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NMSU Alamogordo Campus
Roof Replacement 2019
3550 Tays Center
3551 PPD

RFP#

PROJECT MANUAL

Designer of Record:
Armstrong Group Inc.
P.O. Box 92977
Albuquerque, NM 87199
NM Office: 505.899.0089
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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work under separate contracts.
5. Access to site.
6. Coordination with occupants.
7. Work restrictions.
8. SPECIFICATION AND DRAWING CONVENTIONS

B. Related Requirements:

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

1.3 PROJECT INFORMATION

A. Project Identification: NMSU Alamogordo Campus Roof Replacement 2019: 3550 Tays Center, 3551 Physical Plant Building.

1. Project Location: NMSU Alamogordo Campus
   a. Bid Lot #1: Tays Center
      Bldg #292C, 2400 Scenic Drive, Alamogordo, NM 88310
   b. Bid Lot #2: Physical Plant Building
      Bldg #292T, 2400 Scenic Drive, Alamogordo, NM 88310

B. Owner: New Mexico State University.
1. Owner's Representative:
   a. Orasa Vaught, Associate AIA, LEED AP, Project Manager, Facilities and Services Project Development and Engineering, New Mexico State University, Las Cruces, New Mexico, 575.646.4549 (phone) or e-mail, orasa@nmsu.edu .

C. Designer:

1. Armstrong Group Inc, 505.899.0089 (phone), 505.899.4436 (fax), Project Consultant, David Armstrong, email- davida@agiconsultants.com

1.4 WORK COVERED BY CONTRACT DOCUMENTS

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

1. BID LOT #1 - Tays Center:
   a. **Base Bid**: The removal of the existing roofing and the installation of a new PVC roofing system and as described in the contract documents. The total sqft of the roof area included in the project scope is approximately 24,063 SF.
   Bid Lot #1 - Alternate #1: The scope consists of the removal and replacement of existing stucco system on the east wall of Gymnasium, as indicated in contract documents.

2. BID LOT #2 - Physical Plant Building:
   a. **Base Bid**: The removal of the existing roofing and the installation of a new PVC roofing system and as described in the contract documents. The total sqft of the roof area included in the project scope is approximately 3,483 SF.
   b. **Bid Lot #2 - Alternate #1**: The scope consists of the removal and replacement of the existing HVAC equipment, as indicated on drawings.

1.5 PHASED CONSTRUCTION

A. Will not be permitted.

1.6 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.7 ACCESS TO SITE

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

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Operations will be limited to the roofs and material delivery. Construction employees will have limited access to the inside of the building all interior requirements will have to be scheduled. This will require close scheduling.
   2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

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

1.8 COORDINATION WITH OCCUPANTS

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

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner will require 24 hours in advance of activities that will affect Owner's operations.

1.9 WORK RESTRICTIONS

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

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

B. On-Site Work Hours: See plans for specific work hours. Upon the notice to proceed a pre-construction meetings will be required at each site to establish the schedules.

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 Designer and Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Designers 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 Designer and Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Designers written permission before proceeding with disruptive operations.

E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

F. Controlled Substances: Use of tobacco products and other controlled substances within the building and on the project is not permitted.

G. Employee Identification: provide] identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

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

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

1.10 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. Specification requirements are to be performed by Contractor unless specifically stated in writing.

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 Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

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

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

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

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, 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: Replacement of 5/8" plywood decking.
   1. Unit of Measurement: Square foot

B. Unit Price No. 2: Replacement of Metal B-Decking.
   1. Unit of Measurement: Square Foot

C. Unit Price No. 3: Replacement of wall sheathing.
   1. Unit of Measurement: Square foot

END OF SECTION 012200

SECTION 01 2300 – ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Procedures and descriptions for bid options that decrease or increase scope of project.

B. Related documents and sections:

1. Instructions to Bidders.

1.2 CONDITIONS

A. All requirements of General and Supplementary Conditions, applicable sections of Specifications, and applicable portions of Drawings shall govern scope, quality, and execution of alternates.

B. Alternates will be selected in order listed on Bid Form and as allowed by available funding.

1.3 ADDITIVE ALTERNATES

A. BID LOT #1 - ADDITIVE ALTERNATE #1: Alternate work includes the removal and replacement of existing stucco system on the east wall of Gymnasium, as referenced on sheet A-101, Keynotes P & 12.

B. BID LOT #2 - ADDITIVE ALTERNATE #1: Alternate work includes the removal and replacement of existing HVAC equipment as referenced on sheet A-102, M-101 and M-501.

1.4 NOT USED

1.5 PROCEDURES

A. Consider all work that must be accomplished for complete incorporation of alternates including modifications to Base Bid items.

B. Include in lump sum prices for alternates all costs of labor, materials, equipment, permits, fees, insurance, bonds, overhead, and profit.

C. Immediately after award of Contract, advise all necessary personnel and suppliers as to which alternates have been selected by Owner. Use all means necessary to alert those personnel and suppliers involved as to all changes in the work caused by Owner's selection or rejection of alternates.

D. Coordinate related work and modify surrounding work to integrate work of each alternate.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
   1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

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

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

1.4 ACTION 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. 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 revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed 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. Research reports evidencing compliance with building code in effect for Project, from
j. 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.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect and or Roof Consultant will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

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

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 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. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Requested substitution provides sustainable design characteristics that specified product provided for achieving LEED prerequisites and credits.
c. Substitution request is fully documented and properly submitted.
d. Requested substitution will not adversely affect Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.
i. 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.

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue through the Roof Consultant 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."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Roof Consultant 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. Work Change Proposal Requests issued by Architect of Roof Consultant 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.

e. Quotation Form: Use forms acceptable to Architect.

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 Roof Consultant.

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 Section 012500 "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.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect of Roof Consultant will issue a Change Order for signatures of Owner and Contractor on AIA Document G701

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Work Change Directive: Architect of Roof Consultant may issue a Work Change Directive on AIA Document G714. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Work 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 Work Change Directive.

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

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:
   1. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
   2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
   3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

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

   1. Coordinate 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 Roof Consultant at earliest possible date, but no later than 7 days before the date scheduled for submittal of initial Applications for Payment.
   3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.

4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 011000 "Summary."

B. Format and Content: Use 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. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Name of subcontractor.
    d. Name of manufacturer or fabricator.
    e. Name of supplier.
    f. Change Orders (numbers) that affect value.
    g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

        1) Labor.
        2) Materials.
        3) Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of 5 percent of the Contract Sum.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. 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.

    a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. 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.

8. 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.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. 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.

11. 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.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Roof Consultant] 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: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Submit Application for Payment to Architect by the 15th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

   1. Submit draft copy of Application for Payment 7 days prior to due date for review by Architect.

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

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

F. Application for Payment Forms: Use forms acceptable to Roof Consultant and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.

G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Roof Consultant 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 for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

I. Transmittal: Submit 3 signed original copies of each Application for Payment to Roof Consultant 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.

J. 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 executed waivers of lien on forms acceptable to Owner.

K. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

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. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.

L. 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. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
5. Products list (preliminary if not final).
6. Schedule of unit prices.
7. Submittal schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
12. Initial progress report.
13. Report of preconstruction conference.
14. Certificates of insurance and insurance policies.
15. Performance and payment bonds.
16. Data needed to acquire Owner's insurance.

M. Application for Payment at Substantial Completion: After Architect issues 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 Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

N. Final Payment Application: After completing Project closeout requirements, 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, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. General coordination procedures.
2. Coordination drawings.
3. Requests for Information (RFIs).
4. Project meetings.

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

C. Related Requirements:
1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Owner, Roof Consultant or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

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

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

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

1. Keep list current at all times and submitted to the Roof Consultant.

1.5 GENERAL COORDINATION PROCEDURES

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

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

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

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

C. 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.

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

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

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

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 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 and Roof Consultant.
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 suggested resolution 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.

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

C. RFI Forms: AIA Document G716

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Action: Roof Consultant will review each RFI, determine action required, and respond. Allow 7 working days for Architect's response for each RFI. RFIs received by Roof Consultant after 1:00 p.m. will be considered as received the following working day.

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

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

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

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Roof Consultant in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly use form acceptable to Roof Consultant.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect and Roof Consultant.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Roof Consultants] response was received.

F. On receipt of Roof Consultants action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Roof Consultant within 7 days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

A. General: 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 Roof Consultant, within 3 days of the meeting.

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

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner Roof Consultant; 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.
3. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Submittal procedures.
    l. Preparation of record documents.
    m. Use of the premises.
    n. Work restrictions.
    o. Working hours.
    p. Owner's occupancy requirements.
    q. Responsibility for temporary facilities and controls.
    r. Procedures for moisture and mold control.
    s. Procedures for disruptions and shutdowns.
    t. Construction waste management and recycling.
    u. Parking availability.
    v. Office, work, and storage areas.
    w. Equipment deliveries and priorities.
    x. First aid.
    y. Security.
    z. Progress cleaning.

4. Minutes: Contractor will be will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

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

    a. Contract Documents.
    b. Options.
    c. Related RFIs.
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.
    g. Submittals.
    h. Review of mockups.
    i. Possible conflicts.
    j. Compatibility requirements.
    k. Time schedules.
    l. Weather limitations.
    m. Manufacturer's written instructions.
    n. Warranty requirements.
    o. Compatibility of materials.
    p. Acceptability of substrates.
    q. Temporary facilities and controls.
    r. Space and access limitations.
    s. Regulations of authorities having jurisdiction.
    t. Testing and inspecting requirements.
    u. Installation procedures.
    v. Coordination with other work.
    w. Required performance results.
    x. Protection of adjacent work.
    y. Protection of construction and personnel.

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

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 10 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Roof Consultant; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    a. Preparation of record documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Submittal of written warranties.
    d. Requirements for preparing operations and maintenance data.
    e. Requirements for delivery of material samples, attic stock, and spare parts.
    f. Requirements for demonstration and training.
    g. Preparation of Contractor's punch list.
    h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    i. Submittal procedures.
    j. Coordination of separate contracts.
    k. Owner's partial occupancy requirements.
    l. Installation of Owner's furniture, fixtures, and equipment.
    m. Responsibility for removing temporary facilities and controls.

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

E. Progress Meetings Conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner Roof Consultant, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review 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) Resolution of BIM component conflicts.
        4) Status of submittals.
        5) Deliveries.
        6) Off-site fabrication.
        7) Access.

8) Site utilization.
9) Temporary facilities and controls.
10) Progress cleaning.
11) Quality and work standards.
12) Status of correction of deficient items.
13) Field observations.
14) Status of RFIs.
15) Status of proposal requests.
16) Pending changes.
17) Status of Change Orders.
18) Pending claims and disputes.
19) Documentation of information for payment requests.

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

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

END OF SECTION 013100

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
5. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

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. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

E. 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. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. 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. Roof Consultant the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

F. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Roof Consultants 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 7 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Roof Consultant 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 14 days for review of each resubmittal.

G. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Roof Consultant.
4. Transmittal Form for Electronic Submittals: Use electronic PDF form acceptable to Owner**,** containing the following information:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name of Construction Manager.

e. Name of Contractor.
f. Name of firm or entity that prepared submittal.
g. Names of subcontractor, manufacturer, and supplier.
h. Category and type of submittal.
i. Submittal purpose and description.
j. Specification Section number and title.
k. Specification paragraph number or drawing designation and generic name for each of multiple items.
l. Drawing number and detail references, as appropriate.
m. Location(s) where product is to be installed, as appropriate.
n. Related physical samples submitted directly.
o. Indication of full or partial submittal.
p. Transmittal number**, numbered consecutively**.
q. Submittal and transmittal distribution record.
r. Other necessary identification.
s. Remarks.

H. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Roof Consultant on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

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 Roof Consultant action stamp.

