submitting products not in compliance with the specifications or not accepted as a substitution shall be the sole responsibility of the Contractor.**

D. Verify all measurements so that all parts of Project will fit together.

E. Submit, in writing, requests and reasons for modifications to drawings and specifications. Shop drawings, catalog cuts, charts and other items submitted for review containing notes on changes do not constitute "in writing."

F. **Submittals shall be first checked and approved by Contractor; and bear date, stamps and signature so stating**. Send submittals to Owner's Representative with "Submittal Cover Letter" included herein. Submittals will not be reviewed by Owner's Representative unless accompanied by "Submittal Cover Letter". **PDF attachment to an email submission is acceptable but email shall not substitute for the required cover letter.**

G. For initial and any resubmissions provide submittals in following quantities:

1. Product data of factory produced items:
   a. Two copies for Owner's Representative (one will be returned to Contractor)
   b. One copy for Architect/Engineer of Record.
   c. Plus copies for Contractor's usage and distribution (include sufficient quantity for adequate distribution to field, subcontractors, manuals, Owner and others).
   d. Except as otherwise scheduled, submit items from a single specification section as a bound unit suitable for stamping. Contractor shall not combine submittals from different specification sections or these will be returned to the Contractor without review.
2. Shop drawings covering fabricated work; schedules; charts and similar information: Three reprographic copies of each.

H. Following review, submittals will be returned with appropriate comments.

1. Copy of catalog cuts, for those requiring resubmission, will be retained for Owner's project file; otherwise all will be returned.
2. Transparencies of drawings, schedules, charts and similar information will be returned to Contractor; Owner to retain prints.

3. When transparencies are returned and are stamped "Rejected" or "Revise and Resubmit," correct or revise original drawing and resubmit new transparency and one print. Continue resubmitting until a transparency is stamped "Reviewed" or "Reviewed/Corrections Noted."

I. Distribute transparency submittals stamped "REVIEWED," or "REVIEWED/CORRECTIONS NOTED," for fabrication, erection, purchasing and other requirements. Collect one set of prints of all such submittals for turning over to Owner.

1.02 COORDINATION OF SUBMITTALS

A. Submit shop drawings and samples together for any one category or Section. Do not combine submittals of products specified in different specification sections unless they are interrelated.

B. Coordinate preparation and processing of submittals with performance of work.

C. Coordinate each separate submittal with other submittals and related activities such as testing, purchasing, fabrication, delivery and similar activities that require sequential activity.

D. Coordinate submittal of different units of interrelated work so that one submittal will not be delayed by Owner's Representative need to review a related submittal.

E. Owner's Representative reserves right to withhold action on any submittal requiring coordination with other submittals until related submittals are received.

F. Prepare and transmit each submittal to Owner's Representative sufficiently in advance of scheduled performance of related work and other applicable activities.

1.03 CONTRACTOR'S REVIEW

A. Contractor shall check shop drawings, product data, samples and other information for conformance to Contract requirements, STAMPING EACH SUBMITTAL indicating examination and approval.

B. Major Subcontractors shall check and STAMP SUBMITTALS in similar manner prior to sending to Contractor.

C. Product Data: Collect required product data into single submittal for each unit of work or system. MARK EACH COPY to show which choices and options are applicable to project. **Where product data has been printed to include information on several similar products, some of which are not required for use on project, or are not included in this submittal, mark copies to show clearly that such information is not applicable**.

D. Unmarked or unstamped submittals will be rejected without review.

1.04 SUBMITTAL CONTENTS

A. Illustrated cuts of items to be furnished, layout, scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams, controls, working pressure, material gage or thickness, brand name, catalog number, general type and other pertinent information.

B. Architect-Engineer's Project Title and Comm. No.

C. Submittal number.

D. Section Number and Item of the specifications for which submittal is submitted.

E. Date and dates of revisions.

F. Contractor's stamp of approval, signed and dated.

G. Space for Architect’s review stamp.

H. Details of fabrication, assembly and erection.

I. Materials used.

J. All required dimensions.

K. Details of connections with adjacent work.

L. Information on all items of equipment.

M. Who furnishes related work ("By Others" will not be an acceptable statement).

N. Complete schedules.

O. All protective coating and factory finishes, including type, color and manufacturer's shop and finish coatings.

1.05 SUBMITTAL REVIEW

A. Corrections or comments made on shop drawings, catalog cuts, charts, and other items during review do not relieve Contractor from compliance with requirements of the Contract Documents. This review is for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor remains responsible for determining the accuracy and completeness of other details such as dimensions and quantities; for substantiating instructions for installations; verifying materials, field measurements and related criteria; checking, coordinating, and performing work in compliance with the Contract Documents.

B. Review of shop drawings, product data and samples does not relieve Contractor from responsibility for providing a complete and functioning Project, nor shall it relieve Contractor from responsibility for deviations or errors of any sort.

1.06 SAMPLES

A. Furnish without added cost, for Owner’s Representative review, samples of materials as required by contract documents. Provide size and quantity of samples sufficient to determine suitability for intended use. For materials requiring color selection, submit not less than two samples of each color.

B. Label each sample indicating material represented, specification section number, its place of origin, names of producer and Contractor, and project name.

C. Use no material for which samples are required in the work until their representative samples have been final reviewed by Owner’s Representative.

D. Sample reviews are for examining material characteristics and applicability for intended usage, not for modification of contract documents. After final review, certain samples (if in good condition) may be suitably marked and used in work.

1.07 SUBMITTAL REVIEW "ACTION" DEFINITIONS

A. REVIEWED: Shop drawing, product data, sample is reviewed for general conformance with design concept and general compliance with contract documents; and is released for fabrication and delivery of product.

B. REVIEWED/CORRECTIONS NOTED: Shop drawing, product data and/or sample is reviewed for general conformance with design concept and general compliance with contract documents; and is released for fabrication and delivery of product provided corrections noted are incorporated in work.

C REVISE AND RESUBMIT: Revise shop drawing, product data or sample in accordance with revisions noted; and re-submit.

D REJECTED: Shop drawing, product data or sample is rejected for non-compliance with Contract Documents or being incomplete, or does not contain Contractor's and major Sub-contractor's stamp(s) of approval. Submit correct shop drawing.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION – SUBMITTAL COVER LETTER FOLLOWS

SUBMITTAL COVER LETTER

KMF Commission No._2215.03_____

Contractor: _____

Address: _____

TO: Orange County Library System,
c/o Brian Dornbush,
Facilities and Operations Manager
101 E. Central Boulevard
Orlando, Florida 32801
407.835.7618 (o); 407.495.7009 (c)
Dornbush.brian@ocls.info (e)

DATE: _____

We Are Sending You _ Attached _ Under Separate Cover Via _____:

SPECIFICATION SECTION NO.	DESCRIPTION	QUANTITY VELLUM	BOND	BROCHURE	SAMPLE

Enclosed submittals are made in accordance with Section 01340 of project specifications and related documents. Each submittal has been reviewed by this Contractor for conformance to contract document requirements and is stamped, dated and signed.

CONTRACTOR UNDERSTANDS THAT IT IS HAS FULL, COMPLETE AND TOTAL RESPONSIBILITY FOR SUBSEQUENT COMPLIANCE OF ITEMS SUBMITTED FOR REVIEW OR USED FOR FINAL CONSTRUCTION OF THIS PROJECT IN ACCORDANCE WITH INTENT EXPRESSED BY THE CONTRACT DOCUMENTS, EXCEPT THAT AS PROVIDED IN AIA A201, 12.3.1, (OR A107, 9.4 AS APPROPRIATE).

THIS SUBMITTAL CONTAINS THE FOLLOWING DEVIATIONS FROM THE CONTRACT DOCUMENTS. THESE ITEMS ARE BEING SUBMITTED FOR CONSIDERATION AND POSSIBLE ACCEPTANCE BY ARCHITECT AND OWNER: (IF NONE, WRITE "NONE")

DEVIATION ITEMS:	SAVINGS TO OWNER IF ACCEPTED:
_____	$ _____
_____	$ _____

By _____

_____

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Engineer or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Division 01 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
2. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

D. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. 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 tradespeople of the corresponding generic name.

1.4 CONFLICTING REQUIREMENTS

A. General: If 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 Architect for a decision before proceeding.

B. 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 requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

A. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

B. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.

9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For 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.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of

manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
2. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
3. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
4. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 50 00 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.02 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water Service: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.02 SUBMITTALS

A. Implementation and Termination Schedule: Within 15 days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.03 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Florida Building Code requirements.
2. Florida Fire Prevention Code.
3. Health and safety regulations.
4. Utility company regulations.
5. Police, fire department and rescue squad rules.
6. Environmental protection regulations.

B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations and Demolition Operations,” ANSI A10 Series standards for “Safety Requirements for Construction and Demolition,” and NECA Electrical Design Library “Temporary Electrical Facilities.”

1. Electrical Services: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code.”

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.04 DELIVERY, STORAGE AND HANDLING

A. Storage is limited to the construction area roof for protection of materials and equipment they furnish without overloading the roof. Materials and equipment shall be stored so as to ensure preservation of their quality and fitness for Work. Perishable items and items affected by weather, rain, wind, dust, heat or cold shall be covered with temporary waterproof tarpaulin and lifted on skids or similar that will allow water to pass below. Contractor shall ensure and be responsible for any materials stored on the roof and use whatever measure necessary to ensure same will remain in place in inclement and high wind weather conditions. Materials and equipment shall be stored on wooden skids and not on roof surface blocking water flows. Skids shall not be positioned to restrict flow of water on the roof. Each Contractor and Subcontractor shall provide adequate additional offsite storage facilities in performance of the work

1.05 PROJECT CONDITIONS

A. Temporary Utilities: not applicable.

B. Conditions of Use: Keep facilities clean and neat in appearance. Operate in a safe and efficient manner. Provide roof edge and other protection measures as required to comply with all OSHA regulations. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do no allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 TOILET FACILITIES

A. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Toilets shall be located on ground level located in the secured fenced area restricted to construction personnel, Owner’s Representative, Architect and Inspectors. Secure units to prevent damage or overturning. Lock units when not in use. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

3.02 WATER

A. Contractor shall install, move and remove temporary water service as required for construction operations.

B. Additional temporary hose bibbs shall be provided as needed.

C. Hoses shall be provided by trade requiring water.

3.03 ELECTRIC

A. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
2. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage.
3. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
4. Provide metal conduit enclosures or boxes for wiring devices.

B. Lighting: For work performed after dusk, provide temporary lighting.

1. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.

3.04 ACCESS TO CONSTRUCTION OPERATIONS

A. Contractor shall provide, maintain and pay for such temporary stairs, material lifts etc as may be required to provide access to the roof level. Obtain street permit to allow Contractors, Subcontractors and Material Suppliers to delivery materials and equipment to construction operations. Lane/road closures will be required to occur overnight. See Section 01 56 33 – Temporary Security Barriers.

B. Permanent roadways may be used under responsibility of Contractor, only if such roadways are adequate for weight of construction equipment. Any damage to roadway shall be repaired by Contractor to the satisfaction of the authority with jurisdiction over the street.

C. City may allow Contractor to block a section one lane of the Wall Street with cost being the responsibility of the Contractor. Any damage to roadway shall be repaired to the satisfaction of the authority with jurisdiction over the street by City approved contractor. Contractor for roofing shall be responsible for cost of repairs. Contractor is advised to provide protection for the existing street.

3.05 SUPPORT FACILITIES INSTALLATION

A. Locate temporary construction and support facilities for easy access.

1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Provide noncombustible construction for storage located within the construction area. On-roof storage shall stay back 30 feet (9 m) face of occupied spaces within the building. Comply with requirements of NFPA 241.

C. Field Offices: At contractor’s option provide insulated, weathertight temporary office not to exceed 80-96 SF to be located within the secured enclosure on grade level at the Project Site. This option may or may not be possible depending on space available onsite or in the public right of way.

D. Storage and Fabrication Sheds: not permitted. Items which cannot be stored on the roof shall be stored offsite and brought to the jobsite as needed.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Note Contactor shall be held responsible for tie down of materials and all resulting damage caused due to high wind events, including hurricanes.

1. Close openings through roof decks and horizontal surfaces construction. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

F. Temporary Lifts and Hoists: Provide facilities for hoisting materials. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.

G. Access to the roofs shall be located outside the building via temporary stairs and ladders provided by the contractor.

H. Provide protection at grade level to keep general public outside of the drop areas around the building. Where the drop area cuts off access doors provide steel frame/wood plank tunnel/canopy capable of withstanding the dropped loads per OSHA or other authority having jurisdiction requirement. Tunnel/Canopy shall extend from the point of building access out past the drop area zone.

3.06 FIRE SUPPRESSION

A. Fire suppression shall conform to OSHA, NFPA, IBC for temporary suppression.

3.11 PROJECT SIGNs

A. No project sign nor Contractor signs nor signs advertising a product or material vendor permitted

3.07 COLLECTION AND DISPOSAL OF WASTE

A. Collect remove waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Dumpster location to be coordinated with Owner and/or City. Contractor may be able to arrange for a dumpster in the dock area. Do not hold materials more than seven days during normal weather or three days when temperature is expected to rise above 80°F. Handle hazardous, dangerous or unsanitary waste materials separately form other waste by containerizing properly. Dispose of material in lawful manner.

B. Waste Management Plan: Develop a waste management plan for Work performed on the Project. Indicate the type of waste material the Project will produce and estimate quantities of each type. Provide detailed information on on-site waste storage and separation of recyclable rubbish and debris separate categories. Provide information on the destination of each type of waste material and the means to be used to dispose of all waste material.

3.13 SECURITY ENCLOSURE AND LOCKUP

A. Ground level access to roof area shall be secure against unauthorized entrance at all times. Provide substantial secure temporary enclosures at ground floor and other locations of possible entry, with locked entrances.

B. Enforce discipline in connection with the secured installation and release of material to minimize the opportunity for theft and vandalism.

C. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide directional and warning signage, lighting, including flashing red or amber lights.

D. Contractor shall note that Wall Street is regularly occupied by homeless individuals and is often used as a place to sleep generally across from the library. Contractors are hereby notified of their presence and may require extra ordinary to measures to ensure the safety of work area, construction workers and the homeless individuals as well.

3.14 EXISTING FREIGHT ELEVATOR

A. Contractor may <u>not</u> use existing freight or passenger elevators.

3.15 VENTILATION

A. Provide temporary air handling units, fans or similar equipment as required to purge enclosed areas of solvents, excess water vapor, carbon dioxide and similar substances that would otherwise damage finishes or become an irritant to human occupancy. See special requirements for working near air intakes.

3.16 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water-filled hoses from freezing.

C. Termination and Removal: Unless the Owner's Representative requests that it be maintained longer, remove each temporary facility when the need has ended. Restore permanent construction that may have been damaged because of interference with the temporary facility. Repair damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances. Repair or replace street paving, curbs, and plaza pavers, special finished walks, sidewalks as required by the owner and governing authority.
3. At Substantial Completion, clean and renovate permanent facilities used during the construction.

END OF SECTION

SECTION 01 56 33 - TEMPORARY SECURITY BARRIERS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Temporary Use Chain-Link Fences
2. Temporary Use Swing type Gates.

B. Related Sections include the following:

1. Division 00 – Procurement and Contracting Requirements - BY OCLS

1.02 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide chain-link fences and gates capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Minimum Post Size and Maximum Spacing for Wind Velocity Pressure: Determine based on mesh size and pattern specified, and on the following minimum design wind pressures and according to CLFMI WLG 2445:
   a. Wind Speed: 120 mph.
   b. Fence Height: 8 feet.
   c. Line Post Group: IA, ASTM F 1043, Schedule 40 steel pipe
   d. Wind Exposure Category: B.
2. Determine minimum post size, group, and section according to ASTM F 1043 for framework up to 12 feet (3.66 m) high and post spacing not to exceed 10 feet (3 m).

1.03 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.

1. Fence and gate posts, rails, and fittings.
2. Chain-link fabric, reinforcements, and attachments.
3. Gates and hardware.

B. Shop Drawings: Show locations of fences, gates, posts, rails, tension wires, details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, gate elevations, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

1. Engineering Responsibility: Preparation of data for chain-link fences and gates, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified according to NETA ETT, or the National Institute for Certification in Engineering Technologies, to supervise on-site testing specified in Part 3.

1.05 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

B. Interruption of Existing Utility Service: Do not interrupt utility services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner’s Representative no fewer than two days in advance of proposed interruption of utility services.
2. Do not proceed with interruption of utility services without Owner’s Representative’s written permission.

PART 2 - PRODUCTS

2.01 CHAIN-LINK FENCE FABRIC

A. General: Provide temporary ground level fencing to prevent access to the work area from non-authorized access. Provide fabric in one-piece heights measured between top and bottom of

outer edge of selvage knuckle or twist. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:

1. Steel Wire Fabric: Metallic-coated wire with a diameter of 0.148 inch (3.76 mm).
   a. Mesh Size: 2 inches (50 mm)
   b. Weight of Metallic (Zinc) Coating: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft. (366 g/sq. m) with zinc coating applied after weaving.
2. Selvage: Knuckled at both selvages

2.02 INDUSTRIAL FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:

1. Group: IA, round steel pipe, Schedule 40
2. Strength Requirement: Heavy industrial according to ASTM F 1043.
3. Post Diameter and Thickness: According to ASTM F 1043.
   a. Line Post: 2.375 inches (60 mm).
   b. End, Corner and Pull Post: 2.875 inches (73 mm).
   c. Swing Gate Post: According to ASTM F 900.
      1) Openings up to 12 Feet (3.7 m): Steel post, 2.875-inch (73-mm) diameter, and 4.64-lb/ft. (6.91-kg/m) weight.
      2) Openings Wider Than 12 Feet (3.7 m): Steel post, 4-inch (102-mm) diameter, and 8.65-lb/ft. (12.88-kg/m) weight.
4. Coating for Steel Framing:
   a. Metallic Coating:
      1) Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. (1.22-kg/sq. m) zinc coating per ASTM A 653/A 653M.

2.03 TENSION WIRE

A. General: Provide horizontal tension wire at the following locations:

1. Location: Extended along top and bottom of fence fabric.

B. Metallic-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, marcelled tension wire complying with ASTM A 817, ASTM A 824, and the following:

1. Metallic Coating: Type II, zinc coated (galvanized) by hot-dip process, with the following minimum coating weight:
   a. Matching chain-link fabric coating weight.

2.04 INDUSTRIAL SWING GATES

A. General: Comply with ASTM F 900 for double swing gate types.

1. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1043 and ASTM F 1083 for materials and protective coatings.

B. Frames and Bracing: Fabricate members from round, galvanized steel tubing with outside dimension and weight according to ASTM F 900 and the following:

1. Gate Fabric Height: 2 inches (50 mm) less than adjacent fence height.
2. Leaf Width: As indicated.
3. Frame Members:
   a. Tubular Steel 1.90 inches (48 mm) round.

C. Frame Corner Construction:

1. Welded or assembled with corner fittings and 5/16-inch- (7.9-mm-) diameter, adjustable truss rods for panels 5 feet (1.52 m) wide or wider].

D. Hardware: Latches permitting operation from both sides of gate, hinges, center gate stops and keepers for each gate leaf more than 5 feet (1.52 m) wide. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

1. Provide padlocks and chains for locking gates.

2.05 FITTINGS

A. General: Comply with ASTM F 626.

B. Post and Line Caps: Provide for each post.

C. Rail and Brace Ends: Attach rails securely to each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Rail Clamps: Line and corner boulevard clamps for connecting intermediate rails in the fence line-to-line posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches (50 mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:

a. Hot-Dip Galvanized Steel: `` fabric.

I. Finish: Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. (366 g /sq. m) zinc.

2.06 TEMPORARY ANCHORS

A. Provide ballast of contractor's choice that is fixed, of sufficient weight to perform purpose intended and will not damage existing finish construction. Do not use bags of stone or other materials that can be easily picked up an thrown.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.03 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

1. Install fencing on established boundary lines inside property line.

3.04 CHAIN-LINK FENCE INSTALLATION

A. Post Setting: Set posts for temporary installation.

1. Verify that posts are set plumb, aligned, and at correct height and spacing.

B. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment.

C. Line Posts: Space line posts uniformly at 8 feet (2.44 m) o.c.

D. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at 2/3 fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

E. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- (3.05-mm-) diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches (610 mm) o.c. Install tension wire in locations indicated before stretching fabric.

1. Top Tension Wire: Install tension wire through post cap loops.
2. Bottom Tension Wire: Install tension wire within 6 inches (150 mm) of bottom of fabric and tie to each post with not less than same diameter and type of wire.

F. Posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

G. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches (50 mm) between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

H. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches (380 mm) o.c.

I. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at 1 end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches (300 mm) o.c. and to braces at 24 inches (610 mm) o.c.

J. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.05 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.06 ADJUSTING

A. Gate: Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

END OF SECTION

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching. **Contractors shall note that the entire building is considered to be architecturally historically significant and ALL patching shall match the existing in terms of material, color, finishes. Acceptance of any single patch and collectiove patching shall be the sole discretion of the Owner.**

B. Refer to other specification sections for specific requirements and limitations applicable to cutting and patching individual parts of work.

