PROJECT MANUAL

ENGINEERING ROOF REPLACEMENT

50 STATE ROUTE 120
EAST RUTHERFORD, NJ 07073

FOR THE

NEW JERSEY SPORTS & EXPOSITION AUTHORITY

SJM ARCHITECTURE, LLC
954 KINDERKAMACK ROAD
RIVER EDGE, NJ 07661
Project Number SM2022.NJSEA.001

_____ Date:
Stephen J. Martinez, RA AI 20890

NEW JERSEY SPORTS & EXPOSITION AUTHORITY
ENGINEERING ROOF REPLACEMENT
50 STATE ROUTE 120
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SECTION 010150 - CONTRACTOR'S USE OF PREMISES

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2. DESCRIPTION

A. Work included:

1 This Section applies to situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon Owner's property.

1.3. QUALITY ASSURANCE

A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.

B. Owner may require all personnel who will enter upon the Owner's property certify their awareness of and familiarity with requirements of this Section.

1.4. TRANSPORTATION FACILITIES

A. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach job site. If any damage occurs the contractor is responsible for repairs.

B. Contractor's vehicles:

1 Require Contractor's vehicles, vehicles belonging to employees of Contractor, and all other vehicles entering upon Owner's property in performance of Work of Contract, to use only the Access Route approved in advance by Owner.

2 Do not permit such vehicles to park on any street or other area of Owner's property except in the area approved by Owner as "Contractor's Parking Area."

1.5. LANDSCAPING

A. Provide adequate protection for trees, grass, shrubs and all other landscaping during set-up or construction. If any damage occurs the contractor is responsible for repairs as designated by the Owner.

1.6. FACILITY USAGE

A. Provide adequate protection for all interior and exterior portions of the building during set-up and construction. If any damage occurs the contractor is responsible for repairs as designated by the Owner.

B. Restrooms and other amenities of the building will only be used with permission of the Owner. If such authorization is given, the Contractor is responsible for maintaining cleanliness and repairs as designated by the Owner.

1.7. SECURITY

A. Restrict access of all persons entering upon the Owner's property to the Access Route and to the actual site of the work.

* * * END OF SECTION 010150 * * *

SECTION 011000 - SUMMARY

PART 1 - GENERAL

0.1 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Work restrictions.
5. Specification and drawing conventions.

B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

0.2 PROJECT INFORMATION

A. Project Identification: Engineering Roof Replacement, NJS&EA 50 State Route 120, East Rutherford, NJ 07073.

1. Project Location:
   a. Engineering Building

B. Owner: New Jersey Sports & Exposition Authority
50 State Route 120
East Rutherford, NJ 07073

1. Owner's Representative: TBD BY OWNER
Telephone Number: TBD

C. Architect: SJM Architecture, LLC
954 Kinderkamack Road
River Edge, NJ 07661
Telephone Number: 551-427-1487

D. Schedule: Contractor to complete work within 30 days from receipt of building permit.

0.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Project shall consist of roof replacement work, including but not limited to:

   a. Demolition of Roof assembly demolition down to deck, copping, flashing, gutters, equipment curbs and rails, roof drains, leaders, and scuppers as per Drawings.

   b. New construction of scheduled roof assembly, insulation, copping, flashing, gutters, equipment curbs and rails, rood drains, leaders, and scuppers as per Drawings.

   c. Salvage and re-installation of existing equipment, refrigerant lines, cables, and ladder.

B. Type of Contract.

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

0.4 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

0.5 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

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

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 8 a.m. to 6 p.m., Monday through Friday, except as otherwise indicated.

1. 9 a.m. to 5 p.m. Saturdays
2. No non emergency work permitted on Sundays and holidays

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing 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.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, 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.

E. Controlled Substances: Use of tobacco products and other controlled substances within the existing building is not permitted.

0.6 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. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

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

C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the 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.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012000 - PROJECT MEETINGS

1. PART 1 - GENERAL REQUIREMENTS

1.1. RELATED DOCUMENTS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2. PRECONSTRUCTION CONFERENCE

A. The Preconstruction Conference will be scheduled within 15 working days after the Owner has issued the Notice to Proceed, but prior to actual start of the Work.

B. Attendance: Representative of owner, roofing manufacturer/supplier, and contractor.

C. Minimum agenda: Data will be distributed and discussed on:

1 Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and the owner’s representative.

2 Channels and procedures for communication.

3 Review set-up area.

4 Review all required permits.

5 Review insurance requirements.

6 Construction schedule, including sequence of critical work.

7 Contract Documents, including distribution of required copies of Drawings and revisions.

8 Processing of Shop Drawings and other data submitted to the owner’s representative for review.

9 Processing of field decisions and Change Orders.

10 Rules and regulations governing performance of the work.

11 Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

1.3. PROGRESS MEETINGS

A. Will be scheduled by owner's representative weekly or as described at the pre-bid meeting.

B. Attendance: Owner, Contractor, Job Superintendent, Roofing Material Manufacturer/Supplier, and Sub-Contractors, as appropriate.

C. Minimum Agenda:

1 Review of work progress.

2 Field observations, problems, and decisions.

3 Identification of problems which impede planned progress.

4 Maintenance of progress schedule.

5 Corrective measures to regain projected schedules.

6 Planned progress during succeeding work period.

7 Coordination of projected progress.

8 Maintenance of quality and work standards.

9 Effect of proposed changes on progress, schedule, and coordination.

10 Other business relating to work.

1.4. PRE-FINAL INSPECTION

A. Contractor must inform material supplier and building owner's representative prior to application of flood coat and gravel. Pre-final inspection will then be scheduled.

B. Installations or details noted as deficient during inspection must be repaired and corrected by applicator.

C. Once corrections have been made, contractor must inform material supplier and building owner's representative so a second inspection can be scheduled.

D. Material supplier must approve roofing system prior to application of flood coat, surfacing application and/or gravel surfacing.

1.5. FINAL INSPECTION

A. Scheduled by roofing material manufacturer upon job completion.

B. Attendance: Owner or designated representative, contractor, roofing material manufacturer/supplier.

C. Minimum Agenda:

1 Walkover inspection.

2 Identification of needed corrections to be completed by contractor with final approval from warrantor.

* * * END OF SECTION 012000 * * *

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Contingency allowances.

C. Related Requirements:

1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.3 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect and Construction Manager for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, supervision, and related costs for products and equipment ordered by Owner under the bid contingency allowance are as follows:
   1. For all bid contingency allowance work performed by the contractor and all subcontractors, the gross cost to the Owner shall not exceed an overhead and profit margin as per the terms set forth in Section 012600 Contract Modification Procedures.

C. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.7 TRAFFIC CONTROL ALLOWANCES

A. Traffic Control allowances include the costs that are paid to local authorities to provide street closures and/or supervision services during construction. These costs are to be submitted to the Architect and Construction Manager for approval prior to proceeding with the work. This allowance does not include any labor, material or equipment costs to the contractor(s) that are necessary to perform construction activities.

B. Contractor is not entitled to overhead and profit markups on Traffic Control allowance draws.

C. At Project closeout, credit unused amounts remaining in the Traffic Control allowance to Owner by Change Order.

1.8 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results for all 3rd Party inspections excluding any environmental testing of soil required for disposal.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum. Contractor is not entitled to overhead and profit markups on Testing and Inspecting draws.

C. Costs of testing and inspection services not required by the Contract Documents are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Contingency Allowance: Include the sum of **$25,000** for use according to written instructions by the Architect or Owner.

B. Total of allowance No. 1, No. 2, No. 3 as included on the project bid form: **$25,000**

END OF SECTION 012100

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:

1. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.

1.2 DEFINITIONS

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

1.3 PROCEDURES

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

B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1: Metal Deck In-fill.
   1. Removal of Historic Fill soil.
      a. In-fill existing penetration as noted on drawings with metal deck to match existing adjacent. Make watertight.
   2. Unit of Measurement: Square-feet
   3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
   4. Unit price with allowance adjustment requirements in Section 012100 "Allowances."

END OF SECTION 012200

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

0.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Section:

1. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

0.2 DEFINITIONS

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

0.3 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Submit written request to Architect for review and approval.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
b. Coordination information, including a list of changes or modifications 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 substitution 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 and 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. Detailed comparison of Contractor's construction schedule using proposed substitution 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.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. 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.
l. 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 ten (10) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within ten (10) days of receipt of request, or ten (10) days of receipt of additional information or documentation.

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.

0.4 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

0.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than fifteen (15) 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:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Requested substitution will not adversely affect Contractor's construction schedule.
c. Requested substitution has received necessary approvals of authorities having jurisdiction.
d. Requested substitution is compatible with other portions of the Work.

e. Requested substitution has been coordinated with other portions of the Work.
f. Requested substitution provides specified warranty.
g. 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.

B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

0.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

0.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions." form included in the Project Manual.

0.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

0.4 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: Refer to Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

0.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701 form included in Project Manual.

0.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 form included in Project Manual. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

0.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

0.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:

   a. Application for Payment forms with continuation sheets.
   b. Submittal schedule.
   c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date but no later than seven (7) days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

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

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents.

   a. Include separate line item under Punch List for corrective work and project closeout requirements in an amount totaling five percent (5%) of the Contract Lump Sum and subcontract amount.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

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

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

0.3 APPLICATIONS FOR PAYMENT

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

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Progress payments shall be submitted to Architect two weeks prior to second or fourth Wednesday of each month.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application for Payment Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in the Project Manual.

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

    1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
    2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

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

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Submittal schedule (preliminary if not final).
5. List of Contractor's principal consultants.
6. Copies of building permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
8. Initial progress report.
9. Certificates of insurance and insurance policies.

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

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

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

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707-1994, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.

8. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013000 - SUBMITTALS

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2. SUBMITTAL PROCEDURES

A. Coordination of submittals:

1 Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.

2 Verify that each item and the submittal for it conform in all respects with the specified requirements.

3 By affixing the Contractor's signature or approval stamp to each submittal, he/she certifies that this coordination has been performed.

B. Substitutions:

1 The Contract is based on the standards of quality established in the Contract Documents. To give all bidders equal opportunity, use of any materials or methods other than those specified will require the proper submittal information and must be pre-approved in written addenda 10 days prior to bid due date.

2 The following products do not require further approval except for interface within the Work:
a. Minor products specified by reference to standard specification such as ASTM and similar standards.
b. Products specified by manufacturer's name and catalog model number.

3 Building owner reserves right to final authority on acceptance or rejection of any substitute.

4 Request for substitutions will be accepted from prime bidders only. Requests for substitutions from parties not bidding on the project as a primary contractor will not be considered.

C. "Or equal":

1 The specified materials are named to denote the kind and quality required, whether or not the words "or approved equal" are used. These materials shall serve as standards and all proposals shall be based upon the same.

2 Where the phrase "or equal," or "or equal as approved by the Owner," occurs in the Contract Documents, the material or method must be so approved for this Work by the Owner prior to receipt of bids.

3 The decision of the Owner or Owner’s representative’s recommendation shall be final.

1.3. SUBMITTAL DOCUMENTS

A. Only Bidders proposing substitutes to the material or methods specified in this specification required to submit the following documentation.

1 A list of three (3) jobs of similar size, where the proposed materials have been used, under similar conditions, as specified.

2 Accredited testing laboratory certificate verifying physical performance attributes of materials meet specifications.

3 Shop Drawings:
   a. Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
   b. Owner will review and comment on required changes. The Contractor may make and distribute corrected copies as are required for his purposes.

4 Copy of the roofing supplier's warranty which meets all requirements of the specified warranty.

5 Individual product identification, including material supplier's literature and MSDS sheets.

6 Letter from material supplier signed by a corporate officer, on company stationary, confirming that all bidding documents have been approved, that the site has been inspected and meets the requirements for suitability, and that the specified warranty shall be provided upon satisfactory completion of the project.

7 Material supplier providing the roofing warranty shall be ISO 9001:2000.
   a. Submit a copies of the material suppliers Certificates of Registration

8 Verify material supplier is a financially stable organization with the ability to protect the building Owner from both product liability and warranty claims relating to roofing that might arise during the course of the warranty period. It is the intent of the building Owner to establish requirements that will protect him, be fair to all suppliers and ensure that requirements are in line with the exposure of the supplier. The following information will be provided by the material supplier that will issue the warranty and will be submitted by the prime bidder:
   a. A certificate of insurance for product liability with minimum limits in accordance with the following formula:
      (a) Product Liability Insurance will be a minimum aggregate coverage, not less than 10% of total company sales, with coverage of not less than 1 million dollars per occurrence.
      (b) First dollar coverage.
      (c) Coverage provided by an admitted company licensed to do business in New Jersey with an A.B. Best rating of A- or better.
   b. An affidavit signed by a corporate officer stating that they are not currently, nor have been within the last five (5) years, involved in litigation regarding asbestos content of their materials. Or provide a list of all pending asbestos related litigation, an estimate of the dollar amount of all potential asbestos related liability and a summary of all asbestos related settlements over the last five years.
   c. An affidavit signed by a corporate officer that the cost of the warranty claims has not exceeded 2% of that company's total roofing product sales in any of the last five (5) years.

9 Any proposed substitute materials or methods must also be accompanied by the following documentation:
   a. A detailed analysis of the roofs being bid on.

b. A complete specification of the proposed substitute. If, after review, the substitute is found to be acceptable, copies will be provided to each bidder who has picked up the original specification.
d. Written explanation of why substitutions should be considered is required.

10 Product samples of the smallest standard package size of any adhesive, coating, mastic, sealant, or ply sheet.

1.4. BID DOCUMENTS

A. Bid and Proposal Form shall contain quotes to be identified "BASE BID" for the specified materials and methods.

B. Each bid shall be accompanied by a bid guarantee of 10% of the bid amount. The bid guarantee may be in the form of a bond or a certified check, cashier's check, or letter of credit.

C. Certificate of insurance with limits specified in Section 00100.

D. Evidence of experience as specified in Section 00100.

* * * END OF SECTION 013000 * * *

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Requests for Information (RFIs).
2. Project meetings.

B. Related Sections:

1. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

1.3 COORDINATION

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 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 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. Project closeout activities.
7. Project closeout activities.

1.4 REQUESTS FOR INFORMATION (RFIs)

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

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as 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. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: AIA Document G716

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow ten (10) working 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 RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.

c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Architect's actions on submittals.
f. 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 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 Division 01 Section "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 ten (10) days of receipt of the RFI response.

E. 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 ten (10) days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log in format approved by Architect and submit weekly. Include the following:

1. Project name.
2. RFI number including RFIs that were dropped and not submitted.
3. RFI description.
4. Date the RFI was submitted.
5. Date Architect's response was received.

1.5 PROJECT MEETINGS

A. General: Architect will schedule and conduct 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.
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 five (5) days of the meeting.

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

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; 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:

    a. Tentative construction schedule, including project duration..
    b. Critical work sequencing and long-lead items.
    c. Designation of key personnel and their contact information.
    d. Procedures for processing field decisions and Change Orders.
    e. Procedures for RFIs.
    f. Procedures for testing and inspecting.
    g. Procedures for processing Applications for Payment.
    h. Distribution of the Contract Documents.
    i. Submittal procedures.
    j. Use of the premises.
    k. Work restrictions.
    l. Working hours.
    m. Owner's occupancy requirements.
    n. Responsibility for temporary facilities and controls.
    o. Procedures for disruptions and shutdowns.
    p. Construction waste management and recycling.
    q. Parking availability.
    r. Equipment deliveries and priorities.
    s. First aid.
    t. Security.
    u. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: Architect will conduct progress meetings at biweekly intervals.