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: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Roof Consultants action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Post electronic submittals as PDF electronic files directly to Roof Consultants FTP site specifically established for Project.

a. Roof Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Submit electronic submittals via email as PDF electronic files.

a. Roof Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

3. Action Submittals: Submit 3 paper copies of each submittal unless otherwise indicated. Roof Consultant will return 2 copies.
4. Informational Submittals: Submit 2 paper copies of each submittal unless otherwise indicated. Roof Consultant] will not return copies.

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

1. If information must be specially prepared for submittal because standard 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. Submit Product Data in the following format:

a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents.

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 (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm) .
3. Submit Shop Drawings in the following format:

    a. PDF electronic file.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.
5. Submit product schedule in the following format:

    a. PDF electronic file.

E. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

F. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

G. Comply with submittal requirements in sections 074190, 06100, 07222, 07542, 07620 and 07710.

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

I. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

J. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

K. 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.

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

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

N. 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.

O. Product Test Reports: Submit written reports indicating that 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.

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.

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 Roof Consultant.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "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 ROOF CONSULTANTS ACTION

A. Action Submittals: Roof Consultant will review each submittal, make marks to indicate corrections or revisions required, and return it. Roof Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:

B. Informational Submittals: Roof Consultant] will review each submittal and will not return it, or will return it if it does not comply with requirements. Roof Consultant will forward each submittal to appropriate party.

C. Incomplete and Partial submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

D. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 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, Roof Consultant occupants of Project, and authorities having jurisdiction.

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

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

1.4 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 narrative that indicates the dust- and HVAC-control measures proposed for the time frame of the project.

F. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

EXECUTION

1.5 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.

1. Connect temporary sewers to [**municipal system**] [**private system indicated**] as directed by authorities having jurisdiction.

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

D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. 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.
1. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

G. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

1.6 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

B. 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.

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

D. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

1. Do not load elevators beyond their rated weight capacity.
2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

E. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

1.7 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.

1. Comply with work restrictions specified in Section 011000 "Summary."
2. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.

C. Tree and Plant Protection as required

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

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. 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 Requirements:
   1. Section 012500 "Substitution Procedures" for requests for substitutions.
   2. Section 014200 "References" for applicable industry standards for products specified.

1.3 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.

1.4 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. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Owners Action: If necessary, Roof Consultant will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect and Roof Consultant will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

    a. Form of Approval: As specified in Section 013300 "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 Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 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. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 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. Protect 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.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 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. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "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.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

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. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.

4. Manufacturers:

    a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.

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 Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. 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 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

1.3 ACTION SUBMITTALS

A. Product Data:

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit changeover information related to Owner's use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Instruct Owner's personnel in operation, adjustment, and maintenance of products,
4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
5. Complete final cleaning requirements, including touchup painting.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Roof Consultant 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.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.7 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: 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, or when delay in submittal of warranties might limit Owner's rights under warranty.

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

1. Bind warranties and bonds in heavy-duty, three-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.

PART 2 - PRODUCTS

2.1 MATERIALS

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

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
g. Sweep concrete floors broom clean in unoccupied spaces.
h. Leave Project clean.

C. Construction Waste Disposal: Comply with waste disposal requirements.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof and wall sheathing.

B. Preservative treatment of wood.

C. Fire retardant treatment of wood.

D. Miscellaneous framing and sheathing.

E. Telephone and electrical panel boards.

F. Wood nailers, curbs, and cant strips for roofing and items installed on roof.

G. Concealed wood blocking for support of door hardware, toilet and bath accessories, wall cabinets, wood trim, TV brackets and visual display boards.

H. Miscellaneous wood nailers and furring strips.

1.02 RELATED SECTIONS

1. Section 07 4190 – 72 MIL Induction Welded PVC System
2. Section 07 6200 – Sheet Metal Flashing and Trim
3. Section 07 7100 – Manufactured Roof Specialties

1.03 REFERENCES

A. AFPA WCD 1 T11 - Manual for Wood Frame Construction; American Forest and Paper Association; 1988.

B. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 1997.

C. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 1996.

D. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.

E. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 1994.

F. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 1995.

1.04 SUBMITTALS

A. Product Data: Provide technical data on sheathing, wood preservative materials, fasteners and application instructions.
B. Provide Fastening patterns and procedures that meet ES-1 code requirements.

1.05 QUALITY ASSURANCE

A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 DIMENSION LUMBER

A. Grading Agency: Western Wood Products Association (WWPA).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Blocking, Furring, and Nailers:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.02 CONSTRUCTION PANELS

A. APA Rated Roof Sheathing: Exterior Exposure Class, and as follows:
   1. Structural I., 1/2" CDX Plywood.
   2. Span Rating: 24/0.

B. Wall Sheathing: Water resistant core gypsum sheathing complying ASTM C 79, 5/8" thick at exterior steel stud walls receiving stucco finish.

C. Miscellaneous Panels:
   1. Concealed Plywood: PS 1, C-C Plugged, exterior grade.
   2. Electrical Component Mounting: APA rated sheathing, fire retardant treated.

2.03 ACCESSORIES

A. Fasteners and Anchors:

1. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
2. Anchors: Bolt type for anchorage wood blocking.

B. Building Paper: Weather barrier as manufactured by Tyvek and type appropriate for commercial stucco installation.

2.04 FACTORY WOOD TREATMENT

A. Fire Retardant Treatment: AWPA Treatment C20, Interior Type, Class A, Low Hygroscopic, chemical treatment pressure impregnated; capable of providing a maximum flame spread/smoke development rating of 20 / 25.

B. Pressure Treatment of Lumber Above Grade: AWPA Treatment C2 using waterborne preservative to 0.25 lb/cu ft retention.
1. Kiln dry after treatment to maximum moisture content of 19 percent.
2. Treat wood in contact with roofing, flashing, or waterproofing.
3. Treat wood in contact with masonry or concrete.
4. Treat wood less than 18 inches above grade.

C. Pressure Treatment of Lumber in Contact with Soil: AWPA Treatment C2 using waterborne preservative designated in AWPA C2 as suitable for ground contact use to 0.4 lb/cu ft retention.

PART 3 EXECUTION

3.01 FRAMING INSTALLATION

A. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

B. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA WCD 1 T11.

C. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, and trim. Fire treated members shall be used in rated construction for support of these items.

3.02 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

A. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
B. Parapet edge and roof termination conditions-Install per ES-1 requirements with lapping and staggering procedures.

3.03 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels perpendicular to framing members, with ends staggered and sheet ends over firm bearing to conform with UL 90 requirement for roof assembly.
   1. Use sheathing clips between roof framing members.
   2. Provide solid edge blocking between sheets.

3.04 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

END OF SECTION

SECTION 072423 – POLYMER-BASED EXTERIOR FINISH SYSTEM OVER CEMENT BOARD

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Refer to all project drawings and other related sections of this specification to determine the type and extent of the work.

B. Cement Board Stucco wall system: composite wall system consisting of air/water resistive barrier, Base Coat, Reinforcing Mesh, and Finish Coat.

C. Products are listed in this specification to establish a standard of quality. BASF Senergy is the basis of design. The following cement board based systems are considered acceptable alternates: Parex; Dryvit; and Sto. Any substitutions to this specification shall be submitted to and receive approval from the Architect at least per Owner's bidding procurement procedures. Proof of equality shall be borne by the submitter.

D. The Basis of Design (BOD) shall be Senergy Cement Board Stucco (CBS) 1000 wall system as manufactured by BASF Wall Systems, Shakopee, Minnesota.

E. This specification section represents a stucco replacement solution. This Polymer-Based Exterior Finish System Over Cement Board solution includes removal of the stucco, lathe, and Tyvek membrane. This proposed stucco replacement solution includes leaving the existing sheathing in place as much as possible. Price the work assuming 20% of the sheathing shall need to be replaced due to damage during the stucco removal. This solution requires installation of the waterproofing system specified herein over the existing (and patched) sheathing prior to the installation of the cement board and polymer based exterior finish system.

1.2 RELATED SECTIONS

A. Section 07 62 00 Sheet Metal Flashing and Trim

1.3 REFERENCES

A. ASTM C150 Specification for Portland cement.

B. ASTM D1682 Test for Break Load and Elongation of Textile Fabrics.

C. ASTM E84 Tests for Surface Burning Characteristics of Building Materials.

D. ASTM G23 Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Exposure of Non-metallic Materials.

E. ASTM G53 Operating Light and Water Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials.

F. ASTM C67 Sampling and Testing Brick and Structural Clay Tile.

G. ASTM B117 Standard Method of Salt Spray (Fog) Testing.

H. ASTM D968 Abrasion Resistance of Organic Coatings by Falling Abrasive.

I. FS TT-C-555B Coating Textured for Interior and Exterior Masonry Surfaces.

J. MIL-Y-114OG Yarn, Cord, Sleeving, Cloth and Tape-Glass.

K. Mil. Std. 810B Mildew Resistance (Method 508)

L. ASTM E96 Water Vapor Transmission (Method B)

M. ASTM A653/Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated A63M (Galvannealed) by the Hot-Dip Process

1.4 DEFINITIONS

A. Senergy CBS 1000 System: Exterior cement board based stucco assembly comprised of air/water-resistive barrier, Base Coat, Reinforcing Mesh and Finish Coat.

1.5 SUBMITTALS

A. Product Data: Provide current published data on Senergy CBS 1000 System materials, product characteristics, performance criteria, limitations and durability, or similar materials for approved alternates.

B. Shop Drawings: Indicate wall joint pattern and joint details, thickness, and all installation details.

C. Samples: Submit two, 24 x 24 inch size samples of system illustrating Finish Coat color and texture range.

D. Certificate: System manufacturer's approval of applicator.

E. Sealant: Sealant manufacturer's certificate of compliance with ASTM C920.

F. System manufacturer's current specifications, typical details, system design guide and related product literature which indicate preparation required, storage, installation techniques, jointing requirements and finishing technique.

G. Copy of system manufacturer's system 10 year warranty for the specified system.

1.6 QUALITY ASSURANCE

A. Manufacturer: More than ten years in the cement board stucco industry, with more than five (5) completed cement board stucco commercial projects valued at over $1 million dollars.

B. Applicator: Approved by Systems Manufacturer in performing work of this section.

C. Regulatory Requirements: Conform to applicable code requirements for finish system.

D. Field Samples:
1. Construct one field sample panel for each color and texture, minimum twenty foot by sixteen foot in size, of system materials illustrating method of demolition, new material, attachment, finish, color and texture. Install at location where mock-up replaces an existing full panel from joint to joint.
2. Prepare each sample panel using the same tools and techniques to be used for the actual application.
3. Locate sample panel where directed.
4. Accepted sample panel may remain as part of the work.
5. Field samples shall be comprised of all wall assembly components including substrates, air/water- resistive barrier, base coat, reinforcing mesh, primer, as required, finish coat and typical sealant/flashing conditions.

