



SPECIFICATIONS FOR
ARMSTRONG ELEMENTARY SCHOOL
ROOF RECOVER PROJECT
GREENVILLE, SOUTH CAROLINA
GREENVILLE COUNTY SCHOOLS



Project No. FH216232

**BID DOCUMENTS
NOT FOR CONSTRUCTION**

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Environmental Facilities Geotechnical Materials

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SECTION 008000 – INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 BIDDER QUALIFICATIONS

- A. Bidders must be licensed General Contractors of the class required by South Carolina Statutes for executing the work being bid.
- B. Prior to an award of contract, and upon request, submit to Owner satisfactory evidence of current and appropriate license pursuant to the applicable provisions of that State's General Statutes governing the business of "General Contracting" and such other rules, regulations and/or ordinances as may be applicable to performance of the work specified herein. Failure to provide evidence of an appropriate license by any bidder as described herein shall result in that bid, quotation or proposal not being considered.
- C. Bidder must be a Roofing Contractor with at least four years of contracting experience in the type of work involved in this project and must have performed work similar in scope to the work proposed in this project. Provide evidence of qualifications upon request by Owner. The contracting firm's experience will be considered in the enforcement of this paragraph.
- D. All experience must have been acquired by bidding contractor named on the form of proposal. Firms using aliases, or who have changed names during the four-year period are subject to disqualification at the discretion of the Owner.
- E. Submit upon request of Owner certification from the roofing materials manufacturer that the bidding contractor is acceptable to the roofing system manufacturer as an installer of the manufacturer's system in all regards and no warranties required by the contract documents will be withheld by the manufacturer solely as a result of the bidder's qualifications to perform the work.
- F. Bidder, by submitting a bid for this project, certifies that the bidding contractor is acceptable to the roofing system manufacturer as an installer of the manufacturer's system in all regards and no warranties required by the contract documents will be withheld by the manufacturer solely as a result of the bidder's qualifications to perform the work.

1.2 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

- A. The Bidder is required, before submitting his proposal, to visit the site of the proposed work and familiarize himself with the nature and the extent of the work and any surface and subsurface conditions that may in any manner affect the work to be done, and the equipment, materials, and labor required, and the cost thereof. Bidder is also required to examine carefully the Plans and Specifications and Contract Documents and to inform himself thoroughly regarding any and all conditions and requirements that may in any manner affect the work to be performed under the Contract.

- B. Ignorance on the part of the Contractor will in no way relieve him of the obligations and responsibilities assumed under the Contract. No information derived from maps, drawings, specifications, or from Employees of the City, the Engineer, or his assistants, shall relieve the Contractor from any risk or from fulfilling all terms of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 008000

3. Comprehensive Automobile Liability shall include coverage for all owned, non-owned, and hired automotive equipment, all having limits of not less than:
 - a. Bodily Injury Liability \$ 500,000 per person
 - b. Property Damage Liability \$1,000,000 per occurrence
 - c. Property Damage: \$ 200,000 per occurrence
4. Comprehensive Excess (“umbrella”) coverage shall be provided in an amount of not less than \$1,000,000.
5. Workmen’s Compensation as required by Federal and State workers’ compensation and occupational disease laws.

1.4 START AND COMPLETION

- A. Commence work on the project beginning on date of commencement as noted on notice to proceed.
- B. Work on the project is to be substantially complete within **One Hundred Twenty (120) calendar days**. Upon arrival at substantial completion, Contractor shall have thirty (30) calendar days to arrive at final completion.
- C. Prewrite Conference: Prior to start of work there shall be a conference attended by the Contractor, the representative of the Owner, roofing manufacturer’s representative, and other parties who may be designated by the Owner, to be convened at the work site for the purpose of reviewing the specifications and job conditions and resolving any questions then arising. Contractor shall advise the office of the Owner of date and time at least one week before the date to allow proper notification of parties.
- D. Any materials delivered to the site prior to the start of work must be coordinated with the Owner first.
- E. Substantial completion is defined for this project as the successful installation of every component required under the contract document to be installed for this project. A punch list may be issued by the Engineer for work complete at this time.
- F. Submit requests for extension of contract time in writing to Engineer with complete details of conditions necessitating extension and specific time of extension requested. Obtain Owner’s authorization of extension in writing.
- G. Begin the Work on the commencement date set forth in the Contract, perform the Work expeditiously with adequate forces and complete the Work within the Contract Time.
- H. All time limits stated in the Contract are of the essence with respect to contractor’s obligations hereunder.

1.5 LIQUIDATED DAMAGES

- A. Liquidated damages will apply starting the first calendar day after the date established for substantial completion and will be assessed at a rate of **\$1,000.00** per day for each

calendar day, until such time as all construction is complete and has been accepted by the Owner.

- B. Contractor, by submitting a bid for this project, attests and agrees that the value of liquidated damages as stated are a fair and equitable representation of damages to the Owner in the event project is not completed within the allotted time.
- C. When Engineer has certified substantial completion, contractor shall have an additional seven (7) calendar days to complete all work under the contract, including any outstanding punch list items established at the substantial completion; any required submittals, including warranties, releases of liens, unit price logs, consents of surety, final pay request, etc. Date of final completion is defined as the date when all work required under the contract has been completed.
- D. In the event the project extends beyond the contract period (including any extensions to contract, approved by Owner), Owner will back charge the contractor for fees and expenses attributable to additional services by Owner’s consultants which are provided solely as a result of the project being extended beyond the contract period. Owner may withhold monies attributable to these fees and expenses from contractor’s requests for payment. Where liquidated damages are imposed as a result of the contract between the Owner and Contractor, these fees and expenses will be funded from the liquidated damage payments by the contractor. Owner may withhold monies attributable to these fees and expenses from contractor’s request for payment.

1.6 INCLEMENT WEATHER

- A. Where the contract includes schedule requirements including, but not limited to, available working hours, available working days, construction durations, substantial completion date(s), and/or final completion date(s), these requirements shall be graphically shown in the construction schedule. The schedule shall be based on assuming normal inclement weather for each calendar month, and no contract time extensions shall be considered until the calendar month has experienced inclement weather beyond this normal consideration. Furthermore, the Contractor bears the burden of proof to show inclement weather beyond normal considerations, which shall include documentation from the National Weather Service (NWS), or approved equal prior to bid, that the reported inclement weather was outside of the specified parameters to perform the work of this specification. All inclement weather documentation shall be submitted in writing within the payment period for each occurrence.
- B. Normal inclement Weather for each calendar month shall be considered:

	<u>Month:</u>	<u>Days:</u>
1.	January	6
2.	February	5
3.	March	6
4.	April	5
5.	May	5
6.	June	6
7.	July	6
8.	August	6
9.	September	4

10. October	3
11. November	3
12. December	6

- C. No consideration or extension shall be allowed for inclement weather days that fall outside any working restrictions.
- D. Work under this specification shall be adequately staffed to complete the work of this specification given the specified work restrictions with considerations for normal inclement weather.
- E. No financial compensation shall be made due to inclement weather, and any changes to the contract shall be no-dollar time extensions.
- F. The contractor is expected to maintain construction in accordance with the approved schedule less any approved inclement weather days outside of normal considerations. Should the contractor fall behind schedule less any approved inclement weathers days outside normal consideration, this shall be considered non-compliance with the contract and the Designer may act in accordance with the Contract Documents.

1.7 PERMITS

- A. Obtain all necessary licenses and permits required by law in order to accomplish the work. Submit evidence of all required licenses and permits prior to starting work.
- B. Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority having jurisdiction of Contractor's performance of the work or any part thereof. If Contractor knows, or should know that any requirement of these Specifications is at variance with any such laws, ordinances, rules, regulations or orders in any respect, Contractor shall promptly notify Engineer in writing and obtain written instructions before proceeding with the portion of the work thereby affected. If Contractor performs any work which is contrary to such laws, ordinances, rules and regulations without receiving Engineer's instructions, Contractor shall assume full responsibility therefor and shall bear all penalties and costs of remedying the work attributable thereto. However, this section shall not be construed to require Contractor to perform detailed engineering calculations normally performed by Engineer except when specifically provided.

1.8 GUARANTEES AND WARRANTY

- A. Refer to applicable roofing sections for warranty and guarantee information.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 010000

SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: The project consists of:
 - 1. Re-Roofing Project:
 - a. Armstrong Elementary School
- B. Project Location: 8601 White Horse Rd., Greenville, SC 29617
- C. Furnish all labor, materials, tools, equipment, devices, appliances, utilities, transportation, and other facilities and services necessary to accomplish the work described in these specifications.
- D. **Base Bid:** Work under the Base Bid generally consists of the following:
 - 1. On Roof Areas C, D, E, F, G, H, I, K, L, M, N, O, P, Q, R, S, T, and U, (approximately 86,500 square feet) remove existing coping caps, metal and bituminous flashings, aggregate surfacing, gutters, scupper liners, concrete at new overflow scupper locations, etc. and all associated miscellaneous work as specified herein and install new cover board, single ply PVC roofing system, scupper liners, metal and associated flashings, coping caps, gutters, downspouts, and all associated miscellaneous work as specified herein.
 - 2. On Roof Areas G, K, D, and P work (approximately 6,000 square feet) generally consists of the removal of all existing aggregate surfacing, built up roof membrane, perlite, and wet insulation where indicated on the roof plan and to install new insulation and a cover board to match the existing BUR membrane height, and the installation of a new single ply PVC roofing system and flashings.

1.3 DESCRIPTION OF THE EXISTING SYSTEM

- A. Information in this Section is provided only to establish general description and is not necessarily accurate. Before preparing and submitting a bid, visit site and become satisfied as to the existing conditions, size of roof areas, etc. Receipt of bid will be considered evidence Contractor has inspected roof or otherwise become satisfied on all details relating to the work.
- B. Various lines including, but not necessarily limited to, coaxial cables, telephone wires, etc. are present on roof surfaces. Become familiar with the locations, purposes and types of lines present and ensure that all lines are properly protected during the course of the work, remain in service during the course of the work and reposition them in their appropriate places at the conclusion of the work unless specifically indicated otherwise herein or on drawings. Carefully coordinate any activities relating to such lines with the Owner prior to conducting such activities.
- C. The existing roof systems consist of the following:

Areas C, D, E, F, G, H, I, K, L, M, N, O, P, Q, R, S, T, U (86,650 SF)				
Roofing	Deck	Drainage	Approx. Eave Height	Slope
Gravel surfaced fiberglass felt and asphalt built-up membrane over a layer of 1/2" perlite adhered in asphalt over polyisocyanurate insulation mechanically fastened to the deck	Steel	Scuppers/ Gutters	Varies (Maximum Height: 25 ft.)	1/4" per ft. Structural

Area J (3,000 SF)				
Roofing	Deck	Drainage	Approx. Eave Height	Slope
Standing seam metal roof	Unknown	Gutter and Downspouts	15 ft.	3" per ft.

- D. Base flashings are modified bitumen.
- E. Metals generally consist of prefinished metal.
- F. Contractor shall be responsible to document all existing damage to facility prior to beginning work and producing documentation acceptable to Engineer prior to starting work. Damage discovered during the project which was not documented and which is not clearly the responsibility of others may be presumed by the Engineer or Owner as the responsibility of the Contractor. Documentation may be in the form of written statements

and/or drawings but must also be supported by photographs and/or video tape supplied by contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 011400 – WORK RESTRICTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Schedule deliveries per requirements of Owner.
- B. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
- C. Contractor shall abide by all security and badging requirements of the Owner.

1.3 OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.
- B. Contractor shall coordinate with Owner on-site personnel on any building shutdowns; 72 hour prior notice required.
- C. Contractor will be stopped if construction operations interfere with facility operations. Contractor must coordinate all operations with Owner's representatives.

1.4 USE OF SUBCONTRACTORS

- A. The Contractor may use Subcontractors to accomplish such miscellaneous or associated work as structural modifications, plumbing, relocation of conduit, service piping and/or HVAC equipment, etc.

NOTE: THE ROOFING CONTRACTOR MAY NOT SUBCONTRACT ANY PART OF THE ROOFING WORK SPECIFIED HEREIN WITHOUT THE PRIOR WRITTEN CONSENT OF THE OWNER.