1. Requirements of this Section apply to each Contractor.

1.02 PERFORMANCE REQUIREMENTS

A. Provide cutting in safe, controlled manner that minimizes damage and endangerment to construction already in place.

B. Patch surfaces to match adjacent construction in new condition unless otherwise specified.

C. Caps, insulation, fillers and miscellaneous closure materials shall be provided as necessary to prevent rain, cold air, moist air, pests or other hazards from endangering construction already in place, including without limitation, the following hazards:

1. Water damage
2. Pest infestation
3. Condensation damage
4. Pipe freezing and accompanying water damage to contents

D. Concealed Conditions

1. This work shall include removal of brackets, supports, anchorages and accessories of existing equipment that is to be removed.
2. Following this removal work, provide patching of holes and damage to existing finishes caused by removals.
3. Determination of extent and types of removal/patching work shall be made during prebid walk through.

1.03 QUALITY ASSURANCE

A. Qualifications: Engage experienced workers skilled in trades associated with patching work required. Workers shall specialize in the patching and finishing work required (i.e. use gypsum board contractor for patching gypsum board, painting contractor for painting, etc.).

B. Requirements for Structural Work: Do not cut and patch structural elements in manner that would reduce their load-carrying capacity or load-deflection ratio.

1. Obtain approval of cutting and patching proposal before cutting and patching following structural elements:
   a. Foundation construction

b. Bearing and retaining walls
c. Structural concrete
d. Structural steel
e. Lintels
f. Timber and primary wood framing
g. Structural decking
h. Stair systems
i. Miscellaneous structural metals
j. Exterior curtain wall construction
k. Equipment supports
l. Piping, ductwork, vessels and equipment
m. Structural systems of special construction in Division 13

C. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of cutting and patching proposal before cutting and patching following operating elements or safety related systems:
   a. Shoring, bracing and sheeting
   b. Primary operational systems and equipment
   c. Air or smoke barriers
   d. Water, moisture or vapor barriers
   e. Membranes and flashings
   f. Fire protection systems
   g. Noise and vibration control elements and systems
   h. Control systems
   i. Communication systems
   j. Conveying systems
   k. Electrical wiring systems
   l. Special construction specified by Division 13 Sections

D. Visual Requirements: Do not cut and patch construction exposed on exterior or in occupied spaces in manner that would, in the Owner's Representative's opinion, reduce building's aesthetic qualities or result in visual evidence of cutting and patching. Provide cutting and patching in visually satisfactory manner. If possible, retain original installer or fabricator to cut and patch following categories of exposed work. If not possible to engage original installer or fabricator, engage another recognized experienced and specialized firm subject to Owner's Representative's acceptance.

1.04 WARRANTY

A. Existing warranties: Replace, patch and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to adjacent materials already in place. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match adjacent surfaces to fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of materials already in place.

PART 3 - EXECUTION

3.01 EXAMINATION

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

B. Before proceeding, meet at site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.

B. Protection: Protect construction already in place during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of project that might be exposed during cutting and patching operations.

1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.03 PERFORMANCE

A. General: Employ skilled workers in trade affected to perform cutting and patching. Proceed with cutting and patching at earliest feasible time and complete without delay.

B. Cut construction already in place to provide for installation of components and performance of construction activities. Patch to restore surfaces to match original condition.

C. Cut construction already in place using methods least likely to damage elements to be retained or adjoining construction. Where possible, review proposed procedures with original installer; comply with original installer's recommendations.

1. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. To avoid marring finished surfaces, cut or drill from exposed or finished side into concealed surfaces.
3. Cut through concrete and masonry using cutting machine such as carborundum saw or diamond core drill.
4. Comply with requirements of applicable Sections of Division 2 where cutting and patching requires excavating and backfilling.
5. Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.

D. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of installation.
2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in new space to provide even surface of uniform color and appearance. Remove floor and wall coverings already in place and replace with new materials, if necessary to achieve uniform color and appearance.
4. Where patching occurs in smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received primer and second coat.
5. Patch, repair or rehang ceilings already in place as necessary to provide even plane surface of uniform appearance.
6. Patch holes through roofs, walls, floors and similar items left by removal of equipment, ducts, conduits, piping and similar items.
7. Refinish areas disturbed by new or remodeled construction which are not to receive new finishes.
8. Align and match new work with work already in place except where otherwise dimensioned or detailed.

3.04 CLEANING

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

END OF SECTION

SECTION 01 74 23 - CLEANING

PART 1- GENERAL

1.01 GENERAL

A. Contractors shall keep premises, both private and public, including paved surfaces, walks and lawn areas, free from accumulation of dirt, waste materials or rubbish caused by work of project.

B. Each Contractor and sub-contractor shall be responsible for removing from premises bulk debris, scrap and other refuse created by their work and by their working forces.

C. Each subcontractor requiring higher degree of cleaning than that specified, before applying finish work, shall be responsible for performing that cleaning work.

D Contractor shall walk the perimeter of the site at the end of each day that construction was performed checking and retrieve any materials that may have blown away from the construction area or otherwise missed the dumpster.

E Jobsite area is frequented by homeless individuals using the area for overnight accommodation. Dumpsters shall be securely covered over at the end of each day to prevent access into and potential for removal of materials that may become a makeshift shelter. Contractor shall be responsible for cleaning up materials that were removed from an unsecured dumpster.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. Contractor shall:

1. Remove paint, excess sealant compound, and other soiled spots from metal copings and trims.
3. Remove marks, stains and soiled spots from finished surfaces. Refinish or replace surfaces where necessary.
4. Remove debris, nails and metal scrap from roof areas.
5. Remove construction debris from lawn areas, walks, paving and other exterior areas.

B. Use cleaning materials recommended by manufacturer of material or equipment being cleaned.

3.02 FINAL JOB CONDITION

A. Should any work or punch list work be done after final cleaning, affected areas shall be cleaned again so that upon completion of work, premises shall be left in cleaned.

END OF SECTION

SECTION 01 77 00 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures
2. Project record document submittal
3. Operating and maintenance manual submittal
4. Submittal of warranties
5. Final cleaning

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following and list any exceptions in request.

1. Application for Payment that coincides with, or first follows, date Substantial Completion is claimed, show 100 percent completion for portion of Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and statement showing accounting of changes to Contract Sum.
2. If 100 percent completion cannot be shown, include list of incomplete items, value of incomplete construction, and reasons Work is not complete.
3. Advise Owner of pending insurance change over requirements.
4. Submit project specific warranties, workmanship bonds, maintenance agreements, final certifications, inspections by authorities (building including roofing and accessories, electrical, plumbing, boilers, fire marshal, elevators and similar items) and similar documents.
5. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
6. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
7. Deliver tools, spare parts, extra stock, and similar items.
8. Advise Owner's personnel of change over in security provisions.
9. Complete start up testing of systems, and instruction of Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from site, along with construction tools, mock-ups, and similar elements. Pay particular attention to testing of natural gas burning appliances to ensure that equipment has been fine tuned using exhaust gas analyzers to minimize carbon monoxide production and to ensure proper flue draw.
10. **Provide temporary measures to protect the building air intakes from solvent smell, excess water vapor, excess carbon dioxide and similar substances or concentrations of substances that would otherwise become an irritant to human occupancy. Coordinate with installers of materials that produce objectionable smells, gases or similar irritants to provide thorough and complete ventilation and removal of objectionable concentrations of such substances prior to occupancy. Such materials include, without limitation and to the extent applicable, sealants; carpeting; adhesives; wallcoverings; furnishings; paint; special coatings; moisture from concrete, gypsum board or plaster work; tile or stone setting mortars and grouts; welding operations; waterproofing primers and solvents; leveling grouts; plasticizers within plastics; plywood or other formaldehyde off-gassing materials.**
11. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of request for inspection, Owner's Representative will either proceed with inspection or advise Contractor of unfilled requirements. Owner's Representative will prepare Certificate of Substantial Completion following inspection, or advise Contractor of construction that must be completed or corrected before certificate will be issued.

1. Owner's Representative will repeat inspection when requested.
2. Results of completed inspection will form basis of requirements for final acceptance.

1.03 FINAL ACCEPTANCE

A. Preliminary Procedures (where applicable): Before requesting final inspection for certification of final acceptance and final payment, complete following. List exceptions in request.

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

B. Re-inspection Procedure: Owner's Representative will re-inspect Work upon receipt of notice that Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to Owner's Representative.

1. Upon completion of re-inspection, Owner's Representative will prepare certificate of final acceptance, or advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, re-inspection will be repeated.

1.04 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in secure, fire resistive location; provide access to record documents for Owner's Representative's reference during normal working hours.

B. Record Drawings: Maintain clean, undamaged set of blue or black line white prints of Contract Drawings and Shop Drawings. Mark set to show actual installation where installation varies substantially from Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record cross reference at corresponding location on Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of Work.
2. Mark new information that is important to Owner, but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.
4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set. Provide one set to Owner's Representative for Owner's records and one set to Architect.

C. Record Specifications: Maintain one complete copy of Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with text of Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of Work, submit one copy of record Specifications to Owner's Representative for Owner's records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to site, and from manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit one complete set of record Product Data to Owner's Representative for Owner's records and one complete set to Architect.

E. Record Sample Submittals: Immediately prior to date or dates of Substantial Completion, Contractor will meet at site with Owner's Representative and Owner's personnel to determine which of submitted Samples that have been maintained during progress of Work are to be transmitted to Owner for record purposes. Comply with delivery to Owner's Sample storage area.

F. Miscellaneous Record Submittals: Refer to Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of Work. Immediately prior to date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Owner's Representative for Owner's records.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Maintenance Instructions: Provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include detailed review of following items:
1. Maintenance information for stair system and roof hatch
2. Record documents
3. Cleaning instructions
4. Warranties and bonds

3.02 FINAL CLEANING

A. Contractor shall take all precautions necessary to prevent construction debris, materials etc from blowing off roof and falling to the ground. Contractor shall provide ground level protection where work is ongoing overhead.

B. Contractors shall keep ground level premises used during construction, both private and public, including paved surfaces, walks and planting areas, free from accumulation of dirt, waste materials or rubbish caused by work of this project.

C. Building interiors used for construction worker access shall be broom clean at all times. While Contractor for General Construction shall perform this work, each Contractor and sub-contractor shall be responsible for removing from premises bulk debris, scrap and other refuse created by their work and by their working forces.

1. Each subcontractor requiring higher degree of cleaning than that specified, before applying finish work, shall be responsible for performing that cleaning work.

D. Contractor for General Construction shall:

1. Remove paint, excess glazing compound, excess caulking compound, and other soiled spots from windows, doors and glass, leaving both sides of glass in polished condition.
2. Remove labels that are not permanent labels, marks, stains and soiled spots from finished surfaces. Refinish or replace surfaces where necessary.
3. Remove dust, dirt, fingerprints, paint droppings and other blemishes from aluminum and stainless steel trim and finish hardware, and leave same in polished condition.
4. Sweep, mop and dust clean floors; vacuum carpeting.
5. Remove debris, nails and metal scrap from roof areas.
6. Remove construction debris from lawn areas, walks, paving and other exterior areas.
7. Repair or replace lawn areas, walks, paving and other exterior areas damaged as a result of construction so as to match adjacent surfaces.

E. Each Contractor and subcontractor shall remove dust, dirt, marks, stains, paint droppings and soiled spots from equipment and material installed by them in finished areas, including exposed items such as piping, ductwork, air outlets, hangers and supports, trim, electrical equipment, lighting fixtures, unit ventilators, and similar items.

F. Use cleaning materials recommended by manufacturer of material or equipment being cleaned.

G. Final Job Condition: Should any work or punch list work be done after final cleaning, affected areas shall be cleaned again so that upon completion of work, premises shall be left in cleaned condition ready for occupancy by Owner.

H. Remove temporary protection and facilities installed for protection of work during construction.

3.04 COMPLIANCE

A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from site and dispose of in lawful manner.

B. Where extra materials of value remaining after completion of associated work have become Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

SECTION 02 41 17 – SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Demolition and removal of portions buildings and support structures.
2. Demolition and removal of site improvements adjacent to a building or structure to be demolished.
3. Disconnecting, capping or sealing, and removing site and other utilities

1.02 DEFINITIONS

A. Demolish: Completely remove and legally dispose of off-site.

B. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

C. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner. Include fasteners or brackets needed for reattachment elsewhere.

C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.03 MATERIALS OWNERSHIP

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

B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during building demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1. Coordinate with Owner's historical adviser, who will establish special procedures for removal and salvage.

1.04 SUBMITTALS

A. Proposed Protection Measures: Submit informational report, including drawings, that indicates the measures proposed for protecting individuals and property , for environmental protection, for dust control and , for noise control. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings and Building that Remains: Detail special measures proposed to protect existing building and adjacent buildings to remain.

B. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services.
3. Shutoff and capping or re-routing of utility services.

C. Building Demolition Plans: Drawings indicating the following:

1. Locations of temporary protection and means of egress for adjacent occupied buildings.

D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

E. Pre-demolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by building demolition operations.

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed work similar to that indicated for this project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Predemolition Conference: Conduct conference at Project site to review methods and procedures related to building demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review items to be salvaged and returned to Owner.
8. Review means for managing ground surface water.

1.06 PROJECT CONDITIONS

A. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
   a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

B. Owner assumes no responsibility for actual condition of buildings and structures to be demolished.

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

B. Hazardous Materials: Aside from the hazardous materials indicated in the Available Information section, it is not expected that hazardous materials will be encountered in the work. If materials suspected of containing hazardous materials are encountered, do not

disturb; immediately notify the Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.

B. Review Project Record Documents of existing construction. Owner does not guarantee that existing conditions are the same as those indicated in Project Record Documents.

C. Inventory and record the condition of items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Architect.

E. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with Division 1 Section "Photographic Documentation."

F. Engage a professional engineer to perform an engineering 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 building demolition operations.

G. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

A. Refrigerant: Remove and store refrigerant according to 40 CFR 82 and regulations of authorities having jurisdiction.

B. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
1. Arrange to shut off indicated utilities with utility companies.
2. If utility services are required to be removed, relocated, or abandoned, before proceeding with building demolition provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
3. Cut off pipe or conduit a minimum of 24 inches (610 mm) below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

C. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

D. Removed and Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.03 PROTECTION

A. Existing Facilities: Protect adjacent roof, walkways, loading docks, building entries, and other building facilities during demolition operations.

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

C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
   a. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 1 Section "Temporary Facilities and Controls."

1. Protect existing site improvements, appurtenances, and landscaping to remain.
2. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
3. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
4. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
5. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
6. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise from occupied portions of adjacent buildings.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.04 DEMOLITION, GENERAL

A. General: Demolish indicated existing buildings and structures and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
2. Maintain adequate ventilation when using cutting torches.
3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

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

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.05 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

D. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.

E. Masonry: Cut masonry at junctures with construction indicated to remain, using power-driven saw, then remove masonry between saw cuts.

F. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished at junctures with construction indicated to remain, then break up and remove.

G. Structural Steel: Dismantle field connections without bending or damaging steel members. Do not use flame-cutting torches unless otherwise authorized by authorities having jurisdiction.

H. Equipment: Disconnect equipment at nearest fitting connection to services, complete with service valves. Remove as whole units, complete with controls.

I. Below-Grade Construction: Demolish foundation walls and other below-grade construction.

1. Completely remove below-grade construction, including basements, foundation walls, and footings.

J. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet (1.5 m) outside of footprint indicated for new construction. Abandon utilities outside this area.

1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Division 2.
2. Should active utilities be accidentally uncovered stop work immediately. Do not proceed further until decision has been reached as to how to proceed.

K. Use of explosives is prohibited.

3.06 SITE RESTORATION

A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Division 2.

C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

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.

B. Burning: Do not burn demolished materials.

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

3.08 CLEANING

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

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Wood blocking and nailers.
   2. Plywood backing panels

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
   1. NLGA: National Lumber Grades Authority.
   2. SPIB: The Southern Pine Inspection Bureau.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

   1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
   2. For fire-retardant treatments specified to be High-Temperature (HT) type, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

B. For products receiving a fire/waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

C. Research/Evaluation Reports: For the following, showing compliance with Florida building code:
1. Fire-retardant-treated wood.
2. Wood-preservative-treated wood
3. Power-driven fasteners.
4. Powder-actuated fasteners.
5. Expansion anchors.
6. Metal framing anchors.

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

1.5 QUALITY ASSURANCE

A. Source Limitations for Engineered Wood Products: Obtain each type of engineered wood product through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood). Fire Retardant Treated Wood used in exterior applications must contain code compliant stamp noting compliance with ASTM D2898.

1. Use Exterior Fire-X Lumber and Plywood by Hoover Wood Products, or approved equal for coping blocking and all other exterior locations.

2. Use Interior Pyroguard Lumber and Plywood by Hoover Wood Products, or approved equal for interior blocking, and electrical panel or equipment backing panels.

Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction. Color coated wood products without third party inspection label will not be accepted.

B. 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. Nailers.

B. For items of dimension lumber size, provide Construction or No. 1 grade lumber with 19 percent maximum moisture content of any species.

C. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:

1. Southern yellow pine, No. 1 grade; SPIB.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 FASTENERS

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

B. Nails, Brads, and Staples: ASTM F 1667.

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

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

A. 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.

B. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2. Material: Stainless Steel with bolts and nuts complying with ASTM B 633, Class Fe/Zn 5.

2.5 MISCELLANEOUS MATERIALS

A. Flexible Flashing (to be used as a separator between preservative-treated wood and metal decking, where applicable): Self-adhesive, rubberized-asphalt compound, bonded to a high-density, polyethylene film to produce an overall thickness of not less than 0.025 inch (0.6 mm).

3 EXECUTION

3.1.1.1 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 furring, nailers, blocking and similar supports to comply with requirements for attaching other construction.

B. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

C. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

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

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

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

1. Table 2304.9.1, "Fastening Schedule," Florida Building Code.

F. Use through bolted unless otherwise indicated. Where screws or nails are permitted on the drawings, Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

1. Comply with approved fastener patterns where applicable.

3.1.1.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

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

END OF SECTION

SECTION 07 22 00 - ROOF INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Work shall include, but is not limited to, the following:
   1. Preparation of existing lightweight insulating concrete over concrete roof deck and all flashing substrates.
   2. Insulation
   3. Cover-board
   4. Sealing joints between insulation and dissimilar materials
   5. All related materials and labor required to complete specified roofing necessary to receive specified manufacturer's warranty.

1.02 RELATED SECTIONS

A. Division 010000 – General Requirements
B. Division 011000 – Summary of Work
C. Division 072713 – Modified Bituminous Sheet Vapor Retarders
D. Division 075216 – Styrene-Butadiene-Styrene (SBS) Modified Bitumen Membrane Roofing
E. Division 076200 – Sheet Metal Flashing and Trim

1.03 DEFINITIONS

A. ASTM D 1079-Definitions of Term Relating to Roofing and Waterproofing.
B. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

1.04 REFERENCES

A. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.
B. AMERICAN STANDARD OF TESTING METHODS (ASTM):
   1. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board.
   2. ASTM C 1325 – Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
   3. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):
   1. ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

2. ANSI/SPRI IA-1, Standard Field Test Procedure for Determining the Mechanical Uplift Resistance of Insulation Adhesives over Various Substrates.
3. ANSI/FM 4474- American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.

D. FLORIDA BUILDING CODE (FBC):
1. 2020 Florida Building Code (FBC).

E. NATIONAL ROOFING CONTRACTORS' ASSOCIATION (NRCA).

F. UNDERWRITERS LABORATORY (UL):
1. UL 790 Standard Test Methods for Fire Tests of Roof Coverings.
2. UL 1256 – Fire Test of Roof Deck Constructions.

1.05 ACTION SUBMITTALS

A. Product Data Sheets: Submit manufacturer's product data sheets, installation instructions and/or general requirements for each component.

B. Safety Data Sheets: Submit manufacturer's Safety Data Sheets (SDS) for each component.

C. Sample/Specimen Warranty from the manufacturer and contractor.

D. Shop Drawings: Provide roof plan and applicable roof system detail drawings.

1.06 INFORMATIONAL SUBMITTALS

A. Contractor Certification: Submit written certification from roofing system manufacturer certifying that the applicator is authorized by the manufacturer to install the specified materials and system.

1.07 WARRANTY & CLOSEOUT SUBMITTALS

A. Roof must be thoroughly cleaned prior to turnover and must be approved/accepted by the Owner.

B. A pull test must be witnessed by the Owner. Written results on Contractor's letterhead must be provided to the Owner prior to acceptance of the required manufacturer warranty.

C. Warranty: Provide manufacturer's and contractor's **project specific edge to edge all warranty covering all materials and labor installed as specified in sections 072200, 075216, and 076200** upon substantial completion of the roofing system.

D. The manufacturer shall provide the owner with the manufacturer's no dollar limit (NDL) warranty providing labor and materials for 25 years from the date the warranty is issued at acceptance of the contracted work. During this period, the manufacturer shall pay all cost of repairs to the roof system necessary to correct roof leaks resulting from improper workmanship in the application of the roofing system and substrate components.

E. All warranties and guarantees shall be in written form acceptable to the Owner and shall be made by an authorized representative of the roofing system manufacturer.

F. Any guarantee by the contractor for the workmanship over a set initial period shall be between the Contractor and the Manufacturer and shall NOT affect the Manufacturer's 25-year NDL warranty with the Owner.

G. During the warranty period, the Manufacturer and the Contractor agree that within 24 hours of receipt of notice from the Owner, they will inspect and make immediate emergency repairs to the defects or to leaks in the roofing system. They further agree that, within a reasonable time, they shall restore the affected items to the standard of the original specifications.

H. All emergency work and permanent work done during the warranty period shall be done without cost to the Owner, except in the event is is determined that such leaks were caused by Owner abuse, vandalism, lightning, hurricane, tornado other cause not typically attributed to the installed system.