E. Testing:
1. General Air/Water-Resistive Barrier Minimum Performance:
   a. ASTM E2570 Water-resistive barrier coatings used under EIFS
   b. ASTM E2357 Air leakage of air barrier assemblies
      i. Criteria: 0.2 l/(s.m^2) @ 75 Pa, (0.04 cfm/ft^2 @ 1.57 psf)

c. ASTM E2178 Air permeance of building materials
   i. Criteria: 0.02 l/(s.m^2) @ 75 Pa, (0.004 cfm/ft^2 @ 1.57 psf)
d. ASTM E283 Rate of air leakage
e. ASTM E96 Water vapor transmission
f. ASTM D4541 Pull-off strength of coatings
   i. Criteria: Min. 110 kPa (15.9 psi) or substrate failure
g. ASTM D1970 Nail sealability (without sheathing fabric)
   i. Criteria: No water penetration at galvanized roofing nail penetration under 127 mm (5 inches) head of water after 3 days at 4° C (40° F)
h. ASTM E84 Surface burning
   i. Criteria: Flame spread < 25; Smoke development < 450

2. Air/Water-Resistive Barrier ICC-ES AC-212:
   a. Sequential testing:
      i. ASTM E1233 Structural
      ii. ASTM E72 Racking
      iii. ICC-ES AC-212 Restrained Environmental conditioning
         A. Criteria: No cracking at joints or interface of flashing
      iv. ASTM E331 Water Penetration
         A. Criteria: No water penetration after 15 min @ 137 Pa (2.86 psf)
   b. Sequential testing:
      i. ICC-ES AC-212 UV light exposure
      ii. ICC-ES AC-212 Accelerated aging
         A. Criteria: No cracking or bond failure to substrate
      iii. AATCC 127-1985 Hydrostatic pressure test
         A. Criteria: No water penetration after 21.7 inches (550 mm) water for 5 hours
   c. ASTM E2485 Freeze-thaw
      i. Criteria: No sign of deleterious effects after 10 cycles
   d. ASTM D2247 Water resistance
      i. Criteria: No deleterious effects after 14 day exposure
   e. ASTM C297 Tensile bond
      i. Criteria: Minimum 103 kPa (15 psi)
   f. ASTM C197 Tensile bond (after freeze-thaw)
      i. Criteria: Minimum 103 kPa (15 psi) avg; no failure after 10 cycles freeze-thaw

3. Air/Water-Resistive Barrier ICC-ES AC 148:
   a. Sequential testing:
      i. ICC-ES AC148 UV light exposure
      ii. ICC-ES AC148 Accelerated aging
         A. Criteria: No cracking or bond failure to substrate

iii. AATCC 127-1985 Hydrostatic pressure test
A. Criteria: No water penetration after 21.7 inches (550 mm) water for 5 hours

b. ASTM D3330 Method F Peel adhesion
i. Criteria: After UV exposure; After accelerated aging; After elevated temperature exposure; After water immersion

c. ASTM D1970 (Modified) & AAMA 711 Nail sealability after thermal cycling
i. Criteria: No water penetration at galvanized roofing nail penetration under 31 mm (1.2 inch) head of water after 24 hours at 4° C (40° F)

d. ASTM D5034 & AAMA 711 Tensile strength after UV exposure
i. Criteria: Minimum 0.5 N/mm (2.9 lbs/inch)

e. ASTM D1970 & AAMA 711 Cold temperature pliability
i. Criteria: No cracking after bending around a 25 mm (1 inch) mandrel after 2 hour exposure to -18° C (0° F)

f. AAMA 711 Resistance to peeling
i. Criteria: No signs of distress or failure after 24 hours of exposure at room temperature, 50° C (122° F), 65° C ·149° F), 80° C (176° F)

4. CBS 1000 System and Component Performance:
a. ICC_ES AC59 Direct-applied Exterior Finish Systems (DEFS)
b. ASTM E330 Transverse wind-load
i. Criteria: Steel stud framing (16 gauge, 3 5/8") @ 16" o.c.
ii. Criteria: Steel stud framing (20 gauge, 3 5/8") @ 16" o.c.
iii. Criteria: Wood assembly (2" x 4") @ 16" o.c.
c. AC59 Bond strength after accelerated weathering and freeze-thaw test
i. Criteria: Minimum 34.3 kPa (5 psi)
d. ASTM E72 Racking test
i. Criteria: No failure of finish at substrate joints before failure of substrate OR no failure at 1" net deflection
e. AC59 Restrained environmental cycling test
i. Criteria: No cracking of finish or other distress after 5 cycles of water spray (24 hrs.) and radiant heat (72 hrs.)
f. ASTM E331 Water penetration
i. Criteria: No water penetration after 15 minutes @ 137 Pa (2.86 psf)
g. NFPS 268 Radiant heat exposure
i. Criteria: No ignition at 20 minutes
h. ASTM E119 Fire endurance
i. Criteria: Maintain fire resistance of existing rated assembly
i. NFPA 285 & UBC Standard 26-9 Intermediate scale multi-story fire test
i. Criteria: Resist flame propagation over the exterior surface. Resist vertical spread of flame within combustible core / component of panel from one story to the next. Resist vertical

spread of flame over the interior surface from one story to the next. Resist lateral spread of flame from the compartment of fire origin to adjacent spaces.

j. ASTM E84/UL 723 Surface burning
   i. Criteria: Flame spread < 25; Smoke developed < 450
k. ASTM D968 Abrasion resistance
   i. Criteria: No cracking or loss of film integrity at 528 qt. (500L) of sand

l. ASTM G153 (formerly G23) Accelerated weathering
   i. Criteria: No deleterious effects after 2,000 hours
m. AC59 Freeze-thaw
   i. Criteria: No deleterious effects after 10 cycles
n. Mil Std 810B, Method 508 Mildew resistance
   i. Criteria: No fungus growth after 28 days
o. ASTM B117 Salt fog resistance
   i. Criteria: No deleterious effects after 300 hours
p. ASTM D2247 Water resistance
   i. Criteria: No deleterious effects after 14 days exposure

5. Reinforcing Mesh Testing:
   a. ATM E2098 Alkali resistance of reinforcing mesh
      i. Criteria: Greater than 120 pli (21 dN/CM) retained tensile strength

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products per manufacturer's recommendations.

B. Deliver materials in original unopened packages with manufacturer's labels intact.

C. Protect materials during transportation and installation to avoid physical damage.

D. Store materials in cool, dry place protected from freezing. Store at no less than 40°F/4°C.

E. Store cement boards flat and protected from direct sunlight and extreme heat.

F. Store reinforcing mesh and flexible flashing in cool, dry place protected from exposure to moisture.

1.8 PROJECT/SITE CONDITIONS

A. Do not apply system materials in ambient temperatures below 40°F/4°C). Provide properly vented, supplementary heat during installation and drying period when temperatures less than 40°F/4°C.

B. Do not apply materials to frozen surfaces.

C. Maintain ambient temperature at or above 40°F/4°C during and at least 24 hours after materials are installed and until dry.

1.9 SEQUENCING AND SCHEDULING

A. Coordinate and schedule installation of materials with related work of other sections.

B. Coordinate and schedule installation of trim, flashing, and joint sealers to prevent water infiltration behind the System.

C. Coordinate and schedule installation of air/weather barrier, etc.

1.10 WARRANTY

A. Provide 10 year wall systems manufacturer's material warranty for wall system installations.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: CBS 1000 System manufactured by BASF Corporation

B. Approved alternatives:
1. Dryvit Cement Board MD™
2. StoQuik® Silver Cement Board Stucco Systems
3. Parex® NuTech WaterMaster

2.2 MATERIALS

A. Air/water-Resistive Barrier Components:
1. Air/Water-Resistive Barrier:
a. SENERSHIELD-R: A one-component fluid-applied vapor permeable air/water-

resistive barrier.
b. Or Approved Equal.

2. Rough Opening and Joint Treatment to meet project conditions:
   a. SHEATHING FABRIC: A spun-bonded non-woven reinforced polyester web for use with Senergy fluid applied air/weather-resistive barriers; OR
   b. A one-component elastomeric material for use as a flexible flashing membrane.
3. Transitional Membrane / Expansion Joint Flashing:
   a. WS FLASH: 30-mil thick, self-sealing, self-healing composite membrane of polyester fabric and rubberized asphalt. Compatible with Senergy liquid air/weather resistive barriers.
   b. FLASHING PRIMER: A water-based primer for use prior to application of WS FLASH on all acceptable surfaces.

B. Base Coats:
1. ALPHA GENIE Base Coat: A100% acrylic, fiber-reinforced base coat, adhesive and leveler that is field-mixed with Type I or Type II Portland cement.

C. Portland cement:
1. Conform to ASTM C150, Type I, II, or I/II, grey or white; fresh and free of lumps.

D. Water:
1. Clean and potable without foreign matter.

E. Senergy Reinforcing Mesh: Balanced, open-weave glass, fiber reinforcing mesh, twisted multi-end strands treated for compatibility with Senergy Base Coats.
1. FLEXGUARD 4: Standard weight, 4 oz.
2. INTERMEDIATE 12: Intermediate weight, 12 oz.
3. CORNER MESH: Intermediate weight, pre-marked for easy bending, for reinforcing at exterior corners.
4. SELF-ADHERING MESH TAPE: a standard weight mesh coated with a pressure sensitive adhesive for use with base coat as reinforcement over acceptable sheathing joints, rough openings and at terminations

F. BASF Primer:
1. BASF TINTED PRIMER: A 100% acrylic-based primer to alleviate shadowing and enhances performance of the Senergy Wall Systems. Color to closely match the selected Senergy Finish Coat color.

G. Senergy Finish Coat:
1. SENERFLEX Finish: 100% acrylic polymer compatible with base coat; Senergy finish color to match existing:
   a. TEXTURE: can achieve a wide variety of free-formed, textured

appearances, including stipple and skip-trowel

2. SENERFLEX TERSUS Finish: Modified acrylic based finish with water repellent properties, compatible with base coat:
   a. M1.5: A 1.5 mm uniform aggregate creating a medium sand texture.

2.3 ACCESSORIES

A. Starter track, L bead, J bead, angled termination bead, casing beads, corner beads, expansion joints and weep screed must comply with ASTM D1784 or C1063 for vinyl. Type as recommended by manufacturer of approved wall system.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Site Conditions:
   1. Verify project site conditions.

B. Walls:
   1. Substrates/Sheathing:
      a. Wall sheathing shall be securely fastened per applicable building code and sheathing manufacturer's requirements.

      b. Examine surfaces to receive materials and verify that substrate and adjacent materials are dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 1/4" in 10'.
   2. Air/weather Barrier:
      a. Verify that the air/weather barrier is installed over the sheathing per applicable building code requirements, manufacturers' specifications and project details, prior to application of the Stucco System.
   3. Furring:
      a. Install 18 gauge galvanized 3-inch x ½-inch x 2 ½-inch furring over steel stud framing in compliance with project documents.
   4. Cement-Board Substrates:
      a. Acceptable substrates are cement-boards which satisfy ASTM C1325 (Type A, Exterior).
      b. Cement-board must be securely fastened per manufacturers' recommendations, applicable building code and project requirements.
      c. Walls shall have maximum deflection not to exceed L/360 of span

under positive or negative design loads

d. Cement-board must be a single piece around corners of openings.

e. Cement-board must be fastened with corrosion resistant fasteners.

f. Cement-board and sheathing joints must be offset.

5. Flashings:
   a. Head, jamb and sills of all openings shall be flashed with secondary air/weather barrier in compliance with project drawings.
   b. Windows and openings shall be flashed in compliance with project drawings.
   c. Individual windows that are ganged to make multiple units require that the heads be continuously flashed and/or the joints between the units shall be fully sealed.
6. Utilities: The system shall be properly terminated at all lighting fixtures, electrical outlets, hose bibs, dryer vents, etc.
7. Kick-out flashing shall be installed and angled (min 100 degrees) to allow for proper drainage and water diversion.

C. Do not proceed until all unsatisfactory conditions have been corrected.

D. Install supplemental framing/blocking may be required to secure cement board at vertical control/expansion joints.

3.2 PREPARATION

A. Protect all surrounding areas and surfaces from damage and staining during application of Cement Board Stucco System.

B. Protect finished work at end of each day to prevent water penetration.

C. Prepare substrates in accordance with manufacturer's instructions.

3.3 MIXING

General: No additives are permitted unless specified in product mixing instructions. Close containers when not in use. Prepare in a container that is clean and free of foreign substances. Do not use a container which has contained or been cleaned with a petroleum-based product. Clean tools and equipment with water immediately after use. Dried material can only be removed mechanically.

A. Air/Water-Resistive Barriers:
   1. WS FIL & SENERSHIELD-R/RS/VB: Mix with a clean, rust-free paddle and drill until thoroughly blended. Do not add water.
   2. Cold Temperature Additive: LT ADDITIVE: Pour the entire contents of

one (1) bottle of LT ADDITIVE into one (1) full pail of SENERSHIELD-R/RS/VB. Mix with a clean, rust-free paddle and drill until fully blended.