1.5 SAFETY AND PROTECTION

- A. The Contractor will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. He will take all necessary precautions for the safety of, and will provide the necessary precautions to prevent damage, injury or loss to:
1. All employees on the work and other persons who may be affected thereby.
 2. All the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and,
 3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavement, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- B. Contractor will prevent any work which could reasonably be deemed to be hazardous from taking place over or adjacent to occupied areas. Contractor will be responsible to coordinate with the Owner the vacating of such affected areas of all occupants and will give the Owner adequate notice to allow time to comply. Contractor will post a watchman inside the building in the affected area(s) at all times during the work to ensure no one enters or remains in the affected area(s).
- C. The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He will erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. All damage, injury or loss to any property caused, directly or indirectly in whole or in part, by the Contractor, and Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, will be remedied by the Contractor.
- D. Roof access shall be from the facility exterior unless otherwise approved by Owner.
- E. Tobacco products will not be allowed on the site at any time, including e-cigarettes. Contractor is responsible to enforce the tobacco policy of the Owner with regard to Contractor's personnel. Non-compliance by any of Contractor's personnel will be justification for removal of those individuals from this project.
- F. Equipment, materials, etc. shall be cordoned off from the public in a manner acceptable to the Owner and/or Engineer so as to prevent access to this equipment by non-contractor personnel. In the event, Owner and/or Engineer do not approve the methods used by contractor to enclose such equipment, Engineer and/or Owner may instruct contractor to take additional precautions at contractor's expense up to and including a complete enclosure of the work area around the equipment and related work area by a 72 inch high chain link fence with lockable gate. Enclosed area shall be sufficiently large as to allow the storage of materials within the fenced area and any related equipment and personnel necessary to maintain the equipment. Additionally, any related safety provisions imposed by local fire marshals, etc. are to be implemented by contractor at contractor's expense. Contractor is responsible to determine what procedures will be acceptable prior to submitting a bid or proposal.
- G. Submit plans for removal and reroofing to Owner for his approval prior to starting work so that, if necessary, inside operations can be coordinated with the roofing work.

- H. Safety barricades consisting of orange fencing are to be provided by the Contractor around loading and unloading areas from the rooftop, material and dumpster storage, etc.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011400

SECTION 012100 – ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Unit price allowances.
- C. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures."
 - 2. Division 1 Section "Unit Prices."
 - 3. Division 1 Section "Quality Control."

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Engineer from the designated supplier.

1.3 SUBMITTALS

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

- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

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

1.5 CONTINGENCY ALLOWANCES

- A. No general allowance required.

1.6 UNUSED MATERIALS

- A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Engineer, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Engineer, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 UNIT PRICE QUANTITY ALLOWANCE

- A. The lump sum bid amount shall include the following unit price allowance items:

1. Allowance No. 1: Replace 6,000 square feet of deteriorated or damaged metal deck.
2. Allowance No. 2: Replace 500 board feet of damaged or deteriorated wood blocking.
3. Allowance No. 3: Install 600 fasteners to secure existing wood blocking to structure.
4. Allowance No. 4: Wire brush and paint 6,000 square feet of rusted steel deck.
5. Allowance No. 5: Install 2,000 fasteners to secure steel deck sidelaps.
6. Allowance No. 6: Install 2,000 fasteners to secure steel decking to framing.
7. Allowance No. 7: Install 400 anchor bolts to supplement the existing nailers where not currently in compliance with FM1-49.
8. Allowance No. 8: Remove the existing roof membrane and insulation down to the deck where insulation is wet and install 6,000 square feet of insulation, coverboard, and membrane as specified.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Add Alternate No. 1:
 - 1. On Area J, (approximately 3,000 square feet) seal transitions, between metal roof panels and ridge flashing, laps in flashing, holes in metal panels and flashing, along the ridge and expansion joint of metal roof and spot seal as necessary with sealant matching the existing color of the roof.
 - 2. Install new PMMA liquid flashing at cricket locations on Roof Area J as indicated on the plans.

B. Add Alternate No. 2:

1. On Areas R and P, (approximately 2,000 square feet of wall surface area) provide new finish coating on EIFS.

END OF SECTION 012300

SECTION 012500 – 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Division 1 Section "Unit Prices."

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Engineer are for information only. Do not consider them 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.
- B. 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.
- C. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- 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. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Engineer.

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 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.
- F. Proposal Request Form: Use AIA Document G709-Construction Change Order for proposal requests.
- G. Change Order proposal shall be submitted by the Contractor to the Engineer. If the proposal is approved by the owner, written confirmation shall be given to the Contractor to proceed with proposed work.
- H. The Contractor shall not commence work or purchase materials for such proposed work until written approval is received.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012700 - 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes administrative and procedural requirements for unit prices.
- B. Related sections include the following:
 - 1. Division 1 Section "Summary of Work."
 - 2. Division 1 Section "Allowances."
 - 3. Division 1 Section "Contract Modification Procedures."

1.3 USE OF UNIT PRICES

- A. Unit prices are required for the items listed below. The associated quantity is indicated for each item in Section 01210, Paragraph 3.3. Allowances shall be included in the Base Bid.
- B. Unit prices quoted by the contractor are to be used to increase or decrease the contract amount. Additive amounts will be at 100% of the quoted unit price and deductive amounts will be at 100% of the quoted unit price. Deductive unit prices will apply only to those items for which specific quantities have been included in the scope of work for Base Bid.
- C. The Contractor will be compensated at the unit price bid for the exact quantity of work performed under each unit price item. If allowances are included in the base bid for unit price work, the actual quantity of work paid for under the allowance will be at the unit price established in the proposal. The quantities indicated in the quantity allowance are estimated quantities only for the purpose of comparing bids. The Contract Sum will be adjusted accordingly (up or down) based upon the unit prices to reflect the actual work performed.
- D. All unit prices are to include all costs associated with implementing the unit of work, including but not necessarily limited to all labor, insurance, materials, tools, equipment, devices, appliances, utilities, transportation, profit and overhead necessary to remove, replace and legally dispose of off-site any damaged or deteriorated item.
- E. Prior to performing any work under unit pricing, the Contractor shall notify the Engineer to allow for measurement of the actual quantities of work. Any work performed under these items without prior approval and measurement shall be at the Contractor's expense.

1.4 DAILY LOGS

- A. Contractor shall maintain a daily log showing dates, location and exact quantities of unit price work. Copies of log shall be submitted with each application for payment regardless of whether unit price work is accomplished during the period covered by the application. If no unit price work is accomplished during the period, log shall include a statement to that effect. No payment application will be approved unless accompanied by daily logs.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials necessary to complete this item shall be in accordance with the Specifications.

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

- A. Unit prices are required for the following items. Provide each unit price on the Bid Form.
1. Unit Price No. 1 – Replace deteriorated metal deck.
 - a. Description: Replace deteriorated metal deck according to Division 7 Section “Reroofing Preparation.”
 - b. Unit of Measurement: Per square foot.
 1. Unit Price No. 2 – Replace wood blocking.
 - a. Description: Replace damaged or deteriorated wood blocking according to Division 6 Section, “Rough Carpentry.”
 - b. Unit of Measurement: Per board foot.
 2. Unit Price No. 3 – Attach wood blocking.
 - a. Description: Furnish and install new fasteners to secure the exiting wood blocking to the structure according to Division 6 Section “Rough Carpentry.”
 - b. Unit of Measurement: Per fastener.
 3. Unit Price No. 4 – Wire brush/paint steel deck.
 - a. Description: Wire brush and paint steel deck according to Division 7 Section “Reroofing Preparation.”
 - b. Unit of Measurement: Per square foot.

4. Unit Price No. 5 – Install metal deck sidelap fasteners.
 - a. Description: Install metal deck sidelap fasteners according to Division 7 Section “Reroofing Preparation.”
 - b. Unit of Measurement: Per fastener.

5. Unit Price No. 6 – Fasten steel deck to framing.
 - a. Description: Fasten steel deck to framing according to Division 7 Section “Reroofing Preparation.”
 - c. Unit of Measurement: Per fastener.

6. Unit Price No. 7 – Install anchor bolts to supplement the existing nailers where not currently in compliance with FM1-49.
 - a. Description: Install stainless steel fasteners to supplement the existing nailers where not currently in compliance with FM1-49. according to Division 6 Section “Rough Carpentry.”
 - b. Unit of Measurement: Per unit.

7. Unit Price No. 8 – Replace wet insulation and deck.
 - a. Description: Remove the existing roof membrane and insulation down to the deck where insulation is wet and install insulation, coverboard, and membrane as specified. Replace in accordance with Division 7 Section “Thermoplastic Membrane Roofing.”
 - b. Unit of Measurement: Per square foot.

END OF SECTION 012700

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 Divisions 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section “Allowances” for procedural requirements governing handling and processing of allowances.
 - 2. Division 1 Section “Contract Modification Procedures” for administrative procedures for handling changes to the Contract.
 - 3. Division 1 Section “Unit Prices” for administrative requirements governing use of unit prices.

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. Refer to Section 013300 – Submittal Procedures.

1.5 APPLICATION FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
- B. Initial Application for Payment and final Application for Payment involve additional requirements.
- C. 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.

- D. Payment Application Times: Submit progress payments to Engineer according to the schedule established in the pre-construction meeting.
- E. Payment Application Forms: Use AIA Documents G702 and G703 as form for Applications for Payment.
- F. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal document on behalf of Contractor. Engineer will return incomplete applications without action.
- G. Match entries to data on the approved Schedule of Values.
- H. Include amounts of fully-approved Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- I. Transmittal: Submit four (4) signed and notarized digital copies of each Application for Payment to Engineer.
- J. Include Manufacturer's Certificates of Compliance with applications for payment of materials. Request certificates from material suppliers at time materials are ordered.
- K. A payment or payments made to Contractor for work performed shall not constitute acceptance or approval of the work and shall in no way relieve Contractor from the requirements of the Contract.
- L. All sums received by Contractor for any part or parts of the work furnished or performed by a Subcontractor shall be paid promptly to the latter by Contractor and while in the hands of Contractor shall constitute trust funds held for the use and benefit of Owner.
- M. If payments are to be made on account of materials or equipment not incorporated in the work but delivered and suitably stored at the site, or at such other location agreed upon in writing, submit bills of sale or other documents satisfactory to Owner establishing Owner's title to such materials or equipment or otherwise protecting Owner's interest therein including the prepayment of applicable insurance and transportation charges to the site.
- N. Contractor warrants and guarantees the title to all work, materials and equipment covered by an invoice, whether or not incorporated in the work, will pass to Owner upon Contractor's receipt of the payment covering such work, materials and equipment, free and clear of all liens or other similar or dissimilar encumbrances in any way affecting Owner's title thereto. Submit Release of Liens with each payment application.
- O. Initial Application for Payment: Refer to Division 1 Section "Submittal Procedures" for items that must precede or coincide with submittal of first Application for Payment.
- P. Final Application for Payment: Refer to Division 1 Section "Submittal Procedures" for items that must precede or coincide with submittal of final Application for Payment.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013300 – SUBMITAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

- A. Shop Drawings: Drawings, diagrams, illustrations, schedules, performance charts, brochures and other data prepared by Contractor or any Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor which illustrate some portion of the work.
- B. Samples: Physical examples furnished by Contractor to illustrate materials, equipment or workmanship and establish standards of work.

1.4 SUBMITTALS

- A. Prior to the start of work, forward the following submittals in PDF via email or download link to the Engineer for review and approval.
 - 1. Give written notification of the brand name and manufacturer of each material proposed for use and include a statement that all proposed materials meet the specification requirements. Obtain Engineer's approval prior to placing orders.

NOTE: SUBMITTAL OF CATALOG CUT SHEETS, ETC. IN LIEU OF THE MATERIALS LIST REQUIRED ABOVE IS NOT ACCEPTABLE.

- 2. Submit a Schedule of Values on a copy of AIA Document G703 listing each phase of the work and its scheduled value for each site. Contractor must be prepared to verify all material costs by producing supplier invoices, bills of lading, etc. upon request by Owner or Engineer. The Schedule of Values shall be broken down as listed below:
 - a. Mobilization, insurance, bonds
 - b. Demolition
 - c. Insulation materials
 - d. Insulation labor

- e. New roof membrane materials
 - f. New roof membrane installation
 - g. New coverboard materials
 - h. New coverboard installation
 - i. Sheet metal materials
 - j. Sheet metal installation
 - k. Manufacturer's inspection
 - l. Cleanup, demobilization
 - m. Unit price work in Base Bid (separate line items)
 - n. Warranty
3. Schedule of Work.
 4. Emergency Contact List.
 5. Evidence of all licenses and permits have been applied for.
 6. Shop Drawing Schedule.
 7. Personnel List.
 8. Superintendent Experience List.
- B. Prior to payment for materials, furnish, in triplicate, Manufacturer's Certificates of Compliance with materials' specifications, for materials incorporated into the work, signed by a responsible officer of the manufacturing firm and notarized. Each certificate shall be an original document printed on the manufacturer's standard letterhead. Each certificate shall specifically reference the project and the applicable compliance standard.
- C. Prior to installing the following items, forward the following submittals via email to the Engineer for review and approval.
1. Sheet metal: Shop drawings of all specified types of metal shapes, two 6 inch long samples of each metal shape, prefinished metal color charts.
 2. Sealant: Material manufacturer's technical manuals and installation instructions.
- D. Prior to final payment, forward the following submittals via email to the Engineer for review and approval.
1. A Manufacturer's Certificate clearly stating that the specified roof covering meets the requirements for an Underwriters' Laboratories, Inc. Class A roof covering.
 2. Contractor's Warranty (on form herein).
 3. Manufacturer's Guarantee (if applicable).
 4. Asbestos Free Warranty (on form herein).
 5. Manufacturer's final inspection report.
 6. Punch list completion certification.
 7. Consent of surety.
- 1.5 SHOP DRAWINGS AND SAMPLES
- A. Within two weeks after award of Contract, Contractor shall provide Engineer and Owner with a schedule of the dates for submission of each shop drawing and sample required by the Contract. The sequence of submittals shall permit an orderly review by Engineer with reasonable time allowed for checking, correction and rechecking corrections, as well as returning the approved or rejected shop drawings and samples to Contractor and, in turn, to any Subcontractor.