I. WARRANTY SHALL NOT REQUIRE THE OWNER TO PERFORM ANYTHING EXCEPT ROUTINE MAINTENANCE AS IDENTIFIED IN THE CONTRACTOR PROVIDED ROOFING MANUAL AND SHALL NOT REQUIRE THE OWNER TO TRACK WEATHER CONDITIONS / INCIDENTS NOR MAINTAIN ANY LOGS OF ANY TYPE.

J. Within a period of three (3) to six (6) months after the final completion, an aerial infrared scan of the roof system must be performed by a third-party vendor not affiliated with the roofing contractor and the results transmitted to the owner. The aerial scan and results report shall meet the documentation requirements of the Infraspection Institute for infrared inspection of insulated roofs.

K. Roofing Manual: At closeout, provide a roofing manual that includes one copy of all approved submittals, names and contact information for all roof related contractors who worked on the project, roof inspection, maintenance instructions and a copy of the inspector's final approval and a copy of the warranty. If the selected Manufacturer has a printed Owner's inspection checklist it shall also be included in the manual. This manual shall be separate of any other manuals required by the contract documents and shall be turned over to the Owner.

1.08 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS:
   1. Manufacture shall have 20 years of experience manufacturing roofing materials.
   2. Trained Technical Field Representatives, employed by the manufacturer, independent of sales.
   3. Provide reports in a timely manner of all site visit reports.
   4. Provide specified warranty upon satisfactory project completion.

B. CONTRACTOR QUALIFICATIONS:
   1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
   2. Applicators shall have completed projects of similar scope using same materials as specified herein.

3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roof system through satisfactory project completion.
4. Applicators shall be skilled in the application methods for all materials.
5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to each product data sheet or other published literature for specific requirements.
B. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.
C. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location.
D. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.
E. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.10 SITE CONDITIONS

A. SAFETY:
1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
2. Refer to NRCA CERTA recommendations, local codes and building owner’s requirements for hot work operations.
3. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid-applied, or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
4. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified hot asphalt-applied materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions. .

5. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

B. ENVIRONMENTAL CONDITIONS:

1. Monitor substrate temperature and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.

1.11 PERFORMANCE REQUIREMENTS

A. FIRE CLASSIFICATION:

1. Roof construction performance testing shall be in accordance with UL 1256, FM 4450 or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.
   a. Roof construction meets requirements of UL 1256, or FM Class 1.

B. ROOF SLOPE:

1. Finished roof slope shall be ¼ inch per foot (2 percent) minimum for roof drainage. Finished roof slope may be less where permitted by the Florida Building Code – Existing Building only where achieving ¼ inch slope is not achievable due to low window sills, door exits to roof, and other existing conditions on a case by case basis. Conditions where this apply must be approved by the Owner's Representative and Warranting Entity before proceeding.

C. ENERGY CONSERVATION REQUIREMENTS:

1. Polyisocyanurate Insulation "R" Value: Shall be determined in accordance with ASTM C1289-11a.
2. Thermal Resistance 'R' for the specified roof insulation system shall include the continuous insulation (ci) above the roof deck.
   a. Minimum Value, continuous insulation (ci) above-deck: R=25.

PART 2 **PRODUCTS**

2.01 MANUFACTURER

A. SINGLE SOURCE MANUFACTURER: All roofing materials shall be provided by a single supplier with 20 years or more manufacturing history in the US.
   1. Comply with the Manufacturer's requirements as necessary to provide the specified warranty.
B. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company.
C. ACCEPTABLE MANUFACTURER:

   1. SOPREMA, (Basis of Design) located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.
   2. SIPLAST, located at 1000 Rochelle Blvd., Irving, TX. 75062-3940 Tel: 469-995-2200, Fax 469-995-2205, Toll Free: 800-922-8800, Website www.siplast.com
   3. DERBIGUM AMERICAS, INC., located at: 4800 Blue Parkway.; Kansas City, MO 64130; Tel: 800-727-9872; Tel: 816-921-0221; Website: www.derbigum.us
   4. GARLAND COMPANY, INC., located at: 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com

2.02 ROOFING SYSTEM

A. RIGID INSULATION
   1. POLYISOCYANURATE INSULATION:
      a. SOPREMA SOPRA-ISO: Closed cell polyisocyanurate foam core bonded on each side to a glass fiber-reinforced felt facer.
         i. Thickness: 1.5 inch minimum board thickness. Total thickness of existing lightweight insulating concrete and new polyisocyanurate insulation to meet specified insulation system thermal resistance continuous 'R' value of 25. Notify Architect where existing conditions prevent R25 which may occur at existing low window sills, door threshold, etc.
         ii. Provide two separate layers of insulation minimum with a combined total thickness required to meet the R value. A single layer board is not acceptable.
         iii. Dimensions: 4 x 4 ft boards
         iv. Meets or exceeds ASTM C1289, Type II, Class 1, Grade 2 (20 psi).
         v. Meets or exceeds ASTM-D3273 for resistance to mold growth
      b. SOPREMA SOPRA-ISO Tapered: Closed cell polyisocyanurate foam core bonded on each side to a glass fiber-reinforced felt facer, tapered to provide slope.
         i. Taper: 1/8, 1/4, 1/2 in per foot. Insulation, crickets and saddles provided with taper as required for positive roof slope. Use of

1/8 only permitted where existing conditions makes use of 1/4 slope impossible and approved by the Owner's Representative in advance of install.

ii. Dimensions: 4 x 4 ft boards

iii. Meets or exceeds ASTM C1289, Type II, Class 1, Grade 2 (20 psi).

iv. Use of tapered boards shall be above the minimum R value of the roof system.

B. COVER-BOARD

1. ASPHALTIC ROOF BOARD

a. SOPREMA SOPRABOARD: Mineral fortified, asphaltic roof substrate board with glass fiber facers. For use as roof cover-board and for vertical flashing substrate. ASPHALTIC ROOF BOARD shall be manufactured by the membrane supplier.

i. Thickness: 1/4 in

ii. Dimensions: 4 x 8 ft acceptable for mechanical attachment.

iii. Water absorption: Less than 1 percent per ASTM D994.

iv. Impact resistance: Included in FM Approvals per 4450/4470 for FM Severe Hail (SH) rating.

v. Compressive strength, psi (kPa) measured at 50 percent compression, per ASTM C472:

a) 1/4 in board: 1,320 (9,100)

vi. Puncture resistance, lbf (N) per ASTM E154:

a) 1/4 in board: 100 (445)

C. INSULATION CANT AND TAPERED STRIP

1. CANT STRIP, MODIFIED BITUMEN

a. SOPREMA SOPRACANT MB: Modified bitumen cant strips for use heat-welded SBS modified bitumen.

i. Length: 39.4 in sections.

ii. Cross-section dimensions: 1.25 x 1.25 x 2 in face width. 2.25 x 2.25 x 3.25 in face width. Typical minimum 3.25 face width. Reduce size to 2 inch face only where required for flashing conditions.

D. INSULATION ADHESIVE

1. POLYURETHANE FOAM INSULATION ADHESIVE

a. SOPREMA DUOTACK 365: Two-component, polyurethane foam insulation adhesive, applied in ribbons from cartridges or two-component bulk packaging with pump-driven delivery system.

i. Ribbon size: 1/2 in to 3/4 in wide.

ii. Ribbon spacing: As required to meet specified wind uplift resistance performance.

a) Field of Roof (Zone 1'): 12 in on-centers

b) Field of Roof (Zone 1): 12 in on-centers
c) Perimeter of Roof (Zone 2): 6 in on-centers
d) Corners of Roof (Zone 3): 4 in on-centers

b. SOPREMA DUOTACK SPF HFO: Two-component, polyurethane foam insulation adhesive, applied in ribbons from two-component compressed cylinders.
i. Ribbon size: 2-1/2 to 3-1/2 in wide.
ii. Ribbon spacing: As required to meet specified wind uplift resistance performance.
a) Field of Roof (Zone 1'): 12 in on-centers
a) Field of Roof (Zone 1): 12 in on-centers
b) Perimeter of Roof (Zone 2): 6 in on-centers
c) Corners of Roof (Zone 3): 4 in on-centers

2.03 ACCESSORIES

A. PRIMERS:
1. SOPREMA ELASTOCOL 500 PRIMER: Asphalt cut-back primer. Primer for the preparation of substrates for asphalt applications.
a. Meets or exceeds ASTM D41
b. VOC content: 350 g/L or less.

B. INSULATION SEAL BETWEEN BOARD AND SIMMILAR AND DISSIMILAR MATERIALS
1. Great Stuff low expanding foam or equal installed at perimeter of the building between the exterior walls or vertical offsets in the roof levels and the edge of the insulation board. Installed also at all through roof penetrations, where may flow between inside and outside of building, such as plumbing vents, conduits, etc. INSTALLATION MUST BE INSPECTED BEFORE APPLICATION OF COVER BOARD.

PART 3 **EXECUTION**

3.01 EXAMINATION

A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.
B. Conduct qualitative insulation adhesive adhesion tests, or quantitative bonded pull tests as necessary to ensure satisfactory adhesion is achieved.
C. The contractor shall examine all roofing substrates including, but not limited to: insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.
D. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.
E. During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified

roofing system.

3.02 PREPARATION

A. Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.

B. Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor's acceptance of conditions.

3.03 PRIMER APPLICATION

A. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified roofing materials.

B. Apply primer using brush, roller, or sprayer at the rate published on the product data sheet.

C. Asphalt Primer: Apply primer to dry compatible masonry, metal, wood, and other required substrates before applying asphalt.

D. Self-Adhesive Membrane Primer: Apply self-adhered primer to dry, compatible substrates as required to enhance adhesion of self-adhesive membrane plies. Ensure self-adhered membrane primer is tacky to-the-touch, but not wet. Primer should not transfer to the fingertips when touched.

E. Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the membrane plies. Adjust primer and membrane application methods as necessary to achieve the desired results.

3.04 INSULATION ADHESIVE APPLICATION

A. DUOTACK 365

1. Apply the specified two-component insulation adhesive to adhere Insulation Layers and Cover-board to the deck and insulation substrate(s).
2. Follow insulation adhesive product data sheets and published general requirements for installation requirements.
3. Apply insulation adhesive in uniform ribbons, 1/2 in to 3/4 in wide.
4. Immediately install insulation components into insulation adhesive and apply weight to ensure the materials maintain full contact with all ribbons for complete adhesion. Do not allow insulation adhesive to skin-over before placing the insulation materials into the adhesive.
5. Adhere the insulation system to meet the specified wind uplift resistance performance and specified warranty requirements.
6. Minimum insulation adhesive ribbon spacing:
   a. Field of Roof (Zone 1'): 12 in on-centers.
   b. Field of Roof (Zone 1): 12 in on-centers.
   c. Perimeter of Roof (Zone 2): 6 in on-centers.
   d. Corners of Roof (Zone 3): 4 in on-centers.

B. DUOTACK SPF HFO

1. Apply the specified two-component insulation adhesive to adhere Insulation Layers and Cover-board to the deck and insulation substrate(s).

2. Follow insulation adhesive product data sheets and published general requirements for installation requirements.
3. Apply insulation adhesive in uniform ribbons, 2-1/2 to 3-1/2 in wide.
4. Install insulation components into insulation adhesive and apply weight to ensure the materials maintain full contact with all ribbons for complete adhesion. Do not allow insulation adhesive to skin-over before placing the insulation materials into the adhesive.
5. Adhere the insulation system to meet the specified wind uplift resistance performance and specified warranty requirements.
6. Minimum insulation adhesive ribbon spacing:
    a. Field of Roof (Zone 1'): 12 in on-centers.
    b. Field of Roof (Zone 1): 12 in on-centers.
    c. Perimeter of Roof (Zone 2): 6 in on-centers.
    d. Corners of Roof (Zone 3): 4 in on-centers.

3.05 INSULATION SYSTEM APPLICATION

A. Follow insulation system component product data sheets, published general requirements and, approvals.
B. Install all insulation system components on clean, dry, uniform and, properly prepared substrates.
C. All insulation system boards shall be carefully installed and fitted against adjoining sheets to form tight joints.
D. Insulation system boards that must be cut to fit shall be saw-cut or knife-cut in a straight line, not broken. Chalk lines shall be used to cut insulation components. Uneven or broken edges shall not be accepted. Remove dust and debris that develops during cutting operations.
E. Stagger successive layers of insulation 12 in vertically and laterally to ensure board joints do not coincide with joints from the layers above and below.
F. Crickets, saddles, and tapered edge strips shall be installed before installing Cover-boards.
G. Install tapered insulation, saddles and crickets as required to ensure positive slope for complete roof drainage.
H. Cover-boards shall be installed to fit tight against adjacent boards. When required by the Cover-board manufacturer, a uniform gap shall be provided between Cover-boards using a uniform guide placed between board joints to form a gap between all boards during installation.
I. The finished insulation system surface shall be tight to, and flush with, adjacent substrates to form a satisfactory substrate to install specified roof membrane and flashings.
J. Install specified cants where required for membrane flashing transitions.

3.06 CLEAN-UP

A. Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

END OF SECTION

SECTION 07 27 13

SBS MODIFIED BITUMINOUS SHEET VAPOR RETARDERS

PART 1 GENERAL

1.01 SUMMARY

A. Work shall include, but is not limited to, the following:
   1. Preparation of existing lightweight insulating concrete over concrete roof deck, and all flashing substrates.
   2. SBS-modified bitumen roof vapor retarder.
   3. SBS-modified bitumen membrane flashings
   4. Liquid-applied, reinforced flashings at penetrations.
   5. All related materials and labor required to complete specified roofing necessary to receive specified manufacturer's warranty.

1.02 RELATED SECTIONS

A. Division 011000 – Summary of Work
B. Division 072200 – Roof Insulation
C. Division 075216 – Styrene-Butadiene-Styrene (SBS) Modified Bitumen Membrane Roofing
D. Division 076200 – Sheet Metal Flashing and Trim

1.03 DEFINITIONS

A. ASTM D 1079-Definitions of Term Relating to Roofing and Waterproofing.
B. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

1.04 REFERENCES

A. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.
B. AMERICAN STANDARD OF TESTING METHODS (ASTM):
   1. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
   2. ASTM D 312- Standard Specification for Asphalt Used in Roofing.
   3. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
   4. ASTM D 3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered.
   5. ASTM D 3746 - Standard Test Method for Impact Resistance of Bituminous Roofing System.
   6. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
   7. ASTM D 4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
   8. ASTM D 5147 - Standard Test Methods for Sampling and Testing Modified

Bituminous Sheet Material.

9. ASTM D 5849 - Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement)
10. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
11. ASTM D 7379 - Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive.
12. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):
   1. ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
   2. ANSI/FM 4474- American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.

D. FLORIDA BUILDING CODE (FBC):
   1. 2020 Florida Building Code (FBC).

E. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA).

F. UNDERWRITERS LABORATORY (UL):
   1. UL 790 Standard Test Methods for Fire Tests of Roof Coverings.
   2. UL 1256 – Fire Test of Roof Deck Constructions.

1.05 ACTION SUBMITTALS

A. Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.

B. Safety Data Sheets: Submit manufacturer’s Safety Data Sheets (SDS) for each component.

C. Sample/Specimen Warranty from the manufacturer and contractor.

D. Shop Drawings: Provide roof plan and applicable roof system detail drawings.

1.06 INFORMATIONAL SUBMITTALS

A. Contractor Certification: Submit written certification from roofing system manufacturer certifying that the applicator is authorized by the manufacturer to install the specified materials and system.

1.07 CLOSEOUT SUBMITTALS

A. Warranty: Provide manufacturers and contractor’s warranties upon substantial completion of the roofing system.

1.08 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS:
   1. Manufacturer shall have 20 years of experience manufacturing SBS-modified bitumen roofing materials.

B. CONTRACTOR QUALIFICATIONS:
   1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
   2. Applicators shall have completed projects of similar scope using same materials

as specified herein.

3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roof system through satisfactory project completion.
4. Applicators shall be skilled in the application methods for all materials.
5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
6. Contractor shall maintain a copy of all submittal documents, on-site, available always for reference.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to each product data sheet or other published literature for specific requirements.
B. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.
C. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.
D. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.
E. Carefully store roof membrane materials delivered in rolls on-end with selvage edges up. Store and protect roll storage to prevent damage.
F. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.10 SITE CONDITIONS

A. SAFETY:
1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
2. Heat-welding shall include heating the specified membrane ply using propane roof torches or electric hot-air welding equipment. The contractor shall determine when and where conditions are appropriate to utilize heat-welding equipment. When conditions are determined by the contractor to be unsafe to proceed, equivalent SBS-modified bitumen materials and methods shall be utilized to accommodate requirements and conditions.
3. Refer to NRCA CERTA recommendations, local codes and building owner’s requirements for hot work operations.
4. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid-applied, or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
5. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

B. ENVIRONMENTAL CONDITIONS:
   1. Monitor substrate temperature and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
   2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.

1.11 PERFORMANCE REQUIREMENTS

A. FIRE CLASSIFICATION:
   1. Vapor Retarder/Air Barrier included in system performance testing in accordance with UL 790, ASTM E108, FM 4450 or FM 4470.
      a. Meets requirements of UL Class A or FM Class A.
   2. Vapor Retarder/Air Barrier included in system performance testing in accordance with UL 1256, FM 4450 or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.
      a. Meets requirements of UL 1256, or FM Class 1.

1.12 WARRANTY

A. Vapor Retarder shall be included in the specified roofing Manufacturer's No Dollar Limit (NDL) Warranty. The Vapor Retarder/Air Barrier manufacturer shall provide the owner with the manufacturer's warranty for **25** years from the date the warranty is issued.
B. The contractor shall guarantee the workmanship and shall provide the owner with the contractor's warranty covering workmanship for a period of **5** years from completion date.
C. All warranties and guarantees shall be in written form acceptable to the Owner and shall be made by an authorized representative of the roofing system manufacturer.
D. Any guarantee by the contractor for the workmanship over a set initial period shall be between the Contractor and the Manufacturer and shall NOT affect the the Manufacturer's 25-year NDL warranty with the Owner.
E. During the warranty period, the Manufacturer and the Contractor agree that within 24 hours of receipt of notice from the Owner, they will inspect and make immediate emergency repairs to the defects or to leaks in the roofing system. They further agree that, within a reasonable time, they shall restore the affected items to the standard of the original specifications.
F. All emergency work and permanent work done during the warranty period shall be done without cost to the Owner, except in the event is is determined that such leaks were caused by Owner abuse, vandalism, lightning, hurricane, tornado other cause not typically attributed to the installed system.
G. WARRANTY SHALL NOT REQUIRE THE OWNER TO PERFORM ANYTHING EXCEPT ROUTINE MAINTENANCE AS IDENTIFIED IN THE CONTRACTOR PROVIDED ROOFING MANUAL AND SHALL NOT REQUIRE THE OWNER TO

TRACK WEATHER CONDITIONS / INCIDENTS NOR MAINTAIN ANY LOGS OF ANY TYPE.

PART 2 **PRODUCTS**

2.01 MANUFACTURER

A. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company. A 'Quality Compliance Certificate (QCC) for reporting/confirming the tested values of the SBS-Modified Bitumen Membrane Materials will be supplied upon request.

B. ACCEPTABLE MANUFACTURER: Bidders may select from one of the four listed manufacturers. Vapor Barrier, Roofing, Insulation and Metals shall all be supplied through the one manufacturer selected by the bidder for warranty purposes.

1. SOPREMA, (Basis of Design) located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

2. SIPLAST, located at 1000 Rochelle Blvd., Irving, TX. 75062-3940 Tel: 469-995-2200, Fax 469-995-2205, Toll Free: 800-922-8800, Website www.siplast.com

3. DERBIGUM AMERICAS, INC., located at: 4800 Blue Parkway.; Kansas City, MO 64130; Tel: 800-727-9872; Tel: 816-921-0221; Website: www.derbigum.us

4. GARLAND COMPANY, INC., located at: 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com

2.02 SBS-MODIFIED BITUMEN VAPOR RETARDER

A. VAPOR RETARDER, COLD ADHESIVE APPLIED (direct to LWC – Main Roof Areas where dry insulation will be adhered above the vapor barrier):

1. SOPREMA SOPRALENE 180 SANDED: SBS-modified bitumen membrane sanded on both top and bottom surfaces. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:
   a. Thickness: 118 mils (3.0 mm)
   b. Width: 39.4 in (1 m)
   c. Length: 32.8 ft (10 m)
   d. Roll weight: 84 lb (38.1 kg)
   e. Net mass per unit area, lb/100 sq ft (g/sq m): 78 lb (3808 g)
   f. Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
   g. Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%

h. Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
i. Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
j. Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 65%, XMD 80%
k. Tear Strength @ 73.4°F (23°C), lbf (N): MD 125 lbf (556 N), XMD 85 lbf (378 N)
l. Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
m. Dimensional stability, %: MD/XMD: Less than 0.5%
n. Compound stability, °F (°C): MD/XMD: 240°F (116°C):

B. VAPOR RETARDER, HEAT-WELDED (Main Roof Areas where wet LWIC is being removed and replaced with dry insulation):
1. SOPREMA SOPRALENE 180 SP 3.0: SBS-modified bitumen membrane with a plastic burn-off film on the bottom surface and a sanded top surface. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:
a. Thickness: 118 mils (3.0 mm)
b. Width: 39.4 in (1 m)
c. Length: 32.8 ft (10 m)
d. Roll weight: 83 lb (37.6 kg)
e. Net mass per unit area, lb/100 sq ft (g/sq m): 77 lb (3758 g)
f. Peak load @ 0°F (-18°C), lbf/in (kN/m). MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
g. Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%
h. Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
i. Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
j. Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m):MD 65%, XMD 80%
k. Tear Strength @ 73.4°F (23°C), lbf (N):MD 125 lbf (556 N), XMD 85 lbf (378 N)
l. Low temperature flexibility, °F (°C):MD/XMD: -15°F (-26°C)
m. Dimensional stability, %: MD/XMD: Less than 0.5%
n. Compound stability, °F (°C): MD/XMD: 240°F (116°C)

2.03 ACCESSORIES

A. PRIMERS:
1. SOPREMA ELASTOCOL 500: Asphalt cut-back primer. Primer for the preparation of roof membrane and flashing substrates for asphalt, heat-welded, hot asphalt and SOPREMA COLPLY ADHESIVE, solvent-based, cold adhesive-applied and cement applications.
a. Meets or exceeds ASTM D41
b. VOC content: 350 g/L or less.