1. Attendees: In addition to representatives of Owner, and Architect, contractor, and other entities 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.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other 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 utilization.
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.

3. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Contractor's construction schedule.
2. Field condition reports.

1.2 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. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.

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

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

1. Float time belongs to Owner.

1.3 INFORMATIONAL SUBMITTALS

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

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

C. Field Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. 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.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections:

1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
2. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect at Contractor's request for use in preparing submittals.

1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow ten (10) days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow (10) ten days for review of each resubmittal.

D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Name of subcontractor.
    f. Name of supplier.
    g. Name of manufacturer.
    h. Submittal number or other unique identifier, including revision identifier.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Location(s) where product is to be installed, as appropriate.
    l. Other necessary identification.

E. Options: Identify options requiring selection by the Architect.

F. Deviations: Identify deviations from the Contract Documents on submittals.

G. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

H. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form acceptable to Architect. Architect will return submittals, without review, received from sources other than Contractor.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
4. .Architect may invoice additional charges at no cost to Owner if Contractor fails to comply with requests noted for resubmittal.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams showing factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

    a. Four paper copies of Product Data, unless otherwise indicated. Architect, will return two copies to Contractor and forward one copy to Owner.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Compliance with specified standards.
    d. Notation of coordination requirements.
    e. Notation of dimensions established by field measurement.
    f. Relationship and attachment to adjoining construction clearly indicated.
    g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
3. Submit Shop Drawings in the following format:

    a. Four opaque copies of each submittal. Architect will retain one copy and forward one copy to Owner; remainder will be returned.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of applicable Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

D. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

E. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

F. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

G. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

K. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

M. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

N. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

O. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

P. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action**.**

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. 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.

C. Related Sections:

1. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.2 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 Architect.

C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

E. 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 specified requirements.

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

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

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

I. 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. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: 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 conflicting 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.

1.4 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

A. 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. 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.

C. 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.

D. 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.

1.7 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

B. 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.

C. 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.

D. 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 (Not Used)

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

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

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

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

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

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

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. 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.

1.3 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

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

C. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: indicated on drawings.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Field Offices: The Contractor shall provide in his Base Bid the cost to provide and maintain in good condition (1) one field office trailer for the exclusive use of the Construction Manager and one (1) for their own use. The field offices shall be ready no later than (30) thirty days after Notice to Proceed, and it is estimated that the field offices will be required until such time that interior construction will allow for a space to used for a temporary field office.

C. The Construction Manager's Field Office Trailer (exact location in lot to be determined) and shall be a weatherproof construction, having a floor area of not less than 420 SF (12'x35') and a ceiling height of 7 ½ feet, having two partitions and doors providing two rooms, one for an office and the other to hold meetings. The field office shall have (1) one clothes closet of ample size and all stairs shall have safety rails installed. The bathroom should be in good working order for the project duration and stocked with all lavatory supplies as needed for the project duration. The Contractor will be responsible to install and pay for all utilities for the trailer for the project duration and will be required to disconnect all utilities upon project completion. Doors and windows shall be equipped with adequate locks and all keys shall be given to the Construction Manager.

Provide the following items & equipment in the Construction Manager's Field Office as part of the Contractor's Base Bid:

a. Provide heating sufficient to maintain a minimum of 70 degrees F interior temperature during the winter. Provide air conditioning sufficient to maintain a maximum of 75 degrees F interior temperature during the summer.
b. Provide coffee machine with coffee service for project duration.
c. Provide water cooler with bottled water service for project duration.
e. Provide weekly Cleaning Services of Trailer
f. Provide the following new or reconditioned furnishings for the Construction Manager's exclusive use:
   1. (2) Two 3' x 6' metal desks
   2. (2) Two high-back swivel chair and (2) side chairs
   3. (1) Drafting table and (1) chair for standard size plans
   4. (1) conference table and chairs to accommodate 10 persons
   5. (1) mobile plan rack with twelve 30" sticks
   6. (2) Two fire resistant 36" wide legal 4 drawer lateral file cabinets with locks and hanging file folders.
   7. One 36"x48" commercial grade melamine dry-erase board and a four (4) pack of assorted color dry-erase markers.
   8. One metal bookshelf with 4 shelves (min of 20 l.f.)
   9. (1) One First Aid kit.
   10. (2) Two trash receptacles and (2) two display boards.
   11. Fire Extinguishers as required.
   12. Internet Service: Cable modem or broadband service in each field office with a static I.P. address

D. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install electric power service overhead unless otherwise indicated.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

I. Contractor to provide various electrical equipment & office supplies for the exclusive use of the Construction Manager. This includes, but is not limited to:

(1) Network Capable / Commercial Color Copier / Printer (8 ½ x 11, 8 ½ x 14, 11 x 17) Automatic Feeder, Scanner, Fax, Stapler & Stand
(1) Wireless N Router

The Contractor is required to utilize the Construction Manager's Project Management Software: ProCore Contract Management Program) through the entire duration of the project. The Contractor will be provided with user credentials upon award of contract.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 312000 "Earth Moving."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course.

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

    a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touchup signs so they are legible at all times.

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

K. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

G. Site Enclosure Fence: Prior to commencing earthwork, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As indicated on Drawings.
2. Privacy screening to be included in bid and to be maintained as part of contract.
3. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Discard or replace water-damaged and wet material.
4. Discard, replace, or clean stored or installed material that begins to grow mold.
5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.

2. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 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.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Section:

1. Division 01 Section "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable

product request within ten (10) days of receipt of request, or ten (10) days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:

a. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

4. Manufacturers:

   a. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

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

1. Evidence that the proposed product does not require revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Progress cleaning.
4. Protection of installed construction.
5. Correction of the Work.

B. Related Sections:

1. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

2. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement.

C. Curb Lines and Levels: Locate and lay out control lines and levels for curbs, fencing, and finish surface levels.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of use.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for material movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials

specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

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

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

3.7 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed.

1.4 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons.
4. Quantity of waste salvaged, both estimated and actual in tons.
5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.5 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements.

B. Refrigerant Recovery Technician Qualifications: Comply with requirements in Section 024116 "Structure Demolition." and Section 024119 "Selective Demolition."

C. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 013100 "Project Management and Coordination."

1.6 WASTE MANAGEMENT PLAN

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A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and, construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous solid waste generated by the Work. Facilitate recycling and salvage of materials

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.

2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Comply with requirements in Section 024119 "Selective Demolition" for salvaging demolition waste.

B. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

C. Salvaged Items for Sale: Not permitted on Project site.

D. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
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.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

    a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.4 RECYCLING DEMOLITION WASTE

A. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

B. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

C. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.

D. Conduit: Reduce conduit to straight lengths and store by material and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.

3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner’s property.

C. Burning: Do not burn waste materials.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.

B. Related Sections:

1. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
7. Complete final cleaning requirements, including touchup painting.
8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

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

1. Submit list of incomplete items in the following format acceptable to the architect:

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Provide two copies of warranties

2. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.

3. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
4. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return 1 copies.

C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

C. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Name and contact information for Commissioning Authority.
8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
9. Cross-reference to related systems in other operation and maintenance manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Precautions against improper use.
7. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.

7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.

2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.

F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017838 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit two paper-copy set(s) of marked-up record prints.
2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit three paper-copy set(s) of marked-up record prints.
2) Print each drawing, whether or not changes and additional information were recorded.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Record data as soon as possible after obtaining it.
    c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

2.2 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 017838

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

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

1.2 DEFINITIONS

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

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

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

1.3 FIELD CONDITIONS

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

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

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

D. Hazardous Materials: Hazardous materials are present in materials to be selectively demolished including roof tear off described in Section 070150.19, Preparation For Re-Roofing.

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

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

1.4 WARRANTY

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

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

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

1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

3.3 PREPARATION

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

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

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

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

3.4 SELECTIVE DEMOLITION, GENERAL

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

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

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

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

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.

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

B. Burning: Do not burn demolished materials.

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

3.6 CLEANING

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

END OF SECTION 024119

SECTION 053100 – STEEL DECKING

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. Section Includes:

1. Roof deck.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATION SUBMITTALS

A. Product Certificates: For each type of steel deck, signed by product manufacturer.

B. Welding certificates.

C. Field quality-control test and inspection reports.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

1. Power-actuated mechanical fasteners.

E. Research/Evaluation Reports: For steel deck.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.

B. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

D. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those steel deck units tested for fire resistance per ASTM E 119 by a testing and inspection agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

E. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

F. FMG Listing: Provide steel roof deck evaluated by FMG and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1.7 MEASUREMENTS

A. Field Measurements: Obtain all field measurements required for proper fabrication and installation of work. Submit prior to installation, all measurements indicating discrepancies from the drawings. Describe in writing, and where applicable, by sketches proposed methods of correcting the discrepancies. Measurements are the responsibility of the contractor.

B. Lay out each part of the work in strict accordance with the architectural, structural, mechanical, electrical, plumbing and all other drawings and be responsible for correct location of the same. Lay out from at least two pre-established benchmarks and axis lines, individually correct for length and bearing.

C. Templates: Furnish templates and layout drawings for exact locations of items to be embedded in concrete, with setting instructions required for installation of embedded items.

D. Coordination: Steel deck shop drawings shall be coordinated as with the supporting structural steel shop drawings; this included dimensions and measurements indicated on those shop drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

C. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 35 percent.

2.2 ROOF DECK

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

1. Canam United States; Canam Group Inc.
2. Consolidated Systems, Inc.; Metal Dek Group.
3. Epic Metals Corporation.
4. Marlyn Steel Decks, Inc.
5. New Millennium Building Systems, LLC.
6. Nucor Corp.; Vulcraft Group.

B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G90 (Z275) zinc coating.
2. Deck Profile: Match existing adjacent
3. Profile Depth: Match existing adjacent
4. Design Uncoated-Steel Thickness: As indicated; 0.0358-inch (0.91 mm) minimum.
5. Span Condition: Triple span or more.
6. Side Laps: Overlapped or interlocking at Contractor’s option and in coordination with the deck manufacturer.

2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 30 for overhang and slab depth.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

H. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.

I. Galvanizing Repair Paint: ASTM A 780.

J. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

K. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction [and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].

1. Flat Paints and Coatings: 50 g/L.
2. Non-flat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.
4. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
5. Zinc-Rich Industrial Maintenance Primers: 340 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

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

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows:

1. Weld Diameter: 5/8 inch (16 mm), nominal.
2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds 12 inches (305 mm) apart in the field of roof and 6 inches (150 mm) apart in roof corners and perimeter, based on roof-area definitions in FMG Loss Prevention Data Sheet 1-28.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 18 inches (450 mm) and as follows:

1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
2. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (51 mm) minimum.

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld or mechanically fasten flanges to top of deck. Space welds or mechanical fasteners not more than 12 inches (305 mm) apart with at least one weld or fastener at each corner.

1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.5 REPAIRS AND PROTECTION

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

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 053100

SECTION 061000 - ROUGH CARPENTRY

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. Work Included: Provide rough carpentry work as specified and as shown on the Drawings, including the following:

1. Wood grounds, nailers, blocking and furring.
2. Plywood construction panels.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for manufactured materials, including plywood construction panels and related materials.

B. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, and using treated material.

1. Submit certification by treating plant stating type of treatment, preservative retained and conformance with applicable standards.
2. Submit a statement that moisture content of treated materials complied with levels indicated before delivery.

1.4 QUALITY ASSURANCE

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

1.5 PRODUCT HANDLING

A. Delivery and Storage: Keep materials under cover and dry. Stack wood to provide air circulation within and around stacks.

1.6 PROJECT CONDITIONS

A. Coordination: Fit carpentry work to other work accurately. Correlate location of rough carpentry for attachment of other work.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

A. Lumber Standards: Comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee.

B. Grade Stamps: Furnish lumber with grade stamp of inspection agency to show compliance with grading rules, and identifying grading agency, grade, species, moisture content and mill.

C. Provide lumber sizes as required by PS 20, unless otherwise shown.

1. Provide dressed lumber, S4S.
2. Provide seasoned lumber with 15% maximum moisture content.

2.2 MISCELLANEOUS LUMBER

A. General: Provide wood for support or attachment of other work including cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members of sizes and shapes shown.

B. Grade: Construction Grade lumber of western or southern species.

2.3 PLYWOOD PANELS

A. Plywood Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood construction panels and, for products not made under PS 1 provisions, with APA PRP-108.

1. Composite wood manufacturer's product data for each composite wood product used indicating that the bonding agent contains no urea formaldehyde.
2. Adhesive manufacturer's product data for each adhesive used indicating that the adhesive contains no urea formaldehyde.

a. Low VOC: All adhesives shall comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

B. Trademark: Factory-mark each construction panel with APA trademark to show compliance with grade requirements.

C. Plywood Backing Panels: For mounting electrical, telephone, or other equipment, provide fire-retardant-treated plywood panels with grade designation, APA C-D PLUGGED EXPOSURE 1, in thickness indicated, or, if not otherwise indicated, not less than 1/2 inch or as required.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners and Anchorages: Provide size, type, material and finish complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers, anchors and connectors of the size and type recommended by the manufacturer for each use indicated including recommended nails.

1. Where rough carpentry work is exposed to weather, within exterior construction (such as

roofing and exterior masonry and wall construction, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153).

2. Provide galvanized steel connectors, minimum 16 gage, of type and size as recommended by manufacturer for uses indicated.
3. At all wood preservative treated wood use stainless steel, type 304, fasteners and anchors.

2.5 WOOD TREATMENT BY PRESSURE PROCESS

A. Preservative Treatment: Comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark.

1. Pressure-treat above-ground items with water-borne preservatives to comply with AWPB LB-2. After treatment, kiln-dry lumber and plywood to 15% maximum moisture content. Treat the following:

a. Wood cants, nailers, curbs, blocking and stripping in connection with exterior wall construction roofing, flashing and waterproofing.
b. Wood sills, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.

2. Complete fabrication of treated items prior to treatment, where possible. Coat field cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPA M4.

B. Fire-Retardant Treatment: Treat all interior wood and wood products indicated or required by Code to be fire-retardant, using methods accepted by the New Jersey Building Code. Identify treated lumber with appropriate marking.

1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
2. Nonbearing exterior walls where no fire rating is required.
3. Roof construction, including girders, trusses, framing and decking.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard defective materials. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

B. Securely attach carpentry work as required by specified standards. Countersink nail heads on exposed carpentry work and fill holes.

C. Use fasteners of size to not penetrate members to exposed side or into finish materials. Make tight connections; install fasteners without splitting of wood; predrill as required.

D. Provide concealed blocking, sheet metal grounds and additional items as necessary and as indicated on the Drawings.

3.2 WOOD GROUNDS, NAILERS, SLEEPERS, AND BLOCKING

A. Provide where shown for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Where possible, anchor to concrete and masonry during their installation.

C. Provide permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2 inch wide and of thickness to match finish material. Remove temporary grounds when no longer required.

3.3 INSTALLATION OF PLYWOOD PANELS

A. General: Comply with applicable recommendations contained in Form No. E 30, "APA Design/Construction Guide - Residential & Commercial," for types of plywood panels and applications indicated.

B. Fastening Methods: Anchor to wall construction. Using anchors and fasteners appropriate to the substrate construction. At gypsum board construction fasten to studs. At masonry construction use masonry anchors.