- B. The project schedule shall provide Engineer with at least 10 working days from the date Engineer receives a submittal until the date the submittal is required to be returned to Contractor. If a submittal contains more than 10 shop drawings, Contractor shall indicate which drawings must be returned within the period of 10 working days, and, in such event, Engineer shall have an additional 10 working days to return the balance of the submittal.
- C. Contractor shall be responsible for coordinating the schedule for submittal of shop drawings and samples with Contractor's progress schedule and the requirements of the Contract. Failure of Contractor to schedule and submit shop drawings and samples in ample time for checking, correction and rechecking will not justify any delay in the timely performance of the work. All shop drawings and samples shall bear the following information and shall be submitted by transmittal form:
1. Owner's and Engineer's respective project numbers.
 2. Date of submittal.
 3. Submittal Number.
 4. Title of Project.
 5. Name of Contractor and date of Contractor's approval.
 6. Name of Subcontractor or supplier and date of submittal to Contractor.
 7. Reference to Specification Section and paragraph and/or Drawing Number(s).
 8. The specific location of that portion of the work covered by the submission.
 9. Any qualification, departure or deviation from the requirements of the Contract.
 10. Any additional information required by the Specifications for the particular material being furnished.

NOTE: ENCLOSED FORM OF TRANSMITTAL IS FOR CONVENIENCE AND MAY BE USED AT CONTRACTOR'S OPTION, EXCEPT THAT ITS USE DOES NOT RELIEVE CONTRACTOR FROM THE OBLIGATION TO SATISFY ALL SUBMITTAL REQUIREMENTS. SHOULD CONTRACTOR ELECT NOT TO USE THE ENCLOSED FORM, THEN ALL REQUIRED INFORMATION MUST BE PROVIDED ON FORM SUPPLIED BY CONTRACTOR.

- D. Each shop drawing shall be numbered. The same numbering system shall be retained throughout all revisions. Each drawing shall have a clear space for the approval stamps of Contractor, Engineer and Engineer's consultants, if any.
- E. In submitting shop drawings for approval, all associated shop drawings relating to a complete assembly shall, where possible, be submitted at the same time so that each may be checked in relation to the entire proposed assembly.
- F. Contractor shall prepare composite shop drawings and installation layouts, when required, to depict proposed solutions for tight field conditions. The composite shop drawings and field installation layouts shall be coordinated in the field by Contractor and its Subcontractors for proper relationship to the work of all other trades involved in the work.
- G. Prior to submission, Contractor shall review, affix a stamp on, and indicate approval of all shop drawings and samples. Contractor shall determine and verify field measurements and availability of the material, and shall have coordinated each shop drawing and sample with requirements of the Contract.

- H. With respect to standard manufactured items, Contractor shall submit to Engineer manufacturer's illustrated cuts of the items to be furnished showing details, sizes and dimensions and all other pertinent information.
- I. For all other shop drawings, Contractor shall submit to Engineer one (1) digital copy of each drawing. The drawing will be returned to Contractor after review, comment and stamping by Engineer.
- J. Engineer will review Shop Drawings and Samples to determine conformance with the design concept of the Project and with the information given in the Contract. Engineer's approval of a separate item shall not be construed to mean approval of the assembly of which such item is a part.
- K. Engineer's approval of Shop Drawings or Samples shall not relieve Contractor of responsibility for any deviation from the requirements of the Contract unless Contractor has informed Engineer in writing of such deviation at the time of submission and Engineer has given written approval to the specific deviation, nor shall Engineer's approval relieve Contractor from responsibility for errors or omissions in the shop drawings or samples.
- L. Contractor shall make any corrections required by Engineer and shall resubmit corrected copies of shop drawings or new samples until approved. Contractor shall direct specific attention in writing, or on resubmitted shop drawings, to revisions other than the corrections required by Engineer. The number and distribution of copies shall be the same as in Contractor's first submission.
- M. In the event that Engineer shall mark shop drawings "approved" or "approved as noted," Contractor shall make such corrections, if any, as may be noted. Correction shall be made on, and prints for final distribution shall be made from, the transparencies bearing Engineer's notations and impress stamps. Final distribution of prints shall be made by Contractor.
- N. No portion of the Work requiring a shop drawing or sample submission shall be commenced until the submission has been approved by Engineer. All such portions of the work shall be in accordance with approved shop drawings and samples.
- O. Any work which will result in structural changes in walls, steel, floors and masonry shall not be commenced by Contractor prior to Engineer's written approval. Contractor's submission for such work shall fully describe all details of methods, shoring and bracing.
- P. No sheet metal item is to be purchased, fabricated, or installed until all required shop drawings and related submittals for each item are approved by Engineer. Items purchased, fabricated and/or installed which are not in compliance with approved shop drawings are subject to immediate removal from the project at contractor's expense.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SUBMITTAL TRANSMITTAL

Date: _____

From: _____

To: Terracon Consultants, Inc.
2701 Westport Road
Charlotte, NC 28208

Project Name: Armstrong Elementary School

Owner: Greenville County Schools

Owner's Project Number: _____

Engineer's Project Number: FH216232

Submittal Number: _____ No. of Copies: _____

Specification Section and Paragraph Reference(s): _____

Drawing/Detail Reference(s): _____

Location of Work: _____

Product Manufacturer: _____

Supplier/Subcontractor: _____

Date submitted to Contractor: _____

Qualifications/Deviations from Specifications: _____

CONTRACTOR'S APPROVAL

THIS SUBMITTAL HAS BEEN PREPARED BY THE CONTRACTOR OR THOROUGHLY REVIEWED BY THE CONTRACTOR AND IS A CONTRACTOR APPROVED SUBMITTAL SUBJECT TO ANY QUALIFICATIONS MADE HEREON OR ON THE ATTACHMENTS.

SIGNED: _____

DATE: _____

NAME: _____

ENGINEER'S APPROVAL

APPROVED _____; APPROVED AS NOTED _____; NOT APPROVED - RESUBMIT _____;
REVIEWED _____; APPROVED FOR CONSTRUCTION ACCORDING TO NOTATIONS.
REVISE AND RESUBMIT _____; REFER TO APPROVAL STAMP ON ATTACHMENT _____

Checking by Engineer is only for conformance with the design concept of the project and compliance with the information given in the contract documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction, and for coordination of the work of all trades.

SIGNED: _____

DATE: _____

PROJECT SUBMITTAL CHECKLIST

- Materials List
- Material Data Sheets
 - o Prefinished Metal
 - o Sealant
 - o PVC Membrane
 - o Coverboard
 - o Polyisocyanurate Insulation
 - o Base Flashing
 - o Asphalt Primer
 - o Asphalt Roofing Cement
 - o Self-Adhering Underlayment
 - o PMMA Roof Coatings
 - o EIFSs materials
- Manufacturer's Application Procedures
 - o Thermoplastic Membrane Roofing
 - o PMMA Roof Coatings
- Copies of Authorizations and Licenses from Authorities having jurisdiction
- AIA Document G703, Schedule of Values
- Material Safety Data Sheets
- Schedule for Removal and Installation
- Written Safety Procedures
- Underwriter's Laboratories, Inc. Class A Roof Covering Certificate from Roofing System Manufacturer
- Shop Drawings
- New Cricket Layout
- Metal Samples
- Color Chart
- Documentation of Existing Conditions
- Certification from Manufacturer that Contractor is an Approved Installer
- List of Subcontractors
- List of Contractor Staff Assignments and Qualifications
- Sample Warranties for Roof Recover system
- Polyisocyanurate Insulation Certificate
- Deck Fastener Pull Test and Adhesion test Results

END OF SECTION 013300

SECTION 014000 – QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CONTRACTOR EMPLOYEES

- A. None but skilled foremen and workmen shall be employed on work requiring special qualifications. Any person employed on the work who fails, refuses or neglects to obey the instructions in anything relating to this work, or who appear to be disorderly, insubordinate, unfaithful or incompetent, shall upon the order of the Owner be at once discharged and not again employed on any part of the work. Any interference with, or abusive or threatening conduct toward the Engineer or his assistants by the Contractor or his employees or agents, shall be authority for the Owner to annul the Contract and re-let the work.

1.3 JOB SUPERINTENDENT

- A. For the purposes of these Specifications, the designation of “superintendent” is hereby defined as the individual present on the job site at all times work is being performed and whose primary responsibility is to supervise and direct the performance of the work.
- B. The superintendent shall not be changed except with the consent of the Owner and Engineer, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employment.
- C. The superintendent shall be in attendance at the project site at all times during the progress of the work and his duties as superintendent shall be limited to this project only. The superintendent shall supervise and instruct workmen without engaging in the work process. Should the superintendent be absent temporarily from the project at any time, he shall designate a competent foreman to assume his duties. During the superintendent’s absence, the foreman shall not engage in the work process but shall supervise and instruct only. Likewise, any communications given to the foreman shall be as binding as if given to the Contractor.
- D. The superintendent shall have had a minimum of four (4) years’ continuous experience as a job superintendent on projects of similar size and scope.
- E. Only the project superintendent (or the designated foreman in the superintendent’s absence) will be permitted inside the facility, except when accompanied by the superintendent to perform work or in cases of emergency, except as described in Section 011400.

- F. The Contractor shall provide the Owner, in writing, the names of the proposed project manager, job superintendent and foreman for approval no later than seven (7) days prior to the Prewrite Conference. Also include chronological listing of superintendent's experience by project name, type system, size and required warranty.
- G. Once approved, neither the project manager nor the superintendent will be changed except with the consent of the Owner unless either prove to be unsatisfactory to the Engineer, Owner and/or Contractor, or ceases to be in the Contractor's employment.
- H. Promotion or reorganization within the company will not be an acceptable cause for reassignment of project manager or superintendent.
- I. It shall be the superintendent's responsibility to communicate all matters pertaining to the Work with the Owner and/or Engineer. In case of emergency or safety, superintendent shall communicate directly with the Owner, and, immediately thereafter, notify the Owner and/or Engineer. No decisions regarding changes in the Work will be made without the Owner's knowledge.
- J. The job superintendent will have a local contact phone number. The job superintendent shall be required to communicate in English.
- K. Contractor shall provide telephone numbers of at least two (2) responsible persons who could be contacted for emergency inspections in the event of roof leakage or periods of internal precipitation during non-working hours, holidays, etc. while the roofing project is in progress.

1.4 INSPECTION

- A. Owner will provide inspection during the work. Such inspection may be periodic or daily.
- B. The words "supervise" and "inspect" wherever used herein in connection with the duties or activity of the Engineer shall in no way, expressed or implied, relieve the Contractor from his responsibilities for the safety of the workmen, the preservation of the work or proper performance under this Contract. The Engineer shall not be responsible for the safety of the workmen, the safeguarding of the work, or the proper performance of the Contractor.
- C. No Inspector shall have the power to waive the obligations resting upon the Contractor to furnish good material and do good work as herein prescribed. Any failure or omission on the part of any Inspector or the Engineer to condemn any defective material or work shall not release the Contractor from the obligation to at once tear out, remove, and properly replace or rebuild the same at any time upon discovery of the defect and upon notice from the Owner or Engineer to do so.
- D. Work found to be in violation of specifications or not in accordance with established workmanship practices and standards will be subject to complete removal and proper replacement with new materials at Contractor's expense.
- E. Remove materials stored on site which are marked by the Inspector as not meeting the requirements of the contract documents.

- F. Failure of Owner or Engineer to discover or reject defective work, or work not in accordance with the Contract, shall not be deemed an acceptance thereof, nor a waiver of Owner's rights to Contractor's compliance with the Contract or performance of the work, or any part thereof. No partial or final payment, or partial or entire occupancy, by Owner shall be deemed to be an acceptance or work or of material which is not strictly in accordance with the Contract, nor shall it be deemed to be a waiver by Owner of any of Owner's rights pursuant to this Contract or otherwise.

1.5 SUBCONTRACTORS

- A. Use of Subcontractors to accomplish such miscellaneous or associated work as structural modifications, plumbing, relocation of conduit, service piping and/or HVAC equipment, etc. is permitted. Do not subcontract any part of the roofing work specified herein without the prior written consent of the Owner.

1.6 PRECONSTRUCTION CONFERENCE

- A. Prior to the start of work there shall be a conference attended by the Contractor, the representative of the Owner, and other parties who may be designated by the Owner, to be convened at the work site for the purpose of reviewing the specifications and job conditions and resolving any questions then arising.

1.7 MANUFACTURER

- A. A technical representative of the roof system manufacturer shall conduct periodic inspections throughout the course of the work. The representative shall prepare a written report for each inspection and shall promptly provide a copy of each report to the Owner, Contractor and Engineer. Each report shall note any deficiencies the representative observes which require correction. A minimum of three (3) inspections is required for this project including a final inspection after contractor has completed installation of all roof system components.