2. NOTE: Primer not required for SOPREMA COLPLY EF Adhesive and SOPREMA COLPLY EF Flashing Cement applications.

B. VAPOR RETARDER ADHESIVES:
1. SOPREMA COLPLY EF ADHESIVE: Premium, non-toxic, low odor, solvent-free, polymeric membrane adhesive for use with all SBS-modified bitumen sanded base ply and all Cap Sheet membrane applications.
a. VOC Content: 32 g/L or less VOC Content.
b. Meets or exceeds ASTM D7379

C. FLASHING CEMENT
1. SOPREMA COLPLY EF FLASHING CEMENT: Premium, non-toxic, low-odor, solvent-free, polymeric membrane flashing cement for use with sanded base ply and all sanded Cap Sheet flashing applications.
a. VOC Content: 32 g/L or less VOC Content.

D. GENERAL PURPOSE ROOFING CEMENT AND MASTIC
1. SOPREMA SOPRAMASTIC: SBS Mastic. Fiber-reinforced, roofing cement, packaged in 5-gallon pails. General purpose roofing cement for low-slope roofing used for sealing membrane T-joints and membrane edges along terminations, transitions and at roof penetrations.
a. VOC Content: 190 g/L or less.
b. Meets or exceeds ASTM D4586, Type I, Class II.
2. SOPREMA SOPRAMASTIC: SBS Mastic. Fiber-reinforced, roofing cement, packaged in 10.4 oz caulk tubes. General purpose roofing cement for low-slope roofing used for sealing membrane T-joints and membrane edges along terminations, transitions and at roof penetrations.
a. VOC Content: 190 g/L or less.
b. Meets or exceeds ASTM D4586, Type I, Class II.
3. SOPREMA SBL ROOF CEMENT: Asbestos-free, trowel grade elastomeric utility cement.
a. VOC Content: 226 g/L or less.
b. Meets or exceeds ASTM D4586, Type I, Class II.
4. SOPREMA SBL HP FLASHING CEMENT: Asbestos-free, trowel grade roof flashing cement.
a. VOC Content: 223g/L or less.
b. Meets or exceeds ASTM D4586, Type I, Class II.

E. GENERAL PURPOSE SEALANT
1. SOPREMA SOPRAMASTIC SP1: General purpose, paintable, gun-grade, elastomeric, polyether moisture curing sealant for sealing SBS membrane terminations, Kynar 500 PVDF, horizontal and vertical construction joints.
a. VOC Content: 20 g/L or less.
b. Meets or exceeds ASTM C920, Type S, Grade NS, Class 50.
c. [Standard color].

F. LIQUID-APPLIED REINFORCED FLASHING SYSTEM:
1. SOPREMA ALSAN FLASHING: Single-component, polyurethane-bitumen resin with polyester reinforcing fleece fabric fully embedded into the resin to form roof system flashings.
a. VOC Content: 250 g/L.
b. SOPREMA ALSAN FLASHING: Liquid resin, Meets or exceeds ASTM C836.
c. SOPREMA ALSAN POLYFLEECE: Non-woven polyester reinforcement.

d. Surfacing: SOPREMA ALSAN FLASHING with mineral granules broadcast into wet SOPREMA ALSAN FLASHING to match adjacent SBS-modified bitumen cap sheet.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.
B. The contractor shall examine all roofing substrates including, but not limited to: insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.
C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.
D. During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.

3.02 PREPARATION

A. Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.
B. Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor's acceptance of conditions.

3.03 PRIMER APPLICATION

A. Examine all substrates, and conduct adhesion peel tests as necessary, to ensure satisfactory adhesion is achieved.
B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified materials.
C. Apply primer using brush, roller, or sprayer at the rate published on the product data sheet.
D. Asphalt Primer: Apply primer to dry compatible masonry, metal, wood, and other required substrates before applying asphalt and heat-welded membrane plies. Primer is optional for solvent-based solvent based SBS adhesives and cements, refer to product data sheets.
E. Primer is not required for SOPREMA COLPLY EF Adhesive and SOPREMA COLPLY EF Flashing Cement.
F. Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the membrane plies. Adjust primer and membrane application methods as necessary to achieve the desired results.

3.04 MEMBRANE ADHESIVE APPLICATION

A. The ambient temperature shall be above 50°F (10°C), and the adhesive temperature shall be a minimum of 70°F (21°C) at the point of membrane application.
B. To ensure the adhesive is applied at 70°F (21°C), during cold weather, drums and 5-gallon pails shall be stored in heated areas. Drums and 5-gallon pails exposed to cold temperature on the roof shall be provided with heaters when necessary to ensure the minimum application temperature is maintained.
C. Priming substrates is optional when solvent-based membrane adhesives are used. Primer may be applied to reduce adhesive consumption rates for some absorptive substrates. Primer is not required for COLPLY EF.
D. PARTIALLY ADHERED (RIBBON-APPLIED) ADHESIVE APPLICATION:
   1. SOPREMA COLPLY EF ADHESIVE shall be applied in ½ to ¾ in wide ribbons to the deck surface.
   2. Apply COLPLY EF in uniformly spaced ribbons, 6 in on centers maximum spacing. Spacing shall be reduced to 4 in on centers in roof perimeters and corners where required for wind uplift ratings or manufacturer's warranty.
   3. Ribbons shall be installed to ensure partial attachment where necessary to promote relief of vapor pressure that may occur between the substrate and underside of the ply.
E. Immediately install the SBS vapor retarder ply into the adhesive before the adhesive begins to skin over. Once adhesive skins over, the ply will not adhere.

3.05 FLASHING CEMENT APPLICATION

A. The ambient temperature shall be above 50°F (10°C), and the flashing cement temperature shall be a minimum of 70°F (21°C) at the point of membrane application.
B. To ensure the flashing cement is applied at 70°F (21°C), during cold weather, pails shall be stored in heated areas. Pails exposed to cold temperature on the roof shall be provided with heaters when necessary to ensure the minimum application temperature is maintained
C. Priming substrates is optional when solvent-based membrane adhesives are used. Primer may be applied to reduce adhesive consumption rates for some absorptive substrates.
D. SOPREMA COLPLY FLASHING CEMENT may be applied using ¼ inch notched trowel. Apply 2.0 – 2.5 gallons per square to each surface. Primer may be used to reduce consumption of solvent-based flashing cement.
E. SOPREMA COLPLY EF FLASHING CEMENT may be applied using ¼ inch notched trowel. Apply 2.0 – 2.5 gallons per square to each surface. Priming substrates is not required when using SOPREMA COLPLY EF FLASHING CEMENT.
F. Application rates vary based on substrate porosity and roughness.

3.06 SBS MASTIC AND GENERAL-PURPOSE ROOFING CEMENT APPLICATION

A. Apply SOPREMA SOPRAMASTIC general purpose SBS mastic and roofing cement to seal drain leads, metal flanges, seal along membrane edge at terminations, and where specified and required in detail drawings.
B. Do not use general purpose SBS mastics and roofing cement where flashing cement applications are required. Do not use SBS mastics and roofing cement beneath SBS-modified bitumen membrane and flashing plies.
C. Apply general purpose SBS mastic and elastic roofing cement using caulk gun, or notched trowel at 2.0 – 2.5 gallons per square on each surface. Application rates vary based on substrate porosity and roughness. Tool-in as necessary to seal laps.

3.07 COLD ADHESIVE-APPLIED VAPOR RETARDER APPLICATION

A. Follow material product data sheets and published general requirements for installation instructions.
B. Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application of the membrane adhesive and membrane plies.
C. Unroll membrane onto the roof surface and allow the membrane to relax prior to installing the membrane.
D. Re-roll the membrane for the plies to be rolled into the adhesive while ensuring the specified side and end-laps are maintained.
E. Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
F. Cut rolls to working lengths and widths to conform to roof conditions and lay out to always work to a selvage edge.
G. Ensure all substrates are prepared as necessary, and all substrates are acceptable to receive the specified adhesive and membrane.
H. Install the specified membrane adhesive ahead of the membrane application. Do not allow the adhesive to skin-over before the membrane is applied into the adhesive. The membrane will not adhere where adhesive has skinned over.
I. Where laps are adhered using membrane adhesive, apply sufficient adhesive coverage to ensure 1/8 to 1/4 in bleed-out is present at all laps.
J. Once set in place, ensure specified side-laps and end-laps are maintained.
K. At end-laps, cut a 45-degree dog-ear away from the selvage edge for all T-joints.
L. For low-slope areas where the roof slope falls below 1/4 in per foot, and where otherwise specified, leave all membrane side and end-laps dry to hot-air weld or torch all laps watertight. Embed granules, where present, when heat welding sheets.
M. Use a follow tool, weighted roller or broom the leading edge of the membrane to the substrate, working forward and outward as necessary to remove wrinkles. Avoid walking over the membrane during application.
N. Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight. Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
O. Inspect the installation each day to ensure the plies are adhered. Repair all voids, wrinkles, open laps, and all other deficiencies.

3.08 LIQUID-APPLIED, SINGLE-COMPONENT, BITUMEN-URETHANE FLASHING APPLICATION

A. Refer to manufacturer’s details drawings, product data sheets and published general requirements for application rates and specific installation instructions
B. Pre-cut SOPREMA ALSAN POLYFLEECE polyester reinforcing fleece to conform to roof terminations, transitions and penetrations being flashed. Ensure a minimum 2 in overlap of fleece at side and end-laps. Ensure the completed liquid-applied flashing membrane is fully reinforced.
C. Apply the base coat of SOPREMA ALSAN FLASHING liquid-applied flashing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion at 2.0 gallons per square.
D. Immediately apply the SOPREMA ALSAN POLYFLEECE reinforcing into the wet base coat of resin. Using a brush or roller, work the SOPREMA ALSAN POLYFLEECE into the wet resin while applying the second coat of SOPREMA ALSAN FLASHING resin to

completely encapsulate the fleece at 2.0 gallons per square, and extend the liquid resin 1 inch beyond the fleece.

E. Apply a finish coat of SOPREMA ALSAN FLASHING resin at 2.0 gallons per square within 2-3 hours. When applying the finish coat more than 24 hours, the surface may need to be cleaned using acetone or MEK to ensure satisfactory adhesion.

F. Broadcast SG mineral granules into the wet finish coat as required to match the adjacent cap sheet.

3.09 CLEAN-UP

A. Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

END OF SECTION

SECTION 07 52 16 - MODIFIED BITUMINOUS MEMBRANE ROOFING(SBS)

PART 1 GENERAL

1.01 SUMMARY

A. Work shall include, but is not limited to, the following:
   1. Preparation of existing lightweight insulating concrete over concrete deck, and all flashing substrates.
   2. SBS-modified bitumen base ply(s), heat-welded.
   3. SBS-modified bitumen cap sheet, heat-welded.
      a. [Granule surfacing: Highly reflective, bright white mineral granule surfacing, listed by the Cool Roof Rating Council (CRRC).]
   4. SBS-modified bitumen membrane flashings.
   5. Liquid-applied, reinforced flashings.
   6. Refer to related Sections for Insulation and Coverboard systems.
   7. All related materials and labor required to complete specified roofing necessary to receive specified manufacturer's warranty.

1.02 RELATED SECTIONS

A. Division 010000 – General Requirements
B. Division 011000 – Summary of Work (Project)
C. Division 061000 – Rough Carpentry
D. Division 072200 – Roof Insulation
E. Division 076200 – Sheet Metal Flashing and Trim

1.03 DEFINITIONS

A. ASTM D 1079-Definitions of Term Relating to Roofing and Waterproofing.
B. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

1.04 REFERENCES

A. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.
B. AMERICAN STANDARD OF TESTING METHODS (ASTM):
   1. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
   2. ASTM D 312- Standard Specification for Asphalt Used in Roofing.
   3. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
   4. ASTM D 3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered.

5. ASTM D 3746 - Standard Test Method for Impact Resistance of Bituminous Roofing System.
6. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
7. ASTM D 5147 - Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.
8. ASTM D 5849 - Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement)
9. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
10. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
11. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)::
1. ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge System Used with Low Slope Roofing System.
2. ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
3. ANSI/SPRI IA-1, Standard Field Test Procedure for Determining the Mechanical Uplift Resistance of Insulation Adhesives over Various Substrates.
4. ANSI/FM 4474- American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.

B. COOL ROOF RATING COUNCIL (CRRC)

C. FLORIDA BUILDING CODE (FBC):
1. 2020 Florida Building Code (FBC).

D. NATIONAL ROOFING CONTRACTORS' ASSOCIATION (NRCA).
1. UL 790 Standard Test Methods for Fire Tests of Roof Coverings.
2. UL 1256 – Fire Test of Roof Deck Constructions.

1.05 ACTION SUBMITTALS

A. Product Data Sheets: Submit manufacturer's product data sheets, installation instructions and/or general requirements for each component.

B. Safety Data Sheets: Submit manufacturer's Safety Data Sheets (SDS) for each component.

C. Sample warranty from the manufacturer and contractor.

D. Provide roof plan and representative detail drawings.

1.06 INFORMATIONAL SUBMITTALS

A. Submit a letter from the roofing manufacturer indicating the contractor is an authorized applicator.

1.07 CLOSEOUT SUBMITTALS

A. Cleaning: Roof must be thoroughly cleaned prior to turnover and must be approved/accepted by the Owner.

B. Uplift Test: A pull test must be witnessed by the Owner. Written results on Contractor's letterhead must be provided to the Owner prior to acceptance of the required manufacturer warranty.

C. Warranty: Provide manufacturer's project specific edge to edge all warranty covering all materials and labor installed as specified in sections 072200, 075216, and 076200 upon substantial completion of the roofing system. Warranty shall be as follow under the warranty section in this specification.

D. Owner Responsibility: Warranty shall not require the owner to perform anything except routine maintenance as identified in the contractor provided roofing manual and shall not require the owner to track weather conditions / incidents nor maintain any logs of any type.

E. Special Requirement: Within a period of three (3) to six (6) months after the final completion, an aerial infrared scan of the roof system must be performed by a third-party vendor not affiliated with the roofing contractor and the results transmitted to the owner. The aerial scan and results report shall meet the documentation requirements of the Infraspection Institute for infrared inspection of insulated roofs.

F. Roofing Manual: At closeout, provide a roofing manual that includes one copy of all approved submittals, names and contact information for all roof related contractors who worked on the project, roof inspection, maintenance instructions and a copy of the inspector's final approval and a copy of the warranty. If the selected Manufacturer has a printed Owner's inspection checklist it shall also be included in the manual. This manual shall be separate of any other manuals required by the contract documents and shall be turned over to the Owner .

1.08 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS:
1. Manufacturer shall have 20 years of manufacturing experience.
2. Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.
3. Manufacturer shall provide site visit reports in a timely manner.

B. CONTRACTOR QUALIFICATIONS:
1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
2. Applicators shall have completed projects of similar scope using same or similar materials specified.
3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roofing from beginning through satisfactory project completion.
4. Applicators shall be skilled in the application methods for all materials.
5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.

6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to each product data sheet or other published literature for specific requirements.
B. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.
C. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.
D. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.
E. Carefully store roof membrane materials delivered in rolls on-end with selvage edges up. Store and protect roll storage to prevent damage.
F. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.10 SITE CONDITIONS

A. SAFETY:
1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
2. Where open flames are used, Contractor shall provide adequate fire fighting equipment and have personnel assigned to fire watch.
3. Heat-welding shall include heating the specified membrane ply using propane roof torches or electric hot-air welding equipment. The contractor shall determine when and where conditions are appropriate to utilize heat-welding equipment. When conditions are determined by the contractor to be unsafe to proceed, equivalent SBS-modified bitumen materials and methods shall be utilized to accommodate requirements and conditions.
4. Refer to NRCA CERTA recommendations, local codes and building owner’s requirements for hot work operations.
5. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid-applied, or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.

6. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified hot asphalt-applied materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
7. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

B. ENVIRONMENTAL CONDITIONS:

1. Monitor substrate temperature and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.
3. Heat-Welding Application: Take all necessary precautions and measures to monitor conditions to ensure all environmental conditions are safe to use roof torches and hot-air welding equipment. Combustibles, flammable liquids and solvent vapors that represent a hazard shall be eliminated. Flammable primers and cleaners shall be fully dry before proceeding with heat-welding operations. Prevent or protect wood, paper, plastics and other such combustible materials from direct exposure to open flames from roof torches. Refer to NRCA CERTA recommendations.

1.11 PERFORMANCE REQUIREMENTS

A. WIND UPLIFT RESISTANCE:

3. Performance testing shall be in accordance with ANSI/FM 4474, FM 4450, FM 4470, UL 580, or UL 1897.
   a. Roof System Design Pressures: Calculated in accordance with ASCE 7, or applicable standard, as per the Roof Plan drawings.

B. FIRE CLASSIFICATION:

1. Performance testing shall be in accordance with UL 790, ASTM E108, FM 4450 or FM 4470 to meet the ½:12 roof slope requirement.
   a. Meets requirements of UL Class A or FM Class A.

2. Performance testing shall be in accordance with UL 1256, FM 4450 or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.
   a. Meets requirements of UL 1256, or FM Class 1.

C. ROOF SLOPE:
1. Finished roof slope for SBS modified bitumen surfaces shall be ¼ inch per foot (2 percent) minimum for roof drainage where possible. Finished roof slope may be less where permitted by the Florida Building Code – Existing Building only where achieving ¼ inch slope is not achievable due to low window sills, door exits to roof, and other existing conditions on a case by case basis. Conditions where this apply must be approved by the Owner's Representative and Warranting Entity before proceeding.

D. IMPACT RESISTANCE:
1. Performance testing for impact resistance shall be in accordance with FM 4450, FM 4470, ASTM D3746 or CGSB 37-GP 56M to meet the specified impact resistance requirements.
   a. Meets requirements for FM-SH (Severe Hail), ASTM D3746, or CGSB 37-GP 56M.
2. Performance testing for Large Missile Impact Resistance shall be in accordance with SSTD 12-99.
   a. Meets requirements for State of Florida Public Shelter Design Criteria for Enhanced Hurricane Protection Areas.

E. CYCLIC FATIGUE:
1. The roof system shall pass ASTM D5849 Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement). Passing results shall show no signs of cracking, splitting or tearing over the joint.
   a. Roof system shall pass Test Condition 5, tested at -4°F (-20°C) in accordance with ASTM D5849. (SOPREMA SOPRALENE polyester reinforced membranes)

F. COOL ROOF RATING COUNCIL (CRRC):
1. The cap sheet shall be granule-surfaced. **SG bright white granule-surfaced cap sheet is basis of design**. Cap sheet shall be listed by the Cool Roof Rating Council (CRRC) with the following minimum published values, including CRRC 3-year Rapid Ratings:

a.	Solar Reflectance:	Initial: 0.7	3-year: 0.62
b.	Thermal Emittance:	Initial: 0.9	3-year: 0.9
c.	Solar Reflectance Index (SRI):	Initial: 86	3-year: 75

1.12 WARRANTY

A. Warranty: Provide manufacturer's and contractor's **project specific edge to edge all warranty covering all materials and labor installed as specified in sections 072200, 072713, 075216, and 076200** upon substantial completion of the roofing system.

B. The manufacturer shall provide the owner with the manufacturer's no dollar limit (NDL) warranty providing labor and materials for 25 years from the date the warranty is issued at acceptance of the contracted work. During this period, the manufacturer shall pay all cost of repairs to the roof system necessary to correct roof leaks resulting from improper workmanship in the application of the roofing system and substrate components.

C. The contractor shall guarantee the workmanship and shall provide the owner with the contractor's warranty covering workmanship for a period of **5** years from completion date.

D. All warranties and guarantees shall be in written form acceptable to the Owner and shall be made by an authorized representative of the roofing system manufacturer.

E. Any guarantee by the contractor for the workmanship over a set initial period shall be between the Contractor and the Manufacturer and shall NOT affect the the Manufacturer's 25-year NDL warranty with the Owner.

F. During the warranty period, the Manufacturer and the Contractor agree that within 24 hours of receipt of notice from the Owner, they will inspect and make immediate emergency repairs to the defects or to leaks in the roofing system. They further agree that, within a reasonable time, they shall restore the affected items to the standard of the original specifications.

G. All emergency work and permanent work done during the warranty period shall be done without cost to the Owner, except in the event is is determined that such leaks were caused by Owner abuse, vandalism, lightning, hurricane, tornado other cause not typically attributed to the installed system.

H. WARRANTY SHALL NOT REQUIRE THE OWNER TO PERFORM ANYTHING EXCEPT ROUTINE MAINTENANCE AS IDENTIFIED IN THE CONTRACTOR PROVIDED ROOFING MANUAL AND SHALL NOT REQUIRE THE OWNER TO TRACK WEATHER CONDITIONS / INCIDENTS NOR MAINTAIN ANY LOGS OF ANY TYPE.