END OF SECTION 061000

SECTION 071000 - MODIFIED BITUMINIOUS MEMBRANE RE-ROOFING PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes removal of existing roofing system in preparation for new roof system, as indicated on architectural drawings.

B. Remove the existing roof system including the recovery board, insulation, base flashings, sheet metal, vent stack flashings, completely to the existing roof deck. Sweep and clean all debris off of the deck and adjacent areas.

C. Once roof system has been removed, inspect existing deck and perimeter wood blocking for integrity. Install new decking to match existing decking where applicable and as directed by the Architect. Follow all structural metal deck guidelines to assure proper installation of deck infill where necessary.

D. Provide a price per lineal foot for replacing perimeter wood blocking that is damaged or deteriorated.

E. Provide a price per square foot for replacing/repairing metal decking that is damaged or deteriorated.

F. Inspect new drain plumbing to ensure proper water flow and re-secured as needed.

G. Matching perimeter wood blocking heights with new insulation heights is the responsibility of the installing contractor.

H. Related Sections:
1. Section 07 22 00 – Roof Insulation
2. Section 07 55 00 – Modified Bituminous Membrane Roofing – Torch Applied
3. Section 07 60 00 – Sheet Metal Flashing & Trim

1.2 SYSTEM DESCRIPTION

A. Roof Areas as Indicate: Remove complete existing roof system including the roof plies, insulation and associated materials down to the roof deck, perimeter structure and roof penetrations prior to installing the new roof system. Remove and replace damage roof deck.

B. Remove roof mounted equipment as required to install new roof, membrane and curbs. Replace as required.

1.3 SUBMITTALS

A. Field Reports: Indicate results of deck quality and fastener pullout tests to be submitted to owner’s representative.

B. Fastener pullout test reports for the individual roof deck types.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with industry standards.

1.5 QUALIFICATIONS

A. Materials Removal Firm: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 PRE-INSTALLATION MEETINGS

A. Convene a minimum two weeks prior to commencing work of this section.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not remove existing roofing membrane when weather conditions threaten integrity of building contents or intended continued occupancy.

C. Maintain continuous temporary protection prior to and during installation of new roofing system to keep building weather tight.

1.8 SCHEDULING

A. Schedule Work to coincide with commencement of installation of new roofing system.

1.9 COORDINATION

A. Remove only existing roofing materials being replaced with new materials, as weather will permit.

B. Coordinate Work with other affected mechanical and electrical work associated with roof penetrations.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Temporary Protection: Sheet polyethylene or fiber reinforced plastic; furnish weights to retain sheeting in position.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing roof surface is clear and ready for work of this section.

B. Perform pullout testing on roof decks using the specified base sheet fasteners and/or insulation fasteners to confirm the required pullout values as specified in the Modified Bituminous Membrane Roofing specification.

3.2 PREPARATION

A. Remove complete existing roof system including the roof plies, insulation and associated materials down to the roof deck, perimeter structure and roof penetrations prior to installing the new roof system.

B. Sweep roof surface clean of loose matter.

C. Remove loose refuse and dispose off site in a manner compliant with all local, state and federal laws / regulations for waste disposal.

D. Ensure existing substrate is sloped, and/or level and plumb, as per the project documents prior to the laying of new insulation.

3.3 EXISTING CONSTRUCTION

A. Remove metal counter flashings.

B. Remove existing roofing system(s), perimeter base flashings, flashings around roof protrusions, metal edge systems, coping cap systems, pitch pans and pockets, insulation vents, and leaders as necessary

C. Remove damaged deck materials.

D. Remove inadequate or damaged curbing.

E. Replace removed deck surface with new deck surfacing to match existing where required.

F. Replace removed curbing w/ new curbing where required.

3.4 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution Requirements: Protecting installed construction.

B. Install temporary protective sheeting over uncovered deck surfaces.

C. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.

D. Provide for surface drainage from sheeting to existing and new drainage facilities.

E. Do not permit traffic over unprotected or repaired deck surface.

END OF SECTION 071000

SECTION 072200 - ROOF INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY:

A. This section includes information for the installation of the tapered polyisocyanurate insulation system, and roof recovery board, over the properly installed and prepared metal deck substrate section for the Modified Bituminous Membrane Roof System.

B. The Contractor shall install the specified tapered polyisocyanurate roof insulation over the properly prepared metal roof deck. The new polyisocyanurate insulation shall be mechanically fastened to the roof deck in accordance with the project specifications to meet or exceed the wind uplift requirements. On top of the polyisocyanurate insulation, a non-structural, high density, fiberboard recovery board shall be installed and adhered with the specified insulation adhesive in accordance with the project specifications. Where the tapered insulation system is too thick to be mechanically attached, the base layer(s) should be mechanically attached to the metal roof deck, and the subsequent layer(s) shall be adhered in the specified insulation adhesive.

I. Install specified tapered crickets/saddles at all roof top equipment and between scuppers and drains where necessary.

J. Install specified tapered insulation at first four (4) feet of new gutter line. **Gutter will be accepted without additional tapered insulation.**

K. Smooth any build up of materials along the insulation to prevent air pockets. Shave, trim and grind down any irregularitites to make all new insulation fit properly.

1.3 RELATED SECTIONS

A. Division 07 10 00 “Modified Bituminous Membrane Re-Roofing Procedures
B. Division 07 55 00 “Modified Bituminous Membrane Roofing – Torch Applied)
C. Division 07 60 00 “Sheet Metal Flashing and Trim”.

1.4 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM C-1289, Specification for Faced Rigid Polyisocyanurate Thermal Insulation
   2. ASTM D-312-00, Specification for Asphalt Used in Roofing.
   3. ASTM D-1863, Specification for Mineral Aggregate Used on Built-Up Roofs.
   4. ASTM D-2178, Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.

5. ASTM D-4601, Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
6. ASTM D-5147, Sampling and Testing Modified Bituminous Sheet Material.
7. ASTM E108-00, Test Methods for Fire Test of Roof Coverings.

B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)

C. Factory Mutual Research (FM):
1. Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.

E. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.

F. Warnock Hersey (WH):
1. Fire Hazard Classifications.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

H. Steel Deck Institute, St. Louis, Missouri (SDI)

I. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)

J. Insulation Board, Polyisocyanurate (FS HH-I-1972)

K. Insulation Board, Thermal (Fiberboard) (FS LLL-1-535B)

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with this specification.

B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

C. Provide a sample of each insulation type.

D. Shop Drawings

1. Submit four (4) copies of manufacturer's shop drawings indicating complete installation details of flat insulation system, drain location, sump, roof slopes, thicknesses, tapered crickets and saddles.

2. Shop drawing shall include: Outline of roof, location of drain, sump, complete board layout of tapered insulation components (crickets and saddles), thickness and the minimum and average "R" value for the completed insulation system.

1.6 QUALITY ASSURANCE

A. Certify that roof system furnished is approved by an approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

B. Pre-installation Meeting: Refer to Division 7 Section Modified Bituminous Membrane Roofing specifications for pre-installation meeting requirements.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. In accordance with the manufacturer’s recommendations, immediately remove the plastic wrapping on the recovery boards and cover with a watertight, ventilated enclosure (i.e. tarpaulins). Prevent the formation of condensation on the boards.

E. Store materials off the ground and roof surfaces. Any warped, broken or wet insulation boards shall be removed from the site.

F. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.

G. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

PART 2 - PRODUCTS

2.1 APPROVED EQUIVALENT

A. Basis of Design: Materials, manufacturer’s product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

B. Contractor must submit any product not specified to Architect in order for product to be considered for approval. The Architect will notify Contractor in writing of decision to accept or reject request.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 1 provisions.

1. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.

2. The Architect's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 INSULATION MATERIALS

A. Thermal Insulation Properties and Approved Insulation Boards.

1. Tapered Polyisocyanurate Roof Insulation; ASTM C-1289:

Qualities:	Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
Thickness:	Minimum 5" (3" @ Gutter)
R-Value:	Minimum 30 (5.2" Thickness)
Compressive Strength:	Minimum 20 psi
Tapered Slope:	1/4": 1'
Source of Supply:	Tapered H-Shield; Hutter Panels Tapered E'NRG'Y-3; Johns Manville EnergyGuard; GAF Approved Equivalent

Insulation board shall meet the following requirements:
UL, WH or FM listed under Roofing Systems
Federal Specification HH-I-1972, Class 1

2. Non-structural, water-resistant, fiber-reinforced gypsum substrate recovery board:

Qualities:	*Non-structural, water-resistant, fiber-reinforced gypsum roof board*
Board Size:	*Four feet by four feet (4' x 4')*
Thickness:	*One-Half (1/2) inch*
R-Value:	*0.50*
Source:	*Securock by United States Gypsum Company (USG)*

Insulation board shall meet the following requirements:
UL, WH, FM listed under Roofing Systems.
Federal Specification LLL-I-535-B.

2.3 RELATED MATERIALS

A. Fiber Cant and Tapered Edge Strips: Preformed perlite (torch applied system), or fiberboard (cold applied system) insulation units of sizes/shapes indicated as per the approved manufacturer.

1. Acceptable Manufacturers:

Johns Manville
GAF
Approved Equivalent

B. Crickets: Shall be fabricated from tapered polyisocyanurate insulation and shall ensure complete drainage of the roof system.

1. Shall be fabricated from 1/2":1' tapered polyisocyanurate.

C. Gutter: First four (4) feet of roof from gutter line shall be fabricated from tapered polyisocyanurate insulation and shall ensure complete drainage of the roof system. The additional tapered insulation shall be shall be four (4) feet wide, run the entire length of the gutter and fabricated from ½":1' tapered polyisocyanurate

D. Asphalt Primer**:** V.O.C. compliant, ASTM D41.

E. Cold Applied Insulation Adhesive **-** INSUL-LOCK HR or approved equal; Cold applied, highly elastomeric, high rise, fast setting, two-component with a one step application mechanism, VOC compliant, foamable insulation adhesive that contains no solvents and sets in minutes. Designed to adhere approved insulation to insulation, structural decks, base sheets, smooth and graveled surfaced built-up roofs.

1. Tensile Strength (ASTM D 412-92)	250 psi
2. Density (ASTM D 1875-90)	8.5 lbs/gal
3. Viscosity (ASTM D 2556-93a)	22,000-60,000 cP
4. Peel Strength (ASTM D 903)	17 lb/in
5. Flexibility (ASTM D 816-82)	Pass @ -70°F

F. Roof Insulation Fasteners:

1. OMG Standard corrosion resistant roofing screw fastener with Sentri coating as recommended by roof membrane manufacturer.

2. Approved fasteners with three (3) inch coated disc to meet or exceed the specific project wind uplift requirements listed in Section 1.16 "Design and Performance Criteria" of Division 7 Section "Modified Bituminous Membrane Roofing". Length as required to penetrate roof deck per the screw manufacturers recommendation or one (1) inch if not listed.

G. Roof Board Joint Tape: Six (6) inches wide glass fiber mat with adhesive compatible with insulation board facers.

PART 3 - EXECUTION

3.1 INSPECTION OF SURFACES

A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.

1. Verify that deck surfaces and project conditions are ready to receive work of this section.
2. Verify that deck is supported and secured to structural members.
3. Verify that drain bowl assemblies are installed and set at proper height to permit a slope of ½" per foot within the sump. The sump shall be a four (4) foot square sump, unless noted otherwise and/or required to be smaller or larger to accommodate drainage around equipment.
4. Verify that work which penetrates roof deck has been completed.
5. Verify that wood nailers are properly and securely installed.
6. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
7. Verify that existing wood blocking and nailers that are of the size and type specified to be used are sound and not rotted or detiorated. Replace deteriorated wood with new wood of like kind, size and configuration per the project details and specifications. Install new wood blocking as specified in the project documents.
8. Verify that deck surfaces are dry, free of snow or ice, not corroded/rotten or deteriorated, and are structurally sound. **Replace decking that is deteriorated or is not structurally sound in like kind to match existing.**
9. Do not proceed until defects are corrected.
10. Do not apply insulation until substrate is dry. Confirm that moisture content of the concrete roof deck, wood blocking and nailers does not exceed twelve (12) percent by moisture meter tests.
11. Broom or air blow clean substrate immediately prior to application.
12. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.
13. Verify that vapor barrier has been completed, prepared and ready for application of the insulation system on top.
14. Contractor is responsible to verify existing and new substrates are sloped as stated in/on the project documents prior to installation of insulation system. All defects in roof pitch to be accommodated with tapered insulation to ensure a positive pitch to all roof drains.

3.2 INSTALLATION

A. Mechanically Fastened Polyisocyanurate Insulation System to Metal Deck.

1. Approved polyisocyanurate insulation boards shall be installed with joints in continuous straight lines, perpendicular to roof slopes with joints staggered between rows. Tightly butt substrate boards together. Boards shall be fully attached to the deck with an approved mechanical fastening system. As a minimum, the amount of fasteners shall be in accordance with the following:

- Six (6) fasteners per 4' x 4' board in Zone 1 (field of roof)
- Nine (9) fasteners per 4' x 4' board in Zone 2 (perimeter of roof)

- Twelve (12) fasteners per 4' x 4' board in Zone 3 (corners of roof)

Zones 2 & 3 must extend from the roof edge onto the roof area a minimum distance of 10% of the building width.

2. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.

3. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.

4. **Minimum penetration into deck shall be per the screw manufacturer's field confirmed pull tests, but not less than one and one-half (1.5) inches.**

B. Recovery Board Attachment with Cold Applied Insulation Adhesive:

1. The surface must be thoroughly cleaned using compressed air, vacuum equipment or hand/power brooms to remove dust, loose dirt or debris.

2. Apply specified insulation adhesive directly to the insulation board, in a ribbon pattern in 3/4" beads, using an automatic applicator, at the maximum spacing listed below. Immediately place the recovery board into the wet adhesive. Do not slide the recovery board into the adhesive. Do not allow the adhesive to skin over. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular of uneven surfaces may prevent the insulation from making positive contact with the adhesive. In these cases, relief cuts or a temporary weight may be required.

- Beads shall be at 12 inches o.c. maximum per 4' x 4' board in Zone 1 (field of roof)
- Beads shall be at 9 inches o.c. maximum per 4' x 4' board in Zone 2 (perimeter of roof)
- Beads shall be at 6 inches o.c. maximum per 4' x 4' board in Zone 3 (corners of roof)

C. General Installation Requirements.

1. Approved insulation shall be sumped and tapered around roof drains. Ensure the roof drains are set at the proper height to provide a smooth transition from the roof insulation system into the sump. Tapered insulation sump shall start at the drain with a thickness required to achieve ½" per foot slope for the specified minimum dimension two (2) feet from the center line of the drain. Install tapered insulation sump in such a way to provide proper slope for runoff. Shape insulation with tool as required so completed surface is smooth and flush with ring of drain. Under no circumstances will the membrane be left unsupported in an area greater than one quarter (¼) inch. Install recovery board over tapered insulation sump as required.

2. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (¼) inch away from the vertical surface.

3. Install no more insulation at one time than can be roofed on the same day.

4. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work. Install an envelope water stop at the edge of insulation to prevent water infiltration into new insulation/roof system.

5. Cant Strips/Tapered Edge Strips: Install preformed fourty five (45) degree cant strips at junctures of vertical surfaces. Provide preformed, tapered edge strips at perimeter of edges of roof that do not terminate at vertical surfaces and/or indicated on the drawings. Tape joints of insulation as per manufacturer's requirements. The wall/cant juncture will be examined for air passage. If airflow is present, joint between cant and wall will be sealed with closed cell joint backing and joint sealant.