1.8 FINAL INSPECTION

- A. The Engineer and Owner shall conduct a final inspection of all work included in the contract as soon as possible after receiving written notification from the Contractor that the work is complete and ready for inspection.
- B. A final inspection report shall be prepared by the Engineer listing observed deficiencies and shall be furnished to the Contractor.
- C. Contractor shall prepare digital copy of a Certificate of Substantial Completion, AIA Document G704, and forward to the Engineer for execution.
- D. Upon satisfactory completion of all deficiencies, Contractor shall initial each item on the report certifying his compliance and return to the Engineer.

- E. No portion of the final payment shall be made until all items have been satisfactorily corrected and the project given approval.
- F. All project completion documents are to be submitted within thirty (30) days following acceptance by the Owner.

1.9 TESTING

- A. Materials stored on site which are marked by the Inspector, Engineer or Owner as not meeting the requirements of the contract documents are to be removed from the site by the contractor immediately.
- B. At conclusion of each day's work, Contractor shall carefully inspect work including temporary daily tie-offs to ensure system is completely watertight; all stored materials are suitably protected from the weather and all equipment is stored in such a manner as not to interfere with facility operations.

1.10 ADHESION TESTS

- A. Prior to proceeding with the application of new cover board and roof membrane over the existing roof, contractor shall coordinate with roofing system manufacturer's technical representative and conduct random adhesion tests of specified cover board and adhesives using equipment calibrated to provide accurate withdrawal resistance loads. Perform cover board adhesive pull tests for each roof area to receive new single ply PVC recover roof system. Test all areas as required by roofing system manufacturer. Submit results of testing tot Engineer within 48 hours of testing.
 - 1. Obtain written confirmation from roofing system manufacturer that test results are acceptable and installation will meet all specification requirements, manufacturer's installation requirements and manufacturer's warranty requirements.
 - 2. Previous adhesion testing (for reference) has been performed by OMG, Inc. Contact Mr. Clint Kircher for testing results: Phone: (217) 827-1175; Email: ckircher@omginc.com

END OF SECTION 014000

SECTION 015000 – TEMPORARY FACILITIES, CONTROLS AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities, controls, protection and disconnects, including temporary utilities.

1.3 SUBMITTALS

- A. Submit plans for work for approval prior to starting work so that, if necessary, inside operations can be coordinated with the work.

1.4 TEMPORARY UTILITIES

- A. Contractor personnel may not use toilet or washroom facilities in existing buildings.
- B. Contractor will be responsible to provide portable toilet facilities and facilities for washing and clean-up as necessary. Facilities will be located at sites approved by the Owner.
- C. On-site lunchroom facilities will not be available to Contractor personnel.

1.5 CONTRACTOR'S CONTACT LIST

- A. Contractor shall provide telephone numbers of at least two (2) responsible persons who could be contacted for emergency inspections in the event of roof leakage or periods of internal precipitation during non-working hours, holidays, etc. while the roofing project is in progress.

1.6 CONNECTS AND DISCONNECTS

- A. In the event it is necessary to disconnect any electrical wiring or connections, plumbing lines or other building services, notify the Owner. Do not disconnect or connect services unless authorized in writing by Owner.
- B. Include in Base Bid all costs required for modification of existing service piping, wiring and duct work required in connection with the lifting, removal or relocation of roof-mounted equipment.

- C. All associated work is to be accomplished by appropriately licensed personnel in accordance with all applicable codes and regulations.
- D. Review roof-top equipment usage with Owner and facility user at beginning of project. Disable equipment determined to be essential to the operations of the facility only at those times prescribed by the Owner. This may require work to be done at other than normal operating hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015000

SECTION 017320 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Removals.
- B. Related Sections include the following:
 - 1. Division 1 Section "Allowances."
 - 2. Division 1 Section "Unit Prices."
 - 3. Division 7 Section "Reroofing Preparation."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REMOVALS

- A. On Roof Areas C, D, E, F, G, H, I, K, L, M, N, O, P, Q, R, S, T, and U, remove all existing loose gravel from roof surface by means of wet-vac and discard.
 - 1. Power broom all roof surfaces. Spud high spots to obtain an even surface and to allow for installation of new recover roof system with no standing water.
 - 2. Only firmly embedded aggregate may be left in place.
 - 3. Remove all dirt, debris, mole-runs, and blisters per the roof system manufacturer's requirements.
 - 4. Disable existing built-up four-ply roof system per the roof system manufacturer's requirements.
 - 5. Take necessary precautions to protect existing roof system from damage or moisture or water entry at all times.
- B. Remove all existing aggregate surfacing, flashings, metal flashings and drainage components and discard. Where indicated, remove existing roof system down to the deck and discard. Contractor shall take reasonable precautions as necessary to avoid damaging deck during removals, like backing out screws, etc. Deck damage as the result of removals will be repaired by the Contractor at no cost to Owner.

- C. Remove or correct any obstruction which might interfere with the proper application of new materials.
- D. Contractor is to provide means and methods as necessary to protect adjacent surfaces from damage. Components damaged will be repaired by the contractor at no cost to the owner.
- E. Lift or remove all existing HVAC, duct, ventilators and counterflashings so that existing flashings can be totally removed and new flashings installed.
- F. Remove all existing cants, metal copings, edge metal, and counterflashings and discard.
- G. Remove all existing scupper liners, gutters, and downspouts and discard.
- H. Remove and dispose of all wet insulation, roofing materials, and deteriorated deck.
- I. Carefully relocate all electrical, co-axial, telephone, fiber optic, intercom and miscellaneous wires, cables, etc. as required to accomplish work specified herein. Accomplish such relocation without interrupting the service provided by these lines except as specifically authorized by the Owner. Become familiar with each line and the level of precaution necessary to relocate them or work around them. Upon completion of roofing work, relocate lines to their original positions and secure them as originally secured unless indicated otherwise in these specifications or on the project drawings.

END OF SECTION 017320

SECTION 017330 – ASBESTOS PRODUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes procedural requirements relating to asbestos-containing materials.

1.3 PROCEDURES

- A. It is the intention of these Specifications that no asbestos-bearing materials be incorporated into the work and that, unless specifically designated to remain, no existing asbestos-bearing materials incorporated in the existing roof system will remain subsequent to completion of the work. In the event additional hidden or unanticipated asbestos-bearing materials are present in the existing roof system, stop all work in the affected area, notify the Engineer and provide temporary protection as required. Costs incurred, if any, due to the presence of hidden and/or unanticipated asbestos-bearing materials will be resolved by Change Order to this Contract.

1.4 WARRANTY

- A. Upon completion of the work, and before final payment and/or release of retainage, submit, and obtain from each subcontractor, material supplier and equipment manufacturer and submit, a properly executed Asbestos Free Warranty. Provide Warranty in the form included herein. Ensure forms are signed by a responsible officer of the Contractor, subcontractor, material supplier and equipment manufacturer and are notarized.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

ASBESTOS FREE WARRANTY

Owner: Greenville County Schools

Location of Building: 8601 White Horse Rd., Greenville, SC

Name of Building: Armstrong Elementary School

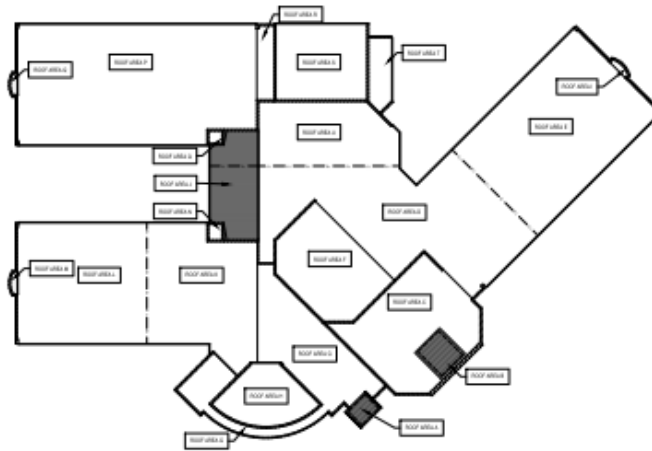
Know all men by these presents that we, _____
(Contractor, Subcontractor, Material Supplier or Equipment Manufacturer)

having furnished labor, materials, equipment and/or supplies; removed roofing, roof insulation, vapor retarder, flashings and/or miscellaneous roof system components; accomplished certain repairs to existing roof system; installed new roofing, roof insulation vapor retarder, flashing and/or miscellaneous roof system components;

from, to and/or on _____ as shown on the roof plan below under
(Buildings, Roof Areas, etc.)

contract between _____ and _____
(Owner and Contractor) (Contractor and/or Subcontractor, Material Supplier or Equipment Supplier)

warrant to Owner with respect to said work that no materials containing asbestos fibers were incorporated into the work, and that, to our knowledge and belief, no materials containing asbestos remain in or are covered by the work.



Exceptions: _____
If there are no exceptions, state "No Exceptions" here

IN WITNESS WHEREOF, we have caused this instrument to be duly executed, this _____ day of _____, 20 _____.

WITNESS:

Company

By

Notary Public

END OF SECTION 01733

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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Complete final cleaning requirements, including touchup painting.
 - 3. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer and Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer 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 Owner, 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.

1.4 FINAL COMPLETION

A. Final Inspection shall be conducted as follows:

1. The Engineer and Owner will conduct a final inspection of all work included in the contract as soon as possible after receiving written notification by the Contractor that the work is complete and ready for inspection.
2. The final inspection report shall be prepared by the Engineer and Owner listing observed deficiencies and furnished to the Contractor.
3. Upon satisfactory completion of all deficiencies, Contractor shall initial each item on the report certifying his compliance and return to the Engineer.
4. No portion of the final payment will be made until all items have been satisfactorily corrected and the project closeout documents submitted to the Engineer. Final payment shall be made within thirty (30) days of receipt of closeout documents.
5. All project completion documents are to be submitted within thirty (30) days following acceptance by the Owner.

B. Refer to Closeout Document Checklist at the end of this Section for all documents to be submitted and approved by Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. 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 portion of Project:
 - a. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - b. 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.
- c. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - d. Clean transparent materials, including glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish glass, taking care not to scratch surfaces.
 - e. Remove labels that are not permanent.
 - f. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - g. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

PROJECT DOCUMENT CHECKLIST

- AIA Document G704, "Certificate of Substantial Completion."
- AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
- AIA Document G706A, "Contractor's Affidavit of Release of Liens."
- AIA Document G707, "Consent of Surety to Final Payment."
- Asbestos Free Warranty
- Contractor's Warranty
- Metal Finish Warranty
- Manufacturer's Warranty, including Maintenance Manuals
 - o PVC Recover Roof System
- Copy of Final Inspection
- Record Drawings
- Manufacturer's Inspection Reports
- UL Class A Certificate

END OF SECTION 017700

SECTION 061000 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Rooftop equipment bases and support curbs.
 - 2. Wood nailer.
- B. Related Sections include the following:
 - 1. Division 1 Section "Allowances."
 - 2. Division 1 Section "Unit Prices."
 - 3. Division 7 Section "Thermoplastic Membrane Roofing."
 - 4. Division 7 Section "Sheet Metal Flashing and Trim."

1.3 DELIVERY, STORAGE AND HANDLING

- A. Supply and keep all materials dry at all times prior to application.
- B. Store all lumber/plywood in dry, covered storage, or on platforms, and with weatherproof coverings. Coverings shall be waterproof breathable type material such as heavy canvas. Materials which are not stored under specified covers are subject to removal from the site at Owner's or Consultant's discretion.

PART 2 - PRODUCTS

2.1 FASTENERS

- A. Provide stainless steel fasteners at all locations where fastener will come into contact with pressure-treated lumber.
- B. For securing lumber or plywood to lumber, provide stainless steel ring shank nails of sufficient length to penetrate a minimum of 1½ inches into the underlying member but not smaller than 8d nails.
- C. For securing wood to concrete or masonry, secure using Tapcon Masonry fasteners at 12 inches on center, staggered.

- D. For securing wood to steel, secure using self-drilling/self-tapping fasteners.
- E. Anchor Bolts: 1/2 inch diameter, length to embed in concrete/grouted CMU a minimum of 5 inches, with appropriately-sized nuts and minimum one inch diameter washers.

2.2 WOOD PRODUCTS

- A. Lumber: No. 2 grade (or better) southern yellow pine or douglas fir unless specifically noted otherwise. Each piece of lumber shall bear the inspection stamp of the Southern Pine Inspection Bureau (SPIB) or the Western Wood Products Association (WWPA) indicating the grade and type of lumber.
 - 1. Wood Preservative: Alkaline Copper Quaternary (ACQ) pressure-treatment conforming to AWWPA Standard C-2 (above ground). Retention of preservative shall be 0.25 pcf. All material shall be kiln dried to 19 percent or less moisture content. Field cuts and holes shall be treated at job site during construction in accordance with AWWPA Standard M-4 when lumber thickness exceeds 2 inches.
- B. Plywood: APA Rated Sheathing (CDX) with waterproof glue for exterior applications in thicknesses specified. All plywood shall comply with the requirements of U.S. Product Standard PS1-09 and each sheet shall clearly bear the APA trademark of the American Plywood Association. Minimum span rating for 15/32 inch plywood shall be 32/16 and shall be so marked on each sheet

PART 3 - EXECUTION

3.1 GENERAL

- A. Secure wood nailers over existing nailers in two rows staggered and spaced not over 12 inches in each row in accordance with FM 1-49 requirements.
- B. Stagger fasteners when securing nominal 6 inch wide lumber or wider.