I. Within a period of three (3) to six (6) months after the final completion, an aerial infrared scan of the roof system must be performed by a third-party vendor not affiliated with the roofing contractor and the results transmitted to the owner. The aerial scan and results report shall meet the documentation requirements of the Infraspection Institute for infrared inspection of insulated roofs.

J. Roofing Manual: At closeout, provide a roofing manual that includes one copy of all approved submittals, names and contact information for all roof related contractors who worked on the project, roof inspection, maintenance instructions and a copy of the inspector's final approval and a copy of the warranty. If the selected Manufacturer has a printed Owner's inspection checklist it shall also be included in the manual. This manual shall be separate of any other manuals required by the contract documents and shall be turned over to the Owner .

PART 2 PRODUCTS

2.01 MANUFACTURER

A. SINGLE SOURCE MANUFACTURER: All SBS modified bitumen membrane and flashing sheets shall be manufactured by a single supplier with 20 years or more manufacturing history in the US.

1. Comply with the Manufacturer's requirements as necessary to provide the specified warranty.

B. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company. A 'Quality Compliance Certificate (QCC) for reporting/confirming the tested values of the SBS-Modified Bitumen Membrane Materials will be supplied upon request.

C. ACCEPTABLE MANUFACTURER: Bidders may select from one of the four listed manufacturers. Vapor Barrier, Roofing, Insulation and Metals shall all be supplied through the one manufacturer selected by the bidder for warranty purposes.

1. SOPREMA, (BASIS OF DESIGN), located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

2. SIPLAST, located at 1000 Rochelle Blvd., Irving, TX. 75062-3940 Tel: 469-995-2200, Fax 469-995-2205, Toll Free: 800-922-8800, Website www.siplast.com

3. DERBIGUM AMERICAS, INC., located at: 4800 Blue Parkway.; Kansas City, MO 64130; Tel: 800-727-9872; Tel: 816-921-0221; Website: www.derbigum.us

4. GARLAND COMPANY, INC., located at: 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com

2.02 ROOFING SYSTEM

A. ROOFING SYSTEM BASIS OF DESIGN: SOPREMA

1. The roof membrane assembly shall consist of a multi-ply, prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, secured to a prepared substrate. Reinforcement mats shall be impregnated (saturated) and coated with a high quality SBS modified bitumen blend. The cross section of the sheet material shall contain no oxidized or non-SBS modified bitumen.

1.02 SBS-MODIFIED BITUMEN MEMBRANES

A. BASE SHEET:

1. BASE PLY, HEAT-WELDED:

a. SOPREMA SOPRALENE FLAM 180: SBS-modified bitumen membrane with plastic burn-off film on top and bottom surfaces. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:
   i Thickness: 118 mils (3.0 mm)
   ii Width: 39.4 in (1 m)
   iii Length: 32.8 ft (10 m)
   iv Roll weight: 81 lb (36.7 kg)
   v Net mass per unit area, lb/100 sq ft (g/sq m): 75 lb (3662 g)
   vi Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
   vii Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%
   viii Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
   ix Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
   x Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 65%, XMD 80%
   xi Tear Strength @ 73.4°F (23°C), lbf (N): MD 125 lbf (556 N), XMD 85 lbf (378 N)
   xii Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
   xiii Dimensional stability, %: MD/XMD: Less than 0.5%
   xiv Compound stability, °F (°C): MD/XMD: 240°F (116°C)

2. INTER PLY, HEAT-WELDED:
   a. SOPREMA SOPRALENE FLAM 180: SBS-modified bitumen membrane with plastic burn-off film on top and bottom surfaces. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:
      i Thickness: 118 mils (3.0 mm)
      ii Width: 39.4 in (1 m)
      iii Length: 32.8 ft (10 m)
      iv Roll weight: 81 lb (36.7 kg)
      v Net mass per unit area, lb/100 sq ft (g/sq m): 75 lb (3662 g)
      vi Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
      vii Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%
      viii Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
      ix Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
      x Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 65%, XMD 80%
      xi Tear Strength @ 73.4°F (23°C), lbf (N): MD 125 lbf (556 N), XMD 85 lbf (378 N)
      xii Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
      xiii Dimensional stability, %: MD/XMD: Less than 0.5%

xiv Compound stability, °F (°C): MD/XMD: 240°F (116°C)

B. FLASHING BASE PLY

1. FLASHING BASE PLY, HEAT-WELDED:
   a. SOPREMA SOPRALENE FLAM 180: SBS-modified bitumen membrane with plastic burn-off film on top and bottom surfaces. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:
      i Thickness: 118 mils (3.0 mm)
      ii Width: 39.4 in (1 m)
      iii Length: 32.8 ft (10 m)
      iv Roll weight: 81 lb (36.7 kg)
      v Net mass per unit area, lb/100 sq ft (g/sq m): 75 lb (3662 g)
      vi Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
      vii Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%
      viii Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
      ix Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
      x Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 65%, XMD 80%
      xi Tear Strength @ 73.4°F (23°C), lbf (N): MD 125 lbf (556 N), XMD 85 lbf (378 N)
      xii Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
      xiii Dimensional stability, %: MD/XMD: Less than 0.5%
      xiv Compound stability, °F (°C): MD/XMD: 240°F (116°C)

C. CAP SHEET:

1. CAP SHEET, HEAT-WELDED:
   a. SOPREMA SOPRALENE FLAM 180 FR GR SG: SBS-modified bitumen membrane Cap Sheet with a burn-off film bottom surface and mineral granule top surface. Non-woven polyester reinforced. UL Class A for specified roof slope requirements. Meets or exceeds ASTM D6164, Type I, Grade G, per ASTM D5147 test methods:
      i Thickness: 157 mils (4.0 mm)
      ii Width: 39.4 in (1 m)
      iii Length: 32.8 ft (10 m)
      iv Roll weight: 118 lb (53.5 kg)
      v Net mass per unit area, lb/100 sq ft (g/sq m): 110 lb (5371 g)
      vi Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
      vii Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%
      viii Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)

ix Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
x Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 65%, XMD 80%
xi Tear Strength @ 73.4°F (23°C), lbf (N): MD 125 lbf (556 N), XMD 85 lbf (378 N)
xii Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
xiii Dimensional stability, %: MD/XMD: Less than 0.5%
xiv Compound stability, °F (°C): MD/XMD: 240°F (116°C)
xv Granule Surfacing:
a) White mineral granules.
b) SOPREMA SG GRANULE: Highly reflective, bright white mineral granule surfacing, listed by the Cool Roof Rating Council (CRRC).

D. FLASHING CAP SHEET

1. FLASHING CAP SHEET, HEAT-WELDED:
a. SOPREMA SOPRALENE FLAM 180 FR GR: SBS-modified bitumen membrane Cap Sheet with a burn-off film bottom surface and mineral granule top surface. Non-woven polyester reinforced. UL Class A for specified roof slope requirements. Meets or exceeds ASTM D6164, Type I, Grade G
i Thickness: 157 mils (4.0 mm)
ii Width: 39.4 in (1 m)
iii Length: 32.8 ft (10 m)
iv Roll weight: 118 lb (53.5 kg)
v Net mass per unit area, lb/100 sq ft (g/sq m): 110 lb (5371 g)
vi Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
vii Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 35%, XMD 40%
viii Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
ix Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 55%, XMD 60%
x Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 65%, XMD 80%
xi Tear Strength @ 73.4°F (23°C), lbf (N): MD 125 lbf (556 N), XMD 85 lbf (378 N)
xii Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
xiii Dimensional stability, %: MD/XMD: Less than 0.5%
xiv Compound stability, °F (°C): MD/XMD: 240°F (116°C)
xv Granule Surfacing:
a) White mineral granules.
b) SOPREMA SG GRANULE: Highly reflective, bright white mineral granule surfacing, listed by the Cool Roof Rating Council (CRRC).

1.03 ACCESSORIES

A. PRIMERS:
   1. SOPREMA ELASTOCOL 500 Primer: Asphalt cut-back primer. Primer for the preparation of membrane substrates for asphalt, heat-welded, hot asphalt and COLPLY ADHESIVE, solvent-based, cold adhesive-applied and cement applications.
      a. Meets or exceeds ASTM D41
      b. VOC content: 350 g/L or less.

B. GENERAL PURPOSE ROOFING CEMENT AND MASTIC:
   1. SOPREMA SOPRAMASTIC: SBS Mastic. Fiber-reinforced, roofing cement, packaged in 5-gallon pails. General purpose roofing cement for low-slope roofing used for sealing membrane T-joints and membrane edges along terminations, transitions and at roof penetrations.
      a. VOC Content: 190 g/L or less.
      b. Meets or exceeds ASTM D4586, Type I, Class II.
   2. SOPREMA SOPRAMASTIC: SBS Mastic. Fiber-reinforced, roofing cement, packaged in 10.4 oz caulk tubes. General purpose roofing cement for low-slope roofing used for sealing membrane T-joints and membrane edges along terminations, transitions and at roof penetrations.
      a. VOC Content: 190 g/L or less.
      b. Meets or exceeds ASTM D4586, Type I, Class II.
   3. SOPREMA SBL ROOF CEMENT: Asbestos-free, trowel grade elastomeric utility cement.
      a. VOC Content: 226 g/L or less.
      b. Meets or exceeds ASTM D4586, Type I, Class II.
   4. SOPREMA SBL HP FLASHING CEMENT: Asbestos-free, trowel grade roof flashing cement.
      a. VOC Content: 223g/L or less.
      b. Meets or exceeds ASTM D4586, Type I, Class II.

C. GENERAL PURPOSE SEALANT

   1. SOPREMA SOPRAMASTIC SP1: General purpose, paintable, gun-grade, elastomeric, polyether moisture curing sealant for sealing SBS membrane terminations, Kynar 500 PVDF, horizontal and vertical construction joints.
      a. VOC Content: 20 g/L or less.
      b. Meets or exceeds ASTM C920, Type S, Grade NS, Class 50.
      c. Standard color, custom color.
   2. SOPREMA SOPRAMASTIC ALU: Modified bitumen mastic, aluminum hued for application to membrane edge and perimeter metal.
      a. VOC Content: 270 g/L or less.
      b. Standard color.

D. LIQUID-APPLIED REINFORCED FLASHING SYSTEM:
   1. SOPREMA ALSAN FLASHING: Single-component, polyurethane-bitumen resin with polyester reinforcing fleece fabric fully embedded into the resin to form roof system flashings.
      a. VOC Content: 250 g/L.
      b. SOPREMA ALSAN FLASHING: Liquid resin, Meets or exceeds ASTM C836.

c. SOPREMA ALSAN POLYFLEECE: Non-woven polyester reinforcement.
d. Surfacing: SOPREMA ALSAN FLASHING with mineral granules broadcast into wet SOPREMA ALSAN FLASHING to match adjacent SBS-modified bitumen cap sheet.

E. MINERAL GRANULES:
1. SOPREMA Granules: No. 11, mineral coated colored granules, color to match cap sheet, supplied by membrane cap sheet manufacturer.
a. SOPREMA SG GRANULES

F. EXPANSION JOINT:
1. SOPREMA SOPRAJOINT: Low-profile, polyester knit-reinforced, SBS-modified bitumen expansion joint membrane. Top surface consists of an aluminum-clad bond-breaker, with plastic burn-off film on the bottom surface for torch or hot air welding.
a. Thickness: 160 mils (4.0 mm)
b. Width: 18 in (457 mm)
c. Roll Length: 32.8 ft (10 m)
d. Expansion joint, maximum unsupported span: 2 in (51 mm)
e. Expansion joint, maximum displacement: 5/8 in (16 mm)

G. WALKWAY PROTECTION:
1. SOPREMA SOPRAWALK: Polyester reinforced SBS modified bitumen walkway protection with a granule surface and sanded underside.
a. Thickness: 200 mils (5.0 mm)
b. Width: 39.4 in (1 m)
c. Roll Length: 26 ft (7.9 m)
d. Granule Surfacing:
i Color: [Black] or [Grey]

PART 2 EXECUTION

2.01 EXAMINATION
A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.
B. The contractor shall examine all roofing substrates including, but not limited to insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.
C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.
D. During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.

2.02 PREPARATION
A. Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.
B. Where conditions are found to be unsatisfactory, work shall not begin until conditions are

made satisfactory to begin work. Commencing of work shall indicate contractor's acceptance of conditions.

2.03 PRIMER APPLICATION

A. Examine all substrates, and conduct adhesion peel tests as necessary, to ensure satisfactory adhesion is achieved.

B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified roofing materials.

C. Apply primer using brush, roller, or sprayer at the rate published on the product data sheet. Lightly prime for uniform coverage, do not apply heavy or thick coats of primer.

D. Asphalt Primer: Apply SOPREMA ELASTOCOL 500 primer to dry compatible masonry, metal, wood and other required substrates before applying asphalt and heat-welded membrane plies. Primer is optional for solvent based solvent based SBS adhesives and cements. Refer to product data sheets.

E. Primer is not required for SOPREMA COLPLY EF ADHESIVE and SOPREMA COLPLY EF FLASHING CEMENT.

F. Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the membrane plies. Adjust primer and membrane application methods as necessary to achieve the desired results.

2.04 HEAT WELDING

A. The Contractor is responsible for project safety. Where conditions are deemed unsafe to use open flames, manufacturer's alternate membrane application methods shall be used to install SBS modified bitumen membrane and flashings. Acceptable alternate installation methods include hot asphalt, cold adhesive-applied, self-adhered membranes and mechanically fastened plies. Hot-air welding equipment may be used in lieu of roof torches to seal membrane side and end laps where heat welding the laps is necessary. Refer to NRCA CERTA, local codes and building owner's requirements for hot work operations.

B. Single or multi-nozzle, hand-held propane roof torches shall be used to install heat-welded membrane and flashing plies. Multi-nozzle carts (dragon wagons) may also be utilized to install membrane plies. Seven (7) nozzle carts are recommended for more uniform heat application in lieu of five (5) nozzle carts.

2.05 SBS MASTIC AND GENERAL-PURPOSE ROOFING CEMENT APPLICATION

A. Apply SOPREMA SOPRAMASTIC general purpose SBS mastic and roofing cement to seal drain leads, metal flanges, seal along membrane edge at terminations, and where specified and required in detail drawings.

B. Do not use general purpose SBS mastics and roofing cement where flashing cement applications are required. Do not use SBS mastics and roofing cement beneath SBS-modified bitumen membrane and fl ashing plies.

C. Apply general purpose SBS mastic and elastic roofing cement using caulk gun, or notched trowel at 2.0 – 2.5 gallons per square on each surface. Application rates vary based on substrate porosity and roughness. Tool-in as necessary to seal laps.

D. Embed matching granules into wet cement where exposed.

2.06 HEAT-WELDED, FULLY ADHERED MEMBRANE APPLICATION

A. Follow material product data sheets and published general requirements for installation instructions.

B. Ensure environmental conditions are safe and satisfactory, and will remain safe and

satisfactory, during the application of the heat-welded membrane and flashings.

C. Ensure all primers are fully dry before beginning heat-welding operations.

D. Unroll membrane onto the roof surface and allow time to relax prior to heat welding.

E. Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.

F. Ensure all roofing and flashing substrates are prepared and acceptable to receive the heat-welded membrane.

G. Cut membrane to working lengths and widths to conform to rooftop conditions and lay out to always work to a selvage edge.

H. Ensure specified side-laps and end-laps are maintained. End-laps should be staggered 3 ft apart.

I. Direct roof torch on the roll as necessary to prevent overheating and damaging the membrane and substrates.

J. As the membrane is unrolled, apply heat to the underside of the membrane until the plastic burn-off film melts away. Continuously move the torch side-to-side across the underside of the roll to melt the bitumen on the underside of the sheet, while continuously unrolling membrane.

K. While unrolling and heating the sheet, ensure approximately ¼ to 1/2 in of hot bitumen flows ahead of the roll as it is unrolled, and there is 1/8 to 1/4 in bleed out at all laps.

L. Adjust the application of heat to the underside of the membrane and to substrate as required for varying substrates and environmental conditions.

M. At the 6 in end-laps, melt the plastic burn-off film from the top surface or embed granules and remove surfacing, where present, using a torch or hot-air welder.

N. At end-laps where T-Joints exist, cut a 45-degree dog-ear away from the selvage edge, or otherwise ensure the membrane is fully heat-welded watertight at all T-joints.

O. Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight. Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.

P. Inspect the installation each day to ensure the plies are fully adhered. Repair all voids, wrinkles, open laps, and all other deficiencies.

Q. Offset cap sheet side and end-laps away from the base ply laps so that cap sheet laps are not located within 18 in of base ply laps.

2.07 FLASHING APPLICATION, HEAT WELDED

A. Refer to SBS manufacturer's membrane application instructions, flashing detail drawings, and follow product data sheets and other published requirements for installation instructions. Refer to manufacturer's membrane flashing detail drawings.

B. The contractor is responsible for project safety. Refer to NRCA CERTA recommendations and building owner requirements for hot work operations.

C. Where required to seal substrates for fire safety, install specified adhered, self-adhered or fastened backer ply to the substrate. Ensure backer-ply covers and seals all substrates requiring protection from exposure to torch operations.

D. Ensure all flashing substrates that require primer are primed, and the primer is fully dry.

E. Unroll the flashing base ply and flashing cap sheet onto the roof surface to their complete length. Once relaxed, cut the membrane to the required working lengths to accommodate the flashing height, cants, and the required over-lap onto the horizontal roof surface.

F. Cut the flashing membrane from the end of the roll to always install flashings to the side-lap line or selvage edge line.

G. Lay out the flashing base ply and flashing Cap Sheet to offset all side-laps a minimum of 12 inches so that side-laps are never aligned on top of the ply beneath. Shingle the

flashing ply laps to prevent back-water laps.

H. Install non-combustible cant strips at transitions where required.

I. Ensure correct membrane and flashing sequencing to achieve redundant, multi-ply, watertight flashings.

J. ROOF MEMBRANE BASE PLY:
   1. Before installing flashings, install the roof membrane base ply in the horizontal field of the roof, and extend the base ply up to the top of the cant, where present, at roof terminations, transitions, and penetrations.

K. FLASHING BASE PLY:
   1. Install the flashing base ply starting at the top leading edge of the vertical flashing substrate, down over the cant and onto the horizontal surface of the roof a minimum of 3 inches beyond the of base of the cant onto the roof. Cut the base ply at corners to form 3-inch side-laps. Install gussets to seal corner transitions.
   2. Install one or more flashing base ply(s) at all roof terminations, transitions, and penetrations.

L. ROOF MEMBRANE CAP SHEET:
   1. Install the roof membrane Cap Sheet in the horizontal field of the roof over the flashing base ply up to the roof termination, transition, or penetration, and up to the top of cants where present.
   2. Using a chalk line, mark a line on the membrane cap sheet a minimum of 4 inches from the base of the cant onto the roof. Where granules are present, embed the cap sheet granules using a torch and trowel or granule embedder to prepare the surface to receive the flashing cap sheet.

M. FLASHING CAP SHEET:
   1. Install the flashing Cap Sheet starting at the top leading edge on the vertical substrate, over the cant and onto the roof surface 4 inches from the base of the cant onto the roof.
   2. Install the flashing Cap Sheet to ensure a minimum two (2) ply flashing system is present at all roof terminations, transitions, and penetrations.

N. During the membrane and flashing installation, ensure all plies are completely adhered into place, with no bridging, voids, or openings. Ensure bitumen or flashing cement bleed-out is present at all flashing side and end-laps.

O. Use a damp sponge float or damp rag to press-in the heat-welded flashing plies during installation.

P. Where sufficient bitumen bleed-out is not present, and for all self-adhered plies, apply specified gun-grade sealant or mastic to seal the membrane termination along all roof terminations, transitions, and penetrations. These include gravel stop edge metal, pipe penetrations, along the top edge of curb and wall flashing, and all other flashing terminations where necessary to seal flashings watertight.

Q. Fasten the top leading edge of the flashing 8 in on-centers with appropriate 1 in metal cap nails or other specified fasteners and plates. Seal fastener penetrations watertight using specified sealant or mastic.

R. Manufacturer’s liquid-applied, reinforced flashing systems shall be installed where conditions are not favorable to install SBS modified bitumen flashings. Such conditions include irregular shapes penetrating roof surfaces (I-beams), confined areas and low flashing heights. Manufacturer’s liquid-applied, reinforced flashing systems are recommended in lieu of pitch pans and lead pipe flashings.
   1. For SBS modified bitumen flashings that are heat-welded installed, refer to manufacturer’s installation guidelines for SOPREMA ALSAN FLASHING.

2.08 LIQUID-APPLIED, SINGLE-COMPONENT, BITUMEN-URETHANE FLASHING SYSTEM APPLICATION

A. Refer to manufacturer's details drawings, product data sheets and published general requirements for application rates and specific installation instructions
B. Pre-cut SOPREMA ALSAN POLYFLEECE polyester reinforcing fleece to conform to roof terminations, transitions and penetrations being flashed. Ensure a minimum 2 in overlap of fleece at side and end-laps. Ensure the completed liquid-applied flashing membrane is fully reinforced.
C. Apply the base coat of SOPREMA ALSAN FLASHING liquid-applied flashing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion at 2.0 gallons per square.
D. Immediately apply the SOPREMA ALSAN POLYFLEECE reinforcing into the wet base coat of resin. Using a brush or roller, work the SOPREMA ALSAN POLYFLEECE into the wet resin while applying the second coat of SOPREMA ALSAN FLASHING resin to completely encapsulate the fleece at 2.0 gallons per square, and extend the liquid resin 1 inch beyond the fleece.
E. Apply a finish coat of SOPREMA ALSAN FLASHING resin at 2.0 gallons per square within 2-3 hours. When applying the finish coat more than 24 hours, the surface may need to be cleaned using acetone or MEK to ensure satisfactory adhesion.
F. Broadcast mineral granules into the wet finish coat as required to match the adjacent cap sheet.