3.4 CLEANING

A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

END OF SECTION 072200

SECTION 075500 - MODIFIED BITUMINOUS MEMBRANE ROOFING - TORCH APPLIED

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY -

A. Torch applied asphalt modified bituminous membrane roofing over prepared substrate and insulation system.

1. Remove existing roof system down to the metal roof decks.
2. Install specified roof insulation system and recovery board in accordance with Division 7 Section “Roof Insulation”.
3. Install one (1) ply of the specified self adhered modified bitumen base sheet over all exposed wood surfaces prior to the installation of torch applied membranes
4. Install the specified SBS modified base roofing ply throughout the field via the specified torch methods.
5. Install one (1) ply of the specified SBS modified mineral surfaced cap sheet over the base roofing ply via the specified torch methods
6. Install two (2) ply modified asphalt membrane flashing system in the specified torch applied flashing adhesive where applicable.
7. Apply specified aluminum coating over field and flashings (All Roof Areas U.N.O.).

B. This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the torch applied modified bituminous membrane roof system over prepared substrates.

1.3 RELATED SECTIONS

A. Division 7 Section “Roof Insulation” for insulation above the roof deck.
B. Division 7 Section “Modified Bituminous Membrane Re-Roofing Procedures”.
C. Division 7 Section “Sheet Metal Flashing and Trim”.

1.4 REFERENCES

A. American Society of Civil Engineers (ASCE):
1. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.

B. American Society for Testing and Materials (ASTM):
1. ASTM D41, Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.

2. ASTM D312, Specification for Asphalt Used in Roofing.
3. ASTM D451, Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
4. ASTM D1079, Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
5. ASTM D1863, Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
6. ASTM D2178, Specification for Asphalt Glass Felt Used as a Protective Coating for Roofing.
7. ASTM D2822, Specification for Asphalt Roof Cement.
8. ASTM D2824, Specification for Aluminum-Pigmented Asphalt Roof Coating.
9. ASTM D4601, Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.
10. ASTM D5147, Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
11. ASTM D6162, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
12. ASTM D6163, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
13. ASTM E108, Test Methods for Fire Test of Roof Coverings.

C. Factory Mutual Research (FM):
   1. Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA):
   1. Roofing and Waterproofing Manual.

E. Underwriters Laboratories, Inc. (UL):
   1. Fire Hazard Classifications.

F. Warnock Hersey (WH):
   1. Fire Hazard Classifications.

1.5 SYSTEM DESCRIPTION

A. It is the intent of this specification to install a long-term, quality roof system that meets or exceeds all current NRCA guidelines as stated in the most recent edition of the NRCA Roofing and Waterproofing Manual. Please discuss any concerns with the Engineer and Roofing System Manufacturer.

1.6 DISCLOSURE OF MATERIALS

A. The materials outlined herein are the materials that are to be used in this project. When a particular make or trade name is specified, it shall be indicative of the minimal standard of material required and to be used.

   i. The Architect reserves the right to be the final authority on the acceptance or rejection of any or all bids, or materials that has not met all specified requirement criteria.

1.7 SUBMITTALS

A. Submit under provisions of Contract Documents, Division 1 and this section.

B. Product Data: Provide manufacturer's technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.

C. Samples: Submit two (2) samples of each product specified.

D. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membrane.

E. Manufacturer's Fire Compliance Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

F. Manufacturer's Wind Uplift Certificate: The manufacturer of the modified bitumen membrane must provide certification that the proposed roof system will be secured properly to the structure to meet or exceed the specific project wind uplift requirements per Section 1.16 Design and Performance Criteria.

G. Manufacturer's Manufacturing Certificate: Certify that modified membrane materials to be used on this project conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

H. Manufacturer's Manufacturing Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001:2008 compliance certificate.

I. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77°F. Tests at 0°F will not be considered.

J. Submit a copy of an unexecuted manufacturer's warranty for review.

K. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

L. Provide a sample of each insulation type.

M. Shop Drawings:
   1. Submit four (4) copies of manufacturer's shop drawings indicating complete installation details of tapered and flat insulation system, including identification of each insulation

block, sequence of installation, layout, drain locations, sumps, roof slopes, thicknesses, tapered crickets and saddles.

2. Shop drawing shall include: Outline of roof, location of drains, sumps, complete board layout of tapered insulation components, thickness and the minimum and average "R" value for the completed insulation system.

N. **Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7-16, Method 2 for Components and Cladding, prepared by an engineer employed by the system manufacturer. In no case shall the design loads be taken to be less than those detailed in article 1.16 of this specification.**

1.8 QUALITY ASSURANCE & QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 15 years documented experience and having ISO 9001:2008 certification.

B. Manufacturer: The manufacturer must also have current ISO 9001:2008 certification for the manufacturing of the products to be utilized on this project.

C. Installer: Company specializing in modified bituminous roofing installation with a minimum 5 years experience and certified by roofing system manufacturer as qualified to install manufacturer's roofing materials.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work and at any time roofing work is in progress. Maintain proper supervision of workmen. Maintain a copy of the specifications in the possession of the Supervisor/Foremen and on the roof at all times.

1. Maintain a copy of the Contract Documents in the possession of the Supervisor/Foreman and on the roof at all times.

E. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.

1. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner has the right to hire a qualified contractor and backcharge the original contractor.

G. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.9 PRE-INSTALLATION CONFERENCE

A. Pre-Installation Roofing Conference: Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of modified bituminous roofing system installation and associated work**.**

B. Require attendance of installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing which must precede or follow roofing work (including mechanical work if any), Architect, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, testing agencies and governing authorities.

C. Objectives of conference to include:
   1. Review foreseeable methods and procedures related to roofing work.
   2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.
   3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
   4. Review roofing system requirements (drawings, specifications and other contract documents).
   5. Review required submittals both completed and yet to be completed.
   6. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
   7. Review required inspection, testing, certifying and material usage accounting procedures.
   8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).
   9. Record discussion of conference including decisions and agreements (or disagreements) reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
   10. Review notification procedures for weather or non-working days.

D. The Owner's Representative will designate one of the conference participants to record the proceedings and promptly distribute them to the participants for record.

E. The intent of the conference is to resolve issues affecting the installation and performance of roofing work. Do not proceed with roofing work until such issues are resolved the satisfaction of the Owner and Engineer of Record. This shall not be construed as interference with the progress of Work on the part of the Owner or Engineer of Record.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end. Cover the roll goods with a canvas tarpaulin or other breathable material (not polyethylene).

C. In accordance with the manufacturer's recommendations, immediately remove the plastic wrapping on the roof recovery boards and cover with a watertight, ventilated enclosure (i.e. tarpaulins). Prevent the formation of condensation on the boards.

D. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.

E. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

F. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

1.11 MANUFACTURER'S INSPECTIONS

A. When the project is in progress, the roofing system manufacturer **must** provide the following:
   1. Keep the Architect/Owner informed as to the progress and quality of the work as observed.
   2. Provide job site inspections a **minimum of three (3) days a week** with weekly reports to the Architect/Owner.
   3. Report to the Architect/Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractors attention.
   4. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

B. At the request of the Owner, the roofing system manufacturer shall provide the Owner, or his representative, **with an annual inspection of the roofing system.** This period shall be for the duration of the delivered warranty period.

1.12 PROJECT CONDITIONS

A. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

B. Do not apply roofing insulation or membrane to damp deck surface.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.13 SEQUENCING AND SCHEDULING

A. Sequence installation of modified bituminous sheet roofing with related units of work specified in other sections to ensure that roof assemblies including roof accessories, flashing, trim and joint sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.

B. Fully complete the installation of insulation system and base roofing ply assembly, and/or the installation of the modified bituminous membrane roof ply each day. Phase construction between the base roofing ply and modified membrane roof ply (top ply) is acceptable.

1.14 WARRANTY

A. Upon completion of installation, and acceptance by the Architect, the manufacturer will supply to the **Owner a single-source, thirty (30) year Edge-to-Edge no dollar limit (NDL) warranty.** This Edge-to-Edge warranty shall cover the roof system and flashings, coating, roof flood coat and gravel and the pre-fabricated metal edge fascia system. Warranty will include the roof systems, modified bitumen flashings, pre-manufactured metal edge fascia system and the transition between all systems.

B. Installer will submit a minimum of a three (3) year warranty to the manufacturer with a copy directly to Owner.

C. At the request of the Owner, the roofing system manufacturer shall provide the Owner, or his representative, with an annual inspection of the roofing system. This period shall be for the duration of the delivered warranty period.

1.15 SITE CONDITIONS

A. Field measurements and material quantities:

1. Contractor shall have SOLE responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

B. Existing Conditions:

1. Building space directly under roof area covered by this specification will be utilized by on-going operations. Do not interrupt Owner operations unless prior written approval is received from Owner.

C. Waste Disposal:

1. Do not re-use, re-cycle or dispose of materials except in accordance with all applicable regulations. The use of products is responsible for proper use and disposal of product containers.

D. Safety Requirements:

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, local and Owner fire and safety requirements.
3. Advise Owner whenever work is expected to be hazardous to Owner, employees, and/or operators.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
5. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, fuels, solvents, torches and open flames are being used.

1.16 DESIGN AND PERFORMANCE CRITERIA

A. Uniform Wind Uplift Load Capacity

1. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.

a. Design Code: ASCE 7-16, Method 2 for Components and Cladding.

b. Category III Building with an Importance Factor of 1.0.

c. Wind Speed: 124 mph

d. Exposure Category: C

e. Design Roof Height: 30 feet

f. Minimum Building Width: 103 feet

g. Roof Pitch: 1/4 inches per foot (tapered insulation)

i. Topographic Factor: 1.00

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. When a particular trade name or performance standard is specified it shall be indicative of the minimum standard required. Product names for the materials used in this section shall be based on performance characteristics of the modified bitumen roof system manufactured by The Garland Company, Cleveland, OH, (908) 812-6971 and shall form the basis of design for these contract documents.

B. Provide primary products, including each type of roofing membrane, base flashings, flashing membrane ply, miscellaneous flashing materials and surfacing’s from a single source roof

manufacturer. Provide secondary products (insulation, recovery board, etc.) only as recommended by the roof manufacturer of primary products for use with the roof system specified.

C. Any item or materials submitted as a substitution to the basis of design manufacturer specified, must be submitted by the bidding Contractor and must comply in all respects as to the quality and performance of the brand name specified. The Architect shall be the sole judge as to whether or not an item submitted as a substitute is truly equal. Should the Contractor choose to submit a substitute product, he shall assume all monetary or other risk involved, should the Architect find the substitution unacceptable.

D. The following manufacturers are acceptable, providing they meet these specifications and the minimum standards stated.

a. The Garland Company, Inc.
b. Approved Equal

2.2 DESCRIPTION

A. Modified bituminous roofing work including but not limited to:

1. Prior to installing the insulation system on the roof deck, repair or replace any defects in accordance with the project specifications.

2. Installation of polyisocyanurate insulation and recovery board over the properly prepared roof deck in accordance with Division 7 Roof Insulation Section.

3. Self-Adhered Base Flashing Ply: SA BASE IV or approved equal; One (1) ply of 110 mil thick SBS fiberglass reinforced, self-adhering modified base sheet fully adhered to any **exposed wood surfaces that need to be waterproofed.**

4. Base Roofing Ply: HPR TORCH BASE SHEET or approved equal; One (1) ply of 110 mil thick SBS Torch Grade Base Sheet fully adhered to approved torchable insulation with roofer's torches.

5. Base Flashing Ply: HPR TORCH BASE SHEET or approved equal; One (1) ply of 110 mil thick SBS Torch Grade Base Sheet fully adhered to approved torchable insulation with roofer's torches.

6. Modified Membrane Roofing Ply: STRESSPLY IV PLUS MINERAL **(All Roof Areas U.N.O.);** One (1) ply of 195 mil thick SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual polyester/fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed.

7. Modified Membrane Flashing Ply: STRESSPLY IV PLUS MINERAL; One (1) ply of 195 mil thick SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified

roofing membrane with a fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed.

8. Surfacing: GARLA-BRITE or approved equal; A non- fibered, asphalt-based aluminum roof coating system **(All Roof Areas U.N.O**.).

2.3 BITUMINOUS MATERIALS

A. Asphalt Primer: V.O.C. compliant, ASTM D-41.

B. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.

C. Flashing Adhesive: FLASHING BOND or approved equal, cold applied flashing adhesive.

D. Aluminized Asphalt Roofing Mastic: SILVER-FLASH or approved equal.

E. Elastomeric Asphaltic Sealant: GARLA-FLEX SEALANT or approved equal.

F. Penetration Sealant: TUFF-FLASH PLUS LO LIQUID FLASHING ADHESIVE

2.4 SHEET MATERIALS

A. Base Roofing Ply: SA BASE IV or approved equal **(For exposed wood surfaces only)**
1. SA BASE IV: 110 mil SBS fiberglass reinforced self-adhering modified base sheet with the following minimum performance requirements according to ASTM D-5147.

Properties (Finished Membrane):		
Tensile Strength (ASTM D-5147) 2 in/min. @73.4 ± 3.6°F	MD 75 lbf/in	XD 50 lbf/in
Tear Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 105 lbf	XD 100 lbf
Elongation at Maximum Tensile (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 5.0%	XD 5.0%
Low Temperature Flex (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	0°F	
Thickness :	100 mils	

B. Base Roofing Ply: HPR TORCH BASE SHEET or approved equal
1. HPR TORCH BASE SHEET: 110 mil SBS Torch Grade Base Sheet with woven fiberglass scrim reinforcement with the following minimum performance requirements according to ASTM D-5147.

Properties: (Finished Membrane):

Tensile Strength (ASTM D-5147) 2 in/min. @73.4 ± 3.6°F	MD 210 lbf/in	CMD 210 lbf/in
Tear Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 250 lbf	CMD 250 lbf
Elongation at Maximum Tensile (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 4.0%	CMD 4.0%
Thickness :	110 mils	
Post-Consumer Recycled Content :	6%	

C. Base Flashing Ply: HPR TORCH BASE SHEET or approved equal
   1. HPR TORCH BASE SHEET: 110 mil SBS Torch Grade Base Sheet with woven fiberglass scrim reinforcement with the following minimum performance requirements according to ASTM D-5147.

Properties: (Finished Membrane):

Tensile Strength (ASTM D-5147) 2 in/min. @73.4 ± 3.6°F	MD 210 lbf/in	CMD 210 lbf/in
Tear Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 250 lbf	CMD 250 lbf
Elongation at Maximum Tensile (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 4.0%	CMD 4.0%
Thickness :	110 mils	
Post-Consumer Recycled Content :	6%	

D. Modified Membrane Flashing Ply: STRESSPLY IV PLUS MINERAL or approved equal
   1. STRESSPLY IV PLUS MINERAL: 195 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual polyester/fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed. The membrane has the following minimum performance characteristics according to ASTM D 6162 Type III Grade G

Tensile Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 310 lbf/in	XD 310 lbf/in
Tear Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 510 lbf	XD 510 lbf
Elongation at Maximum Tensile (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 9.0%	XD 8.0%

Low Temperature Flexibility (ASTM D-5147)	Passes -40°F (-40°C)
Thickness :	195 mils

E. Modified Membrane Roofing Ply **(All Roof Areas U.N.O.):** STRESSPLY IV PLUS MINERAL or approved equal
   1. STRESSPLY IV PLUS MINERAL: 195 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual polyester/fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed. The membrane has the following minimum performance characteristics according to ASTM D 6162 Type III Grade G

Tensile Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 310 lbf/in	XD 310 lbf/in
Tear Strength (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 510 lbf	XD 510 lbf
Elongation at Maximum Tensile (ASTM D-5147) 2 in/min. @ 73.4 ± 3.6°F	MD 9.0%	XD 8.0%
Low Temperature Flexibility (ASTM D-5147)		Passes -40°F (-40°C)
Thickness :		195 mils

F. Reinforcing Mesh for Flashing Seams – GARMESH or approved equal; Styrene-Butadiene-Rubber (SBR) coated, woven, fiberglass scrim.