B. Senergy Base Coat:

1. ALPHA GENIE Base Coat: Mix base coat with a clean, rust-free paddle and drill until thoroughly blended, before adding Portland cement. Mix one-part (by weight) Portland cement with one-part base coat. Add Portland cement in small increments, mixing until thoroughly blended after each additional increment. Clean, potable water may be added to adjust workability.

C. BASF Primer:

1. BASF TINTED PRIMER: Mix the factory-prepared material with a clean, rust-free paddle and drill until thoroughly blended. A small amount of clean, potable water may be added to adjust workability. Do not overwater.

D. Senergy Finishes:

1. SENERFLEX, and SENERFLEX TERSUS Finish: Mix the factory-prepared material with a clean, rust-free paddle and drill until thoroughly blended. A small amount of clean, potable water may be added to adjust workability. Do not overwater.

3.4 APPLICATION

A. Accessories:

1. Attach Window/Door Drip Edge level and per manufacturer’s instructions.
2. Attach starter track per manufacturer's instructions and details.

B. Air/Water-Resistive Barrier:

1. Air/Water Resistive Barrier:
   a. All sheathing joints and windows/openings must be protected, and the air/water-resistive barrier applied in accordance with Air/Water-Resistive/Vapor Barrier Application Guideline technical bulletin.
   b. Substrate shall be dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than ¼" in 10' (6.4 mm in 3 m).
   c. Unsatisfactory conditions shall be corrected before application of the air/water-resistive barriers.
   d. Apply the SHEATHING FABRIC (or flexible flashing membrane) and air/water-resistive barrier in accordance with the air/water-

resistive barrier product bulletin.

e. Installed materials shall be checked before continuing system application.

f. Ensure the air/water-resistive barrier or flexible flashing membrane overlaps the top flange of the starter track.

2. Water-Resistive Barrier:

a. Install according to the specific water resistive barrier manufacturer's specifications and all applicable building code requirements. The water resistive barrier shall be free of any damage such as holes or breaks and must be applied to all surfaces to receive the stucco wall system. Wrap the water resistive barrier into rough openings (doors, windows, etc.) in accordance with manufacturer's guidelines to increase the level of moisture protection to the building frame and interior. Coordinate work with other trades to assure proper sequencing, detailing and installation of materials.

C. Cement Board: Install cement board over secondary weather barrier, securely fastened, per manufacturers' recommendations, applicable building code and project requirements.

D. Trim Accessories: Install per manufacturer's recommendations. Refer to stucco system's manufacturer's guidelines for accessory placement.

E. SELF-ADHERING MESH TAPE (4"):

1. Center the SELF-ADHERING MESH TAPE (4") over all cement board joints and terminations and firmly press while unrolling.
2. Ensure SELF-ADHERING MESH TAPE is continuous, void of wrinkles. Overlap SELF-ADHERING MESH TAPE a minimum 2 1/2" (65 mm).
3. Apply mixed Base Coat to surface of SELF-ADHERING MESH TAPE by troweling from the center to the edges.
4. Allow Base Coat and SELF-ADHERING MESH TAPE to dry prior to application of Reinforcing Mesh and Base Coat.

F. CORNER MESH:

1. Install CORNER MESH at corners.
2. Apply CORNER MESH prior to application of reinforcing mesh.
3. Cut CORNER MESH to workable lengths.
4. Apply mixed Base Coat to insulation board at outside corners using a stainless-steel trowel.
5. Immediately place CORNER MESH against the wet base coat and embed the CORNER MESH into the base boat by troweling from the corner; butt

edges and avoid wrinkles.

6. After base coat is dry and hard, apply a layer of selected Reinforcing Mesh over the entire surface of the CORNER MESH in accordance with 3.04 H.

G. Reinforcing Mesh: Standard or Medium Impact Resistance Reinforcing Mesh: FLEXGUARD 4 INTERMEDIATE 6 and INTERMEDIATE 12:
1. Install Reinforcing Mesh where indicated on drawings.
2. Apply mixed Base Coat to entire surface of the cement board with a stainless-steel trowel to embed the reinforcing mesh.
3. Immediately place Reinforcing Mesh against wet base coat and embed the reinforcing mesh into the base coat by troweling from the center to the edges.
4. Lap reinforcing mesh 2 ½" (64 mm) minimum at edges.
5. Ensure reinforcing mesh is continuous at corners, void of wrinkles and embedded in base coat so that no reinforcing mesh color is visible.
6. If required, apply a second layer of base coat to achieve total nominal base coat/reinforcing mesh thickness of 1/16" (1.6 mm).
7. Allow base coat with embedded reinforcing mesh to dry hard (normally 8 to 10 hours).

I. TINTED PRIMER:
1. Apply TINTED PRIMER to the base coat/reinforcing mesh with a sprayer, ⅜" (10 mm) nap roller, or good quality latex paint brush at a rate of approximately 150 - 250 ft² per gallon (3.6 - 6.1m² per liter).
2. TINTED PRIMER shall be dry to the touch before proceeding to the Finish coat application.

J. Finish Coat: SENERFLEX, SENERFLEX TERSUS
1. Apply Finish directly to the base coat with a clean, stainless steel trowel.
2. Apply and level Finish during the same operation to minimum obtainable thickness consistent with uniform coverage.
3. Maintain a wet edge on Finish by applying and texturing continually over the wall surface.
4. Work Finish to corners, joints or other natural breaks and do not allow material to set up within an uninterrupted wall area.
5. Float Finish to achieve final texture.

3.5 CLEANING

A. Clean work per manufacturer’s recommendations.

B. Clean adjacent surfaces and remove excess material, droppings, and debris.

3.6 PROTECTION

A. Protect base coat from rain, snow and frost for 48 - 72 hours following application.

B. Protect installed construction until acceptance.

END OF SECTION

SECTION 07 54-19
72 MIL INDUCTION WELDED PVC SYSTEM

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SCOPE OF WORK

A. Furnish and install a 72 mil minimum, white, polyester scrim reinforced, PVC elastomeric sheet roofing membrane system. Membrane shall be a high molecular weight PVC polymer membrane. Installed system shall include; inducted welded plates & fasteners, insulation, flashing, sealants and all accessories and labor necessary for a complete insulated sheet roofing assembly.

B. Furnish and install this membrane roofing system in strict accordance with Drawings and Specifications approved by Roof Systems Manufacturer. If conflicts in application arise, material will be installed in accordance with the manufacturer's strictest recommendations.

C. Related Sections:
1. Section 06 10 00- Rough Carpentry
2. Section 07 62 00 – Sheet Metal Flashing and Trim
3. Section 07 71 00 – Manufactured Roof Specialties

1.03 REFERENCES

A. IBC-International Building Code-Roofing Related Sections

B. ASTM – American Society for Testing and Materials.

C. Factory Mutual (FM) Engineering Corporation - Roof Assembly Classifications.

D. ASCE-7- American Society of Civil Engineers-Wind Load Pressure Calculation Procedures

E. NRCA – National Roofing Contractors Association.

F. SMACNA – Sheet Metal and Air Conditioners National Association.

G. Underwriters Laboratories (UL) - Fire Hazard Classifications.

H. FS – Federal Standard

I. ANSI / SPRI ES-1 - (see also, Current IBC Section 1504.5)

1.04 BIDDER'S REPRESENTATION

A. A large part of the value of this work is contained in the bidder's and the bidder's proposed

manufacturer's capacity to provide long-term responsibility for the satisfactory performance of the roof. A 20-year, no dollar limit warranty for the benefit of the Owner is required. To that end, the following requirements are essential provisions of this specification:

1. By offering a bid for this work, the bidder certifies that he has visited the site and determined that all the conditions of the surrounding and underlying work are consistent with his proposed manufacturer's requirements for the specified warranty. In the event that the bidder discovers any condition of the surrounding and underlying work that would prevent him or his manufacturer from providing the specified warranty, he shall report it to the design professional not less than ten days prior to the bid opening.
2. By offering a bid for this work, the bidder certifies that he has examined the Contract Documents, can meet all imposed time completion requirements and has found all the details and requirements of the scope of work are complete and consistent with his proposed manufacturer's requirements for the specified warranty. In the event that the bidder discovers any detail or requirement in the Contract Documents that would prevent him or his manufacturer from providing the specified warranty, he shall report it to the design professional not less than ten days prior to the bid opening.
3. By offering a bid for this work, the bidder certifies that he can, within ten calendar days of a notice of award from the Insurer, provide a surety bond for the performance of the work, a surety bond for payment of labor and materials, and a specimen warranty certificate from the manufacturer whose system that is proposed to be used on the project.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. The manufacturer of the roofing system shall be the actual manufacturer of the roofing materials. The insulation and the component materials can be made by others, all testing requirements and implied warranties must be verifiable and labeled under the roofing manufactures name. All manufactures and sub manufactures shall have not less than fifteen (15) years experience in the production of PVC membrane roof systems and their components. Manufacturer must provide approved uplift testing for induction welded roof systems.
2. The manufacturer shall certify the scrim reinforced PVC membrane meets the physical properties specified.
3. The contractor shall include a certification from the manufacturer, on the manufacturer's letterhead, that the proposed membrane, insulation and accessories will be covered in the warranty by the manufacturer of record.

B. Installer Qualifications

1. Applicator: A company approved by Manufacturer, and specializing in single-ply roofing systems with at least twenty (20) installations of thermoplastic, scrim reinforced membrane and 5 installations of heat inducted systems. The crew shall be composed of experienced installers skilled in this roof assembly. The contractor shall provide a superintendent /foreman on site full time that is aware of all project aspects and authorized to make on site decisions as required. The contractor will be required to properly staff the project at all times to meet all schedules and production rates.

C. Inspections

1. Manufacturer's Technical Representative: The manufacturer of the roofing system shall be required to attend the roof pre-installation conference to accept the conditions of the work and to perform interim inspections during installation. After the roof installation is complete, the manufacturer's technical representative, unrelated to the sales department of the manufacturer, shall inspect the work and inform (by written report) the design professional, contractor, Insurer/Insurer's consultant and the installer of defective/incomplete work to be remedied. Those areas indicated shall be corrected to the full satisfaction of the design professional, Insurer, and manufacturer. Copies of all inspection reports from the manufacturer shall be promptly submitted to the design professional and the roofing consultant. The manufacturer shall submit written acceptance of the project to the design professional in issuance of the weather-tightness warranty and that the system has been installed according to the Manufacturer's published specifications and details. Report describing inspections, corrective actions and certifying manufacturer's acceptance of installation shall be submitted to the Architect in accordance with Section 01400 - Quality Requirements.

2. Roofing Consultant: The owner reserves the right to retain, at the owner's expense, an independent consultant service to review construction documents and provide full-time inspection of the roofing system installation. The inspector shall have free access to inspect and test all items related to the project and the work area. The consultant/inspector will be responsible for accepting the installed roofing on behalf of the Insurer. The roofing contractor/general contractor will keep the consultant informed of all schedules, delays and inspections of the manufacturer (2 week notice)

D. Work shall conform to:

1. NRCA Roofing and Waterproofing Manual, Latest Editions.
2. SMACNA Architectural Sheet Metal Manual, 2003 Edition.
3. Underwriters Laboratories, Inc. (UL): Class A Fire Hazard Classification.
4. IBC International Building Code: related current code requirements.
5. ASCE-7- American Society of Civil Engineers-Wind Load Pressure Calculation Procedures and requirements.
6. Factory Mutual Engineering Corporation (FM): Roof assembly classification with a minimum of a wind uplift fastening pattern based on FM 1-90. Property Loss Prevention Data Sheets 1-28 and 1-29, latest Edition, to include perimeter and corner enhancements.