3.2 EXISTING WOOD

- A. Inspect all existing wood blocking and curbs carefully. If there is existing wood which requires replacement, notify the Consultant. Do not proceed with removals until directed by Owner. Install new wood blocking and curbs using the same size and thickness as existing where removed.
- B. Remove one section of coping and subsequent layers of wood blocking to expose the base layer of wood blocking on each roof area to verify attachment of the existing wood blocking to the structure. If fastening pattern is not in accordance with FM 1-49, provide additional fasteners as directed by the Designer.
- C. Remove all existing loose, wet, damaged or deteriorated wood blocking and curbs and discard. Install new wood blocking and curbs using the same size and thickness as existing.

3.3 ROOF EQUIPMENT

- A. Install new wood blocking at all roof mounted equipment as required to provide a minimum flashing height of 8 inches above finished roof level. Fasten wood blocking at 12 inches on center.

3.4 BASE FLASHINGS

- A. Install 3/4" plywood with fasteners spaced 12 inches on center in rows at perimeters spaced no further than 12 inches apart where required to provide flush surface on the inside of the parapets.
- B. Install 3/4" and 1/2" plywood with fasteners spaced 12 inches on center at gravel stops as necessary match the height of the new roof system.

END OF SECTION 061000

SECTION 070000 – REROOFING PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Removals.
 - 2. Preparations.
- B. Related Sections include the following:
 - 1. Division 1 Section “Allowances” for work associated with allowances.
 - 2. Division 1 Section “Unit Prices” for work associated with unit prices.
 - 3. Division 6 Section “Rough Carpentry.”

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site.

1.4 REFERENCED CODES

- A. SCBC 2018
- B. ASCE 7-16
- C. 2012 SMACNA Architectural Sheet Metal Manual

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Listed manufacturers are included to establish a level of quality. Products from other manufacturers are permitted provided they are submitted and approved during the bidding phase.
- B. Use repair materials identical to existing materials.

1. Where identical materials, are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 2. Use materials whose installed performance equal or surpass that of existing materials.
- C. Metal Deck Primer: Sherwin Williams Kem Kromik Universal Metal Primer or approved equal.
- D. Sheet Metal for Steel Decks: 20 gauge galvanized steel.
- E. Steel Deck: ASTM A 653, galvanized G-60 deck, manufactured in accordance with the requirements of the Steel Deck Institute, Inc. for wide rib (Type B) to match existing. Minimum section properties:
1. Yield strength = 33 ksi.
 2. Thickness: 20 gauge.

2.2 FASTENERS

- A. Masonry Anchors: Coated steel screw anchor for use in concrete or concrete masonry units manufactured with threads for cutting into walls of pre-drilled opening to provide tight friction fit, 1/4 inch diameter, length as required to penetrate through materials being secured and embed a minimum 1-1/2 inches into substrate.
- B. Provide stainless steel fasteners at all locations where fastener will come into contact with pressure-treated lumber.
- C. For securing lumber or plywood to lumber, provide hot-dipped galvanized or stainless steel ring shank nails of sufficient length to penetrate a minimum of 1-1/2 inches into the underlying member but not smaller than 8d nails.
- D. Steel Deck Fasteners (to structure): Self-drilling fasteners of sufficient length to secure steel such as #12 diameter TEKS 5.
- E. Steel Deck Side Laps: TEKS 1.

2.3 MISCELLANEOUS MATERIALS

- A. Steel Plate: For covering openings, 20 gauge, single sheet sized to extend 6 inches beyond opening in all directions.
- B. Conduit Supports: Specifically manufactured to provide support for roof-mounted conduit, adjustable height, polycarbonate rectangular base, such as CUSH-A-BLOCK CBN-PRB SERIES as manufactured by ZSi-Foster, Inc. or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION, GENERAL

- A. Prior to the installation of any new roofing, flashings, and metal flashings, broom all loose aggregate from surface and discard.
- B. Clean surfaces of all dust, dirt and other foreign matter.
- C. Extend all existing vents through the roof to the height required by the local plumbing code but not less than 8 inches above finished roof level.
- D. Over all abandoned openings, install new steel plate. Secure to deck using specified fasteners spaced no over 6 inches on center at all edges.
- E. Contractor shall be responsible for observing the roof deck and any deck irregularities (low spots, deflected deck areas, etc.) that could potentially lead to standing water after new roof is installed prior to proceeding with roof installation. Coordinate deck inspection with Engineer. Proceeding with the work will be considered as acceptance of the substrate by Contractor.
- F. On normal workdays when no work is accomplished due to inclement weather or other reasons, visit the site no later than normal start time and verify that the system is completely water-tight, all stored materials are suitably protected from the weather and all equipment is stored in such a manner as not to interfere with facility operations. Be prepared to implement emergency repairs as necessary to prevent leakage into the facility.
- G. Document all existing damage to facility prior to beginning work and produce documentation acceptable to Engineer and Owner prior to starting work. Damage discovered during the project which was not documented and which is not clearly the responsibility of others may be presumed by the Engineer as the responsibility of the Contractor. Documentation may be in the form of written statements and/or drawings but must also be supported with photographs and/or video tape supplied by the Contractor.

3.2 CONNECTS AND DISCONNECTS

- A. In the event it is necessary to disconnect any electrical wiring or connections, plumbing lines or other building services, notify the Owner. Contractor shall not disconnect or connect services unless authorized in writing by Owner.
- B. Modification of existing service piping, wiring and duct work required in connection with the lifting, removal or relocation of roof mounted equipment shall be accomplished by this Contractor and is to be included in the base bid.
- C. All costs required in connection with electrical and/or mechanical service connections/disconnections, including satellites and weather stations, are to be included in the Bid price. All associated work is to be accomplished by appropriately licensed personnel in accordance with all applicable codes and regulations.

- D. Contractor shall review roof top equipment usage with Owner and facility user at beginning of project. Equipment determined to be essential to the operations of the facility may only be disabled at those times prescribed by the Owner. This may require the contractor to work at other than normal operating hours.
1. Route condensate drain line to nearest roof drain or scupper.
 2. Provide pre-manufactured pipe supports and underlying walkpad at existing condensate drain line locations. Space pre-manufactured pipe supports at 4 feet on center maximum.
 3. Adhere walkpad to granule surfacing (after brooming loose granules).
 4. Set all pre-manufactured pipe supports on walkpads without securing.
 5. Provide metal brackets to secure lines to supports.
 6. Furnish and install new pipe supports as necessary to obtain specified spacing.

3.3 STEEL DECK REPAIR

- A. Where steel deck is rusted but remains structurally sound, thoroughly clean deck units of rust and foreign matter with a wire brush. Paint with specified metal primer.
- B. Where steel deck is damaged or rusted through in small areas, clean deck units of rust with a wire brush. Paint with specified metal primer. Install over the damaged area a steel plate secured to the existing steel deck with sheet metal screws around the perimeter of the plate at 6 inches on center. Extend the new steel plate a minimum of 6 inches onto the surface of the existing steel deck beyond the damaged area. At valleys or hips, bend plate to match slope.
- C. Where steel deck units are severely damaged or have deteriorated over large areas, remove the entire existing deck unit and install new decking of the same type and gauge as the existing. Lap new deck units over the existing in the same manner as originally installed but not less than 6 inches. Lap ends only over structural framing. Secure to structural framing with specified fasteners at 12 inches on center at each framing member. Secure deck side laps at not more than 36 inches on center.
- D. Secure all existing loose steel deck to roof framing members using specified fasteners placed 12 inches on center at each available framing member.
- E. Secure metal deck side laps with specified fasteners at spacings not exceeding 36 inches from each other or nearest deck support. For deck supports (framing members) spaced greater than 36 inches on center and less than 72 inches on center, install a single side lap fastener at midspan between framing members.

3.4 PRIMARY SCUPPER INSTALLATION

- A. Maintain sizing of existing scuppers at 4 inches high by 12 inches wide. Raise existing scupper openings as required to be flush with the top surface of the new cover board.
- B. Maintain a minimum 4 inch high scupper opening.

3.5 OVERFLOW SCUPPER INSTALLATION

- A. Locate bottom of overflow scupper 2 inches above primary scupper.
- B. Scupper minimum opening height shall be 4 inches.
- C. Scupper minimum opening width shall be 12 inches.
- D. Extend opening through entire thickness of parapet. Take precautions to avoid damaging adjacent wall surfaces.
- E. Repair exterior finish to match adjacent surfaces.

3.6 DISCONNECTS

- A. In the event it is necessary to disconnect any electrical wiring or connections, plumbing lines or other building services, notify the Owner 72 hours prior to the need to disconnect. Do not disconnect or connect services unless authorized in writing by Owner.
- B. All roof-top equipment shall be returned to working condition prior to completion of work.
- C. Include in Base Bid all costs required for modification of existing service piping, wiring and duct work required in connection with the lifting, removal or relocation of roof-mounted equipment.
- D. All associated work is to be accomplished by appropriately licensed personnel in accordance with all applicable codes and regulations.
- E. Review roof-top equipment usage with Owner and facility user at beginning of project. Disable equipment determined to be essential to the operations of the facility only at those times approved by the Owner. This may require work to be done at other than normal operating hours.
- F. Subsequent to installing hot stack flashings at hot stacks, contractor shall inspect stack connection inside the building to ensure that stack pipe is not disconnected. Any stack pipes found to be disconnected are to be reconnected by personnel appropriately licensed for this type work.

END OF SECTION 070000

SECTION 072400 – EXTERIOR INSULATION FINISHING SYSTEM (EIFS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Replace EIFS as indicated on details in order to raise the base flashing height.
- B. Related Sections:
 - 1. Section 075000 – Membrane Roofing
 - 2. Section 076200 – Sheet Metal Flashing and Trim

1.3 SUBMITTALS

- A. Manufacturer's specifications, details, installation instructions and product data.
- B. Manufacturer's code compliance report or test summary
- C. Manufacturer's standard warranty.
- D. Applicator's industry training credentials.
- E. Samples for approval as directed by Architect or Owner.
- F. Color Selection:
 - 1. Provide manufacturer's standard color palette for Owner's selection.
- G. Insulation Thickness:
 - 1. To match existing.
- H. Mock-Up Testing:
 - 1. Contractor is to coordinate start of EIFS work with Engineer.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

- B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.
- C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.5 PROJECT/SITE CONDITIONS

- A. Maintain ambient and surface temperatures above 40°F (4°C) during application and drying period, minimum 24 hours after application of Air/Moisture barrier and EIFS products.
- B. Provide supplementary heat for installation in temperatures less than 40°F (4°C).
- C. Provide protection of surrounding areas and adjacent surfaces from application of products.

1.6 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide Air/Moisture Barrier and EIFS coatings and accessories from single source manufacturer or approved supplier. Design criteria outlined below was based on design basis of StoTherm ci XPS Lotusan.
- B. The following are acceptable manufacturers:
 - 1. Sto-Corp
 - 2. Parex USA
 - 3. Master Wall, Inc.

2.2 DRYVET AIR/MOISTURE BARRIER

- A. Joint Treatment, Rough Opening Protection and Detail Components:
 - 1. Ready-mixed coating applied by trowel or knife for rough opening protection of frame walls and joint treatment of sheathing when used with StoGuard Mesh. Also used as a detail component with StoGuard Mesh to splice over back flange of starter track, flashing and similar shiplap details.
- B. Waterproof Coating:
 - 1. Ready-mixed waterproof coating for concrete, concrete masonry, wood-based sheathing, and glass mat gypsum sheathing.

C. Transition Components Details:

1. Flexible air barrier membrane for continuity at static transitions such as sheathing to foundation, dissimilar materials (CMU to frame wall), wall to balcony floor slab or ceiling, and shingle lap transitions to flashing. Also used for floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction.
2. One-component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle lap transitions to flashing, wall to balcony floor slab or ceilings, and through wall penetrations – pipes, electrical boxes, and scupper penetrations.

2.3 ADHESIVES

- A. As recommended by system manufacturer.

2.4 INSULATION BOARD

- A. To match existing insulation.

2.5 BASE COAT

- A. One-component polymer modified cement based high build base coat for insulation board. Also used as a leveler for concrete and masonry surfaces.

2.6 REINFORCING MESHES

- A. Standard Mesh

1. Nominal 4.5 oz/yd² (153 g/m²), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials (*achieves Standard Impact Classification when used with Foamular CI-C, Medium Impact Classification when used with Dow Panel Core 20*).

2.7 FINISH COAT

- A. Acrylic based textured wall finish with graded marble aggregate and self-cleaning properties.

2.8 JOB-MIXED INGREDIENTS

- A. Water: Clean and potable.
- B. Portland Cement: Type I, Type II, or Type I-II in conformance with ASTM C 150.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS

- A. Prequalify under Quality Assurance requirements of this specification.