G. Reinforcing Mesh for Fluid Applied Membranes – GRIP POLYESTER SOFT or approved equal;

2.5 SURFACINGS

A. Mineral Surfaced Membrane: Roofing Granules shall meet requirements of ASTM D-451 and/or be recommended by the membrane manufacturer. Loose granules for bleedout shall match size and color of granulated membrane sheet.

B. Mineral Surfaced Membrane: If minerals are not applied properly into the bleedout, apply manufacturers' PYRAMIC BASE COAT or approved equal on field seams of modified bitumen roofing ply and broadcast minerals into the coating while it is still wet. Roofing Granules shall meet requirements of ASTM D-451 and/or be recommended by the membrane manufacturer.

C. SILVER-FLASH or approved equal: Aluminized asphalt mastic for the three-course application on vertical flashing seams.

D. Roof & Flashing Coating (All Roof Areas U.N.O.): GARLA-BRITE or approved equal; ASTM D2824 Type I non-fibered aluminum coating. **Installation of the minerals in the bleedout are still required for the coating application.**

2.6 RELATED MATERIALS

A. Roof Insulation and Recovery Boards: In accordance with Division 7 Roof Insulation Section.

B. Roof Insulation Fasteners: In accordance with Division 7 Sections 07 22 00 & 07 22 10

C. Roof Insulation and Recovery Board Adhesive: In accordance with Division 7 Roof Insulation Sections.

D. Nails and Fasteners: Non-ferrous metal or hot dipped galvanized fasteners complying with ASTM A153 and connectors complying with ASTM A653, Class G185; Type 304 or Type 316 stainless steel fasteners and connectors shall be used with new generation of pressure-treated wood; except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the wood blocking/nailer material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.

E. Metal Discs: Flat discs or caps of zinc-coated sheet metal not lighter than twenty eight (28) gauge and not less than one (1) inch in diameter. Form discs to prevent dishing. Bell or cup shaped caps are not acceptable.

F. Metal Flashing Sheet: Metal flashing sheet is specified in Section 07 60 00 - Sheet Metal Flashing and Trim.

G. Lead Flashing Sheet: Meets Federal Specification QQ-L-201, Grade B, four pounds per square foot.

H. Metal Termination Bars:

1. Shall be heavy flat bar aluminum unless otherwise recommended by membrane manufacturers.

2. Material shall be .125” x 1” (minimum) aluminum conforming to ASTM B-221, mill finish.

I. Protection and Walkway Pads: Recycled rubber (97% recycled rubber), anti-skid surface pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, ½ inch thick, minimum.

1. Minimum Pad Size: 3’-0” x 3’-0”

J. Protection and Walkway Pads Adhesive: GREENLOCK STRUCTURAL SEALANT.

K. Urethane Sealant: One part, non-sag sealant as recommended by the membrane manufacturer for moving joints.

1. Tensile Strength (ASTM D412)	250 psi
2. Ultimate Elongation (ASM D412)	950%
3. Hardness, Shore A (ASTM C920)	35
4. Adhesion-in-Peel (ASTM C920)	25 pli
5. 100% Modulus (ASTM D412)	50 psi
6. Bond (Durability-Class 25, ASTM C920)	Passes
7. Service Temperature Range	-40°F to +180°F
8. Stain and Color Change (ASTM C920)	Passes
9. Tack Free Time (ASTM C679 (max 72 hrs.)	16 hrs.
10. Weep and Sag (ASTM C920 (max 3/16”(4mm)))	Passes
11. Weight loss after heat aging (ASTM C920 (max 10%))	Passes

L. Pitch Pocket Sealer: Seal-Tite or approved equal; one-part, pourable, self-leveling, 100% solids, urethane sealant.

M. Non-Shrink Grout: Use an all-weather fast setting chemical action concrete material to fill pitch Pans.

1. Flexural Strength (ASTM C-78 (modified))	7 days 1100psi
2. High Strength (ASTM C-109 (modified))	24 days 8400lbs (3810kg)

N. Primer: SA Primer or approved equal; polymer emulsion-based primer designed to improve the adhesion of self-adhered membranes (**to be used prior to torch application where exposed wood blocking is found).**

O. Reinforced Liquid Flashing: TUFF-FLASH PLUS LO or approved equal, two (2) part multi-purpose, asphaltic polyurethane based, low-odor, liquid flashing membrane system reinforced with an approved reinforcing scrim as provided by the roof membrane manufacturer.

1. Tensile Strength, ASTM D 412: 650 psi
2. Tear Strength, ASTM D624: 115 lbf/in
3. Elongation, ASTM D 412: 325%
4. Hardness, Shore A ASTM D2240@77°F: 55
5. Density @77 deg. F 8.3 lb/gal typical

P. Bellows Expansion Joint System: METALASTIC or approved equal curb to curb, wall to curb assembly, and Straight Metal Flange (SMF) system as per the project details, documents and manufacturer’s recommendations.

Q. Existing Drains: All existing drains shall be replaced. New drains shall be J.R. Smith, or equal, and match existing drain sizes and configuration. New drain assemblies shall include new drain bowls, deck clamps, clamping ring, hardware and cast-iron strainer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate surfaces to receive modified bituminous membrane roof system and associated work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer.

B. Prior to installing the finish modified membrane roofing ply, the contractor must notify the roof system manufacturer representative, and Owner's representative, to examine the roof area for high and low spots. It may be necessary to mist the roof with water to identify the problem areas. The contractor will correct all problem areas identified. This examination should take place no less than 24 hours in advance of installing the finished membrane.

C. Verify that deck surfaces and project conditions are ready to receive work of this section.

D. Verify that deck is supported and secured to structural members.

E. Verify that deck is clean and smooth, free of depressions, projections or ripples, and is properly sloped to drains or level as shown in the project documents. Clean roof deck of dirt, debris, water and snow.

F. Verify that adjacent roof members do not vary more than 1/4 inch in height.

G. Verify that deck surfaces are dry, free of snow or ice, not deteriorated, do not have bacterial growth, and are structurally sound.

H. Confirm that moisture content within the wood blocking and nailers does not exceed twelve (12) percent by moisture meter tests.

I. Verify that openings, curbs, pipes, conduit, sleeves, ducts, and other items which penetrate the roof are set solidly, and that wood cant strips, wood nailing strips and reglets are set in place. Verify that all roof curb heights are satisfactory and that the wood blocking height along the perimeter of the building and/or roof levels is satisfactory to provide positive roof pitch away from the building edge.

J. Contractor is responsible to verify existing substrate and structure is sloped as stated in/on the project documents prior to installation of insulation system. All defects in roof pitch to be accommodated with tapered insulation to insure a positive pitch to all roof drains.

3.2 PREPARATION - REMOVAL

A. Remove existing roof system(s), counter-flashings, roof flashings, and all accessories back to the roof deck and masonry walls.

B. Remove all existing scupper assemblies and install new scupper assemblies. New scuppers shall be in accordance with the above specification.

1. Prior to beginning work, contractor shall verify/test that existing roof drains are in working, or non-working, order. If the drains are in non-working order, the Owner shall address the non-working drain to working conditions. If the drains are in working order, then the contractor will be required to maintain, and deliver, the drains back to the Owner in working order.

C. Clean substrate of debris and other substances detrimental to roofing installation according to the roof system manufacturer's written instructions. Remove sharp objects.

D. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Use roof drain plugs as required to prevent materials from entering and clogging roof drains and conductors. Remove roof drain plugs at the end of each work day or when rain is forecasted. Replace or restore other work damaged by installation of the modified bituminous roofing system.

E. All existing roofing shall be torn off and removed completely down to the roof structure decking. Remove all Lightweight Concrete down to structural concrete deck **(School #9).** Dispose off-site in dumpsters.

F. Tear off only enough roofing, which can be successfully reroofed, in a single day.

G. Fully complete the installation of insulation system and base roofing ply assembly, and/or the installation of the modified bituminous membrane roof ply each day. Phase construction between the base roofing ply and modified membrane roof ply (top ply) is acceptable.

3.3 PREPARATION – METAL DECK

A. Clean substrate of debris and other substances detrimental to roofing installation according to the roof system manufacturer's written instructions. Remove sharp objects.

B. If bad corroded, deteriorated, damaged or unsound decking is present, it shall be removed and replaced using the same materials as the original, unless otherwise specified.

C. As required, install preformed sound absorbing insulation strips in acoustic deck flutes in accordance with manufacturer's instructions.

3.4 DRAIN INSTALLATION

A. Existing Drains: All existing drains will be replaced. New drains shall be in accordance with project documents and specified above. Sizes shall match existing. Drains will have new deck clamps, threaded receivers, and cast iron metal strainers. On roof sections having a gravel surfacing, a perforated stainless steel gravel guard that is integral with the clamping ring shall be installed. **Drains shall be installed prior to the roof installation at the proper height above the roof deck, and in accordance with the project documents.**

3.5 GENERAL INSTALLATION REQUIREMENTS

A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.

B. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

C. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the modified bituminous roofing system.

D. Coordinate installation of roofing system components so that the insulation is not exposed to precipitation or left exposed overnight. Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation with two (2) plies of #15 organic roofing felt with joints and edges sealed with roofing cement and other jointly agreed upon tie-in detail. Remove cut-offs immediately before resuming work.

E. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

F. Apply roofing materials as specified by manufacturer's instructions.
   1. Keep roofing materials dry before and during application.
   2. Begin and apply only as much roofing in one day as can be completed that same day.

G. Cut-Offs/Envelope Waterstops: At end of each day's roofing installation, protect exposed edge of incomplete work, including ply sheets and insulation. Install waterstop/temporary flashing a minimum of 6 inches under face edge of insulation and wrapped up face and back a minimum of 6 inches from the face in asphalt mastic at ¾ pounds per foot, top dress waterstop with asphalt mastic.

H. All wood blocking and/or sheathing where noted is to be primed with SA primer at a rate of .5 gallons per square and allowed to dry. All wood is to be covered with SA membrane extending beyond the wood edges a minimum of 2" in all direction.

I. A minimum two-hour fire watch is required for each day that torch-applied membranes are Installed unless noted otherwise by Owner. Keep an approved rated fire extinguisher every 3,000 square feet maximum on the roof. The fire extinguisher shall be placed in a central location in that area where all workers know where it is and how to operate in properly.

3.6 INSULATION INSTALLATION

A. Refer to Roof Insulation specification Division 7 Section 07 22 00 for complete installation requirements.

B. Deck type: Metal.

C. Insulation: Tapered and Flat, rigid polyisocyanurate insulation with a minimum total thickness as specified, and a high density, fiber-reinforced recovery board.

D. Insulation Attachment (Metal Decks): Polyisocyanurate insulation and the recovery board shall be installed over the properly prepared metal deck with the specified mechanical fasteners in accordance with wind uplift calculations and manufacturer's recommendations.

E. Joints of Recovery Board: Before installing the torch-applied modified bitumen roof system over the recovery board, ALL joints of the recovery board must be sealed with a 3-course application of mesh and cold-applied, solvent free adhesive or specified roof board joint tape.

3.7 BASE ROOFING PLY INSTALLATION:

A. Install the specified Base Roofing Ply to the properly prepared substrate. Shingle in proper direction to shed water on each area of roofing.

B. To an approved recovery board, lay out the roll in the course to be followed and unroll six (6) feet.

C. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.

D. After the major portion of the roll is bonded, re-roll the first six (6) feet and bond it in a similar fashion.

E. Repeat this operation with subsequent rolls with side laps of four (4) inches and end laps of eight (8) inches.

F. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.

G. Extend underlayment two (2) inches beyond top edges of cants at wall and projection bases.

H. Install base flashing ply to all perimeter and projection details.

I. Keep an approved rated fire extinguisher every 3,000 square feet maximum on the roof. The fire extinguisher shall be placed in a central location in that area where all workers know where it is and how to operate in properly.

3.8 MODIFIED MEMBRANE ROOFING PLY APPLICATION:

A. Install specified Modified Membrane Roofing Ply as described below.

B. Over the specified Base Roofing Ply, lay out the roll in the course to be followed and unroll six (6) feet. Seams for the top layer of modified membrane will be staggered over the Base Roofing Ply sheet seams. End laps of the specified Modified Membrane Roofing Ply shall be

staggered 12 inches minimum with the Base Roofing Ply end laps.

C. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.

D. After the major portion of the roll is bonded, re-roll the first six (6) feet and bond it in a similar fashion.

E. Repeat this operation with subsequent rolls with side laps of four (4) inches and end laps of eight (8) inches. End laps of the specified Modified Membrane Roofing Ply shall be staggered 12 inches minimum.

F. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal. Ensure a uniform and complete bleed out from the side and end laps. Embed minerals into the bleed out while melted and liquid.

G. Install modified flashing ply to all perimeter and projection details.

H. Keep an approved rated fire extinguisher every 3,000 square feet maximum on the roof. The fire extinguisher shall be placed in a central location in that area where all workers know where it is and how to operate in properly.

3.9 FLASHING MEMBRANE INSTALLATION

A. Seal all curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

B. Prepare all drain leads, walls and edge details to be flashed and where shown on the drawings, with asphalt primer at the rate of .75 to one gallon per square. Allow primer to dry tack free.

C. All wood blocking must be covered with manufacture's self-adhering modified membrane prior to the installation of any torch applied materials.

D. The wall/cant juncture will be examined for air passage. If airflow is present, the joint between the cant and wall will be sealed with a closed cell joint backing and reglet joint sealant.

E. Use the specified modified roof membrane flashing ply as the top flashing ply membrane and adhere to the underlying base flashing ply. Unless noted otherwise, secure at a minimum of twelve (12) inches from the finished roof surface using a continuous termination bar fastened at a maximum of six (6) inches on center.

F. Seal all vertical laps of flashing membrane with a three-course application of Silver-Flash aluminized trowel-grade mastic and mesh.

G. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified in other sections.

H. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work as specified in other sections.

I. Flash all penetrations as specified below and per the project documents. If specific detail is not shown in drawings or specified below, flash detail in accordance with the manufacturer's specifications to comply with the specified guaranty.

J. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
2. Run complete roof system plies over drain. Cut out plies inside drain bowl.
3. Set 4lb. lead flashing (thirty (30) inch square minimum) in ¼ inch bed of mastic. Run lead into drain a minimum of two (2) inches. Prime lead at a rate of one hundred (100) square feet per gallon and allow to dry.
4. Install base flashing ply (forty (40) inch square minimum) via torch methods.
5. Install modified membrane (forty-eight (48) inch square minimum) via torch methods. Stop both flashings plies short of the clamping ring and seal edge of modified flashing plies with a three-course application of SILVER-FLASH aluminized mastic and reinforcing mesh.
6. Install clamping ring over lead flashing.
7. Remove drain plug and install strainer.