1.06 SUBMITTALS

A. Provide in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Shop Drawings: Submit shop drawings indicating;
    a. Roof size, location, and type of penetrations as required for the following.
    b. Roof assembly composition and attachment to deck.
    c. Insulation assembly and cricket layout plan with cross sections and slope of tapered insulation.

d. Insulation fastening patterns that are required to conform to wind uplift design based on FM 1-90 insulation fastening requirements at the field, including enhancements at perimeter and corners.

e. Roof perimeter and corner areas as defined by FM Loss Prevention Data Sheet 1-28 with the width dimensioned for each roof section.

f. Complete set of details for all perimeters, drains, penetration and roof accessories flashings and terminations and manufacturer's published installation procedure details. All termination details must conform to project specifications and detail drawings provided.

g. All roof related sheet metal items submitted in conformance with the submittal requirements of Sheet Metal Flashing & Trim specification section, as well as SMACNA approved designs. Flashings at roof perimeters shall be certified ANSI / SPRI ES-1 details. (See currant IBC Section 1504.5).

2. Product Data Submittals:

a. Provide technical product data sheets on ALL materials and accessories that are to be used in the roof assembly and associated with the roof including UL product listing and FM System listing for each type of insulation. The data sheets should be clearly marked where choices occur for type and thicknesses.

b. The Insulation manufacturer shall certify a warranty to the membrane manufacturer in order to meet the complete system warranty.

c. For fasteners that are to penetrate into, or through, pressure preservative treated lumber use stainless steel, hot dipped galvanized coated or provide certification from manufacturer that coating is compatible with preservative used for wood treatment.

d. Manufactures acknowledge letter showing the requirements of attachment, required products, acceptance of details and assemblies.

e. Provide a complete phone list and resumes of all superintendents and foremen that will be on the projects as out lined in spec section 2.1, B.

3. Fire Resistance: Provide roofing system, insulation, and component materials that have been tested for application and slopes indicated and are listed by UL for Class A external fire exposure over decks specified herein. Provide confirmation in submittal package.

4. Wind Uplift: Provide rigid insulation, roofing system, and component materials as specified and that have been tested as a complete system for application for the structural deck and slopes for this project. The system needs to be listed in Factory Mutual Research Approval Guide. Provide attachment to the deck that meets FM 1-90 membrane/insulation fastening requirements. Submit data that confirms this requirement and submit the required fastening patterns.

5. Copy of certificate documenting manufacturer's approval of installer as required in Paragraph 1.4-B-1.

6. Copies of test reports showing compliance with requirements as specified in Paragraph 2.02.

7. Samples:

a. 12 inch square minimum sample of roofing membrane including lap seam

b. Sample RhinoBond Plate and fastener provided by the membrane manufacturer.

8. Provide copy of manufacturers' printed installation instructions and current recommendations.

9. Provide manufacture's notice of approval for warranty, or other manufacturer's signed document which verifies that:

a. The roof system proposed for this project qualifies for their 20 year N.D.L. total system warranty and with the roof system composition listed.

b. The installed roof will meet Class A fire rating.

c. The roof system as installed will meet the specified performance requirements. A listing of the fastening patterns and attachment that meet tested FM 1-90 fastening requirements for the field, perimeter, ridge and corner areas for the project roof decks should be included.

10. Provide copy of warranties required in Paragraph 1.6 for review and approval by design professional. Warranty shall include a minimum wind speed warranty of 90 mph.

11. Provide proposed Over Night seal detail including product data sheets.

12. Provide a complete phone list and resumes of all superintendents and foremen that will be on the projects as out lined in spec section 2.1, B. Turn in no later than at Pre-Roof Meeting.

1.07 WARRANTY

A. Manufacturer's Warranty: Provide roofing manufacturer's total system leak-tight 20-year labor and 20-year material "No Dollar Limit Warranty," including insulation and all components. The warranty shall contain no exclusion or limitation for improper installation, damage from water that ponds, or does not drain freely. Provide all details necessary to qualify for manufacturer's "No Dollar Limit Warranty" and the manufacturer will respond within 48 hours and repair, within five (5) business days, any leaks in the roofing assembly for the warranty period stated above at no cost to the owner, unless the leak is determined to be caused by others. The warranty shall cover wind speeds up to and including 90 mph.

B. Roofer's Guarantee: Provide written guarantee from the Contractor stating that the Contractor will respond within 24 hours and repair within five (5) business days, any leaks in the roofing assembly for 2 years at no cost to the owner.

1.08 PRE INSTALLATION CONFERENCE

A. Conduct a pre-installation conference prior to commencing work of this section at project site under provisions in Division 1 Section "Project Management and Coordination". Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

2. Be prepared to discuss the total number of work days planned to totally complete the roof project including all associated metal work, and what the working schedule will be.
3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
5. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system or whose work will interface with the roof assembly as part of the building envelope.
8. Review governing regulations and school safety requirements.
9. Review temporary protection requirements for roofing system during and after installation.
10. If not already submitted, Provide a complete phone list and resumes of all superintendents and foremen that will be on the projects as outlined in spec section 2.1, B

1.09 DELIVERY, STORAGE, HANDLING

A. Deliver products to site in unopened containers showing brand names and instructions.

B. Store and protect temperature sensitive products in 55° to 72°F environment prior to usage. Store flammable or toxic material according to label instruction.

C. Store each product in weather protected environment, clear of ground and moisture. All insulation and cover boards shall be covered and protected from the elements including, but not limited to, moisture, ultra violet rays and wind, by using secured breathable tarpaulins. The tarpaulins are to be re-secured at the end of each day.

D. Mark wet, damaged & defective materials and remove from site the same day

1.10 JOB SITE CONSIDERATIONS (CAUTIONS AND WARNINGS)

A. Keep all adhesives, sealants and cleaning materials away from ALL ignition sources (i.e., torches, flames, fire, sparks, etc.).

B. Consult container labels and Material Safety Data Sheets for specific safety instructions for all products used on the project.

C. All bonding, splicing, and sealing surfaces must be free of dirt, moisture, and any other contaminants.

D. When the outside temperature is below 40°F (4.44°C), certain combinations of temperature and humidity may cause condensation on the surface of the Membrane Bonding Adhesive. If this condition occurs, do not mate the surfaces. Immediately stop the adhering process until the ambient air conditions no longer causes condensation. When the moisture on the adhesive

completely evaporates, apply additional Bonding Adhesive and proceed.

E. If Bonding Adhesive is used, temperature must be 40°F (4.44°C) and rising for the material to perform as designed.

F. Do not use open flame sources (i.e., propane torches, etc.) to expedite drying of adhesives, sealants, etc. Allow to air dry only.

G. Do not thin or modify any materials.

H. Deliver materials to job site in their original containers as labeled by the manufacturer.

I. Follow directions for protection of materials prior to and during installation. Do not use materials that have been damaged to the point that they will not perform as specified.

J. Care should be used when installing fasteners to avoid possible conduits and other piping in and under the deck.

K. Fumes from adhesive solvents may be drawn into the building during installation, through rooftop intakes. Refer to the Technical Information Sheet "Recommended Guidelines for Application of Roofing Materials to an Occupied Building" in the manufactures manual for specific guidelines.

L. Store the membrane in the original undisturbed plastic wrap in a cool shaded area and cover with light-colored, breathable tarpaulins, in a manner to protect it from damage. Membrane that has been exposed to the elements for approximately 12 hours or more must be prepared with (Splice Wash) prior to hot air welding.

M. PVC is a reflective membrane. Adequate UV eye protection is necessary during installation.

N. Do not use oil base or bituminous base roof cement with PVC Membrane.

O. Contact Manufactures Technical Services and provide procedures for installing the membrane during temperatures less than 40°F (4.44°C).

PART 2 - PRODUCTS

2.01 GENERAL

A. Roof System shall be a UL Class A rated system and attached to the deck in accordance with wind uplift designs based on FM 1-90 fastening requirements including corner and perimeter enhancements for induction welded systems.

B. At all times the job must be staffed with trained employees in the system specified. There must be a superintendent in charge of the project at all times. The superintendent must be onsite as required to make sure the installation is completed properly and for all meetings. There must be a trained foreman on each project full time overseeing all aspects of the installation.

2.02 MEMBRANE

A. Induction Welded, minimum 72 mil, polyester scrim reinforced PVC membrane.

B. Approved Manufacturers:

1. Sika Sarnafil S-327 Membrane

2. Seaman Corporation Fibertite Xtreme membrane

3. Johns Manville – JM PVC (KEE) Membrane Polyester reinforced

4. Carlisle – Sureflex KEE

C. Requests for approval shall be submitted a minimum of 10 days prior to bid, in order to give the Owner Adequate time to review the proposal. The request shall be a complete package as noted below. Requirements to obtain consideration for approval of product include: (submit on Manufacturers letterhead)

1. Complete specification with details for Designers review, along with certification from Manufacturer of substitute membrane that proposed material and system is in compliance with the requirements of this specification.

2. Proof of experience as a manufacturer of the proposed membrane, with a minimum of five (5) years experience with thermoplastic membrane.

3. Provide manufacturer certification that membrane contains no liquid plasticizers, and must be high molecular weight PVC polymers.

4. Provide manufacturers listing of common chemicals that may affect the membrane or the roof system in general.

5. Verification of UL Class A and FM system rating with a membrane attachment and maximum sheet width, in order to minimize seams on the roof. Every roll of membrane shall be UL labeled.

6. Provide adequate background information to the owner, to demonstrate that manufacturer has the capability to service, and back the Warranty for the term herein specified.

2.03 ROOF MEMBRANE

A. Membrane Sheet Material: Membrane shall be 72 mil minimum thickness, white PVC membrane polyester reinforced. There shall be a minimum of 20 mils of PVC membrane above the scrim and the weathering surface of the roof. The PVC sheet physical properties must be actual tested properties of the sheet, not typical or hypothetical values. Membrane must meet or exceed the physical properties of ASTM 4434 for PVC roofing membranes.

2.04 RELATED MATERIALS

A. Flashing: Same membrane as Roofing. For field fabricated vent stacks, pipes and corners provide unreinforced 55mil minimum uncured white PVC.

B. Bonding Adhesive: Standard bonding adhesive provided by Manufacturer to hold flashings in place. Do not apply in seam areas.

C. PVC Coated Metal: as detailed in the plans; otherwise, use specified galvanized metal or color finished metal as detailed.

D. Sealant: Provide to serve as water cut-off mastic, penetration pocket sealer, and to caulk PVC edge to metal. Provide cut edge sealant.

E. Primer: For preparing contaminated membrane for hot-air welding.

F. Seam Caulk: Shall be provided for the purpose of sealing any non encapsulated edge of reinforced membrane.

G. Overnight Seal: As provided by Manufacturer. All seals must be maintained every night.

H. Sealants: Sealants not a part of the Roofing System shall be compatible with PVC materials and applied according to manufacturer's instructions. Acceptable sealants are one part polysulfide

and one part urethane.

I. Mechanical Fasteners: Manufacturer provided fasteners designed for use on Project roof deck based on requirements of induction welded PVC membrane assemblies. Where installation incorporates insulation within the system, provide fasteners with anti-blackout devices as required by each manufacturer. .

J. Polyurethane Insulation Foam Adhesive: One part or two part as recommended by the Manufacturer to adhere insulation in place and applied to meet wind uplift requirements.

K. Foam Backer Rod: Provide acceptable foam backer rod materials for expansion joints or other building envelope interfaces.

L. Nailers: No. 2 or better, treated if required by code.

M. Seam Cleaner: Use a surface cleaner at dirty or contaminated membrane prior to heat weld.

N. Termination Bar: As provided by manufacturer and fastened 6" O.C. with caulking behind the compression point and on top of caulking tray.

O. Pipe Boots & Corners: Provide O.055 inches pre-molded unsupported PVC flashing at 1" to 6" diameter pipes and at inside and outside corners.

P. Edge Metal Systems: As specified in Section 07 62 00 – Sheet Metal Flashing and Trim and/or as detailed in plans.

Q. Counterflashings: As specified in Section 07 62 00 – Sheet Metal Flashing and Trim. Regardless of manufacturer's requirements or details, two piece counter flashings shall be installed.