2.09 WALKWAYS

A. At areas outlined on the drawings, and around the perimeter of all rooftop equipment and at all door and stair landings, install walkway protection.
B. Cut walkway from end of rolls. No piece shall be less than 24 in and no more than 60 in.
C. Remove foil/film or embed granules where present on cap sheet.
D. Provide a 4 in space between sheets for drainage.
E. Locate walkway membranes a minimum of 2 in from side-laps, end-laps and flashing membranes.
F. Fully adhere walkway protection by heat welding or adhering the field with cold adhesive and heat welding a 3 in perimeter.

2.10 CLEAN-UP

A. Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

END OF SECTION

SECTION 07 56 00 - COLD LIQUID APPLIED MEMBRANE ROOFING

PART 1 GENERAL

1.01 SUMMARY

A. The new roofing and waterproofing system shall consist of a cold liquid applied reinforced waterproofing membrane, flashings and finish layers as specified.
B. Work shall include, but is not limited to, the following:
   1. Preparation of existing concrete roof deck, and all flashing substrates.
   2. Liquid applied, reinforced flashings.
   3. Liquid applied, reinforced waterproofing membrane.
   4. Refer to related Sections for [Insulation][Cover Board][and Roof Edge] Systems.
   5. All related materials and labor required to complete specified waterproofing necessary to receive specified manufacturer’s warranty.

1.02 RELATED SECTIONS

A. Division 010000 - General Requirements
B. Division 011000 - Summary of Work

1.03 DEFINITIONS

A. ASTM D 1079- Standard Terminology Relating to Roofing and Waterproofing.
B. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

1.04 REFERENCES

A. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.
B. AMERICAN STANDARD OF TESTING METHODS (ASTM):
   1. ASTM C 836 - Standard Specification for High Solids Content, Cold Liquid applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
   2. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)::
   1. ANSI/SPRI/FM 4435/ES-1 - Wind Design Standard for Edge System Used with Low Slope Roofing System.
   2. ANSI/SPRI FX-1 - Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
   3. ANSI/SPRI IA-1 - Standard Field Test Procedure for Determining the Mechanical Uplift Resistance of Insulation Adhesives over Various Substrates.
   4. ANSI/FM 4474 - American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.
D. FLORIDA BUILDING CODE (FBC):
   1. 2020 Florida Building Code (FBC).

E. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA).
   1. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
   2. UL 1256 – Fire Test of Roof Deck Constructions.

1.05 ACTION SUBMITTALS

A. Product Data Sheets: Submit manufacturer's product data sheets, installation instructions and/or general requirements for each component.
B. Safety Data Sheets: Submit manufacturer's Safety Data Sheets (SDS) for each component.
C. Sample warranty from the manufacturer and contractor.
D. Provide roof plan and representative detail drawings.

1.06 INFORMATIONAL SUBMITTALS

A. Submit a letter from the roofing manufacturer indicating the contractor is an authorized applicator.

1.07 CLOSEOUT SUBMITTALS

A. Warranty: Provide manufacturer's and contractor's project specific edge to edge all warranty covering all materials and labor installed as specified in sections 072200, 072713, 075216, and 076200 upon substantial completion of the roofing system.
B. The manufacturer shall provide the owner with the manufacturer's no dollar limit (NDL) warranty providing labor and materials for 25 years from the date the warranty is issued at acceptance of the contracted work. During this period, the manufacturer shall pay all cost of repairs to the roof system necessary to correct roof leaks resulting from improper workmanship in the application of the roofing system and substrate components.
C. The contractor shall guarantee the workmanship and shall provide the owner with the contractor's warranty covering workmanship for a period of **5** years from completion date.
D. All warranties and guarantees shall be in written form acceptable to the Owner and shall be made by an authorized representative of the roofing system manufacturer.
E. Any guarantee by the contractor for the workmanship over a set initial period shall be between the Contractor and the Manufacturer and shall NOT affect the the Manufacturer's 25-year NDL warranty with the Owner.
F. During the warranty period, the Manufacturer and the Contractor agree that within 24 hours of receipt of notice from the Owner, they will inspect and make immediate emergency repairs to the defects or to leaks in the roofing system. They further agree that, within a reasonable time, they shall restore the affected items to the standard of the original specifications.
G. All emergency work and permanent work done during the warranty period shall be done without cost to the Owner, except in the event is is determined that such leaks were caused by Owner abuse, vandalism, lightning, hurricane, tornado other cause not typically attributed to the installed system.
H. WARRANTY SHALL NOT REQUIRE THE OWNER TO PERFORM ANYTHING EXCEPT ROUTINE MAINTENANCE AS IDENTIFIED IN THE CONTRACTOR PROVIDED ROOFING MANUAL AND SHALL NOT REQUIRE THE OWNER TO

TRACK WEATHER CONDITIONS / INCIDENTS NOR MAINTAIN ANY LOGS OF ANY TYPE.

1.08 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS:
   1. Manufacturer shall have 20 years of manufacturing experience.
   2. Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.
   3. Manufacturer shall provide site visit reports in a timely manner.

B. CONTRACTOR QUALIFICATIONS:
   1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
   2. Applicators shall have completed projects of similar scope using same or similar materials specified.
   3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roofing from beginning through satisfactory project completion.
   4. Applicators shall be skilled in the application methods for all materials.
   5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
   6. Contractor shall maintain a copy of all submittal documents, on-site, available always for reference.

C. SUBSTRATE EVALUATION:
   1. Contractor shall evaluate substrate moisture content and adhesion of waterproofing materials to substrate throughout the work and record with daily inspection reports or other form of reporting acceptable to the owner or his designated representative and waterproofing manufacturer.
      a. Moisture content: Evaluate substrate moisture content to determine acceptability for application of the specified liquid applied waterproofing materials. Moisture testing shall be performed by means suitable to the project application, or by testing substrate relative humidity (RH) in accordance with ASTM F 2170 when needed, required, or if substrate moisture content is in question.
      b. Adhesion: Evaluate soundness and surface preparation of concrete and/or masonry substrates. Prepare representative areas using specified methods complete with applied primer and waterproofing membrane. Test for minimum acceptable tensile bond strength values as required in accordance with ASTM D 4541. Evaluate all areas where concrete appears to differ in appearance or consistency, if multiple areas are involved in the scope of work, evaluate each area with a minimum of (3) tests for every 5,000 ft^2 or as required by project conditions.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to each product data sheet or other published literature for specific requirements.
B. Deliver materials and store them in their unopened, original packaging, bearing

the manufacturer's name, related standards, and any other specification or reference accepted as standard.

C. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.

D. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in (100 mm) or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.

E. Carefully store roof membrane materials delivered in rolls on-end with selvage edges up. Store and protect roll storage to prevent damage.

F. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.10 SITE CONDITIONS

A. SAFETY:

1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
2. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid applied or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
3. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified hot asphalt-applied materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
4. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

B. ENVIRONMENTAL CONDITIONS:

1. Monitor substrate and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation

and maintain dry conditions.

3. Contractor shall implement odor control measures where required during the application of waterproofing materials and adjust methods as necessary to accommodate varying project conditions.

1.11 PERFORMANCE REQUIREMENTS

A. WIND UPLIFT RESISTANCE:
1. Performance testing shall be in accordance with ANSI/FM 4474, FM 4450, FM 4470, UL 580 or UL 1897.
a. Roof System Design Pressures: Calculated in accordance with ASCE 7, or applicable standard, as per the roof plan documents.

1.12 WARRANTY

A. Manufacturer's No Dollar Limit (NDL) Waterproofing Warranty: The manufacturer shall provide the owner with the manufacturer's warranty providing labor and materials for 20 years from the date the warranty is issued.
B. The contractor shall guarantee the workmanship and shall provide the owner with the contractor's warranty covering workmanship for a period of 2 years from completion date.

PART 2 **PRODUCTS**

2.01 MANUFACTURER

A. SINGLE SOURCE MANUFACTURER: All liquid applied PMMA/PMA membrane and accessories shall be manufactured by a single supplier with 20 years or more manufacturing history in the US.
1. Comply with the manufacturer's requirements as necessary to provide the specified warranty.
B. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company. A 'Quality Compliance Certificate (QCC) for reporting/confirming the tested values of the membrane materials will be supplied upon request.
C. ACCEPTABLE MANUFACTURER: Bidders may select from one of the four listed manufacturers. Vapor Barrier, Roofing, Insulation and Metals shall all be supplied through the one manufacturer selected by the bidder for warranty purposes.

1. SOPREMA, (BASIS OF DESIGN), located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

2. SIPLAST, located at 1000 Rochelle Blvd., Irving, TX. 75062-3940 Tel: 469-995-2200, Fax 469-995-2205, Toll Free: 800-922-8800, Website www.siplast.com

3. DERBIGUM AMERICAS, INC., located at: 4800 Blue Parkway.; Kansas City, MO 64130; Tel: 800-727-9872; Tel: 816-921-0221; Website: www.derbigum.us

4. GARLAND COMPANY, INC., located at: 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com

D. LIQUID APPLIED WATERPROOFING SYSTEM

E. FIELD MEMBRANE:
1. POLYMETHACRYLATE MEMBRANE (PMA):
a. SOPREMA ALSAN RS 260 LO FIELD: Low odor, rapid curing, polymethacrylate (PMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing field membranes.
i VOC content: <5 g/L
ii Color: Grey
iii Elongation at 73.4°F (23°C): 55%
iv Peak load at 73.4°F lbf/in: 65
v Tear resistance lbf: 60
vi Shore A hardness, durometer: 84
vii Water absorption at 212°F (100°C): 0.5%
viii Water vapor permeance (perms): 0.2
ix Low temperature flexibility °F (°C): -33 (-36.1)
x Dimensional stability: 0.1%
2. POLYMETHYL METHACRYLATE MEMBRANE (PMMA):
a. SOPREMA ALSAN RS 230 FIELD: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing field membranes.
i VOC content: 26 g/L
ii Color: [Grey]
iii Elongation at 73.4°F (23°C): 55%
iv Peak load at 73.4°F lbf/in: 55
v Tear resistance lbf: 60
vi Shore A hardness, durometer: 87
vii Water absorption at 212°F (100°C): 0.9%
viii Water vapor permeance (perms): 0.3
ix Low temperature flexibility °F (°C): -33 (-36.1)
x Dimensional stability: 0.1%

F. FLASHING MEMBRANE:
1. POLYMETHACRYLATE FLASHING MEMBRANE (PMA):
a. SOPREMA ALSAN RS 260 LO FLASH: Low odor, rapid curing, polymethacrylate (PMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing flashing membranes.
i VOC content: <5 g/L
ii Color:[Grey]
2. POLYMETHYL METHACRYLATE FLASHING MEMBRANE (PMMA):

a. SOPREMA ALSAN RS 230 FLASH: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing flashing membranes.
   i VOC content: 26 g/L
   ii Color: [Grey]
b. SOPREMA ALSAN RS DETAILER: Micro-fiber enhanced, rapid curing, polymethyl methacrylate (PMMA) paste resin used for flashing difficult penetrations where a resin/fleece/resin application is not practical.
   i VOC content: <10 g/L
   ii Color: Pebble Grey

2.02 ACCESSORIES

A. PRIMERS:
1. SOPREMA ALSAN RS 276 PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over wood, concrete and approved waterproofing board substrates.
   a. VOC content: <5 g/L
   b. Color: Clear
2. SOPREMA ALSAN RS 222 PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over asphaltic substrates, wood, concrete, and approved waterproofing board substrates.
   a. VOC content: <5 g/L
   b. Color: Clear
3. SOPREMA ALSAN RS LO PRIMER: Low odor, two-part, epoxy-based primer for concrete and approved substrates.
   a. SOPREMA ALSAN RS LO PRIMER PART A:
      i VOC content: <100 g/L
      ii Color: Ivory
   b. SOPREMA ALSAN RS LO PRIMER PART B:
      i VOC content: <100 g/L
      ii Color: White
4. AQUAFIN VAPORTIGHT COAT SG3 PRIMER: Low odor, two-part, moisture mitigation epoxy-based primer for concrete and approved substrates.
   a. AQUAFIN Vaportight Coat SG3 PART A:
      i VOC content: 0 g/L
      ii Color: Clear
   b. AQUAFIN Vaportight Coat SG3 PART B:
      i VOC content: 0 g/L
      ii Color: Yellowish

B. CATALYST:
1. SOPREMA ALSAN RS CATALYST POWDER: Reactive agent used to cure PMMA/PMA liquid resins.

C. REINFORCING FABRIC:
1. SOPREMA ALSAN RS FLEECE: Woven polyester reinforcement used in PMMA/PMA liquid applied membrane and flashing applications.
   a. Thickness: 25 mils (0.65 mm)
   b. Weights: 110 g/m^2
   c. Width(s): [10.3 in (26 cm)][13.8 in (35 cm)][20.7 in (53 cm)][41.3 in (105 cm)]. Size as required.
   d. Length: 164 ft (50 m)
2. SOPREMA ALSAN RS PRE-CUT FLEECE: Factory pre-cut woven polyester reinforcement used for a variety of penetration flashings in PMMA/PMA liquid applied membrane and flashing applications.
   a. Thickness: 25 mils (0.65 mm)
   b. Weights: 110 g/m^2
   c. Component/Size(s): Small Pipe Flashing ½ - 3 in (13 - 76 mm), Large Pipe Flashing 4 - 8 in (102 – 203 mm), Universal Corner sizes as required.

D. SUBSTRATE PATCHING & REPAIR:
1. POLYMETHYL METHACRYLATE PASTE (PMMA):
   a. SOPREMA ALSAN RS PASTE: Rapid curing, polymethyl methacrylate (PMMA) paste resin used to fill small cracks and voids on non-traffic bearing substrates prior to the application of PMMA/PMA membranes.
      i VOC content: <10 g/L
      ii Color: Pebble Grey
2. POLYMETHACRYLATE MORTAR (PMA):
   a. SOPREMA ALSAN RS 263 LO MORTAR: Rapid curing, polymethacrylate (PMA) liquid resin used for patching, repairs and leveling. Consists of ALSAN RS 223 Powder and ALSAN RS 240 LO liquid resin
      i SOPREMA ALSAN RS 240 LO: Low odor, rapid curing, polymethacrylate (PMA) liquid resin.
         a) VOC content: <5 g/L
         b) Color: Pebble Grey
      ii SOPREMA ALSAN RS 223 POWDER: Filler.

E. CLEANER:
1. SOPREMA ALSAN RS CLEANER: Clear, blended solvent used to clean and prepare plastic and metal surfaces and used to clean existing ALSAN RS surfaces prior to the application of PMMA/PMA liquid applied membrane and flashings.
   a. VOC content: <5 g/L
   b. Color: Clear

PART 3 **EXECUTION**

3.01 EXAMINATION

A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions are satisfactory to begin and remain satisfactory throughout the project.
B. The contractor shall examine all waterproofing substrates including, but not limited to decks, walls, curbs, equipment, fixtures, and wood blocking.
C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing and waterproofing materials.

3.02 PREPARATION

A. Before commencing work each day the contractor shall prepare all substrates to ensure conditions are satisfactory to proceed with the installation of specified materials.
B. Preparation of substrates includes, but is not limited to, the following:
    1. General:
        a. All substrates must be clean, dry, and free from gross irregularities, loose, unsound, or foreign material such as dirt, ice, snow, water, grease, oil, release agents, lacquers, or any other condition that would be detrimental to adhesion of primer and/or resin materials to the substrate. Most surfaces will require mechanical abrasion in the form of scarifying, shot blasting or grinding to achieve a suitable substrate.
        b. Inspect all substrates and correct defects before application of waterproofing materials. Fill all surface voids 1/16 in (1.5 mm) or greater wide and/or deep with appropriate fill material.
    2. Concrete Substrates:
        a. Concrete shall comply with requirements of ACI 301 and ACI 308.
        b. Concrete compressive strength: 3,500 psi for all primers or 2,500 psi minimum when use of a moisture mitigation primer is required.
        c. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
        d. Surface: Scarify, shot blast or grind to ICRI Concrete Surface Profile CSP 3 to CSP 5; CSP 3 being the preferred profile.
        e. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
        f. Areas of spalls, voids, bug holes and other deterioration on vertical or horizontal surfaces shall be repaired as required or recommended.
    3. Masonry Substrates:
        a. Walls shall be structurally sound built of hard kiln dried brick, reinforced concrete block, or waterproof concrete block construction.
        b. Liquid applied membrane must not be applied over soft or scaling brick or block, faulty mortar joints, or walls with broken, damaged, or leaking coping. Areas of spalls, voids, bug holes and other deterioration on vertical surfaces shall be repaired as required or recommended.

c. Walls of ordinary hollow tile, or other materials which in themselves are not waterproofed, should not be accepted as suitable to receive liquid applied membrane unless properly waterproofed to prevent moisture infiltration from above or behind the new liquid applied membrane.
d. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
e. Surface: Scarify, shot blast or grind to ICRI Concrete Surface Profile CSP 2 to CSP 4.
f. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.

4. Metal Substrates:
   a. Clean and prepare metal to near-white metal in accordance with SSPC – SP3 (power tool clean) to a point maximum 1/8 in (3 mm) beyond the termination of liquid applied membrane materials and wipe with solvent cleaner to remove oils, debris, or contaminants.
   b. Stainless Steel Series 300 and 400: Abrade to provide rough, open surface and wipe with solvent cleaner to remove oils, debris, or contaminants.
   c. Galvanized & Zinc-Rich Metals: Galvanized and/or zinc rich metals are coated with either a layer of oil to prevent white rust or is passivated which must be completely removed prior to applying primer or liquid applied waterproofing. This can be confirmed by applying a coat of copper sulfate solution to the prepared and cleaned galvanized/zinc metal. A properly prepared surface will turn black indicating the passivator has been removed. If the surface does not turn black, additional abrasive cleaning will be required.
   d. Adhesion: Examine metal substrates by conducting adhesion testing. Prime with specified metal primer where required to achieve adequate adhesion.
5. Rigid Plastics (PVC & ABS):
   a. Rigid plastics should be lightly abraded and wiped with solvent cleaner. Extend preparation maximum 1/8 in (3 mm) beyond the specified termination of the liquid applied membrane flashing materials.
6. Wood Substrates:
   a. Provide sanded ¾ in (19 mm) minimum thickness APA A-C, Group 1, Exterior or Exposure 1, 48 in (1220 mm) x 96 in (2440 mm) tongue & groove sheathing panels. Install all panels with “A” side up, edges supported by blocking or structural framing, fastened using only non-corrosive screw fasteners with heads installed flush with sheathing applied at 6 in (150 mm) minimum o.c. along panel edges and 12 in (300 mm) o.c. over intermediate supports and/or additional fastening as required by jurisdictional codes. All new plywood substrates shall be structural panels performance-rated pursuant to National Institute of Standards and Technology (NIST) voluntary product standard PS-1-95; identified with American Plywood Association (APA) grade designations.

b. Hygroscopic building materials such as wood plank, timber or plywood will normally have higher moisture content (in the range of 8% to 12%) as they adsorb or desorb moisture to reach equilibrium moisture content with the surrounding air. Cold liquid applied primer and reinforced membrane should not be applied to damp or wet sheathing materials but may be applied to materials with higher moisture contents as indicated above, provided the exposed surface is clean and dry. Ultimately, determinations of moisture content and the resulting bond strength should be performed periodically to determine acceptability. If poor adhesion or blistering occurs, substrate will require additional drying time before proceeding.

c. After priming plywood panels, fill joint gaps, holes, and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 1 in (25 mm) wide bond breaker tape followed with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint. Cover knot holes or cracks with strips of cold liquid applied reinforced waterproofing membrane.

C. Where conditions are found to be unsatisfactory, work shall not begin until conditions are adjusted appropriately. Commencing of work shall indicate contractor's acceptance of conditions.

3.03 PRIMER APPLICATION

A. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
B. Examine all substrates and conduct adhesion peel tests as necessary to ensure satisfactory adhesion is achieved.

3.04 PMMA PRIMER APPLICATION

A. Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
C. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
D. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
E. Allow primer to fully cure before membrane application.

3.05 EPOXY PRIMER APPLICATION

A. Low Odor Primer Applications:
1. Mix A and B parts using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
2. Apply primer to compatible, clean, and prepared substrate preferably with falling temperature to reduce potential for pinholes from "off-gassing" and

as required to enhance adhesion of new specified waterproofing materials.

3. Apply primer using notched squeegee and roller or brush at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
4. When primer will be left exposed beyond recommended recoat times, broadcast to excess with #1 (0.7 – 1.2mm) kiln-dried quartz into the final coat of epoxy primer while still wet at the rate of 30 lb/100 ft^2 (1.5 kg/m^2) as a mechanical bonding layer. After cure, remove loose aggregate and keep dry until subsequent system components are applied.
5. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
6. Allow primer to fully cure and remove excess aggregate before membrane application.

3.06 EPOXY PRIMER APPLICATION

A. Moisture Mitigation Primer Applications:

1. Mix A and B parts using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
2. Apply primer to compatible, clean, and prepared substrate preferably with falling temperature to reduce potential for pinholes from “off-gassing” and as required to enhance adhesion of new specified waterproofing materials.
3. Apply primer using a notched squeegee and roller or brush at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
4. Allow primer to fully cure and inspect for bubbles, blisters, voids or pinholes.
5. Repair bubbles, blisters, voids, and pinholes as recommended by manufacturer.
6. For steep slope, vertical and flashing applications, minimum two coats of primer are required.
7. When primer will be left exposed beyond recommended recoat times, following any required primer repairs, apply a second coat of primer over the in-place primer and broadcast to excess with #1 (0.7 – 1.2mm) kiln-dried quartz into the final coat of epoxy primer while still wet at the rate of 30 lb/100 ft^2 (1.5 kg/m^2) as a mechanical bonding layer. After cure, remove loose aggregate and keep dry until subsequent system components are applied.
8. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
9. Allow primer to fully cure and remove excess aggregate before membrane application.