K. Pre-Manufactured Snap on Metal Edge Fascia System:
1. Inspect the nailer to assure proper attachment and configuration prior to installing the roof system. Install new wood nailers as required and/or specified to achieve the proper height of the insulation plus roof recovery board. Wood nailers shall be set for highest thickness of insulation and roof recovery board, and shall be maintained constant around the perimeter of the roof.
2. Install tapered edge, and or cant strip, in adhesive to create a smooth transition from roof system to wood blocking.
3. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at eight (8) inches o.c.
4. Install new metal fascia/extender system with continuous cleat. Fasten to the wall and/or wood blocking at 6” o.c. each item.
5. Install new pre-fabricated metal cant dam system in a bed of roof cement, and fasten at twelve (12) inches on center both top flange and outside face of cant dam with specified fasteners.
6. Prime cant dam at a rate of one hundred (100) square feet per gallon and allow to dry.
7. Strip in flange with base flashing ply covering entire cant dam via torch methods with six (6) inches on to the field of roof. Assure ply laps do not coincide with metal laps.
8. Install the modified flashing ply via torch methods over the base flashing ply, and nine (9) inches on to the field of the roof.
9. Fasten both flashing plies to the cant dam with a flat head fastener at eight (8) inches o.c.
10. Install pre-fabricated fascia cover over the cant dam and top of flashing plies.

L. Base Flashing For Non-Supported Deck (Wall Expansion Joint):
   1. Inspect the nailer to assure proper attachment and configuration. The wood cant strip should be mechanically attached to the vertical and horizontal wood nailers.
   2. Install compressible insulation in neoprene cradle between wall and vertical wood nailer.
   3. Prime vertical wall at a rate of one hundred (100) square feet per gallon and allow to dry.
   4. Install base flashing ply via torch methods covering entire wall and wrapped to top of wood nailer with six (6) inches on to field of the roof. Nail membrane at eight (8) inches o.c.
   5. Install modified flashing ply over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
   6. Install specified pre-manufactured bellows type wall to curb expansion joint cover in accordance with the project details. Fasten the expansion joint to the curb with neoprene gasketed screws at twelve (12) inches o.c. with fasteners and neoprene washers. Fasten the copper expansion joint to the masonry wall with approved fasteners at eight (8) inches o.c. Furnish continuous prefabricated transitions for all 90 degree junctures/corners. Terminate the end of the expansion joint in accordance with the manufacturer's recommendations.

M. Exhaust Fan/Passive Vent/Air Intake:
   1. Minimum curb height is eight (8) inches off the finished roof surface. As required, raise existing curbs to the required height. Prime vertical curb surface at a rate of one hundred (100) square feet per gallon and allow to dry.
   2. Set cant in cold applied insulation adhesive. Run all plies, including modified membrane, over cant a minimum of two (2) inches.
   3. Install base flashing ply covering curb with six (6) inches on to field of the roof.
   4. Install the modified flashing ply installed over the base flashing ply**,** nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of Silver-Flash aluminized mastic and mesh at all vertical seams.
   5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation. If the existing fan cover cannot fit over the installed flashing system, stop the flashing system at the top of the curb and fasten with cap nails at eight (8) inches on center. Install an 0.040" aluminum slip flashing under the fan cover and fasten to the curb at eight (8) inches on center with neoprene gasketed screws. The slip flashing shall cover the top of the flashing system three (3) inches minimum. Install new corner pieces on the fan cover as required to ensure the cover is watertight.

N. Plumbing/Soil Stack:
   1. Minimum stack height is twelve (12) inches.
   2. Run roof system over the entire surface of the roof. Seal the base of the stack with mastic
   3. Prime flange of new lead sleeve. Install properly sized lead sleeve set in ¼ inch bed of roof cement.
   4. Install base flashing ply by torch methods.
   5. Install modified membrane by torch methods.
   6. Seal the intersection of the membrane and stack with roof cement.

7. Turn sleeve a minimum of one (1) inch down inside of stack. For pipes 2 inches or less in diameter, lead top caps will be required.

O. Pitch Pocket:
1. Run all plies up to the penetration.
2. Place the pitch pocket over the penetration and prime all flanges.
3. Strip in flange of pitch pocket with one (1) ply of base flashing ply. Extend six (6) inches onto field of roof.
4. Install the modified membrane extending nine (9) inches onto field of the roof.
5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with specified two-part pourable sealer.
6. Caulk joint between roof system and pitch pocket with roof cement.

P. Pre-manufactured Curb for Equipment Support:
1. **Secure curb to roof deck.** Minimum curb height above top of roof is eight (8) inches. Install wood blocking on bottom, or top, of curb to achieve this height. Prime vertical at a rate of one hundred (100) square feet per gallon and allow to dry.
2. Set cant in adhesive. Run all field plies over cant of the pre-manufactured equipment support a minimum of two (2) inches.
3. Install base flashing ply covering pre-manufactured curb with six (6) inches on to field of the roof.
4. Install modified flashing ply over the base flashing ply**,** nine (9) inches on to field of the roof. Install flashing plies on top of the curb, and nail at eight (8) inches o.c. with cap nails. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
5. Install pre-manufactured cover. Fasten sides at twenty four (24) inches o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape/sealant between metal covers.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

Q. Curb Detail/Air Handling Station:
1. Minimum curb height is eight (8) inches. Prime vertical at a rate of one hundred (100) square feet per gallon and allow to dry.
2. Set cant in adhesive. Run field plies over cant and up the curb a minimum of two (2) inches.
3. Install base flashing ply covering curb with six (6) inches on to field of the roof.
4. Install modified membrane over cant and up the curb a minimum of two (2) inches.
5. Install modified flashing ply over the base flashing ply**,** nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
6. Install a 0.040” aluminum slip flashing under the existing counterflashing and over the roof flashing system and fasten to the curb at eight (8) inches on center with neoprene gasketed screws. The slip flashing shall cover the top of the flashing system three (3) inches minimum.

R. Wood Sleeper Support:

1. Approved wood of equal thickness to insulation will be placed into position where weight of object is over 12 pounds per square foot. Wood will be two (2) inches wider than base of object being supported.
2. Insulation will be installed up against wood sleeper.
3. Entire roof system will be installed over wood sleeper.
4. A walkpad will be installed in approved adhesive under the wood sleeper support.
5. Treated wood supports for the particular equipment would then be placed on the modified membrane roofing ply. Supports will be a minimum of four (4) inches wide.

S. Heat Stack:
1. Minimum stack height is twelve (12) inches.
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric asphaltic sealant or roof cement.
3. Prime flange of new sleeve. Install properly sized sleeves set in ¼ inch bed of roof cement.
4. Install base flashing ply via torch methods.
5. Install modified membrane via torch methods.
6. Caulk the intersection of the membrane with roof cement.
7. Install new collar over cape. Weld collar or install stainless steel draw brand.

T. Surface Mounted Counterflashing:
1. The minimum flashing height for new counter-flashing is eight (8) inches. Maximum flashing height is thirty (30) inches. Prime vertical wall at a rate of one hundred (100) square feet per gallon and allow to dry.
3. Set cant in adhesive. Run the torch applied roofing ply over cant and stop at the top edge of the cant strip.
4. Install base flashing ply covering wall with six (6) inches on to field of the roof.
5. Install modified membrane roofing ply over cant and up the wall a minimum of two (2) inches.
6. Install modified flashing ply via torch methods over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
7. Install the specified termination bar even with the top of the flashing, and secure the termination bar through flashing and into wall every six (6) inches on center. Seal the top of the termination bar/flashing with a 3-course application of Silver-Flash and Garmesh or elastomeric asphaltic sealant.
8. Install new surface mounted counterflashing on the wall and secure with neoprene gasketed screws at eight (8) inches on center. End joints shall be interlocking and overlapping not less than 3". Corners shall be mitered and welded to a watertight condition. The bottom of the cap flashing insert shall project ¼" from the face of the wall with a down turned drip edge (provide a down turned hem in areas subject to human contact). New counterflashing shall cover the termination bar a minimum of four (4) inches.

U. Curb to Curb Expansion Joint:

1. Install wood blocking to achieve minimum flashing height of eight (8) inches. Chamfer top of curb. Prime vertical curb at a rate of one hundred (100) square feet per gallon and allow to dry.
2. Set cant in adhesive. Run the torch applied roofing ply over cant and stop at the top edge of the cant strip.
3. Install base flashing ply via torch methods covering curb with six (6) inches on to field of the roof.
4. Install modified membrane over cant and stop at the top edge of the cant strip.
5. Install modified flashing ply by torch methods over the base flashing ply, nine (9) inches on to the field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
6. Install a vapor retarder to serve as a retainer for insulation. Attach to top of the chamfered curb. Install compressible insulation inside vapor retarder.
7. Install specified pre-manufactured bellows type curb to curb expansion joint cover in accordance with the project details. Fasten the expansion joint to the curb with neoprene gasketed screws at twelve (12) inches o.c. with fasteners and neoprene washers. Furnish continuous prefabricated transitions for all 90 degree junctures/corners. Terminate the end of the expansion joint in accordance with the manufacturer's recommendations.

V. Area Divider:
1. Minimum curb height is eight (8) inches above roof membrane surface. Prime vertical at a rate of one hundred (100) square feet per gallon and allow to dry.
2. Set cant in adhesive. Run field plies over cant and up the curb a minimum of two (2) inches.
3. Install base flashing ply covering curb with six (6) inches on to field of the roof.
4. Install modified membrane over cant and up the curb a minimum of two (2) inches.
5. Install modified flashing ply over the base flashing ply**,** nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
6. Install a 0.040" aluminum coping cover the curb and roof flashing system, fasten to the curb at eight (8) inches on center with neoprene gasketed screws. The aluminum coping shall cover the top of the flashing system three (3)inches minimum.

W. Hybrid Wall Flashing with Pre-Manufactured Metal Edge Fascia
1. Prime the vertical wall at a rate of one hundred (100) square feet per gallon and allow to dry with asphalt primer a minimum of 12" above new roof surface where new modified bitumen flashing membrane will be installed.
3. Set cant in adhesive. Run all field plies, including modified membrane, to the top edge of cant strip and seal with asphalt mastic to a watertight condition.
4. Install base flashing ply up wall minimum of 12" via torch methods.
5. Install the modified mineral flashing ply via torch methods over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of Silver-Flash aluminized trowel-grade mastic and mesh at all seams.
6. Install the specified termination bar even with the top of the flashing and secure the termination bar through flashing and into wall every six (6) inches on center. Seal the

top of the termination bar/flashing with a 3-course application of Silver-Flash and Garmesh or elastomeric asphaltic sealant

7. *Mechanically attach ½" thick exterior grade plywood to wall above modified bitumen flashing and around window and door openings.*
8. *Install new surface mounted counter-flashing with four (4) inch flange flat against plywood and above termination bar secured @ 12" o.c. New counterflashing shall cover the termination bar a minimum of four (4) inches.*
9. *Prime 4" counter-flashing flange along with the plywood sheathing and wood nailers above with single-ply primer and allow to dry.*
10. *Install minimum 60 mil. EPDM membrane fully adhered in bonding adhesive over four (4) inch counter-flashing flange and covering entire exposed wall. Using a heavy roller ensure membrane is smoothed out and fully adhered. Nail membrane at eight (8) inches o. c. to outside face of nailers on top of wall. Heat weld all seams using lister gun.*
11. *Install new metal fascia/extender system with continuous cleat. Fasten to wall structure or wood blocking as specified. Metal fascia extender shall cover the bottom of the wood nailer and top of wall (interface between wood blocking and wall) a minimum of two (2) inches.*
12. *Install specified pre-manufactured metal fascia system.*

X. Roof Edge with Gutter:

1. Inspect the nailer to assure proper attachment and configuration. **Thickness of wood must be the same height of the polyisocyanurate roof insulation and recovery board.**
2. Run field base roofing ply over the edge. Assure coverage of all wood nailers. Fasten the base roofing ply to the outside face of the wood blocking with ring shank cap nails at eight (8) inches o.c.
3. Install new metal extender with continuous cleat. Fasten to wood/masonry structure as specified. Metal fascia extender shall cover the bottom of the existing fascia a minimum of two (2) inches.
4. Over the field base roofing ply (i.e. before the installation of the cap sheet), install box gutter with 4" flange set in a bed of roof cement. Install internal straps and external brackets fastened every 30 inches on center in a staggered pattern.
5. Gutter flange will be secured with two (2) rows of approved stainless steel fasteners every 6" on center, staggered pattern.
6. Prime metal edge at a rate of one hundred (100) square feet per gallon and allow to dry.
7. Strip in flange with base flashing ply covering entire flange six (6) inches past the inside edge of the wood nailer onto the field of the roof. Assure ply laps do not coincide with metal laps.
8. Install modified membrane roofing ply via torch methods over the field of the roof and base flashing ply (i.e. there is no separate modified membrane flashing ply).
9. Install a bead of rubberized asphaltic sealant at the edge of the flashing membrane and the box gutter.

Y. Reglet Mounted Counterflashing:

1. Remove existing reglet mounted counterflashing system to allow the installation of the new roof flashing and counterflashing system.
2. Minimum flashing height is eight (8) inches. Maximum flashing height is thirty (30) inches. Prime vertical wall at a rate of one hundred (100) square feet per gallon and allow to dry.
3. Set cant in adhesive. Run field plies over the cant and up the wall a minimum of three (3) inches.
4. Install base flashing ply covering wall set via torch methods with six (6) inches on to field of the roof.
5. Install modified membrane roofing ply over cant and up the wall a minimum of two (2) inches.
6. Install modified flashing ply via torch methods over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
7. Install the specified termination bar even with the top of the flashing and secure the termination bar through flashing and into wall every six (6) inches on center. Seal the top of the termination bar/flashing with a 3-course application of Silver-Flash and Garmesh or elastomeric asphaltic sealant.
8. Cut reglet in masonry one joint above flashing.
9. Install new reglet counterflashing with lead expansion wedges at 12” on center and seal reglet opening with high grade polyurethane sealant. End joints shall be interlocking and overlapping not less than 3”. Corners shall be mitered and fabricated to a watertight condition. The bottom of the cap flashing insert shall project ¼” from the face of the wall with a down turned drip edge (provide a down turned hem in areas subject to human contact). New counterflashing shall cover the termination bar a minimum of four (4) inches.

3.10 APPLICATION OF SURFACING

A. Prior to installation of surfacing, the completed roof system must be inspected and approved by the Owner and Manufacturer. An Infrared Scan is to be done at all roof areas to receive flood and gravel surfacing prior to the installation of the surfacing. If necessary, all repairs must be made by the Contractor prior to the application of the surfacing system. All bitumen materials must be properly cured per the manufacturer’s recommendations prior to applying the surfacing system.

B. Mineral Surfaced Membrane System: While bleed out from the side and end laps are still hot, hand broadcast minerals into asphalt bleed out for a monolithic appearance. If minerals are not properly installed in the bleedout, apply manufacturers’ PYRAMIC BASE COATING on all field seams of the modified membrane roofing ply at a rate of two (2) gallons per square, and immediately broadcast loose minerals into the coating while it is still wet.

C. Aluminum Roof Coating **(All Roof Areas U.N.O.):**
   1. Allow all cold applied mastics and roofing to properly dry and cure in accordance with manufacturer’s recommendations before installing the aluminum coating.

2. Base Coat Application: Brush or roller apply one (1) coat of the specified base coat at a minimum rate of 0.75 gallons per one hundred (100) square feet, per coat.

3. Top Coat Application: Brush or roller apply one (1) coat of the specified base coat at a minimum rate of 0.75 gallons per one hundred (100) square feet, per coat.