R. Where plastic drain strainers exist replace with new cast Iron baskets

S. Clean drains and pipes to insure that blockage doesn't exist.

T. Walk Pad: Provide heavy embossed tread pad by PVC manufacture. Recycled products will be provided where possible.

U. T-Joint Covers shall be installed on all T- Joints.

2.05 ROOF INSULATION PRODUCTS

A. INSULATION

1. Description: Roof insulation consisting of a closed cell Polyisocyanurate foam core meeting ASTM Standard Specification
    a. ASTM C1289-16, Type 2, Class 1: Insulation faced with glass fiber reinforced cellulosic felt facers on both major surfaces
2. Nominal Size is 48"x 48" for insulation adhesive application, and 48"x 96" for mechanically attached application.
3. Provide a minimum of two layers of insulation. Minimum of 20 psi compressive strength, square edge
4. All R-Values must be based on the new LTTR ASTM C1289-13e1 standards.

B COVERBOARD

1. Cover board shall be either of the following as approved by membrane manufacturer

for total system warranty, induction weld criteria and roof system code requirements, see drawings.

a. ¼" DensDeck Prime/Securerock, or equal

b. ½" High Density Polyisocyanurate, 150 psi compressive strength

C INSULATION ATTACHMENT

1. Mechanical Fasteners:

a. Attach insulation using Fasteners and Insulation Plates in accordance with the manufacturer's Induction Welded assembly to comply with the wind uplift design based on FM 1-90 as detailed in the specifications above. In a multi-layer insulation assembly, the type and thickness of the top layer of insulation determine fastening pattern. Insulation fasteners shall penetrate the top of the flutes and shall be sufficient to penetrate deck a minimum of ¾" for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a 7/32" carbide drill bit to a depth ½" deeper than the fastener engagement. Roofing contractor is liable for replacing fasteners that extend beyond the bottom of the flutes.

b. Reference Standard: SAE 1022, Heat Treated.

c. Product/Producer: Heavy Duty (HD) fasteners.

d. Provide fasteners sufficient to produce FM I-90 uplift resistance attachment patterns to the deck.

D. JOB REQUIREMENT

1. **Bid Lot #1: Tays Center:**

a. Roof Plan Sheet A-101 Keynote 1:

1. Install new ¼"/FT slope average R-30 tapered polyisocyanurate insulation with a minimum 1 ½" start thickness, ½" high density coverboard as specified and install new PVC induction welded roof assembly. Refer to drawings and details for specified conditions and locations.

2. Polyisocyanurate Crickets: Installed must provide at least a ¼" per foot reverse slope greater than the slope of the field. Install ½" to 0" taper edge board along cricket and field connection. Crickets drawn on drawings are shown for intent only. All crickets should be installed at a minimum 3 to 1 length to width ration and increased as necessary to provide positive drainage.

b. Roof Plan Sheet A-101 Keynote 1A:

1. Install new minimum two layers polyisocyanurate insulation equaling R-30, ½" high density coverboard as specified and install new PVC induction welded roof assembly. Refer to drawings and details for specified conditions and locations.

2. Polyisocyanurate Crickets: Installed must provide at least a ¼" per foot reverse slope greater than the slope of the field. Install ½" to 0" taper edge board along cricket and field connection. Crickets drawn on drawings are shown for intent only. All crickets should be installed at a minimum 3 to 1

length to width ration and increased as necessary to provide positive drainage.

2. **Bid Lot #2: Physical Plant Building:** Roof Plan Sheet A-102 Keynote 1:

   a. Install new ¼"/FT slope average R-30 tapered polyisocyanurate insulation with a minimum 1 ½" start thickness, ½" high density coverboard as specified and install new PVC induction welded roof assembly. Refer to drawings and details for specified conditions and locations.

   b. Polyisocyanurate Crickets: Installed must provide at least a ¼" per foot reverse slope greater than the slope of the field. Install ½" to 0" taper edge board along cricket and field connection. Crickets drawn on drawings are shown for intent only. All crickets should be installed at a minimum 3 to 1 length to width ration and increased as necessary to provide positive drainage.

3. Crickets On All Roofs
   a. Polyisocyanurate Crickets: Installed crickets must be 2X the slope of the roof slope. Crickets drawn on drawings are shown for intent only. All crickets should be installed at a maximum 3 to 1 length to width ration and increased as necessary to provide positive drainage.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION

A. Install membrane and accessories in accordance with plans, specifications and manufacturer's specifications and current recommendations following the most stringent requirement of the three.

B. Do not expose the building and materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day

C. Protect building surfaces against damage from roofing work.

3.02 DECK EXAMINATION AND PREPARATION

A. Inspect roof decks for deficiencies and report to the Design Professional immediately any deficiencies. Do not proceed with installation of roof, until all deficiencies have been corrected. Start of roofing shall constitute acceptance of deck.

1. Verify that deck is supported, secured and free of depressions.
2. Verify that metal deck surfaces are dry and free of snow or ice.
3. Verify that roof openings, curbs, pipes, sleeves, ducts & vents through roof are solidly set and wood nailers are in place
4. On roofs to be recovered, remove and replace any wet roofing and insulation, and remove base flashings, penetration flashings, gravel surfacing, blisters and ridges.
5. On roofs to be replaced, remove all roofing to the deck. Clean deck of all debris.

3.03 PHASED CONSTRUCTION & COMPLETION REQUIRMENTS

C. Phased construction will not be permitted on this project.

D. Once roofing operations are started, the roofing application, including all associated metal work, must be continuous and finalized with all punch lists completed in the number of work days calculated from the following overall production rates:

1. 700 SF/Day (3,500 SF/40 hr Work Week) Completion Rate based on a 5 day 40 hour work week, or

2. 875 SF/Day (3,500 SF/40 hr Work Week) Completion Rate based on a 4 day 40 hour work week.

Unless the Contractor's failure to complete the roof portion of the Work within this time limit is justified for reasons allowed under the Contract, the Contractor shall reimburse the Owner for all related expenses incurred by the Owner due to such failure. These expenses may include, but not be limited to, the additional costs to Owner for related roof consulting and observation services.

3.04 WOOD NAILER LOCATION AND INSTALLATION

A. Install wood nailers at roof edges, metal flashings, gutters, and elsewhere as shown on Drawings and approved shop drawings or as required by system manufacturer Install wood nailers as follows:

1. Nailers are to be installed as per ANSI / SPRI ES-1 compliance

2. Treated Wood Fasteners: All fasteners used in wood that has been pressure treated with preservatives must be hot dipped galvanized coated, stainless steel or approved in writing by the fastener manufacturer for use in treated wood.

3. Chemical treating wood nailer for fire resistance or other purposes may affect the performance of the PVC Membrane and accessories. Consult Manufacturer's Technical Services Department regarding compatibility.

4. Discard units of material with defects that might impair quality of work and units that are too small to use in fabricating work with minimum joints or optimum joint arrangement.

4. The nailer height must match the total thickness of insulation. Where tapered insulation is used, the wood nailer must be tapered so that it will always be flush at the point of contact with the insulation (refer to Details). Set nailers to required levels and lines with members plumb and true.

5. Top of perimeter nailers shall be uniformly flush with the top of insulation.

6. Nailers shall be installed with 1/4" gap between ends of adjoining pieces.

7. Nailers shall be fastened in accordance with the following schedule:

a. Fasteners in 6" or wider (nominal) lumber shall be installed in two (2) rows, staggered one-third of nailer width. Listed spacings indicate distance between fasteners in adjacent rows.

b. Treated Wood Fasteners: All fasteners used in wood that has been pressure treated with preservatives must be hot dipped galvanized coated, stainless steel or approved in writing by the fastener manufacturer for use in treated wood.

c. Corner fastener spacing is ½ of the perimeter spacing (double the fasteners) and

shall extend 8 Ft maximum from all outside building corners.

d. Where two or more nailers are installed, each nailer shall be fastened independently.

a. Over all deck types, the bottom nailer shall be fastened using the specified fasteners and 5/8" diameter washers. Countersink washers and fasteners level with top of wood using spade bit or similar method. Fasten subsequent nailers, where specified, using the specified screws without washers.

b. Nailer attachment shall meet a minimum uplift resistance of 200 lbs.

c. A Fastener shall be 4" in from both nailer ends.

d. Nailer Attachment Schedule (unless noted otherwise on the drawings)

Attachment Substrate	***Perimeter Fastener Spacing (maximum)***
Structural Concrete	12" o.c.
CMU (fastener into solid material)	12" o.c.
Steel Deck	12" o.c.
Wood	12" o.c.

3.05 INSULATION INSTALLATION

A. Install Insulation: Install only as much insulation as can be covered with roofing membrane and completed before the end of the day's work or before the onset of inclement weather.

B. Stagger Insulation Joints: All joints are to be staggered. When installing multiple layers of insulation, all joints between layers should be staggered.

C. Fit Insulation: Neatly fit insulation to all penetrations, projections, and nailers. Insulation should be loosely fitted, with gaps greater than 1/4" being filled with acceptable insulation. Under no circumstances should the membrane be left unsupported over a space greater than 1/4". Tapered or feathered insulation should be installed around roof drains so as to provide proper slope for drainage.

A. Crickets/Saddles:

1. Crickets on plans are shown for intent only. The contractor is responsible for installing the crickets with a sufficient length to width ratio to provide positive drainage to drains/scuppers. The maximum length to width (L:W) ratio for various roof slopes are:

SADDLES AND CRICKETS		
Roof Slope	Saddle/ Cricket Material Slope	Maximum L:W Ratio
1/8	1/4	3:1
1/4	1/2	3:1
3/8	3/4	3.5:1
1/2	1	4:1
3/4	1.5	4:1
1	2	4:1

Do not exceed the maximum ratios. The ratios can be decreased if needed to provide positive drainage.

2. If the crickets are overlaid with a layer of insulation, a row of fasteners should be applied along the cricket valley line to insure the overlay conforms to the cricket configuration. If the crickets are installed on top of all insulation, a tapered edge strip sized from the cricket edge height down to 0" shall be installed.

E. Insulation Attachment to Deck:

1. Attach insulation using Fasteners and Insulation Plates in accordance with the manufacturer's Induction Welded assembly to comply with the wind uplift design based on FM 1-90 as detailed in the specifications above. In a multi-layer insulation assembly, the type and thickness of the top layer of insulation determines the fastening pattern.

2. Fastener lengths shall be sufficient to penetrate into the deck a minimum of ¾" for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a 7/32" carbide drill bit to a depth ½" deeper than the fastener engagement.

3. On exposed metal decks the insulation fasteners shall only penetrate into the deck top flange and shall not extend below the bottom of the flutes into the building interior. Roofing contractor is liable for replacing fasteners that extend beyond the bottom of the flutes

4. On exposed wood decks the fasteners must not penetrate through or split the exposed wood. Roofing contractor is liable for replacing fasteners and any damaged wood ceilings, including the wood finish, resulting from fasteners penetrating through the wood.

3.06 MEMBRANE INSTALLATION

A. Starting at the low point of the roof, place the membrane panels without stretching over the acceptable substrate that is clean and free of debris. Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" and side laps a minimum of 6". Install panels to insure that laps shed water. Allow membrane to relax at least 30 minutes before attachment or splicing. In colder weather allow for longer relax time. Install membrane without wrinkles and without gaps or fish mouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions.

B. Where PVC Membrane has been cut to expose reinforcing membrane, PVC Cut Edge Sealant is to be used to encapsulate exposed edge.

C. Calibrate each induction welding tool in accordance with membrane roofing manufacturer's instructions to appropriate level for weather conditions. Run destructive weld tests before starting each day and after any significant change in the air temperature, and as required by manufacturer's instructions if requirements are greater.

D. Weld membrane to attached Rhino Plates using induction welding tools as recommended by manufacturer, following specified pattern provided by manufacturer. All plates should be welded prior to moving onto a new section. All plates that have damage, asphalt, glues or other defects must be replaced prior to welding.

E. On a daily basis follow manufacturer's direction for verifying that all induction welding are fully bonded to the membrane.