3.2 EXAMINATION

- A. Inspect concrete and masonry substrates prior to start of application for:
 - 1. Contamination—algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
 - 2. Surface absorption and chalkiness.
 - 3. Cracks – Measure crack width and record location of cracks.
 - 4. Damage and deterioration such as voids, honeycombs and spalls.
 - 5. Moisture content and moisture damage—use a moisture meter to determine if the surface is dry enough to receive the products and record any areas of moisture damage.
 - 6. Compliance with specification tolerances—record areas that are out of tolerance (greater than 1/4 inch in 8-0 feet [6mm in 2438 mm] deviation in plane).
- B. Inspect sheathing application for compliance with applicable requirements and installation in conformance with specifications and manufacturer requirements:
 - 1. Glass Mat Faced gypsum sheathing compliant with ASTM C 1177.
 - 2. Exterior Grade and Exposure I wood based sheathing - APA Engineered Wood Association E 30.
 - 3. Cementitious sheathing - consult manufacturer.
 - 4. Attachment into structural supports with adjoining sheets abutted (gapped if wood-based sheathing) and fasteners at required spacing to resist design wind pressures as determined by design professional.
 - 5. Fasteners seated flush with sheathing surface and not over-driven.
- C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the Air/Moisture Barrier and the EIFS installation to the General Contractor. Do not start work until deviations are corrected.

3.3 EIFS REMOVAL AND TRANSITION PREPARATION

- A. Remove 12 inches of EIFS down to substrate starting from 8 inch minimum roof base flashing height at locations indicated on plans.
- B. Grind the bottom four inches of EIFS at the transition from new EIFS to existing EIFS to expose the existing reinforcement.
- C. Install new EIFS in accordance with installation procedures below.
- D. Reinforcing, base coat, and finish coat should lap the existing EIFS by minimum of four inches.

3.4 SURFACE PREPARATION

- A. Remove surface contaminants on concrete, concrete masonry, gypsum sheathing, or coated gypsum sheathing surfaces.
- B. Repair cracks, spalls or damage in concrete and concrete masonry surfaces and level concrete and masonry surfaces to comply with required tolerances.
- C. Apply conditioner (if required by manufacturer) by spray or roller to chalking or excessively absorptive surfaces or pressure wash to remove surface chalkiness.
- D. Remove fasteners that are not anchored into supporting construction and seal holes with air barrier material.
- E. Seal over-driven fasteners with air barrier material and install additional fasteners as needed to comply with fastener spacing requirement.
- F. Replace weather-damaged sheathing and repair or replace damaged or cracked sheathing.

3.5 INSTALLATION

A. Air/Moisture Barrier Installation:

- 1. Install air/moisture barrier in accordance with the manufacturer's installation instructions.

B. EIFS Installation:

1. Adhesive Application and Installation of Insulation Board:

- a. Ensure the air/moisture barrier surface is free of surface contamination.
- b. Tie in new EIFS to maintain existing drainage plain.
- c. Cut the insulation board squarely to a 2 x 4 foot (0.6 x 1.2 m) dimension (if not already furnished pre-cut).
- d. Apply adhesive in accordance with the manufacturer's recommendations.
- e. Bridge sheathing joints by a minimum of 6 inches (152 mm). Interlock inside and outside corners.
- f. Butt all board joints tightly together to eliminate any thermal breaks. Care must be taken to prevent any adhesive from getting between the joints of the boards.
- g. Check for satisfactory contact of the insulation board with the substrate. If any boards have loose areas use the dispensing pistol to create a hole through the board and inject adhesive to attach the loose area. Allow the adhesive to expand to the outer face of the board while withdrawing the pistol. Cut excess adhesive flush with the surface of the insulation. Do not use nails, screws, or any other type of non-thermal mechanical fastener.

2. Slivering and Rasing of Insulation Board Surface:

- a. Fill any open joints in the insulation board layer with slivers of insulation or the spray foam adhesive.

- b. Rasp the insulation board surface to achieve a smooth, even surface and to remove any ultraviolet ray damage.
3. Completion of Backwrapping:
- a. Complete the backwrapping procedure by applying base coat to exposed edges of insulation board and approximately 4 inches (100 mm) onto the face of the insulation board. Pull mesh tight around the board and embed it in the base coat with a stainless steel trowel. Use a corner trowel for clean, straight lines. Smooth any wrinkles or gaps in the mesh.

3.6 BASE COAT AND REINFORCING MESH APPLICATION

- A. Ensure the insulation board is firmly adhered and free of surface contamination or UV degradation, and is thoroughly rasped before commencing the base coat application.
- B. Apply detail mesh at trim, reveals and projecting architectural features. Embed the mesh in the wet base coat. Trowel from the base of reveals to the edges of the mesh.
- C. Standard mesh application: Apply base coat over the insulation board, including areas with Ultra-High impact mesh, with a stainless steel trowel to a uniform thickness of approximately $\frac{1}{8}$ inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2- $\frac{1}{2}$ inches (64 mm) at mesh seams and at overlaps of detail mesh. Feather seams and edges. Double wrap all inside and outside corners with minimum 6 inch (152 mm) overlap in each direction (optional if corner bead accessory is used – see NOTE to paragraph 3.4.2 H1 above). Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible.
- D. Sloped Surfaces: for trim, reveals, aesthetic bands, cornice profiles, sills or other architectural features that project beyond the vertical wall plane more than 2 inches (51 mm) apply waterproof base coat with a stainless steel trowel to the sloped surface and minimum four inches (100 mm) above and below it. Embed standard mesh or detail mesh in the waterproof base coat and overlap mesh seams a minimum of 2- $\frac{1}{2}$ inches (65 mm).
- E. Allow base coat to thoroughly dry before applying primer or finish.

3.7 PRIMER APPLICATION

- A. Ensure the base coat surface is free of surface contamination before commencing the primer application.
- B. Apply primer evenly with brush, roller or proper spray equipment over the clean, dry base coat and allow to dry thoroughly before applying finish.

3.8 FINISH COAT APPLICATION

- A. Finish coat is to be installed at all EIFS surfaces above roof level.

- B. Ensure the base coat surface or primed surface contamination before commencing the finish application.
- C. Apply finish directly over the base coat or primed surface when dry. Apply finish by spray or stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
 - 1. Avoid application in direct sunlight.
 - 2. Apply finish in a continuous application, and work to an architectural break in the wall.
 - 3. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results. Cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
 - 4. Do not install separate batches of finish side-by-side.
 - 5. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
 - 6. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

3.9 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.
- B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

3.10 CLEANING, REPAIR AND MAINTENANCE

- A. Clean and maintain the EIFS for a fresh appearance and to prevent water entry into and behind the system. Repair cracks, impact damage, spalls or delamination promptly.
- B. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into or behind the EIFS and anywhere into the wall assembly.

END OF SECTION 072400

SECTION 074213 – FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Flush-profile, concealed fastener metal wall panels, with related metal trim and accessories.

1.2 RELATED REQUIREMENTS

- A. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing items in addition to items specified in this Section.

1.3 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org:
 - 1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
 - 2. AAMA 809.2 Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE): www.asce.org/codes-standards:
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org:
 - 1. ASTM A755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - 2. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - 3. ASTM C920 - Specification for Elastomeric [Joint Sealants](#).
 - 4. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 - 5. ASTM D4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
 - 6. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
- D. International Accreditation Service (IAS):
 - 1. IAS AC472 Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.

1.4 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer accredited under IAS AC472, Part B.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.
 - 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Product data, including certified independent test data indicating compliance with requirements.
 - b. Samples of each component.
 - c. Sample shop drawings from similar project.
 - d. Project References: Minimum of five installations not less than three years old, with Owner and Architect contact information.
 - e. Sample warranty.
 - f. Certificate of accreditation under IAS AC472 Part B.
 - 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
 - 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years experience with successfully completed projects of a similar nature and scope.
 - 1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, metal panel installer, metal panel manufacturer's technical representative, inspection agency and related trade contractors.
 - 1. Coordinate building framing in relation to metal panel system.
 - 2. Coordinate openings and penetrations of metal panel system.

1.6 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products. Include data indicating compliance with performance requirements.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, and special details. Make distinctions between factory and field assembled work.

1. Indicate points of supporting structure that must coordinate with metal panel system installation.
 2. Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.
- 1.7 INFORMATIONAL SUBMITTALS
- A. Product Test Reports: Indicating compliance of products with requirements.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC472 Part B.
- D. Manufacturer's warranty: Unexecuted sample copy of manufacturer's warranty.
- 1.8 CLOSEOUT SUBMITTALS
- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
1. Deliver, unload, store, and erect metal panels and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
 2. Store in accordance with Manufacturer's written instruction. Provide wood collars for stacking and handling in the field.
 3. Shield foam insulated metal panels from direct sunlight until installation.
- 1.10 WARRANTY
- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.
- B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:

1. **Fluoropolymer Two-Coat System:**
 - a. Basis of Design System: **MBCI, Signature 300.**
 - b. Color fading in excess of 5 Hunter units per ASTM D 2244.
 - c. Chalking in excess of No. 8 rating per ASTM D 4214.
 - d. Failure of adhesion, peeling, checking, or cracking.
 - e. Warranty Period: [40] years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer: **MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.**; Houston TX. Tel: (877)713-6224; Email: info@mbci.com; Web: www.mbci.com.
 1. Provide basis of design product, or comparable product approved by Architect prior to bid.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, as determined by ASTM E1592:
 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
 - a. Wind Negative Pressure: Certify capacity of metal panels by actual testing of proposed assembly.
 2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/120 of the span with no evidence of failure.
- C. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

2.3 FORMED METAL WALL PANELS

- A. **Ribbed-Profile, Concealed Fastener Metal Wall Panels:** Structural metal panels consisting of formed metal sheet with vertical panel edges and flat pan, **with flush joints between panels, field assembled** with nested lapped edges, and attached to supports using concealed fasteners.
1. Basis of Design: **MBCI, Masterline 16 Panel.**
 - a. Nominal Thickness: 24 gage coated thickness, with smooth surface.
 - 1) Exterior Finish: Fluoropolymer two-coat system
 - 2) Color: As selected by Owner from manufacturer's standard colors.
 2. Panel Width: 16 inches (406 mm).
 3. Panel Thickness: 7/8 inch (22 mm).

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide complete metal panel assemblies incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings. Provide required fasteners, closure strips, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panels.
- C. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal panels by means of factory-applied coating, with weathertight resilient washers.

2.5 FABRICATION

- A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

2.6 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621.
1. Basis of Design: **MBCI, Signature 300.**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.
 - 1. Inspect framing that will support insulated metal panels to determine if support components are installed as indicated on approved shop drawings and are within tolerances acceptable to metal panel manufacturer and installer. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal panels.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

3.2 METAL PANEL INSTALLATION

- A. Concealed-Fastener Formed Metal Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, project drawings, and referenced publications. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer. Fasten panel to support structure through leading panel flange. Snap-fit back flange of subsequent panel into secured flange of previous panel. Where indicated, fasten panels together through flush-fitted panel sides.
 - 1. Cut panels in field where required using manufacturer's recommended methods.
 - 2. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.
- C. Attach panel flashing trim pieces to supports using recommended fasteners.

3.3 ACCESSORY INSTALLATION

- A. General: Install metal panel accessories with positive anchorage to building and weather tight mounting; provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
 - 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
 - 3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

3.4 CLEANING AND PROTECTION

- A. Clean finished surfaces as recommended by metal panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION 074213

SECTION 075400 – THERMOPLASTIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Thermoplastic membrane roofing.
 - 2. Coverboard.
 - 3. Crickets/Saddles.
 - 4. Insulation.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry."
 - 2. Division 7 Section "Reroofing Preparation."
 - 3. Division 7 Section "Sheet Metal Flashing and Trim."

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Existing system fastener and adhesive pull tests provided by OMG Roofing, Inc. attached. Contractor to verify adequate uplift resistance with pull tests for every 3,000 square feet.
- C. Provide roofing system meeting wind uplift requirements as follows, layout of zones is as indicated on plans:
 - 1. Zone 1': -22 psf
 - 2. Zone 1: -38 psf
 - 3. Zone 2: -50 psf
 - 4. Zone 3: -69 psf

- D. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- E. Provide a roofing system that complies with the requirements of Underwriters' Laboratories, Inc. for a Class 1A-90 roof covering. Provide a UL Class A certificate, generated by Roofing System Manufacturer, to Owner at project close-out.