3.11 FIELD QUALITY CONTROL

A. Perform field inspection and testing as required by this specification.

B. Correct defects or irregularities discovered during field inspection.

C. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system

3.12 CLEANING

A. Remove any bitumen adhesive drippings from all walls, windows, floors, ladders and finished surfaces.

B. In areas where finished surfaces are soiled by bitumen or any other sources of soiling caused by work of this section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.13 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.

B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. The roofing system manufacturer and/or Owner reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the Roofing Contractor at a negotiated price.

D. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas at his own expense.

E. Repair or replace deteriorated or defective work found at time above inspection as required to produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

F. Notify the Owner and roofing system manufacturer upon completion of corrections.

G. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

END OF SECTION 075500

SECTION 076000 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Provide all labor, equipment, and materials fabricate and install the following.
1. Pre-manufactured metal coping cap system, metal fascia extenders and trim.
2. Scuppers
3. Escutheon plates
4. Reglet mounted counterflashings over bituminous base flashing.
5. Surface mounted wall counterflashings over bituminous base flashing.
6. Counterflashings over bituminous base flashing.
7. Counterflashings at roof mounted equipment and vent stacks.
8. Counterflashings for roof accessories.
9. Counterflashings at walls and penetrations.
10. Lead flashing for bituminous membranes.
11. Other components.

1.2 RELATED SECTIONS

A. Division 6 Section “Rough Carpentry” for wood nailers, cants, curbs, and blocking and for wood-based, structural-use roof deck panels and walls.
B Division 7 Section “Roof Insulation”
C. Division 7 Section “Re-Roofing Procedures”
D. Division 7 Section “Modified Bituminous Membrane Roofing – Torch Applied”

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.

2. ASTM A792 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.

3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

4. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

5. ASTM D692 Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.

6. ASTM B32 Solder Metal

7. ASTM B486 Paste Solder

8. ASTM D226 Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

9. ASTM D486 Asphalt Roof Cement, Asbestos-free

B. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI)

1. ANSI/SPRI ES-1 Testing and Certification Listing of Pre-Manufactured Metal Coping Cap System.

C. Warnock Hersey International, Inc., Middleton, WI (WH)

D. Factory Mutual Research Corporation (FMRC

E. Underwriters Laboratories (UL)

F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

1. 1993 Edition Architectural Sheet Metal Manual

G. National Roofing Contractors Association (NRCA)

1. Roofing and Waterproofing Manual

H. American Society of Civil Engineers (ASCE)

1. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures.

I. FS QQ-L-201 - Specification for Lead Sheet

J. FS O-F-506 - Flux, Soldering, Paste and Liquid

1.4 SUBMITTALS

A. Submit under provisions of this specification.

B. Product Data: Provide manufacturer's specification data sheets for each product.

C. Submit two samples, 12 x 12 inch in size illustrating typical external corner, internal corner, valley, junction to vertical dissimilar surface, material and finish.

D. Shop Drawings

1. For manufactured and **ANSI/SPRI** approved pre-manufactured metal coping caps, edge metal and metal fascia extenders, and all other sheet metal fabrications.

2. Shop drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.

3. Indicate type, gauge and finish of metal.

E. Sample Warranty

1. Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner. Warranty shall be provided from one manufacturer and part of a total Edge-to-Edge roof warranty that includes the modified bitumen membrane roof system, pre-manufactured metal edge fascia system, and flashing systems.

F. Certification

1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.

G. Manufacturer's Product Data

1. Metal material characteristics and installation recommendations.

2. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.

H. ANSI/SPRI ES-1 (Pre-manufactured Metal Edge System)

1. Test report must be submitted for specific project wind uplift requirements per Section 1.16 Design and Performance Criteria within Modified Bituminous Membrane Roofing specification.

1.5 QUALITY ASSURANCE

A. Reference Standards

1. Comply with details and recommendations of SMACNA Manual for workmanship, methods of joining, anchorage, provisions for expansion, etc.

B. If required, fabricator/installer shall submit work experience and evidence of adequate financial Responsibility. The owner’s representative reserves the right to inspect fabrication facilities in determining qualifications.

C. Successful contractor must obtain all components of roof system from a single manufacturer including any roll good materials if required. Any secondary products that are required, which cannot be supplied by the specified manufacturer, must be recommended and approved in writing by primary manufacturer prior to bid submittal.

D. Manufacturer shall have in place a documented, standardized method for maintaining quality control such as ISO-9001 approval.

E. The roof material manufacturer shall conduct all required periodic inspections of work in progress as described herein and shall furnish written documentation of all such inspections.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials which may cause discoloration or staining.

1.7 JOB CONDITIONS

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal roofing system.

B. Protection:

1. Provide protection or avoid traffic on completed roof surfaces.

2. Do not overload roof with stored materials.

3. Support no roof-mounted equipment directly on the roofing system.

C. Ascertain that work of other trades which penetrates the roof or is to be made watertight by the roof, is in place and approved prior to installation of roofing.

1.8 DESIGN AND PERFORMANCE CRITERIA

A. **ANSI/SPRI ES-1 (Pre-manufactured Metal Edge System)**

1. ANSI/SPRI ES-1 test reports must be submitted for specific project wind uplift requirements per Section 1.16 Design and Performance Criteria within Modified Bituminous Membrane Roofing specification.

B. Thermal expansion and contraction:

1. Completed extruded anchor bar system shall be capable of withstanding unlimited thermal expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.9 WARRANTIES

A. Material Manufacturer's Warranty

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.

2. Warranty shall be an Edge-to-Edge roof warranty provided by one manufacturer, and shall include the modified bitumen roof system, pre-manufactured metal edge fascia system, flashings, and the transition between all systems.

3. Provide a manufacturer's Edge-to-Edge roof warranty. The manufacturer will also furnish their standard decorative finish warranty.

4. At the request of the Owner, the Manufacturer will provide an annual inspection. The request for annual inspections shall be applicable for the life of the warranty.

B. Contractor's Warranty

1. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of three (3) years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metal systems (metal fascia extenders, reglet mounted counterflashings, surface mounted counterflashings, overflow scuppers, escutcheon plates, etc.), are to be comprised of Aluminum, coated on both sides with an epoxy primer and on the weathering surface with a polyvinylidene fluoride (Kynar) coated finish. Equipment counterflashings and equipment slip flashings, area dividers and metal expansion joints shall be mill finish. Pitch pockets shall be 20 oz. copper, and have all corners soldiered, and a continuous 4" wide minimum deck flange at corners. All overflow scuppers shall pre-fabricated and have fully welded seams and 4" deck flanges.

1. Materials

a. Aluminum

Aluminum, ASTM B209, alloy 3105-H14, in thickness of 0.050" nominal for all metal fascia extenders, reglet mounted counterflashings, surface mounted counterflashings and overflow scuppers. All equipment counterflashings, overflow scupper escutcheon plates, and slip flashings shall have a thickness of 0.040".

1. Minimum thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor's National Association, Inc. recommendations.

b. Color shall be selected by Architect from manufactures standard color range. Counterflashings, expansion joint covers and slip flashings shall be mill finish.

B. Metal Edge Snap on Fascia System: The Garland Company, Inc (908) 812-6971)) R-Mer Edge Snap-On Fascia System.

1. Metal shall be aluminum, ASTM B209, alloy 3105-H14, in thickness of 0.050" nominal with Kynar 500 or approved equal. Color to be selected by Owner from Manufacturer's color chart.
2. **Cant Dam shall be 22 ga. galvanized and continuous for the entire roof edge and attached per the manufacturer to meet the ANSI SPRI ES-1 testing.**
3. All submittals for approved equals shall conform to Sections 1.5 Quality Assurance and 1.8 Design & Performance Criteria.
4. Provide a manufacturer's Edge-to-Edge roof warranty. Warranted materials shall be free of defects in material and workmanship for five years after shipment. The manufacturer will also furnish their standard decorative finish warranty.
5. Extenders shall be fabricated from 0.050" aluminum with Kynar 500 or approved equal. **Extenders shall not exceed seven (7) inches in length. It is the contractors responsibility to know how many extenders will be needed based on new insulation thickness**. Extender color to match metal edge snap on fascia system.

C. New Surface Mounted Wall Counterflashing system shall be 0.050" aluminum counterflashing system. Flashings shall be formed to be secured with lead plugs on 12" on center, with a continuous bead of specified polyurethane sealant.

E. **Pitch pockets shall be 20 oz. copper, and have all corners soldered, and a continuous 4" wide minimum deck flange at corners.**

F. Two Piece counterflashing systems shall be the two-piece type factory formed system and shall consist of a two-piece Type 300 Series chrome-nickel soft temer stainless steel. Units and type, material, and profile indicated, formed to provide secure interlocking of separate receiver and counterflashing pieces, and compatible with flashing indicated:

1. Material: Stainless steel, 0.0187 inch thick.

2. Surface Mounted Type: Provide with 45-degree caulk cup above fastening flange.

3. Stucco Type: Provide with upturned fastening flange of 4" minimum, and extension leg of length to match thickness of applied finish materials or a minimum of 4".

4. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.

5. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.

6. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of the counterflashing lower edge.

Receiver shall have a special vertical locking slot that requires no malleting or bending to the cap insert member in place.

Cap insert members shall be Type 300 Series soft temper astentic stainless steel 0.018" thick, factory formed to snap lock into vertical locking slot on the receiver portion and provide spring action against the roof flashing system.

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

1. Keystone Flashing Company
2. Fry Reglet Corporation
3. Cheney Flashing Company

G. Miscellaneous Metals and Flashings:

1. Gutters: Kynar finished aluminum, 0.050-inch-thick with 4" wide deck flanges. All gutters shall be fabricated per the project drawings and specifications.

2. Escutcheon Plates: Kynar finished Aluminum, 0.040 inch thick.

3. Surface Mounted Counterflashings: Kynar finished Aluminum, 0.050 inch thick.

4. Copper Metal Flashings: 20 oz. copper.

5. Equipment Slip Flashing: Mill finished Aluminum, 0.040 inch thick.

6. Equipment Support Flashing: Mill finished Aluminum, 0.040 inch thick.

7. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.

8. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.

9. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened. Exposed fasteners shall have a neoprene or other suitable weatherproofing washer.

10. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.

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

12. Sealing Tape: Pressure sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

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

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

15. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

16. Zinc-Coated Steel Sheet: ASTM A526, 0.20% copper, 26 gauges (0.0179"); designation G90 hot-dip galvanized, mill phosphatized.

17. Stainless Steel Sheet: Type 302/304, ASTM A167, 26-gauge, (0.0217"), annealed except dead soft where fully concealed by other work, 2D (dull) finish.

18. Copper Sheet: ASTM B370, 20 oz., temper HOO (cold-rolled).

19. Lead-Coated Copper Sheet: ASTM B101. Type I, Class A (12-15 1 lb. of lead coating per 100 sq. ft.), 17.1 oz. (0.022").

20. Zinc Alloy Sheet: Zinc with 0.6% copper and 0.14% titanium; 0.27" thick (21 gauge); standard (soft) temper, mil finish.

2.2 RELATED MATERIALS

A. Metal Primer: Zinc chromate type.

B. Plastic Cement: ASTM D 4586

C. Sealant: As required by material manufacturer.

D. Lead: Meets Federal Specification QQ-L-201, Grade B, four (4) pounds per square foot.

E. Solder: ANSI/ASTM B32; 95/05 type.

F. Flux: FS O-F-506.

G. Underlayment: Ply of specified base flashing modified membrane, R-MER SEAL high-temperature underlayment, of approved equal.

H. Fasteners:

1. Nails and Fasteners: Non-ferrous metal or hot dipped galvanized fasteners complying with ASTM A153 and connectors complying with ASTM A653, Class G185; Type 304 or Type 316 stainless steel fasteners and connectors shall be used with new generation of pressure-treated wood; except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the wood blocking/nailer material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.

2. Fastening shall conform to ANSI/SPRI ES-1 requirements, SMACNA, or as stated on section details, whichever is more stringent and per the manufacturer's requirements.

I. Metal Termination Bars:

1. Shall be heavy flat bar aluminum unless otherwise recommended by membrane manufacturers.

2. Material shall be .125" x 1" (minimum) aluminum conforming to ASTM B-221, mill finish. Bars shall have holes for fasteners at 6" o.c. maximum.

PART 3 - EXECUTION

3.1 PROTECTION

A. Isolate contact areas of dissimilar metals with heavy asphalt or other approved coating, specifically made to stop electrolytic action.

3.2 GENERAL

A. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction.

B. Fastening of metal to walls and wood blocking shall comply with ANSI-SPRI ES-1, SMACNA Architectural Sheet Metal Manual and/or manufacturer's recommendations whichever is of the highest standard.

C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.

D. Pre-Manufactured metal edge fascia system's continuous cant dam shall be secured to the top and side of wood blocking or wall.

E. Metal fascia exteners shall be secured to wall or wood blocking at the bottom edge with a continuous cleat. Cleats shall be at least one gauge heavier than the metal it secures. Both pieces shall be secured at 6" on center.

3.3 INSPECTION

A. Verify metal wall panels, roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.

B. Verify membrane termination and base flashings are in place, sealed, and secure.

C. Beginning of installation means acceptance of existing conditions.

D. Field measure site conditions prior to fabricating work.

3.4 SHOP FABRICATED SHEET METAL

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.

B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

C. Hem exposed edges.

D. Angle bottom edges of exposed vertical surfaces to form drip.

E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.

F. Joints for the pre-manufactured metal edge fascia system and metale dge fascia extenders hall be formed with 3/8" opening between sections. The joints of the metal edge fascia system nd the metal edge fascia extenders shall be offset a minimum ov twelve (12) inches. The joint openings shall be backed by an internal drainage plate formed to the profile of fascia piece. The pre-manufactured metal edge fascia system and metal fascia extenders shall be embedded in two rows of butyl sealant over the internal drainage plate. The internal drainage plate shall be embedded in two rows of butyl sealant over the continuous cant dam and fastened through the opening between the sections and loose locked to the drip edges.

G. Joints for counterflashings shall be overlapped a minimum of 3", and counterflashings shall extend 4" below the roof flashing termination bar.

H. Install sheet metal to comply with ANSI/SPRI, SMACNA and NRCA standards, and per the manufacturer's instructions.

3.5 FLASHING MEMBRANE INSTALLATION

A. ROOF DRAIN

1. Prime lead at a rate of 100 square feet per gallon and allow to dry.

2. Set lead flashing (30" square minimum) in a 1/4" bed of mastic.

3. Install specified roof flashing system.

4. Install metal clamping ring and strainer. Stop all plies short of the clamping ring and seal edge with a three course application of the specified SILVER-FLASH liquid applied flashing system in the torch applied modified bitumen roof sysetm specification and reinforcing mesh.

B. PLUMBING STACK

1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.

2. Install properly sized sleeves in a 1/4" bed of roof cement.

3. Turn sleeve a minimum of 1" down inside of stack or lead caps on pipes 2" or less in diameter.

4. Caulk intersection of the membrane and flange with elastomeric asphaltic sealant or roof cement.

C. EQUIPMENT SUPPORTS/EXHAUST VENTS/SKYLIGHT CURBS/ROOF HATCH

1. Mill finished aluminum counterflashing and/or slip flashing extender shall be provided with watertight accessories such as miters, transitions, end caps, etc. and finished to match.

2. Accessories: Joint covers, corners, fasteners, strip flashing at joinings, fastening, and other accessories shall be included.