F. For corners and perimeters follow enhancement patterns as specified for FM 1-90 uplift design requirements.

G. Perimeter fastening at all parapets, curbs and ducts, is to form an air/water barrier by turning the field membrane perimeter up onto vertical walls, etc., and terminate with a metal termination bar (term bar) fastened 6" or 8" O.C., depending on how termination bar is pre-punched. Butyl sealant is to be applied behind membrane at termination bar to provide compression seal. Seal corners with manufacturer's appropriate sealant. Leave a ¼" gap between ends of term bar, and do not bend a term bar around a corner.

H. Secure the membrane at all locations where the membrane goes through an angle change of 1" in 12".

I. All membrane fasteners are subject to the requirements in 3.05.E.2, 3 &4.

3.07 MEMBRANE LAP SPLICING

A. Calibrate automatic welder in accordance with membrane roofing manufacturer's instructions to appropriate level for weather conditions. Run destructive weld tests before starting each day, after any significant change in the air temperature, and as required by manufacturer's instructions if requirements are greater

B. Lap splice areas that have been contaminated, or unwrapped or exposed for 12 hrs or more, must be wiped down with a clean white cloth dampened with manufacturer's splice wash prior to heat welding and allow to completely dry.

C. All field and flashing splices on the horizontal surface shall be completed using an automatic heat welder that has been designed for hot air welding of PVC membranes.

D. Hand held welders are only to be used on vertical welds or where an automatic welder is not practical or cannot be used.

E. Seams made with the automatic welder shall be a minimum of 1-1/2" wide. Seams made with hand welders shall be a minimum of 2" wide. Use 2" side silicone or silicone coated steel hand rollers to assure proper mating of surfaces as hand heat welding proceeds.

F. Probe all completed welds daily using a slotted screwdriver, or a dulled cotter pin puller type tool, to verify seam integrity. Do not probe welds until they have had time to cool to ambient conditions. Any welds found to be insufficiently welded need to be repaired on a daily basis. Any seam voids, or insufficient welds, that are 2” or less in length are to be repaired with a patch.

3.08 FLASHING – LIQUID APPLIED

A. Liquid Flashing Products

1. Liquid Flashing Primer: A two-component polymethyl methacrylate-based (PMMA) primer used to promote the adhesion of Liquid Flashing SW and Liquid Flashing WW over wood and concrete surfaces.

2. Liquid Flashing Fleece: A non-woven, needle-punched polyester fleece used as the reinforcement for Sika’s liquid flashing details systems.

3. Liquid Flashing Catalyst: A reactive agent based on dibenzoyl peroxide to induce curing of Sika’s Liquid Flashing SW, Liquid Flashing WW, and Liquid Flashing Primer when mixed.

4. Liquid Flashing SW (summer-grade white): A two-component polymethyl methacrylate-based (PMMA) liquid flashing material used with Liquid Flashing Fleece and cures to form a monolithic reinforced flashing membrane.

5. Liquid Flashing WW (winter-grade white): A two-component polymethyl methacrylate-based (PMMA) liquid flashing material used with Liquid Flashing Fleece and cures to form a monolithic reinforced flashing membrane. The ambient and surface temperatures at application must be between 23°F (-5°C) and 68°F (20°C).

B. Surface Preparation

1. All surfaces should be clean, dry, free of dirt, dust, debris, loose particles, loose paint, rust and other contaminants.

2. Clean new roofing membrane with mineral spirits or all-purpose cleaner which will not remove the lacquer coating from the membrane. If the membrane is old or extremely soiled Sika Seam Cleaner should be used to restore the membrane to a ‘like new’ condition before applying Liquid Flashing.

3. Clean and prepare metal surfaces to near white metal in accordance with SSPC-SP3 (power tool clean). If power tools are not available, use abrasive paper with a grain size of 20 to 40 to remove all loose particles including paint flakes and rust.

4. Grind concrete and masonry surfaces with diamond cup wheel to remove laitance and contaminants.

5. Lightly sand glass, rigid PVC and plastic surfaces. Extend surface preparation a minimum of 1/8 in (3 mm) beyond the termination of the flashing.

6. Wipe metal and glass surfaces with Sika's Seam Cleaner and allow to dry.

7. For repairs or touch-up, wipe previously installed Liquid Flashing with Sika's Seam Cleaner to clean and reactivate the Liquid Flashing and allow to dry.

8. Prime wood and concrete surfaces with Liquid Flashing Primer. Allow Liquid Flashing Primer to cure completely before applying Liquid Flashing.

9. Apply painters tape to 'picture frame' and mask the outside edge of the detail. Place the tape 1/4 in (6.35 mm) beyond where the Liquid Flashing Fleece will terminate.

10. Pre-cut Liquid Flashing Fleece to fit around the penetration. Vertical flashing pieces must extend 2 in (51 mm) from the base and horizontal flashing pieces must extend 4 in (102 mm) out from the base. Flashing height should be a minimum of 8 in (203 mm) where possible.

C. Liquid Flashing Summer White (SW)

Using Liquid Flashing SW ambient temperature must be between 59°F (15°C) and 104°F (40°C) when mixing. Thoroughly mix the entire container of Liquid Flashing SW with a slow-speed (200 to 400 rpm) mechanical mixer (electric drill with a mixing paddle) for two minutes.

Small Batch – 1 Liter

1. After mixing, pour 1 liter of Liquid Flashing SW into a clean plastic container.

2. Add 2 level tablespoons (20 g) of Liquid Flashing Catalyst to Liquid Flashing SW and mix with a slow-speed mechanical mixer for two minutes.

3. Once mixed, the pot life is approximately 10 - 15 minutes depending on the ambient and surface temperature.

D. Liquid Flashing Winter White (WW)

Using Liquid Flashing WW ambient temperature must be between 23°F (-5°C) and 68°F (20°C) when mixing. Thoroughly mix the entire container of Liquid Flashing WW with a slow-speed (200 to 400 rpm) mechanical mixer (electric drill with a mixing paddle) for two minutes.

Small Batch – 1 Liter

1. After mixing, pour 1 liter of Liquid Flashing into a clean plastic container.

2. Add 4 level tablespoons (40 g) of Liquid Flashing Catalyst to Liquid Flashing WW and mix with a slow-speed mechanical mixer for two minutes.

3. Once mixed, the pot life is approximately 10 - 15 minutes depending on the ambient and surface temperature.

E. Application

1. After mixing in the Liquid Flashing Catalyst, apply Liquid Flashing to the clean prepared surface using a small ½ in (13 mm) nap roller with rounded edges.

2. Apply 55 mils (1.4 mm) of Liquid Flashing evenly onto the substrate and terminate onto the inside edge of the painters tape. Place the Liquid Flashing Fleece into the wet Liquid Flashing taking care to remove any air bubbles and wrinkles. Terminate the Liquid Flashing Fleece 1/4 in (6.35 mm) from the inside edge of the painters tape. Apply additional Liquid Flashing at overlaps between the fleece layers.

3. Immediately apply 25 mils (0.6 mm) of additional Liquid Flashing to fully saturate the fleece. Extend Liquid Flashing onto the inside edge of the painters tape. Remove the painters tape immediately after the Liquid Flashing application.

4. Complex and irregular shapes such as nuts, bolts, etc. may require an additional 25 mil (0.6 mm) thick application of Liquid Flashing to ensure full coverage. Wait one hour before applying the additional coat.

3.09 FLASHING - PENETRATIONS

A. General:

1. Flash all penetrations passing through the membrane.
2. The flashing seal must be made directly to the penetration.
3. The penetration must be thoroughly cleaned prior to applying the flashing.

B. Pipes, Round Supports, etc.

1. Flash with Pre-Molded PVC Pipe Flashings where practical.
2. Flash using PVC unsupported Flashing membrane to form a field fabricated flashing only when Pre-Molded Flashing is not practical.
3. At top section of flashing apply Manufacturer’s Water Block sealant between pipe and membrane and compress with a stainless steel clamp.

4. Once flashing is installed, seal around top of flashing with Manufacturer's All Purpose sealant.

C. Flexible Pipe/Conduit Penetrations:

1. Provide a weather tight goose neck conduit for flexible pipe/conduit penetrations secured to the deck. Flash in accordance with Manufacturers Details.

D. Pipe Clusters

1. Provide an insulated roof penetration housing vault by Roof Penetration Housing, LLC (www.roofpenetration housings.com, 1-800-994-0945) or equal, unless detail specifically in the drawings. Each contractor trade (HVAC, Electrical, Plumbing, etc.) shall provide the appropriate exit seals for their specific level of responsibility. Install per manufacturer's requirements and provide their 20 year warranty and certification of ICC 2015 compliance to the owners.

2. Pitch pans are to be avoided. Prior approval from the Design Professional is required for each pitch pan use. If penetration pockets are approved, all piping must be thoroughly cleaned and a minimum clearance of 1" between the penetrations and all sides must be provided. Secure penetration pockets per Manufacturers recommendations. Fill penetration pockets with Pourable Sealer, so as to shed water.

3. Fill penetration pockets with Pourable Sealer, so as to shed water.

E. Flexible Piping Penetrations

1. Provide Roof Penetration Housing Vault for flexible piping, or a weather tight gooseneck with roof outlet angled downward at a minimum of 45º and secured to the deck. Outlet to be sealed with foam insulation and coated with elastomeric sealant. unless detail specifically in the drawings.

2. Flash in accordance with Drawings and Manufacturers Details.

F. Roof Drains

1. Existing drain bowls and rings are to be cleaned and inspected. Broken drain bowls, clamping rings or missing strainers, clamping rings, and bolts are to be replaced. All lead flashings in the drain bowl must be removed.

2. Replace plastic parts with new Cast iron drain parts and strainers.

3. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.

4. Taper insulation around the drain to provide a smooth transition from the roof surface to the drain.

5. Place water stop sealant on top of drain bowl where the clamping ring seats below membrane.

6. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve uniform compression.

7. All drains are to be water tested below the pipe connection to the bowl or if further testing of the drain system is noted in the drawings.

G. Scuppers

1. Provide new PVC coated welded watertight scuppers.
2. Set welded watertight scupper in Water Block Seal and secure to the structure.
3. Flash in accordance with Manufacturers and Plan details.

H. Expansion Joints

1. Install as shown on roof drawings in accordance with Manufacturers details.

3.10 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, SKYLIGHTS, etc.

A. General: Using the longest pieces practical, flash all walls, parapets, curbs, etc., a minimum of 12" high per Details. When special situation flashings will not achieve a minimum 8" finished flashing height, contact manufacturer for recommended details and approvals and notify specifier/owner of conditions and provide acceptance letter from Manufacturer.

B. Flashing Substrates: All flashing substrates are to consist of, or be overlaid with 5/8" minimum CDX plywood or fire treated if code requires.

C. Apply PVC Bonding Adhesive at about the same time to both the membrane flashing and the surface to which it is being bonded so as to allow approximately the same drying time. Apply Bonding Adhesive by rolling the adhesive on to the mating surfaces evenly, avoiding globs or puddles.

D. Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles.

E. To ensure proper contact, compress the flashing to the substrate with a stiff push broom.

F. Provide membrane flashing termination directly to the vertical substrate as shown in Plan Details. At a minimum:

1. Apply water block sealant behind membrane in top area,
2. Attach termination bar 6" or 8" O.C., depending on how termination bar is pre-punched, leaving a ¼" gap between joints of termination bar. Fasten no more than 1" from termination bar ends.
3. Do not bend termination bar around corners.
4. Cutoff excess PVC flashing above termination bar.
5. Apply manufacturer's all-purpose sealant in caulking receiver at top of termination bar, tooling the sealant to facilitate water runoff.
6. Install 2-piece counterflashing with reglet/receiver set in water block sealant against the wall, fastened 12" O.C. and for surface mounted type, apply manufacturer's all-purpose sealant in the caulking receiver and tool to facilitate water runoff.