1.5 SUBMITTALS

- A. Materials List: Give written notification of the brand name and manufacturer of each material proposed for use and include a statement that all proposed materials meet the specification requirements. Obtain approval prior to placing orders.
 - 1. Submittal of catalog cut sheets, etc. in lieu of the materials list required above is not acceptable. Do not submit cut sheets unless specifically requested.
- B. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- C. Manufacturer Certificates: Original document signed by a responsible officer of the manufacturing firm, notarized, on manufacturer's standard letterhead, certifying materials furnished for project comply with the referenced standard. Certificate shall specifically reference the project and applicable compliance standard.
- D. Installation Instructions: Submit manufacturer's latest written installation instructions.
- E. Qualification Data: For Installer and manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- G. Maintenance Data: For roofing system to include in maintenance manuals.
- H. Warranties: Special warranties specified in this Section.
- I. Sample Warranty: Specimen copy of manufacturer's warranty.
- J. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.
- K. Polyisocyanurate Insulation Certificate: Signed by insulation manufacturer stating that polyisocyanurate insulation shipped to this project complies with requirements listed in Part 2.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
- D. Supply and keep all materials dry at all times prior to application.
- E. Store all insulation, insulating board cants, tapered edge strips and lumber/plywood in dry, covered storage, or on platforms, and with weatherproof coverings. Coverings shall be waterproof breathable type material such as heavy canvas. Insulation wrappers are not sufficient. Materials which are not stored under specified covers are subject to removal from the site at Owner's discretion.
- F. Store all roll goods on end on clean floors or platforms. Do not use flattened rolls or rolls with ends damaged.
- G. Materials which, in the opinion of the Owner, have been prematurely exposed to the weather are subject to immediate removal by the contractor and replaced with new materials at contractor's expense. Owner may, at Owner's option, mark such materials with paint or other indelible materials while they remain on-site.
- H. Store solvent bearing materials in dry, cool storage and keep lids tight on partially used containers to prevent escape of solvents.
- I. Store all emulsions in dry storage at temperatures above 40°F.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY AND GUARANTEE

- A. Guarantee: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
 - 1. Guarantee includes roofing membrane, base flashings, roof insulation, fasteners, cover boards, and other components of roofing system.
 - 2. Guarantee Period: 20 years from date of Substantial Completion.
- B. Contractor Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing

system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, and walkway products, for the following warranty period:

- C. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Listed in this section are specifications for materials required generally for use in accomplishing the work specified. Materials not listed may also be required.
- B. Except as specifically noted herein, all reference standards included herein are to be presumed to be the latest published editions of such standards available as of the issue date of these specifications.
- C. Brand or manufacturer names are used as standards of quality where no other appropriate reference is available. Submit substitution requests under requirements listed in other Sections.
- D. Where a generic product or a general manufacturer's product is specified and more than one such product is offered by the manufacturer, provide the manufacturer's premium materials.

2.2 MANUFACTURERS

- A. For purposes of these documents, the roof system manufacturer is defined as the manufacturer of the primary roof membrane. The roof system is intended to encompass, but is not necessarily limited to, all components above the deck including underlayment and/or vapor retarder components, roof insulation, roof membrane, membrane flashings and any proprietary flashing/components of the system manufacturer. Subject to compliance with the material specifications of these documents, all materials are to be supplied by the same manufacturer.
- B. All materials used in systems to be covered by a Manufacturer's Guarantee must be supplied by the same manufacturer, unless the manufacturer issuing the guarantee waives this requirement in writing.
- C. The following material manufacturers are approved for this project. Such approval does not relieve the Contractor from the requirement to supply materials which meet all other requirements of these Specifications.
- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Thermoplastic membrane roofing:
 - a. Seaman Corp.
 - b. Sarnafil
 - c. Johns-Mansville

d. Carlisle

2.3 FLEXIBLE SHEET MEMBRANE MATERIALS

- A. Membrane: Reinforced thermoplastic membrane, white color, minimum thickness to be 60 mil or as required for 20 year roofing system warranty.
 - 1. Fibertite by Seaman Corporation.
 - 2. G-410 by Sarnafil.
 - 3. JM PVC60 by Johns-Manville.
 - 4. Sure-Flex by Carlisle.
- B. Adhesive: Solvent-based contact adhesive.
- C. Wall Flashing: Same as membrane.
- D. Walkpads: Vinyl slip-resistant pad, heat-welded to membrane.
 - 1. Tuff-Trac Walkway Pad.
 - 2. Sarnapad.
 - 3. Equivalent.
- E. Pre-fabricated Flashing Components: Provide other pre-fabricated components as required, such as corner flashing, vent stacks, etc.
- F. Miscellaneous Products: Sealants, primers and cleaners supplied by the membrane manufacturer.

2.4 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
- B. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.
- C. Cold Adhesives: Specially formulated cold process adhesive designed for specified roofing systems; low VOC.
- D. Galvanized Steel Roofing Nails: 11 or 12 gauge hot-dipped galvanized steel with ringed shank, minimum 3/8 inch diameter head, minimum 1-1/2 inch length.
- E. Masonry Anchors: Stainless steel screw anchor for use in concrete, brick or concrete masonry units manufactured with threads for cutting into walls of pre-drilled opening to provide tight friction fit, 3/16 inch diameter, length to achieve 1-1/2 inches of embedment into underlying substrate.

2.5 INSULATION/BOARD GOODS

- A. Polyisocyanurate Roof Insulation: ASTM C 1289, Type II, with felt or glass-fiber mat on both major surfaces, manufactured to meet the following requirements:
 - 1. Nominal Compressive Strength: 20 psi.
 - 2. Dimensional Stability: 2% maximum linear change when conditioned at 158°F and 97% relative humidity.
 - 3. Minimum Curing Time: 24 hrs. plus 24 hrs. for each inch of thickness at a minimum of 60°F before shipment from manufacturer.
 - 4. Maximum Board Thickness: 2 inches.
 - 5. Maximum Size: 4' x 4' – adhered; 4' x 8'.
- B. Cover Board:
 - 1. Maximum Size: 4' x 4' adhered.
 - 2. Compressive Strength: 900 psi.
- C. Contractor shall submit a statement from manufacturer of polyisocyanurate insulation and cover board stating they will certify compliance of material shipped to this project with these requirements.
- D. Tapered Edge Strips: ASTM C 208, wood fiberboard, 1-1/2 inch at thick edge.

2.6 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Insulation Adhesive: Two component, low rise polyurethane foam, approved by membrane manufacturer for insulation and substrates on this project.

2.7 FASTENING DEVICES

- A. Termination Bar: Extruded aluminum bar, 1 inch by 1/8 inch, with pre-punched holes at 6 inches on center.
- B. Insulation Fasteners and Plates: Plated steel fastener and 3-inch diameter round or 3-inch square steel plate as manufactured by or specifically recommended by the roof system manufacturer. Fasteners and plates must be Factory Mutual approved for 1-90 construction with the specified insulation.
- C. Stainless Steel Roofing Nails: 11 or 12 gauge hot dipped galvanized steel ring shank roofing nails, minimum 3/8 inch diameter head as manufactured by W. H. Maze Company. Minimum length 1½ inches.

2.8 FLASHING MATERIALS

- A. Polymethyl-methacrylate (PMMA) Water Proofing Membrane: Two component resin with catalyst and reinforcement fabric. Cold fluid-applied membrane with fleece reinforcement installed to manufacturer recommendations.
 - 1. 90 mil (nominal) dry film thickness to achieve waterproof membrane conforming to ASTM C836.
 - 2. Components shall be mixed to manufacture requirements of a minimum of 2 minutes and to the ratios set by manufacturer.

2.9 WALKWAYS

- A. Walkway Pads: Vinyl slip-resistant pad, heat-welded to membrane.
 - 1. Tuff-Trac Walkway Pad.
 - 2. Sarnapad.
 - 3. Equivalent.

PART 3 - EXECUTION

3.1 GENERAL SCHEDULE

- A. Refer to Table 3-1 for a general schedule of the primary roof components (described from the bottom up) for each roof area. Methods of installation and related materials are in other sections of these specifications.

Table 3-1

Recover Areas C, D, E, F, G, H, I, K, L, M, N, O, P, Q, R, S, T, U
New PVC membrane
New 1/2-inch coverboard (adhered)
New 2-inch polyisocyanurate insulation (adhered)
New 2-inch polyisocyanurate insulation (mechanically attached)
Type B steel deck

- B. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, asphalt, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Accomplish application of roofing materials so that each area will be complete at the end of each workday.
- D. Protect edges and incomplete flashings against water entry at all times. Remove cut-offs and temporary protection prior to resumption of work.
- E. Application rates for insulation adhesives shall be as required by roofing system manufacturer.

3.3 RE-COVER PREPARATION

- A. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
- B. Remove and discard all base flashings, counterflashings, pitch pans, pipe flashings, vents, and like components necessary for application of new membrane.
- C. Remove and replace wet, deteriorated or damaged roof insulation and decking as identified on the plans. Locations of wet insulation that extend beyond the limits on the roof plan are to be replaced with the unit price allowance.
- D. Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
 - 1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
 - 2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
 - 3. Perimeter nailers shall be elevated to match elevation of new roof insulation.
- E. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

3.4 COVERBOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

- C. Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Gaps exceeding 1/4" are unacceptable.
 - 1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.
 - 2. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- D. Adhere to resist uplift pressure at corners, perimeter, and fields of roof

3.5 INSULATION APPLICATION (MECHANICALLY FASTENED)

- A. Apply base layer of insulation. Stagger joints by half of a board.
- B. Fasten base insulation as necessary per manufacturer's instructions to meet required uplift values.

3.6 INSULATION APPLICATION (ADHERED)

- A. Clean surfaces of all asphalt, dirt, dust and other foreign matter.

NOTE: CONTRACTOR SHALL FOLLOW ROOFING SYSTEM MANUFACTURER'S INSTRUCTIONS FOR SUBSTRATE PREPARATION, INCLUDING, BUT NOT LIMITED TO, USE OF PRIMERS AS REQUIRED TO ENSURE PROPER ADHESION.

- B. Install insulation and cover board using 3/4 inch wide ribbons of adhesive. Apply adhesive in ribbons at spacings necessary per manufacturer's instructions to meet required uplift values. In addition, ribbons of adhesive are to be applied along all insulation and Dens-Deck edges.

CONTRACTOR SHALL EMPLOY ALL ADDITIONAL METHODS AND PROCEDURES AS NECESSARY TO ENSURE INSULATION UNITS AND DENS-DECK UNITS ARE FULLY ADHERED TO THE SUBSTRATE INCLUDING APPLYING ADDITIONAL ADHESIVE ALONG EDGES, BALLASTING INSULATION UNITS, INSTALLING MECHANICAL FASTENERS AT INSULATION AND DENS-DECK CORNERS, ETC. WALK BOARDS INTO THE ADHESIVE AND ROLL USING 30 INCH WIDE, 100-150 POUND WEIGHTED STEEL ROLLER.

- C. Stagger all joints off those of preceding layer.
- D. For multiple layers of insulation, install ribbons over preceding layers once fully secured and follow procedures, as specified herein, for attachment of each insulation layer.
- E. Apply insulation with end joints staggered approximately one-half the length of units.
- F. Fit all insulation units snugly to each other and to all vertical surfaces.
- G. Remove and replace all damaged units with new insulation or repair to provide a smooth surface and uniform insulation thickness.
- H. Place insulation into adhesive shortly after it has reached its maximum rise and ballast in accordance with manufacturers requirements.

NOTE: WALKING INSULATION BOARDS IN IMMEDIATELY AFTER PLACEMENT INTO ADHESIVE MAY CAUSE SLIPPAGE/MOVEMENT UNTIL ADHESIVE STARTS TO SET.

- I. Unless noted otherwise, fabricate all crickets from tapered stock as required to provide an installed slope matching that of the adjacent roof area. For example, where the roof slope is 1/4 inch per foot, fabricate crickets from 1/2 inch per foot stock to provide an installed slope of 1/4 inch per foot.
- J. Start cricket construction by striking chalk lines for outer edges of tapered edge strips. Install edge strips along chalk lines, mitering and fitting at the points where lines break.
- K. Build crickets over the tapered of insulation, or base layers if the slope is in the deck. Take special care to prevent water penetration into crickets during construction.
- L. Taper insulation down to drains and primary scuppers beginning at a point approximately 24 inches from drain.
- M. Apply coverboard over all of the insulation layers.

3.7 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Membrane Roof Systems."
- B. Clean surfaces of all dirt, dust and other foreign matter.

3.8 MEMBRANE INSTALLATION

- A. Install membrane in strict accordance with manufacturer's recommendations.
- B. Unroll membrane and allow to relax before installing.
- C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer.
- D. Apply bonding adhesive to substrate and underside of roofing membrane at rate(s) required by roofing manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.
- E. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations and perimeter of roofing.
- F. Apply membrane with side laps shingled with slope of roof where possible.
- G. Seams: Clean seam areas, overlap roofing membrane and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity.

2. Perform pull tests daily of seams. Contractor is to date and maintain on site samples for Engineer's review.

H. Repair tears, voids and lapped seams in roofing that do not meet requirements.

3.9 FLASHING APPLICATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate(s) and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Weld side and end laps to ensure a watertight seam installation.
- E. At vertical terminations, terminate and seal top of sheet flashings and mechanically anchor to substrate with specified fasteners through specified termination bar approximately 1 inch below top edge and spaced not over 6 inches on center.
- F. Unless specifically stated otherwise in these specifications or on drawings all base flashings are to extend a minimum of 8 inches above finished roof level. Costs for modifications to parapets, equipment curbs, expansion joint curbs, etc. are to be included in the contractor's bid.