3. On small units, install an 0.040 mill finished aluminum extender will be installed under the existing counterflashing or curb lip to cover the newly installed roof flashing system by at least 4 inches. The new extender will be secured with fasteners and neoprene washers every 8 inches on center.

D. PITCH POCKET

1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.

2. **Install properly sized and prefabricated stainless steel or copper pitch pockets with welded or soldered watertight joints in a 1/4" bed of roof mastic. The pitch pocket MUST have continuous deck flanges at the corners.**

3. Install specified two ply roof flashing system.

4. Caulk intersection of the flashing membrane and flange with elastomeric asphaltic sealant or roof cement.

5. In accordance with project the detail and manufacturer's recommendations, prime penetrations and the pitch pocket surfaces, and fill pitch pocket with non-shrink grout and pourable sealer.

A. PRE-MANUFACTURED METAL EDGE FASCIA SYSTEM

1. Install new metal fascia/extender system with continuous cleat. Fasten to wood fascia as specified but at a minimum of six (6) inches o.c. Metal fascia extender shall cover the bottom of the wood nailer and top of wall (interface between wood blocking and wall) a minimum of two (2) inches.
2. Position base plies of the modified bitumen membrane roof system over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

3. Install miters first.

4. Cant Dam: Install Cant Dam in a bed of mastic and secure with roofing nails twelve (12) inches on center through the top of metal flange and outside face. Overlap the ends of the cant dam one (1) inch.

5. Modified Flashing System: Prime Cant Dam at a rate of one hundred (100) square feet per gallon and allow to dry. Strip in Cant Dam with base flashing membrane installed in the specified cold applied adhesive and extending six (6) inches into roof field, followed with a cap sheet installed in the specified cold applied adhesive and extending nine (9) inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

6. Fascia Cover: Install fascia cover with splice plate under one end by pressing downward firmly until "snap" occurs and cover is engaged along entire length of miter. Field cut where necessary with fine tooth saw. Sealant is to be placed between six (6) inch wide splice plates on metal edge pieces, one bead, approximately one (1) inch from fascia cover joint.

F. CURB DETAIL/AIR HANDLING STATION

1. Mill finish aluminum slip flashing extender shall be provided with watertight accessories such as miters, transitions, end caps, etc. and finished to match.

2. Accessories: Joint covers, corners, fasteners, strip flashing at joinings, fastening, and other accessories shall be included.

3. Over the termination bar, an 0.040 mill finished aluminum extender will be installed under the existing counterflashing or curb lip to cover the newly installed roof flashing system by at least 4 inches. New counterflashing will be secured with fasteners and neoprene washers every 8 inches on center.

G. HEAT STACK

1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.

2. Install properly sized sleeves in a 1/4" bed of roof cement.

3. Reuse existing collar over cape. Where required, weld collar or install stainless steel draw band.

4. Caulk intersection of the membrane and flange with elastomeric asphaltic sealant.

H. REGLET MOUNTED COUNTERFLASHINGS

1. Install specified roof flashing system with both plies terminating at the top of the specified flashing height. Secure continuous termination bar through top of flashing system and into wall at a maximum of 6” o.c. Caulk top of the termination bar and roof flashing system with a three-course application of asphaltic mastic and reinforcing mesh, or the specified elastomeric asphaltic sealant to provide a watertight seal.

2. Saw cut mortar joint to proper depth to accept receiver. Secure new counterflashing with lead plugs at 12” on center. Seal top of reciever with a continuous bead of the specified polyurethane sealant. End joints shall be interlocking and overlapping not less than 3”. Corners shall be mitered and sealed to a watertight condition. The bottom of the cap flashing insert shall project ¼” from the face of the wall with a down turned drip edge. The new counterflashing shall cover the termination bar and top of the roof flashing system a minimum of four (4) inches.

3. Install counterflashing system in accordance with plan details and in accordance with referenced standards and manufacturer’s instructions.

I. SURFACE MOUNTED COUNTERFLASHINGS

1. Install specified roof flashing system with both plies terminating at the top of the specified flashing height. Secure continuous termination bar through top of flashing system and into wall at a maximum of 6” o.c. Caulk top of the termination bar and roof flashing system with a three-course application of

asphaltic mastic and reinforcing mesh, or the specified elastomeric asphaltic sealant to provide a watertight seal.

2. Install new surface mounted counterflashing receiver and secure with neoprene gasketed fasteners at eight (8) inches on center. Seal top of counterflashing reciever with a continuous bead of the specified polyurethane sealant. End joints shall be interlocking and overlapping not less than 3". Corners shall be mitered and sealed to a watertight condition. The bottom of the cap flashing insert shall project ¼" from the face of the wall with a down turned drip edge. The new counterflashing shall cover the termination bar and top of the roof flashing system a minimum of four (4) inches.

3. Install counterflashing system in accordance with plan details and in accordance with referenced standards and manufacturer's instructions.

END OF SECTION 076000

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof curbs.
2. Equipment supports.

1.2 ACTION SUBMITTALS

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

B. Shop Drawings: For roof accessories.

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

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. AES Industries, Inc.
    b. Curbs Plus, Inc.
    c. Custom Solution Roof and Metal Products.
    d. Greenheck Fan Corporation.
    e. LM Curbs.
    f. Metallic Products Corp.
    g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
    h. Pate Company (The).
    i. Roof Products, Inc.
    j. Safe Air of Illinois.
    k. Thybar Corporation.
    l. Vent Products Co., Inc.
    m. Or Approved Equal.

B. Material: Stainless-steel sheet, 0.078 inch thick.

1. Finish: Manufacturer's standard.

C. Construction:

1. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.
4. Fabricate curbs to minimum height of 12 inches unless otherwise indicated.
5. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.

2.2 EQUIPMENT SUPPORTS

A. Equipment Supports: Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. AES Industries, Inc.
    b. Curbs Plus, Inc.
    c. Custom Solution Roof and Metal Products.
    d. Greenheck Fan Corporation.
    e. LM Curbs.
    f. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
    g. Pate Company (The).

h. Roof Products, Inc.
i. Thybar Corporation.
j. Vent Products Co., Inc.
k. Or Approved Equal.

B. Material: Stainless-steel sheet, 0.078 inch thick.

1. Finish: Manufacturer's standard.

C. Construction:

1. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
2. Liner: Same material as equipment support, of manufacturer's standard thickness and finish.
3. Factory-installed continuous wood nailers 3-1/2 inches wide at tops of equipment supports.
4. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as equipment support.
5. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
6. Fabricate equipment supports to minimum height of 12 inches unless otherwise indicated.

2.3 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 (Z275) coating designation.

1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
3. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.

4. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).

B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, AZ50 (AZM150) coated.

1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
2. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

    a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.

3. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).

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

1. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

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

E. Stainless Steel Sheet and Shapes: ASTM A240/A240M or ASTM A666, Type 304.

F. Steel Shapes: ASTM A36/A36M, hot-dip galvanized according to ASTM A123/A123M unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

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

B. Cellulosic-Fiber Board Insulation: ASTM C208, Type II, Grade 1, thickness as indicated.

C. Glass-Fiber Board Insulation: ASTM C726, nominal density of 3 lb/cu. ft. (48 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C), thickness as indicated.

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

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

F. Underlayment:

1. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
2. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D4397.
3. Slip Sheet: Building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m) minimum, rosin sized.
4. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

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

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

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

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

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

PART 3 - EXECUTION

3.1 INSTALLATION

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

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

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

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

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

3.2 REPAIR AND CLEANING

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

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

1.2 ACTION SUBMITTALS

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

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.4 QUALITY ASSURANCE

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

1.5 WARRANTY

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

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

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

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

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:

1. Architectural sealants shall have a VOC content of 250 g/L or less.

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

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Dow Corning Corporation.
2. Schnee-Morehead, Inc., an ITW company.
3. Sherwin-Williams Company (The).

2.3 JOINT-SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. BASF Construction Chemicals - Building Systems.
2. Construction Foam Products; a division of Nomaco, Inc.

2.4 MISCELLANEOUS MATERIALS

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

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

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

PART 3 - EXECUTION

3.1 PREPARATION

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

1. Remove laitance and form-release agents from concrete.
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

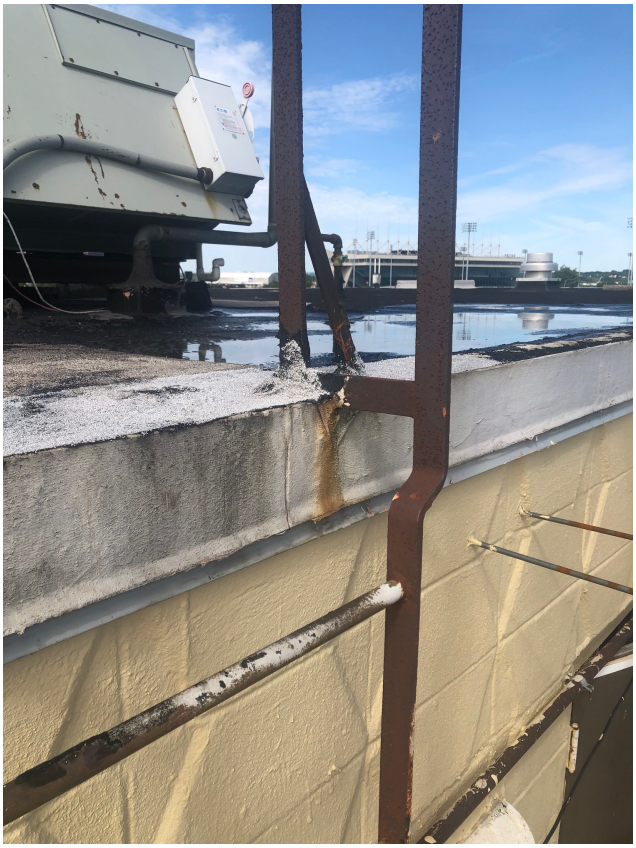
B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

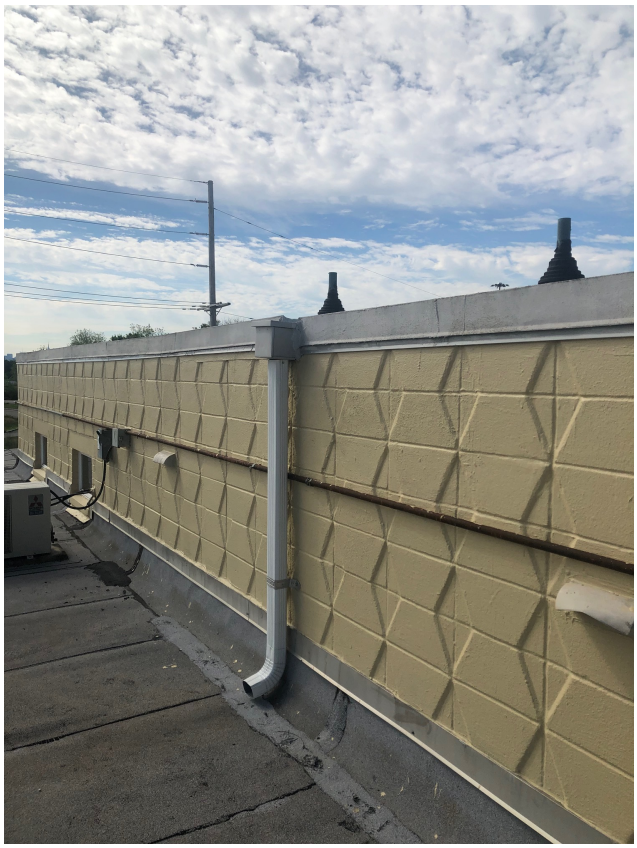
C. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

END OF SECTION 079200 JOINT SEALANTS





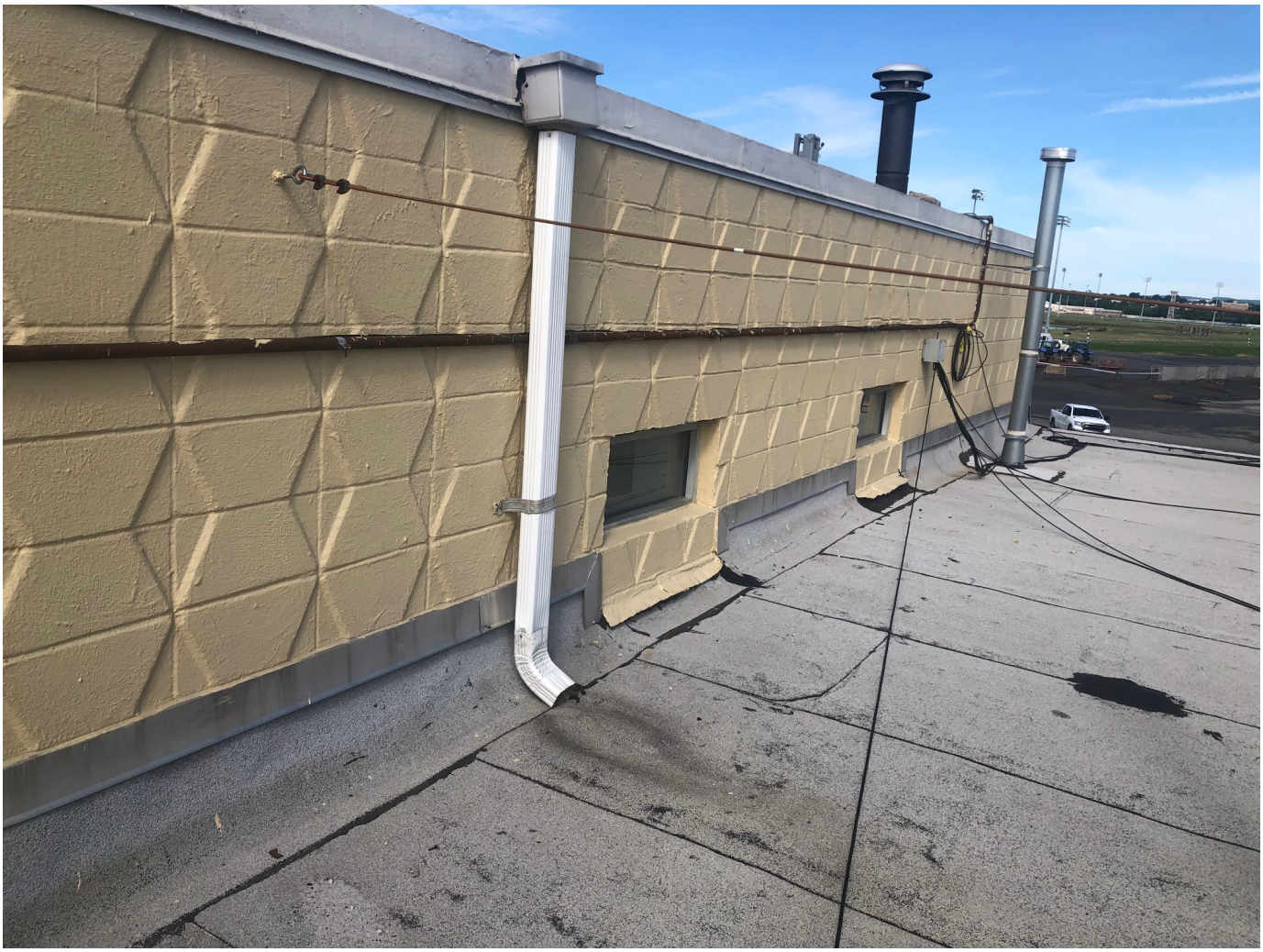


EXHIBIT B -EXISTING SURVEY PHOTOS OF WALL