G. Install PVC T-Joint covers at all field and flashing splice T-joint intersections.

H. Install intermediate flashing attachment for walls greater than 24" at 24" increments.

3.11 FLASHING - ROOF EDGE METALS

A. Flash all roof edges using materials as outlined in specifications and Plan Details. All roof edge attachment to meet ANSI/SPRI ES-1requirements.

B. Use manufacturers coated PVC metal for drip edge, scuppers and similar terminations as shown in plan details. Exposed metal color to be selected by Architect.

C. Field membrane at a minimum is to extend over nailer and down outside face at least ¾" past bottom of wood nailer.

3.12 ROOF WALKWAYS

A. Walkways shall be the Roofing Manufacturer's PVC Walkway material or specified walking and platform systems.

B. Walkways shall be installed in a neat, orderly fashion where indicated on roof plan or in specifications. Chalk line walkway location on roof membrane, and position walkway in place using a chalk line as a guide.

C. Install walkway with sufficient gaps so as not to impede drainage. Do not cover field seams with walkways leaving enough space to properly repair the field seam if needed. If there is a situation where the seams are located in an area that needs to be covered with the walk pad, do the following:

a. Probe and repair the seam as needed.

b. Clean and weld a 6" membrane strip over the seam

c. Probe and repair the 6" strip welds as needed.

d. Apply edge sealant as needed.

e. Install the walk pad over the reinforced seam as needed.

D. Heat weld the perimeters of the walkway material to the PVC membrane per Manufacturers requirements. Place two rows of walk pads 36" wide minimum along three sides of working side of HVAC units and other serviced equipment. Place two rows of walk pad 36" wide minimum along access side(s) of all roof hatches, roof ladders, and other roof access points, and3.12

3.13 FIELD QUALITY CONTROL

A. Perform a water test of all roof drains once the roof is complete. The test, shall be coordinated with the Owner and conducted by the Contractor in the presence of Design Professional. Owner's Roofing Observer and Owner's Representative.

B. The water test shall include the following procedure:

a. Contractor shall provide and/or arrange for necessary equipment, supplies, water, etc. as needed to perform this test.

b. Drain bowl testing:
1) Test drain piping for leaks
2) Test the membrane seal to drain bowl tested with water brought up 2" above immediate roof level.

c. All crickets are to be tested for proper drainage and holding of water in cricket valley

and surrounding membrane field.

3.14 CLEAN-UP

A. Clean all contaminants from building and surrounding areas.

B. Remove bituminous, EPM residue, or other markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this Section, consult Manufacturer of membrane for cleaning advice and conform to their instructions

D. Remove trash, debris, equipment from project site and surrounding areas.

E. Repair or replace damaged building components or surrounding areas to the satisfaction of the building owner.

F. Chemical spills, including bonding adhesive and membrane cleaner, should be cleaned immediately. Areas contaminated by chemicals should be inspected for permanent damage and may require removal and replacement, at no additional cost to the Owner.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SECTION INCLUDES

A. Flashings, counterflashings, sheet metal roofing flashings, scuppers, gutters, downspouts, splash pads, edge strips, formed wall flashing and trim and other fabricated sheet metal items.

1.03 RELATED SECTIONS

A. Section 07 4190 – 72 MIL Induction Welded PVC System

D. Section 06 1000 – Rough Carpentry

1.04 REFERENCES

A. ASTM A 653/A 653M - Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 1997.

B. ASTM B 32 - Standard Specification for Solder Metal; 1996.

C. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 1997a.

D. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 1993.

E. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003, Sixth Edition.

F. NRCA – The NRCA Architectural Sheet Metal and Metal Roofing Manual, Latest Editions.

1.05 SUBMITTALS

A. See Section 01 6000 - Submittals, for submittal procedures.

B. Shop Drawings: Provide for all shop and pre-manufactured fabricated items. Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details. Submit color chart for pre-finished materials.

C. Submit roof manufacturer’s certification that metal fasteners and sealants are acceptable to roof manufacturer.

D. Product Data Sheets on all products

E. For fasteners that are to penetrate into, or through, pressure preservative treated lumber use stainless steel, hot dipped galvanized coated or provide certification from manufacturer that coating is compatible with preservative used for wood treatment.

F. Submit copies of all warranties.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual and The

NRCA Architectural Sheet Metal and Metal Roofing Manual requirements and standard details and Manufacturer's requirements, except as otherwise indicated.

B. Install all sheet metal so as not to allow water infiltration into building.

C. Prevent contact with materials which may cause discoloration or staining.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials which may cause discoloration or staining.

1.08 WARRANTIES:

A. 20 year coating warranties on all coated metals

B. All copings and edge metals must meet ES-1 Code requirements

PART 2 - PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; 0.033 inch (22 gage) thick steel; pre-finished fluorocarbon coating system unless noted otherwise on the drawings.

B. Membrane coated metal is to be used as shown in plans and roof membrane specification section.

2.02 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers. For fasteners that are to penetrate into, or through, pressure preservative treated lumber use stainless steel fasteners, hot dipped galvanized coated fasteners or coated fastener that is certified by manufacturer that coat is compatible with preservative used for wood treatment.

B. Underlayment:

1. ASTM D 2178, glass fiber roofing felt.

2. Self adhering polymer modified bituminous sheet equal to W. R. Grace Ultra Ice and Water Shield.

C. Primer: Zinc chromate type.

D. Protective Backing Paint: Zinc chromate alkyd.

E. Sealant: Type C specified in Section 07 9005 – Joint Sealants.

F. Plastic Cement: ASTM D 4586, Type I.

G. Solder: ASTM B 32; Sn50 (50/50) type.

PART 3 - FABRICATION

3.01 GENERAL FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch.

D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricated corners:

1. Metal corners are to be soldered/welded water tight at curb metal cover flashings.
2. Other, metal corners are to be folded and mitered together with the folded metal sealed water tight with sealant between the folds. Seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward ¼" or ½"inch and hemmed to form drip.

G. All metal roof counterflashings are to be 2-piece (reglet with flashing insert). All metal flashing and reglet corners are to be mitered, folded, caulked and pop riveted in a watertight manner. The reglet/receiver mitered corners are to be fabricated with legs no longer than 18".

3.02 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA Architectural Sheet Metal Manual, Material gauge and profile shall be as indicated on the Drawings. The finish shall match metal roof panels or shall be as indicated on the Drawings. Each gutter joint will be cleaned, primed and covered with either a 6" wide strip of uncured EPDM glued in place in accordance with manufacturer's recommendations with the edges sealed with recommended seam caulk, or a 6" wide strip of weather resistant Eternabond.

B. Downspouts: Rectangular profile - See Drawings for details. Material finish shall match metal roof panels and be fabricated from 22 gauge metal, or as indicated on the drawings.

C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 5 years in accordance with SMACNA Architectural Sheet Metal Manual. Material finish shall match metal roof panels, and be fabricated from 22 gauge metal; or as indicated on the drawings.

D. Accessories: Profiled to suit gutters and downspouts.

1. Anchorage Devices: In accordance with SMACNA requirements.
2. Gutter Supports shall be as indicated on the Drawings.
3. Downspout Supports: Brackets.

E. Seal metal joints.

3.03 COPING FABRICATION

A. Coping will be prefabricated from 22 gauge iron sheet metal with material finish matching metal roof panels, or as indicated on the Drawings.

B. Cover and splice plates will be installed.

C. Coping will be tapered to drain water to the inside.

D. Coping corners are to be mitered, sealed and pop riveted with 30" maximum outside legs. Pop rivets are to penetrate through sealant.

E. Coping Tee joints are to be fabricated with a 5' top of the Tee and a 30" leg inserted under the top of the Tee, sealed and pop-riveted. Pop rivets are to penetrate through sealant.

PART 4 - EXECUTIONS

4.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

4.02 PREPARATION

A. Install starter, edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint

4.03 GENERAL INSTALLATION

A. Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA and NRCA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall opening components such as windows, doors and louvers.

B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

C. Apply plastic cement compound between asphalt primed metal flashings, felt flashings and per NRCA standards.

D. Fit flashings tight in place. Make mitered corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

4.04 COUNTERFLASHING INSTALLATION

A. All metal roof counterflashings are to be 2-piece (reglet/receiver with flashing insert). Counterflashings attached to metal and where slip metal is needed at mechanical curbs, one (1) piece may be used unless Drawings indicate otherwise.

B. Masonry and saw cut reglets: Insert masonry reglets to form tight fit. Secure saw cut reglets in place with appropriate wedges installed. Seal joint with one part polyurethane caulking.

C. Surface mounted flashing receiver: Set receiver into non-skinning butyl caulk and fasten reglet to wall 12” O.C through butyl caulk. Seal top of receiver with one part polyurethane caulking. For stucco stop type reglet: fasten reglet to wall 12” O.C.

D. All metal flashing receiver and reglet lap joints are to be lapped 3” and are to be caulked water tight with polyurethane caulking between the two pieces. The two pieces are to fit flush with one another. Wind clips 1” wide are to be installed spaced approximately 3’4” O.C.

E. All metal flashing and reglet corners are to be mitered, folded, caulked and pop riveted in a watertight manner. The reglet/receiver mitered corners are to be fabricated with legs no longer than 18”.

F. When masonry and stucco stop reglets are to be installed by other trades, insure that they are fully informed on installation requirements.

4.05 GUTTER & DOWNSPOUT INSTALLATION

A. Secure gutters and downspouts in place using concealed fasteners.

B. Slope gutters to outlets.

C. Gutters will be installed in accordance with SMACNA recommendations including a maximum 50 LF run from end to end without an expansion joint. Each gutter joint will be

cleaned, primed and covered with a 6" wide strip of uncured EPDM glued in place in accordance with manufacturer's recommendations and the EPDM edges sealed with recommended seam caulk, or a 6" wide strip of weather resistant Eternabond.

D. Where coping abuts a high wall, a splice plate with edge flanged up and out will be installed against wall in non-skinning butyl sealant. A wall abutment flashing trimmed to fit tight around the splice plate will then (1) be installed in sealant insuring the two corners at the splice plate are completely sealed with the sealant, (2) fastened to the wall and (3) sealed around the edges. Coping will be set in four rows of non skinning butyl sealant on the splice plate as described above leaving a ¼" separation between coping and wall.

E. Coping butt joints are to have both a 6" wide splice plate and 6" wide cover plate at each joint. Separation between coping joints shall be ¼". On each side of the splice plate there is to be two full rows of non-skinning butyl caulking. Under each side of the cover plate there is to be one row of non-skinning butyl caulk. If the parapet is sloped, 2 pop rivets on the uphill side of the cover plate will be installed through the cover plate, through the butyl caulk

END OF SECTION

SPECIFICATION 07 71 00
MANUFACTURED ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof mounted pipe supports and duct supports
B. Roof Hatch Safety Rail
C. Roof Access Ladder

1.02 RELATED SECTIONS

A. Section 07 4190 – 72 MIL Induction Welded PVC System

B. Section 07 6200 – Sheet Metal Flashing and Trim

1.03 REFERENCES

A. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 1993, Fifth Edition.

1.04 SUBMITTALS

A. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual details.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Roof mounted pipe and duct supports
   1. Cooper B-Line, DURA-BLOK: Pipe – DBR Adjust. Height, Duct - DB_DS Series

B. Roof Hatch Safety Rail

   1. SafePro L.P., 1355 N. Walton Walker, Dallas, TX 75211; Phone: 1-877-723-3570; Fax: 214-330-5435; Website: www.safeprosafety.com. Basis of Design: SafePro Roof Hatch Safety Rail, series SP.

2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Roof Access Ladder

1. Alaco Ladder Company., 5167 G Street, Chino, CA 91710-5143; Phone: 1-888-310-7040; Fax: 909-591-7565; Website: www.alacoladder.com. Basis of Design: Model 564 fixed wall ladders.
2. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions.

B. Coordinate installation of components of this section with installation of roofing membrane and base flashings.

C. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

END OF SECTION