3.07 METAL PRIMER APPLICATION

A. Mix primer resin approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.

B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
C. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
D. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
E. Allow primer to fully cure before membrane application.

3.08 SUBSTRATE PATCHING, LEVELING & REPAIR

A. GENERAL:
1. After priming and before commencing with application of liquid applied waterproofing, the contractor shall patch, level, or repair all substrates as required to eliminate bug holes, voids, cavities, low spots, repair cracks or any other condition that may be detrimental to proper application of the liquid applied waterproofing.
B. PATCHING, LEVELING & REPAIRS:
1. Contractor shall use proprietary paste or resin-mortar for all patching, leveling or repairs wherever possible. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
2. Traffic bearing substrates: Use only resin-mortar for all substrate leveling, patching and repairs.
3. Non-traffic bearing horizontal or vertical substrates: Use paste or resin-mortar for all substrate leveling, patching and repairs.
4. Application:
a. Install paste or resin-mortar over a fully cured primer.
b. The substrate shall be dry and free of any dust or loose particles.
c. Mix paste resin and/or resin-mortar using a slow speed agitator prior to pouring into a larger container.
d. When required, combine the paste or resin-mortar with #1 (0.7 – 1.2mm) kiln-dried quartz aggregate as recommended for deep voids or large areas.
e. Mix paste and/or resin-mortar and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
f. Apply the catalyzed paste and/or resin-mortar onto the substrate using a smoothing trowel, working the material into the surface for complete coverage and full adhesion.
g. Paste and/or resin-mortar should be placed in lifts no greater than the maximum thicknesses recommended.
h. If additional lifts will be required, broadcast top surface of the placed paste or resin-mortar with clean dry #1 (0.7 - 1.2 mm) kiln-dried quartz aggregate at approximately 25% coverage while the paste and/or resin-mortar is wet. Place next lift once the paste and/or resin-mortar has cured.
C. NON-MOVING (STATIC) CRACKS – 1 mm or less:
1. Determine that crack is non-moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin mortar or paste as required.

D. MOVING (DYNAMIC) CRACKS – 1 mm or less:
   1. Determine that crack is moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin-mortar or paste as required. After the resin-mortar or paste has cured, apply minimum 4 in (100 mm) wide strip of reinforced cold liquid applied membrane centered over crack.

E. MOVING (DYNAMIC) CRACKS – 3 mm or less:
   1. Determine that crack is moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin-mortar or paste as required. After the resin-mortar or paste has cured, apply bond breaker tape 5 times in width greater than the maximum anticipated expansion. Then cover with a strip of reinforced cold liquid applied membrane centered over crack sized to provided 2 in (50 mm) minimum cover beyond all side of the bond breaker tape but no less than 6 in (150 mm) minimum width.

F. MOVING (DYNAMIC) CRACKS – Greater than 3 mm:
   1. Moving cracks greater than 3 mm must be treated as an expansion joint.

3.09 INSTALLATION & STAGING

A. In a normal cold liquid applied membrane application the substrate is prepared and primed, flashings are installed, followed by the application of the waterproofing membrane and finish. When applying broadcast aggregate, the aggregate should not be left subject to the elements, and therefore must be top coated with finish the same day of application whenever possible.

B. If work is interrupted for more than 12 hours use manufacturer's proprietary cleaner to clean and reactivate applied primer, resin mortar, flashing membrane or field membrane transition areas. Cleaner should be allowed a minimum of 20 minutes evaporation time after application and covered within 60 minutes of application or as recommended by the manufacturer.

3.10 FLASHING MEMBRANE APPLICATION

A. General:
   1. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
   2. Provide a minimum vertical height of 8 in (200 mm) for all flashing terminations wherever possible. Flashing height shall be at least as high as the potential water level that could be reached because of a deluging rain and/or poor slope.
   3. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.
   4. All flashing shall be terminated as required by the manufacturer. Cap flashings or counter flashings may be constructed of metal, stone, tile or other materials properly installed in accordance with industry-accepted practice.
   5. Install all flashing membranes before installing field membranes.
   6. The primed substrate shall be dry and free of any dust, loose particles, or contaminants.
   7. Precut reinforcing fleece to conform to terminations, transitions and

penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side laps and extend flashing 4 in (100 mm) minimum horizontally onto deck unless otherwise specified. Ensure the completed liquid applied flashing membrane is fully reinforced.

8. Wherever possible factory pre-cut fleece pipe penetration and universal corners shall be used.
9. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of waterproofing resin that can be used within the application time.
10. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
11. Immediately apply the reinforcing fleece into the wet base coat of resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
12. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.

B. Penetrations & Flashings:

1. Pipes, Conduits, Posts, Supports and Unusual Shaped Penetrations:
   a. Pipes, conduits, and other items to be flashed must be separated with ½ in (13 mm) minimum clearance or as recommended by manufacturer to adequate waterproof each individual penetration.
   b. All penetrations must be flashed individually. Two or more items ganged together in a flashing will NOT be permitted.
   c. Flash penetrations using cold liquid applied reinforced membrane or proprietary fibrated flashing resin as recommended. Flashing shall be applied using factory pre-cut fleece wherever possible consisting of a reinforced deck skirt/target flashing applied over a reinforced vertical wrap finger flashing.
2. Drains:
   a. Flash drains using cold liquid applied membrane. Flashing shall consist of a membrane target extending minimum 12 in (300 mm) horizontally onto the substrate applied over a finger flashing extended into the prepared drain bowl a minimum of 3 in (75 mm).
   b. At no time should the cold liquid applied membrane be installed to restrict or reduce the drain inlet in size.
   c. For new drains, contractor shall include cost of all plumbing work, piping, and connection to existing storm sewer system.
3. Hot Pipes:
   a. Protect cold liquid applied membrane components from direct contact with steam or heat sources when the in-service temperature exceeds 150°F (65.5°C). In all such cases flash to an intermediate "cool" sleeve.
   b. Fabricate "cool" sleeve in the form of a metal cone using non-ferrous metal in accordance with manufacturer details.

c. Flash sleeve using cold liquid applied reinforced membrane like a standard pipe flashing. Flashing shall consist of a reinforced target applied over a reinforced vertical wrap finger flashing.

4. Flexible Penetrations:
   a. Provide a weather-tight gooseneck set in manufacturers resin paste and secured to the deck.
   b. Flash gooseneck penetrations using cold liquid applied reinforced membrane as recommended. Flashing shall consist of a reinforced target and reinforced vertical wrap finger flashing.
5. Walls, Curbs and Bases:
   a. Flash all walls, curbs and bases using cold liquid applied reinforced membrane. Wherever possible extend flashing up and over tops of walls, curbs, and bases so the membrane terminates on the opposite face of the vertical element.
6. Expansion Joints:
   a. Flash all expansion joints with minimum two layers of manufacturer's cold liquid applied reinforced membrane applied over an expansion joint compressible filler, expansion tube, backer rod and/or bond breaker tape as recommended by manufacturer.
7. Non-standard Flashing Details:
   a. When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations, or protrusions.
8. Thru-Wall Flashings, Mud-set Masonry, & Poured-In-Place Concrete (Bonding/Protection Layer):
   a. For all areas to receive new direct applied cement, concrete, or mortar setting bed, apply a supplementary wearing coat of membrane manufacturer's cold liquid applied resin.
      i Using a lambswool roller, apply an even layer of cold liquid applied resin at the minimum consumption of 30 lb/100 ft^2 (1.5 kg/m^2) or as recommended by the membrane manufacturer and broadcast #1 (0.7 - 1.2mm) kiln-dried quartz aggregate into the wet resin to excess for full coverage.
      ii Allow resin bonding layer to cure as recommended by the membrane manufacturer prior to continuing application or applying loads. Remove excess un-adhered aggregate from surface by broom, vacuum, or oil-free blower prior to apply overburden.
      iii When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations, or protrusions.

3.11 FIELD MEMBRANE APPLICATION

A. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
B. Install all flashing membranes before installing field membranes.
C. The primed substrate shall be dry and free of any dust, loose particles, or contaminants.
D. Precut reinforcing fleece to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side and 4 in

(100 mm) at end-laps. Ensure the completed liquid applied membrane is fully reinforced.

E. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.

F. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.

G. Immediately apply the reinforcing fleece into the wet base coat of waterproofing resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.

H. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.

3.12 ROOF WALKWAYS & PROTECTION

A. Where walkways are required for normal rooftop traffic and as a protective layer to service all rooftop equipment, provide waterproofing manufacturers textured wearing coat with integrally mixed aggregate to create a highly slip-resistant wearing surface.

1. Standard Duty Surfacing Layer: (SOPREMA ALSAN RS 289)
    a. Mix and apply an even topcoat of pigmented textured finish resin using a flat or V-notched trowel at minimum recommended consumption. Use an appropriate roller to remove excess resin or puddling. Roll textured finish resin in one direction, then roll in the cross direction to obtain a uniform finish.
2. Walkway Surfacing Application:
    a. Mask out walkway sections to be no longer than 10 ft (3 m), with a 6 in (150 mm) minimum gap between each section to allow for drainage.
    b. Immediately remove masking before surfacing resin cures.

3.13 CLEAN UP

A. Uncured resin is considered a hazardous material. Unused resin must be catalyzed and cured prior to disposal.

B. Clean up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

3.14 PROTECTION

A. Upon completion of new work (including all associated work), institute appropriate procedures for surveillance and protection of finished work during remainder of construction period. Protect all areas where waterproofing membrane has been installed.

END OF SECTION

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SUMMARY

A. Work shall include, but is not limited to, the following:
   1. Preparation of existing and new substrates.
   2. Branded sheet metal flashings and sheet metal roof edge system for warranty.
   3. Custom fabricated flashings and sheet metal trims using branded sheet metal as required for specified warranty.
   4. Branded Gutters and downspouts for warranty.
   5. All related materials and labor required to complete specified roofing necessary to receive specified manufacturer's warranty.

1.02 RELATED SECTIONS

A. Division 011000 – Summary
B. Division 072200 – Roof Insulation
C. Division 075216 – Styrene-Butadiene-Styrene (SBS) Modified Bitumen Membrane Roofing.
D. Division 07 56 00 - Cold Liquid Applied Membrane Roofing.

1.03 DEFINITIONS

A. ASTM D 1079-Definitions of Term Relating to Roofing, Waterproofing and Waterproofing.
B. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

1.04 REFERENCES

A. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.
B. AMERICAN STANDARD OF TESTING METHODS (ASTM):
   1. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
   2. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)::
   1. ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge System Used with Low Slope Roofing System.

2. ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

D. FLORIDA BUILDING CODE (FBC):
1. 2020 Florida Building Code, Seventh Edition (FBC)
2. 2020 Florida Fire Prevention Code, Seventh Edition (FFPC).

E. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA) Roofing and Waterproofing Manual.

F. SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION INC. (SMACNA) Architectural Sheet Metal Manual.

1.05 ACTION SUBMITTALS

A. Product Data Sheets: Submit manufacturer's product data sheets, installation instructions and/or general requirements for each component.

B. Safety Data Sheets: Submit manufacturer's Safety Data Sheets (SDS) for each component.

C. Sample/Specimen Warranty from the manufacturer and contractor.

D. Shop Drawings: Provide roof plan and applicable roof system detail drawings.

1.06 INFORMATIONAL SUBMITTALS

A. Contractor Certification: Submit written certification from roofing system manufacturer certifying that the applicator is authorized by the manufacturer to install the specified materials and system.

1.07 WARRANTY & CLOSEOUT SUBMITTALS

A. Roof and metals must be thoroughly cleaned prior to turnover and must be approved/accepted by the Owner. Unsightly sealant joints shall be removed and reinstalled to the satisfaction of the Owner.

B. A pull test must be witnessed by the Owner. Written results on Contractor's letterhead must be provided to the Owner prior to acceptance of the required manufacturer warranty.

C. Warranty: Provide manufacturer's and contractor's **project specific edge to edge all warranty covering all materials and labor installed as specified in sections 072200, 072713, 075216, and 076200** upon substantial completion of the roofing system.

D. The manufacturer shall provide the owner with the manufacturer's no dollar limit (NDL) warranty providing labor and materials for 25 years from the date the warranty is issued at acceptance of the contracted work. During this period, the manufacturer shall pay all cost of repairs to the roof system necessary to correct roof leaks resulting from improper workmanship in the application of the roofing system and substrate components.

E. The contractor shall guarantee the workmanship and shall provide the owner with the

contractor's warranty covering workmanship for a period of **5** years from completion date.

F. All warranties and guarantees shall be in written form acceptable to the Owner and shall be made by an authorized representative of the roofing system manufacturer.

G. Any guarantee by the contractor for the workmanship over a set initial period shall be between the Contractor and the Manufacturer and shall NOT affect the the Manufacturer's 25-year NDL warranty with the Owner.

H. During the warranty period, the Manufacturer and the Contractor agree that within 24 hours of receipt of notice from the Owner, they will inspect and make immediate emergency repairs to the defects or to leaks in the roofing system. They further agree that, within a reasonable time, they shall restore the affected items to the standard of the original specifications.

I. All emergency work and permanent work done during the warranty period shall be done without cost to the Owner, except in the event is is determined that such leaks were caused by Owner abuse, vandalism, lightning, hurricane, tornado other cause not typically attributed to the installed system.

J. WARRANTY SHALL NOT REQUIRE THE OWNER TO PERFORM ANYTHING EXCEPT ROUTINE MAINTENANCE AS IDENTIFIED IN THE CONTRACTOR PROVIDED ROOFING MANUAL AND SHALL NOT REQUIRE THE OWNER TO TRACK WEATHER CONDITIONS / INCIDENTS NOR MAINTAIN ANY LOGS OF ANY TYPE.

K. Within a period of three (3) to six (6) months after the final completion, an aerial infrared scan of the roof system must be performed by a third-party vendor not affiliated with the roofing contractor and the results transmitted to the owner. The aerial scan and results report shall meet the documentation requirements of the Infraspection Institute for infrared inspection of insulated roofs.

L. Roofing Manual: At closeout, provide a roofing manual that includes one copy of all approved submittals, names and contact information for all roof related contractors who worked on the project, roof inspection, maintenance instructions and a copy of the inspector's final approval and a copy of the warranty. If the selected Manufacturer has a printed Owner's inspection checklist it shall also be included in the manual. This manual shall be separate of any other manuals required by the contract documents and shall be turned over to the Owner .

1.08 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS:

1. Manufacture shall have 20 years of experience manufacturing roofing materials.
2. Trained Technical Field Representatives, employed by the manufacturer, independent of sales.
3. Provide reports in a timely manner of all site visit reports.
4. Provide specified warranty upon satisfactory project completion.

B. CONTRACTOR QUALIFICATIONS:
   1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
   2. Applicators shall have completed projects of similar scope using same materials as specified herein.
   3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roof system through satisfactory project completion.
   4. Applicators shall be skilled in the application methods for all materials.
   5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
   6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to each product data sheet or other published literature for specific requirements.
B. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.
C. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location.
D. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.
E. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.10 SITE CONDITIONS

A. SAFETY:
   1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
   2. The contractor shall refer to product Material Safety Data Sheets (MDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
B. ENVIRONMENTAL CONDITIONS:
   1. Monitor substrate temperature and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of

specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.

2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.

1.11 PERFORMANCE REQUIREMENTS

A. ROOF EDGE SYSTEM:

1. Performance testing shall be in accordance with ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edges Systems Used with Low Slope Roofing Systems.

a. Wind Load Determination: See Structural drawings

PART 2 **PRODUCTS**

2.01 MANUFACTURER

A. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company. A 'Quality Compliance Certificate (QCC) for reporting/confirming the tested values of the SBS-Modified Bitumen Membrane Materials will be supplied upon request.

B. ACCEPTABLE MANUFACTURER: All metals shall be manufactured by or for the manufacture providing the comprehensive NDL Edge to Edge including all metals warranty. If a manufacturer other than the basis of design is chosen by the bidder then that manufacturer's products must be provided to ensure warranty is from one manufacturer only. Bidders may select from one of the four listed manufacturers. Vapor Barrier, Roofing, Insulation and Metals shall all be supplied through the one manufacturer selected by the bidder for warranty purposes.

1. SOPREMA, (Basis of Design), located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

2. SIPLAST, located at 1000 Rochelle Blvd., Irving, TX. 75062-3940 Tel: 469-995-2200, Fax 469-995-2205, Toll Free: 800-922-8800, Website www.siplast.com

3. DERBIGUM AMERICAS, INC., located at: 4800 Blue Parkway.; Kansas City, MO 64130; Tel: 800-727-9872; Tel: 816-921-0221; Website: www.derbigum.us

4. GARLAND COMPANY, INC., located at: 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com

C. Contractor shall furnish all sheet metal flashings, counter flashings, roof edge system, and all other related sheet metal flashings, fasteners and sealants necessary to flash and counter flash the specified roofing system at all roof terminations, transitions and penetrations. Metals shall be warranting manufacturer's fabricated, or manufacturer branded products. 100% of all metals used on this project shall be covered by the Manufacturer's warranty.

D. Sheet metal flashing materials and fasteners shall be compatible with adjacent materials, to accommodate all project related exposures.

E. Sheet Metal Flashing Material: Stainless Steel. All fabrications shall be factory fabricated welded or soldered.

2.02 SHEET METAL FLASHING

A. SHEET METAL, ROOF EDGE SYSTEMS, GUTTERS, DOWNSPOUTS, AND CUSTOM THRU WALL FLASHINGS AND COLLECTION BOXES:

1. Roof edge system shall include all components and associated fasteners necessary to comply with specified performance requirements. Contractor shall provide all other related fasteners and sealants necessary for the roof edge system.
2. Roof edge systems shall be factory fabricated components, 24 gage minimum thickness and thicker where required to meet ANSI Spree and wind loads specified.
3. All changes in directions (corners), curved pieces, terminal ends, through wall and collection fabrications shall be independent of straight fabrications and shall be measured, fitted and seams welded meet the field condition where fabrication is intended to be used. All custom fabrications shall be field measured and labeled identifying the floor level and location fitting is to be installed. Custom fabrications that do not fit the condition that it was intended shall be removed and refabricated.
4. Fabrications shall receive 2D matte finish produced via cold rolling, then annealing and pickling the material in acid. Finished shall be smooth, non-reflective, and dull, prepared for soldering and welding.
5. Fabrication shall be anchored with concealed fasteners except where impractical as approved by the Owner's Representative.
6. SOPREMA SOPRA-TITE GOLD COPING METAL: Engineered metal coping with hold-down cleats.
   a. Material: Stainless Steel

b. Gauge/Thickness: 22 Ga. Minimum
c. Finish: See 2.02 A.4.
d. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.

7. SOPREMA SOPRA-TITE EXPANSION JOINT METAL: Engineered metal coping with hold-down cleats.
   a. Applications: Roof to Roof and Roof to Wall .
   b. Material: Stainless Steel
   c. Gauge/Thickness: 22 Ga. Minimum
   d. Finish: See 2.02 A.4.
   e. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.
8. SOPREMA FLASHINGS, COUNTERFLASHINGS, TERMINATION BARS:
   a. Applications: One-piece counterflashings as detailed, two-piece counterflashing all versions as detailed and pressure bars where indicated.
   b. Material: Stainless Steel
   c. Gauge/Thickness: 24 Ga. Minimum
   d. Finish: See 2.02 A.4.
   e. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.
9. SOPREMA MODIFIED DRIP EDGE FACIA
   a. Material: Stainless Steel
   b. Gauge/Thickness: 22 Ga. Minimum
   c. Finish: See 2.02 A.4.
   d. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.
10. C`USTOM FABRICATIONS
   a. Material: Stainless Steel
   b. Gauge/Thickness: 22 Ga. Minimum
   c. Finish: See 2.02 A.4.
   d. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.
11. SOPREMA BRANDED SEAL-TITE GOLD IGG-B GUTTER
   a. Material: Stainless Steel
   b. Gauge/Thickness: 22 Ga. Minimum
   c. Finish: See 2.02 A.4.
   d. Joints: Welded
   e. Expansion Joints: Where required when length of gutter exceeds manufacturer’s standard spacing between expansion joints
   f. End Caps: Manufacturer’s standard.

g. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.

12. SOPREMA BRANDED CLOSED FACE INDUSTRIAL DOWNSPOUTS
    a. Material: Stainless Steel
    b. Gauge/Thickness: 22 Ga. Minimum
    c. Finish: See 2.02 A.4.
    d. Joints: Double Seam Lock
    e. Straps: Style 1 Strap and Anchors behind downspout.
    f. Accessories: Provide all accessories such as riveted elbows, boot to gutter connection, turnout drip and splash blocks.
    g. Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.

B. GENERAL PURPOSE ROOFING CEMENT AND MASTIC
1. SOPREMA SOPRAMASTIC: SBS Mastic. Fiber-reinforced, roofing cement, packaged in 5-gallon pails. General purpose roofing cement for low-slope roofing used for sealing sheet metal flashings to SBS membranes.
    a. VOC Content: 190 g/L or less.
    b. Meets or exceeds ASTM D4586, Type I, Class II.
2. SOPREMA SOPRAMASTIC: SBS Mastic. Fiber-reinforced, roofing cement, packaged in 10.4 oz caulk tubes. General purpose roofing cement for low-slope roofing used for sealing sheet metal flashings to SBS membranes.
    a. VOC Content: 190 g/L or less.
    b. Meets or exceeds ASTM D4586, Type I, Class II.

C. GENERAL PURPOSE SEALANT
1. SOPREMA SOPRAMASTIC SP1: General purpose, paintable, gun-grade, elastomeric, polyether moisture curing sealant for sealing SBS membrane terminations, Kynar 500 PVDF, horizontal and vertical construction joints.
    a. VOC Content: 20 g/L or less.
    b. Meets or exceeds ASTM C920, Type S, Grade NS, Class 50.
    c. Standard color.
2. Butyl Sealant: Butyl rubber and polyisobutylene water resistant sealant for concealed sheet metal joints.
3. Butyl Sealant Tape: Butyl rubber and polyisobutylene water resistant sealant tape for concealed sheet metal joints.

PART 3 **EXECUTION**

3.01 EXAMINATION

A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.

B. The contractor shall examine all roofing substrates including, but not limited to: insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.

C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.

D. During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.

3.02 PREPARATION

A. Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.

B. Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor's acceptance of conditions.

3.03 SBS MASTIC AND GENERAL PURPOSE ROOFING CEMENT APPLICATION

A. Apply SOPREMA SOPRAMASTIC general purpose SBS mastic and roofing cement to seal drain leads, metal flanges and where specified and required in detail drawings.

B. Apply general purpose SBS mastic and elastic roofing cement using caulk gun, or notched trowel at 2.0 – 2.5 gallons per square on each surface. Application rates vary based on substrate porosity and roughness. Tool-in as necessary to seal SBS membrane terminations.

3.04 SHEET METAL FLASHING APPLICATION

A. Refer to manufacturer's sheet metal flashing and roof edge system detail drawings, and follow product data sheets and published general requirements for installation instructions.

B. General Requirements:

1. Follow the most recent edition of the SMACNA Architectural Sheet Metal Manual for fabrication and installation requirements.
2. Follow the most recent edition of the NRCA Roofing and Waterproofing Manual for fabrication and installation requirements for specified roofing and flashing.

C. Isolate all metal components from ACQ treated wood or other incompatibles material using specified membrane flashing materials.

D. Appliances such as lightning rods, signs, or antennae shall be separate from the roof edge system.

3.05 GENERAL PURPOSE SEALANT

A. Refer to published installation instructions. Ensure sheet metal and adjacent substrates are clean and free of oils, dust and other incompatible materials.

B. Apply SOPREMA SOPRAMASTIC SP1 general purpose, paintable, gun-grade, elastomeric, polyether moisture curing sealant to seal SBS membrane terminations, exposed fasteners, and other compatible sheet metal horizontal and vertical joints, laps and transitions.

C. Installation of sealants is expected to have professional straight appearance free of ripples, smears and over-bleed. Use painters' tape where required to provide clean lines. Unsightly sealant joints shall be rejected.

3.06 CLEAN-UP

A. Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Sealing exterior and interior joints to make building air and weather tight.
2. Back-up materials and primers

B. Related Sections

1. 07 52 16 – Modified Bitumen Roofing (SBS)
2. 07 62 00 – Sheet Metal Flashing and Trim

1.02 **DESIGN AND CONSTRUCTION STANDARD**

A. All sealants must meet the standards of ASTM Volume 4.07 Building Seals and Sealants for the system designed. This includes latex sealants, which shall meet ASTM Standard C834.

B. Silicone based joint sealant shall be used for exterior joints that do not receive a coating, i. e., brick masonry, stone cladding, metal panel systems, curtain wall panels systems, etc.

C. Urethane based joint sealant shall be used for exterior applications that receive coating material (e.g., Portland cement plaster with a painted surface).

D. Sealant joints shall be constructed with properly sized foam backer rod.

E. Substrate materials to be primed to achieve proper adhesion where recommended or required by the sealant manufacturer or required for warranty purposes. Where required provide a field adhesion tests may be required to verify joint construction and adhesion of materials used.

F. Sealants must meet the ASTM requirements for the system designed, must be covered by the sealant manufacturers 20 year for silicone/15 year for urethane sealant written warranty.

1.03 SUBMITTALS

A. Product Data: For each product specified. Submit manufacturer's specifications and installation instructions.

B. LEED Submittal: NOT REQUIRED THIS PROJECT

1. Product Data for Credit EQ 4.1: For sealants and sealant primers used inside the weatherproofing system, including printed statement of VOC content.

C. Samples: Submit manufacturer's standard bead samples showing full color range available and back-up material to be used.

D. Compatibility and Adhesion and Stain ResistanceTest Reports: Submit reports from manufacturer indicating that materials forming joint substrates and joint backings have been tested for compatibility, adhesion, and stain resistance with joint sealants.

1. Test report may be waived upon written notice by manufacturer of acceptance of surfaces for

material application without tests.

E. Installer's certification of qualifications

1.03 QUALITY ASSURANCE

A. Installer Qualifications: At least five years successful experience in application of materials specified. Installer shall be manufacturer approved.

B. Certifications: Each container and cartridge must bear applicable Federal Specification No. or ASTM No. on label as manufacturer's certification that contents comply with those specifications.

C. Manufacturer shall advise installer of proper procedure for use of materials.

D. Pre-Installation Conference: Conduct conference at project site with Installer, Architect, Owner, Manufacturer's Representative, and other representatives associated with the work. Review methods and procedures. Coordinate sequence and schedule of other materials. Review project requirements and note limitations due to weather and project conditions.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curingtime and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants or other causes.

1.05 PROJECT CONDITIONS

A. Apply exterior caulking only in favorable weather conditions, on dry joints and when temperatureis within range recommended by manufacturer.

1.06 SEQUENCING AND SCHEDULING

A. Coordinate timing of installation of joint sealers with application of waterproofing, to ensure compatible installation.

B. Apply sealants prior to painting, or application of masonry water repellent or other treatment of surfaces adjacent to joints.

1.07 WARRANTY

A. Manufacturer's Warranty: Provide twenty-year silicone/fifteen-year urethane sealant written manufacturer's warranty against failure of materials due to defects of manufacture. Warranty shall include provisions that warrant against staining of adjacent surfaces that exceed test results submitted as part of the submittal requirements.

B. Contractor's Warranty: Provide two year written installer's guaranty against failure due to adhesion and cohesion loss, outgassing from backer materials or other failures in maintaining air or watertight condition or failures in providing non-blistered or unruptured joints.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrate under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide selections made by Architect from manufacturer's full range of colors.

2.02 JOINT SEALANTS

A. Type 1 – Roofing Manufacturer’s Warranted Standard Sealant: General purpose, paintable, gun-grade, elastomeric, polyether moisture curing sealant for sealing SBS membrane terminations. See specification section 07 52 16. Sealant shall be part of the Roof Warranty

B. Type 3 - Silicone Joint Sealants: - Sealant (Vertical and horizontal surfaces): One part Silicone Type, conforming to FS TT- S-001543 latest revision, Type II, Class A and ASTM C 920 latest revision, Type S, Grade NS, Class 25, and uses NT, M, A and O as applicable to other joint substrates.

1. Products: Subject to compliance with warranty and other requirements, provide the following or equal substitute according to Division 01.

a. Dowsil, "790" Basis of Design
b. G.E., "Silpruf"
c. Tremco, "Spectrem 1"
d. Pecora, "864"

C. Type 4 - Urethane Joint Sealants - Multicomponent, Gunnable, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T, M, G, and O as applicable to joint substrates.

1. Products: Subject to compliance with warranty and other requirements, provide the following or equal substitute according to Division 01.

a. Precora, “NR-200 Urexpan”
b. Sika Corp., “Sikaflex-2c SL”
c. Sonneborn Building Products, “Sonolastic SL2”
d. Tremco, “THC-900”
e. Tremco, “Vulkem 245”

D. Type 11 - Sealant: Compression Seals: Manufacturer's standard preformed, precompressed, impregnated open cell foam sealant manufactured from high density urethane foam impregnated with nondrying, water repellent agent; factory produced in precompressed sizes and in roll or stickform to fit joint widths indicated and to develop watertight and airtight seal when compressed to degree specified by manufacturer.

1. Emseal Corporation, "Emseal" or "Emseal Greyflex"
2. Wil-Seal Construction Foams Div. Illbruck, "Will-Seal 150”
3. York Manufacturing, Inc., "York-Seal 100 or 200"
4. Hohmann and Bernard Company., "Polytite R or Standard"

E. Type 12 - Sealant: Compression Seals: Manufacturer's standard preformed, precompressed, impregnated closed cell foam sealant manufactured from ethylene vinyl acetate (EVA) copolymer foam, UV stable primaryseal.

1. Wil-Seal Construction Foams Div. Illbruck, "Will-Seal Coreseal”
2. Equal product by one of the manufacturer’s listed in Type 11 above.

2.03 MISCELLANEOUS MATERIALS

A. Primer: As recommended by manufacturer whose product is used.

B. 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. Use open-cell material where long curing sealants such as Dowsil 790 are used between non pourous materials. Cylindrical Sealant Backings diameter should be no less than 125% of the width

of the joint opening.

C. Bond Breaker Tape: Pressure sensitive polyethylene or Teflon tape as recommended by sealant manufacturer. Three-sided joint adhesion is strictly prohibited.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joint surfaces and backings, and conditions affecting joint sealer performance. Do not proceed until unsatisfactory conditions have been corrected. Starting work constitutes acceptance ofsubstrate conditions.

3.02 PREPARATION

A. Protect adjacent surfaces.

B. Provide clean and dry joints.

C. Remove dirt, grease, mortar, dust, insecure coatings, curing compound, moisture and other substances, which would interfere with bond.

D. Provide test area for each sealant type and in condition where it is proposed to be used to confirm good bond. Do not install sealants that fail bond adhesion test.

E. Wipe metal surfaces with sealant manufacturer's recommended solvent.

F. Prime surfaces of joints as recommended by sealant manufacturer. Apply primer to comply with sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces. Primer may be deleted only on specific joints approved in writing by sealant manufacturer and submitted for review prior to application.

3.03 INSTALLATION

A. Install sealants and back-up material in strict accordance with manufacturer's specifications and instructions.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Apply back-up material to within 3/8" to 1/2" of face of surface to conform to manufacturer's recommendations and to provide 1.25 to 1 ratio to 2 to 1 ratio between width/depth.

D. Wherever possible, apply caulking materials with gun with nozzle of proper size to fit joint.

E. Drive material into joint to completely fill joint and to obtain watertight condition.

F. Install sealants in neat manner in continuous ribbons without gaps or air pockets, and without wrinkles.

G. Tool sealants to form smooth, uniform beads with slight concave surface with material finished slightly below adjoining surfaces.

3.04 CLEANING

A. Immediately remove excess joint sealant and smears with cleaning agents recommended by manufacturer of sealant and substrate being cleaned.

3.05 PROTECTION

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations so that they are without damage at time of Substantial Completion.

3.06 SEALANT SCHEDULE

A. Use Type 1 Sealant only for work performed with respect to the warranted roof installation. Basis of design roofing uses Sopramastic SP1. Other roofing listed manufacturers will their own branded sealant required for the warranty. See specification section 07 52 16.

B. Use Type 3 Sealant for brick to brick, brick to concrete joints, concrete to concrete, brick to aluminum/steel.

C. Use Type 4 Sealant for joints that will be painted over such as cement plaster joints etc.

D. Use Type 11 Sealant for primary or secondary backup sealant where indicated.

E. Use Type 12 Sealant for primary or secondary backup sealant where indicated.

END OF SECTION

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Surface repairs, preparation, painting, and finishing of previously painted exposed exterior items and surfaces including:
   a. Metal Doors and Frames
   b. Railings
   c. Other previously painted exterior steel surfaces except concrete screen frame
   d. Do not allow paint to drip or spill onto the roof or non-painted surfaces.

B. Related Sections

e. Section 01 – No formal testing of coated surfaces was performed. If contractor for this work suspects existing coatings may contain lead or other hazardous material then all testing required by the contractor performing this work shall be provided by the contractor and included in bid for the work. No change authorization will be approved by OCLS after the work is bid.

1.02 DEFINITIONS

A. Gloss Ranges: The following definitions of names that define gloss levels are established by the Master Painters Institute.

MPI GLOSS STANDARDS			
GLOSS LEVEL	**DESCRIPTION**	**GLOSS AT 60 DEG**	**SHEEN AT 85 DEG**
G1	A traditional matte finish - flat	Max. of 5 units	Max. of 10 units
G2	A high side sheen flat - "a velvetlike" finish	Max. of 10 units	10 - 35 units
G3	A traditional "eggshell-like" finish	10 - 25 units	10 - 35 units
G4	A "satinlike" finish	20 - 35 units	Min. of 35 units
G5	A traditional semigloss	35 - 70 units	-
G6	A traditional gloss	70 - 85 units	-
G7	A high gloss	More than 85 units	-

1.03 SUBMITTALS

A. Product Data: For each product specified. Manufacturer's specifications and application instructions. Submit complete schedule listing manufacturer, proprietary names and number, surfaces to be painted, listing primer, finish paint, number of finish coats, and tinting required.

B. Samples: Contractors proposed color samples matching existing pre-painted surfaces.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Paint Coordination: Verify compatibility of finish coat with manufacturer's and fabricator's shop applied prime coats.

1. Provide barrier coats over incompatible primers, or remove and reprime as required.
2. Notify Owner's Representative in writing of any anticipated problems using finish paints specified.

C. Pre-Installation Conference: Between Owner's Representative, Contractor, Paint Manufacturer, and Applicator to discuss materials, application and workmanship. Review work process and all photo documentation requirements

D. Mockup: Provide mockups for restoration of exterior door, frame and section of railing railing/post including one area of prepared surfaces (ready for primer), one area of primer and one area with applied finish coating specified. Mock up shall include three feet length of railing and one post and brace. Field samples shall be done in accordance with PDCA Standard PDCA P5-94. Mockup if approved may remain part of the final construction.

1. Execute work to ensure that materials are properly prepared, with primer and finish applied at proper coverages.
2. Sample area to show sheen, color and texture attainable.
3. For galvanized surfaces, allow paint to dry at least one week and test adhesion. If adhesion is poor, brush blasting per SSPC-SP16 is necessary to remove the treatments.
4. Rusty galvanizing requires a minimum of hand tool cleaning per SSPC-SP2. Prime same day steel is cleaned.
3. After finishes are accepted, this area to be used for comparison in evaluation of other surface finishing with same material.
4. Work subsequently executed which, in Owner's Representative's opinion, does not equal sample preparation, primer, and finish coating, to be repeated as may be necessary without additional charge.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original containers with labels intact and seals unbroken.

B. Storage And Preparation Area

1. Use storage and preparation area at one location only.
2. Confine mixing, cleaning, refuse, and similar work, in this area and keep area clean and neat.
3. Damage to surfaces in this area shall be repaired at applicator's expense.

C. Remove soiled or used rags, waste and trash from premises every night and take every precaution to avoid danger of fire and smells getting into building fresh air intakes.

1.06 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).

C. Do not apply paint in rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated and/or humidity controlled within temperature/humidity limits specified above and by manufacturer during application and drying periods.

D. Apply paint under same level of illumination that will exist when project is complete and occupied.

1.07 SEQUENCING AND SCHEDULING

A. Coordinate sequencing and scheduling of paint to ensure optimal application of paint without damage to adjacent surfaces.

1. Paint hollow metal doors and frames protecting existing door hardware from overrun of paint.
2. Do not paint non previously painted surfaces nor prefinished surfaces such as window frames, mechanical equipment etc. that were factory coated.
3. Do not paint structural framing supporting precast concrete equipment screens.
4. Do not paint equipment support platforms.

1.08 EXTRA MATERIALS

A. Furnish Owner one (1) unopened gallon of each color primer and finish paint used on the project.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Paints: Paint products shall be industrial grade approved for exposed exterior conditions and are indicated in Painting Schedule located at back of this section. Where colors are based on a manufacturer, products from other national manufacturers products will be considered for approval by Owner, provided that paint type, amount of solids, an exact (within 2 Delta E units) color match and sheen (within 5° gloss) of selected colors is provided. Paint manufacture shall not be that of a subsidiary company selling paint under a different name.

1. All paints shall be provided from single named manufacturer. Paints shall be provided in manufacturer's original labeled packaging and not split into unmarked cans.
2. Paints containing lead in excess of 0.06 percent by weight of the total nonvolatile content (calculated as lead metal) shall not be used.

B. Thinners: Not permitted except as approved in writing by the specified manufacturer specifically to suit a special condition on this project. In no case shall use of a thinner modify the manufacturer's warranty or guarantee.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements. Document any unsatisfactory conditions encountered (especially damages caused by others and latent damage as defined by PDCA

P1-92) and make arrangements to have unsatisfactory conditions corrected prior to beginning painting application. Do not begin paint application until unsatisfactory conditions have been corrected. Starting painting will be construed as Applicator's acceptance of surfaces and conditions within that particular area.

1. Schedule examination of conditions in time to allow corrective work to be undertaken without affecting the overall project schedule.

3.02 PREPARATION

A. General: Protect all copper surfaces from surface and structural damage. Section 07 61 93 Copper Sheet Metal Roofing Repairs is part of this work. Contractor shall use whatever means necessary to protect all copper surfaces. If necessary, remove hardware, hardware accessories, plates, lighting fixtures and similar items in place and not to be finish painted, or provide surface applied protection prior to surface preparation and painting operations.

1. At completion of painting of each area, reinstall removed items by workers skilled in trades involved.
2. Prepare surfaces in accordance with paint manufacturer's written instructions except that cadmium, lead, mercury, zinc chromate, or asbestos containing materials shall not be abraded in any manner and shall require express written instructions from manufacturer on proper surface preparation procedures.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
   a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
   b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming. Prime bare steel surfaces within 8 hours of preparation and exposure.
   c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods

D. Previously Painted Surfaces: De-gloss or roughen finish material applied to metal. Clean between coats to produce even smooth finish.

1. Do not remove lead bearing paint (0.06% lead by weight or greater) without prior consultation with and approval of Owner. Submit means and methods of removal or containment of lead bearing paint to Owner for review prior to proceeding with any paint removal work. Do not release lead bearing paint dust.

E. Patching

1. Patch holes, cracks and other defects after first coat, and with automobile body Bondo type repair material.
2. Bring patching compound flush with adjoining surface.
3. Where only one coat of finish paint is to be applied, patch exposed holes, cracks, and other

defects flush prior to painting.
4. Touch up patched areas prior to applying finish coat.

F. Brush surfaces free of dust, chalk, dirt and other deleterious substances.

G. Protect adjacent finished work and materials from paint spatters and drops.

H. Existing Painted Surfaces: Sample and test existing paint to determine compatibility of new primer/tie coat with existing substrate.

1. Wash substrate with material that will not damage copper roof finish or roughen substrate to provide adequate "tooth" for subsequent coats. (This applies to glossy surfaces.)

3.03 APPLICATION

A. Use materials only as specified by manufacturer's instruction labels.

B. Note requirements specified by manufacturer and these specifications as to condition of surfaces before applying finish.

C. Tint in strict accordance with manufacturer's instructions.

D. Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practical after preparation and before subsequent surface deterioration.

E. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coated until the previous coat has cured as recommended by the manufacturer. If sanding is required by the manufacturer to produce a smooth even surface, sand between applications.

F. Tint primers and undercoats to approximate shade of final coat.

G. Apply materials evenly spread and smoothly flowed on without runs or sags.

H. Allow inspection between coats before application of succeeding specified coat, otherwise no credit for coat applied will be given and applicator assumes responsibility to recoat work in question.

I. Paint tops and bottoms of doors.

J. For opaque finishes, completely cover substrate to provide opaque, smooth surface of uniform finish, color, appearance and covering. For dark colors apply additional coats if necessary to ensure proper color matching. Allow each coat to dry completely before application of subsequent coats.

K. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

3.04 CLEANING

A. Correct damages finished surfaces.

B. As word progresses, remove paint spots from surfaces not intended to be painted. Contractor shall use all caution to protect adjacent surfaces and especially the unfinished architectural concrete.

C. Use care to prevent damage to surfaces being cleaned with solvents or cleaning products. Contractor shall keep all solvents and cleaning products from touching copper surfaces.

D. When in doubt, verify proper method of removing paint spots from finish surfaces before attempting to remove them.

E. Remove rubbish, extra paint, empty cans, rags, solvents, cleaners, and other materials from premises.

3.05 PAINT SCHEDULE

A. For purpose of establishing quality level desired, proprietary products of manufacturers' products are listed in following schedule.

B. Submit complete schedule of surfaces, surface preparation, number of coats of paint and finishes as called for under submittals.

C. Exterior Surfaces

1. Exterior Steel and Metal, Previously Painted Bare and Galvanized Steel

a. Touch-Up Abraded Shop Primer:
Sherwin Williams: Pro Industrial Pro-Cryl Primer (Bare Metal After Cleaning)
Sherwin Williams: Pro Industrial Pro-Cryl Primer (Galvanized Surfaces)

b. Primer: One coat - 3.0 Mils DFT
Sherwin Williams: Pro Industrial Pro-Cryl Primer (Bare Metal After Cleaning)
Sherwin Williams: Pro Industrial Pro-Cryl Primer (Galvanized Surfaces)

c. Finish: Two Coats – 3.0 Mils DFT per coat
Sherwin Williams: Pro Industrial Pre-Catalyzed Waterbased Urethane

END OF SECTION