3.10 LIQUID MEMBRANE FLASHING SYSTEM

- A. At roof penetrations and scuppers, install liquid membrane flashing and reinforcement as specified herein.
 1. Follow manufacturer's latest printed installation instructions. Refer to Drawings. Submit three copies to Engineer prior to start of work.
 2. Prep surfaces as required by roofing system manufacturer. Install sealant to fill voids where roofing membranes terminate at penetrations.
 3. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to set.
 4. Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.
 5. Apply an even, generous base coat of flashing resin using a roller at the minimum rate specified by the resin manufacturer to prepared surfaces requiring flashing coverage. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inches and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin at the minimum rate specified by the resin manufacturer immediately following embedment of the fleece, ensuring full saturation of the fleece. Ensure that the flashing resin is applied to extend a 0.25 inch beyond the fleece. Remove the tape before the catalyzed resin sets. Make allowances for saturation of roller covers and application equipment.

6. Should work be interrupted for more than 12 hours or the surface of the catalyzed resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.
7. Apply the color finish over the installed field membrane after the membrane is set, dry and has been in place for a minimum 2 hours.
8. Using the specified cleaner/solvent, wipe field surfaces to receive the color finish layer. Allow the surface to dry for a minimum 20 minutes before continuing work.
9. Apply an even top coat of catalyzed color finish resin at the minimum rate specified by the resin manufacturer. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

B. At locations indicated on drawings, apply PMMA liquid flashing as specified herein.

1. Mix and apply cold fluid-applied reinforced membrane flashing in strict accordance with written instructions of Membrane Manufacturer.

3.11 WALKWAY INSTALLATION

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

1. Install walk pads around upper and lower access ladder points and full perimeter of mechanical units.
2. Install walk pads around full perimeter of roof hatches.

THERMOPLASTIC MEMBRANE RECOVER ROOFING SYSTEM WARRANTY
(on Contractor's Standard Letterhead)

Owner: _____
Installer: _____
Location of Building: _____ Greenville, South Carolina _____
Name of Building: _____ Armstrong Elementary School _____
Roof Areas: _____ C, D, E, F, G, H, I, K, L, M, N, O, P, Q, R, S, T, U _____
Date of Substantial Completion: _____

Know all men by these presents, that we, Installer as defined above, having installed insulation, roofing, flashings and sheet metal work, and having accomplished certain other work on the roof areas identified above under contract between Owner and Contractor, warrant to Owner, with respect to said work that for a period of two (2) years from date of Substantial Completion of said work, the roofing including insulation, roofing membrane, flashings and sheet metal work, shall be absolutely watertight and free from all leaks, provided however that the following are excluded from this warranty:

Defects or failures resulting from abuse by the Owner.

Defects in design involving failure of (1) structural frame, (2) load-bearing walls, and (3) foundations.

Damage caused by fire, tornado, hail, hurricane, acts of God, wars riots or civil commotion.

We, Installer, agree that should any leaks occur in the roofing we will promptly remedy said leaks in a manner to restore the roof to a watertight condition by methods compatible to the system and acceptable under industry standards and general practice.

We, Installer, further agree that for a period of two (2) years from date of Substantial Completion referred to above, we will make repairs at no expense to the Owner, to any defects which may develop in the work including but not limited to open laps, blisters, wrinkles, ridges, splits, warped insulation, and loose flashings in a manner compatible to the system and acceptable under industry standards and general practice.

IN WITNESS WHEREOF, we have caused this instrument to be duly executed, this _____ day of _____, 20 _____.

(Installer)

WITNESS:

by _____
President

Notary Public

The undersigned named Owner agrees, from the date of acceptance of the project, to maintain the roof in accordance with the manufacturers written requirements and agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The Owner recognizes his responsibility to inspect the roof semi-annually.

Owner Date

END OF SECTION 075400

SECTION 076200 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Sheet metal flashing and trim.
- B. Related Sections include the following:
 - 1. Division 7 Section “Thermoplastic membrane roofing.”
 - 2. Division 7 Section “Formed Metal Wall Panels”

1.3 SUBMITTALS

- A. Materials List: Give written notification of the brand name and manufacturer of each material proposed for use and include a statement that all proposed materials meet the specification requirements. Obtain approval prior to placing orders.
 - 1. Submittal of catalog cut sheets, etc. in lieu of the materials list required above is not acceptable.
- B. Submit shop drawings of all specified types of metal shapes, showing details of proposed installation where appropriate.
- C. Submit two 6-inch long samples of each metal shape.
- D. Manufacturer Certificates: Original document signed by a responsible officer of the manufacturing firm, notarized, on manufacturer’s standard letterhead, certifying materials furnished for project comply with the referenced standard. Certificate shall specifically reference the project and applicable compliance standard.
- E. Obtain approval of shop drawings, samples and certifications prior to fabrication and installation.
- F. No sheet metal item is to be purchased, fabricated, or installed until all required shop drawings and related submittals for each item are approved. Items purchased, fabricated and/or installed which are not in compliance with approved shop drawings are subject to immediate removal from the project at contractor’s expense.

- G. Color Chart: Manufacturer's standard range of colors for prefinished metals, including available gauges.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak or loosen and shall remain watertight.
- B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg. F, ambient; 180 deg. F material surfaces to 20 deg. F ambient and material surfaces.

1.5 STORAGE

- A. Restrict on-site storage to minimum for work in progress. Protect all stored metal from exposure to weather and physical damage.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Aluminum-Zinc (Galvalume) Alloy-Coated Steel Sheet: ASTM A 792/A792M, Class AZ50 coating designation, Grade 40 (Class AZM150 coating designation, Grade 275); structural quality.
- B. Stainless Steel: ASTM A167, chromium-nickel steel sheet, AISI Type 304.
- C. Solder: ASTM B 32 with 50% lead and 50% tin unless otherwise specified herein.
- D. Lead: 4 lb. soft lead
- E. Exposed Finish: Kynar[®] 500 based fluoropolymer coating, containing not less than 70% polyvinylidene fluoride resin by weight. Mask metal with protective plastic film.
 - 1. Color: As selected by Owner from manufacturer's full range of colors.

2.2 METAL ROOFING MATERIALS

- A. Sealant: ASTM C920 Type S Grade NS Class 50 Use T, NT, M, A & G compliant sealant.

2.3 AUXILIARY MATERIALS

- A. High temperature self adhering membrane: asphalt based
- B. Sealant: ASTM C 920, Type S, Grade NS, Class 25, one-part polyurethane sealant.
- C. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos-free.
- D. Self-Adhering Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40 mil thick sheet; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold-applied.

2.4 SHEET METAL SCHEDULE

- A. Counterflashing: 24 ga. prefinished galvalume
- B. Counterflashing Receiver: 24 ga. prefinished galvalume
- C. Membrane-Clad Edge Metal: 24 ga. prefinished galvalume
- D. Gutters: 24 ga. prefinished galvalume
- E. Downspouts: 24 ga. prefinished galvalume
- F. Coping Caps. 24 ga. prefinished galvalume
- G. Pourable Sealer Pockets: Membrane-clad or 24 ga. stainless steel
- H. Base Flashing Closures: 24 ga. prefinished galvalume
- I. Flashing Umbrellas: 24 ga. stainless steel
- J. Metal Wall Panels: 24 ga. prefinished galvalume
- K. Conductor Heads: 24 ga. prefinished galvalume
- L. Membrane-Clad Scupper Liners: 24 ga. stainless steel
- M. Membrane-Clad Overflow Scupper Liners. 24 ga. Stainless steel

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Inspect all surfaces to which metal is to be applied. Do not install metal unless surfaces are even, sound, clean, dry and free from defects that might affect the application.
- B. Follow recommendations of Sheet Metal and Air Conditioning Contractors National Association Architectural Sheet Metal Manual (Seventh Edition, 2012) for fabricating in-shop and on-site, and for installation, unless otherwise specified herein or on Drawings.

- C. Follow published instructions of the product manufacturer for installation of extruded or proprietary metal products, unless otherwise specified herein or on Drawings.
- D. Use nails, screws, bolts, cleats or other fasteners of the same material or, if approved by Engineer, of material chemically compatible with the contacted metal.
 - 1. Use stainless steel fasteners at all locations in contact with pressure-treated lumber.
- E. Fabricate cleats to be one gauge heavier than metal to be secured by cleat unless otherwise noted.
 - 1. Secure cleats to substrate with fasteners specifically manufactured for the purpose at spacings of 6 inches, on center. Fasteners are to be manufactured of metal chemically compatible with the contacted metal. Fasteners to be used in wood substrates are to be ring shank. Fasteners to be used in masonry units are to be self-tapping masonry fasteners. Fasteners are to be located as close to hem of cleat as practical but no more than 2 inches from hem unless specifically indicated otherwise herein or on drawings.
- F. Do not place dissimilar metals in direct contact or in positions where water sheds across both metals.
- G. Where aluminum is in contact with masonry or concrete, coat the contacting surface with bituminous paint.
- H. Install metal to be water- and weathertight with lines, arises and angles sharp and true and with plane surfaces free of waves or buckles. All raw edges of exposed or finish sheet metal shall be hemmed.
- I. Install shop-formed flashings in 10 foot lengths maximum and with minimum number of pieces in each straight run.
- J. Miter and seal all inside and outside corners of coping cap. Shop fabricated corner pieces are preferable. Shop fabricated corner pieces are preferable.
- K. Shop form all metal shapes, which are to be formed of prefinished metal, with protective plastic film in place. Do not remove plastic film until just prior to (or, if possible, after) installation.
- L. Form faces of gravel stop-fascia, eave and rake flashings with vertical faces of sufficient width to extend a minimum of 1 inch below wood blocking.
- M. Hem all metal raw edges.

3.2 EDGE METAL INSTALLATION

- A. Install new edge metal as specified herein. Refer to SMACNA Architectural Sheet Metal Manual Figure 2-1 and drawings.
- B. Refer to sheet metal schedule for gauge and metal type.

- C. Fabricate edge metal with flange width no wider than the width of the blocking less $\frac{1}{2}$ inch and not less than 4 inches.
- D. Apply a strip of self-adhering membrane across the top of the blocking over roof membrane and extending down the outside face approximately the width of the vertical section of the gravel stop-fascia. Use strips as long as practical, lapping the ends 6 inches.
- E. Engage formed drip at lower edge of face with continuous cleat. Refer to drawings and SMACNA Architectural Sheet Metal Manual Figure 2-1, Detail 1.
- F. Leave a $\frac{1}{4}$ inch opening between sections. Center the cover plate over the opening, nail with two nails through opening between sections. Refer to SMACNA Architectural Sheet Metal Manual Figure 2-5A.
- G. Nail through flange near center. Space nails 3 inches on center in a staggered pattern. Refer to SMACNA Architectural Sheet Metal Manual Figure 2-1.

3.3 COUNTERFLASHING INSTALLATION

- A. Install new counterflashing at walls and curbs as specified herein. Refer to Drawings.
- B. Refer to sheet metal schedule for gauge and metal type.
- C. Fasten counterflashing at a minimum of 6 inches on center, and install a sealant fillet at the top flange of the counterflashing.
- D. Notch and lap joints and inside corners. Notch and seam outside corners. Do not rivet or otherwise secure joints and corners.
- E. Install new counterflashing at all roof mounted equipment. Extend new counterflashing across top of curb beneath seating flange of unit. Extend flange down a minimum of 4 inches over base flashing. Secure counterflashing to top of curb, or to integral flange of unit with appropriate fasteners at 4 inches on center.

3.4 MISCELLANEOUS FLANGED FLASHING INSTALLATION

- A. Set flange on top of roofing membrane in solid bed of roofing cement.
- B. Set flange in solid bed of roofing cement. If flange width exceeds 12 inches, secure to deck with sheet metal screws or other suitable fasteners placed near each corner and at center of each side.
- C. Except at plumbing vents or other locations where flashing is turned into top of pipe or otherwise integrally secure against water entry, install bonnet flashing extending below and beyond edges of flashing riser and secure mechanically to roof penetration so that connection is watertight. Securement by sealant alone is not acceptable.

3.5 BASE FLASHING CLOSURE INSTALLATION

- A. Install new base flashing closures where base flashings abruptly end as specified herein. Refer to Drawings.
- B. Refer to sheet metal schedule for gauge and metal type.
- C. Completely seal all joints to be watertight.
- D. Install closures over roof membrane and under base flashings.
- E. Extend closures up under counterflashings, where present or specified.
- F. Install closures to completely seal ends of base flashings, membrane and cants as well as end joints of edge metal or drip edge, if present.

3.6 COPING CAP INSTALLATION

- A. Install new coping cap at locations shown on drawings as specified herein.
- B. Refer to sheet metal schedule for gauge and metal type.
- C. Prior to installation of coping cap, apply a strip of self-adhering membrane across the top of the blocking (or other substrate) and extending down the outside and inside face approximately the width of the vertical sections of the coping cap.
- D. Secure both vertical sections with a continuous cleat nailed to wood blocking. Use drive pins where cleats are secured to concrete or masonry.
- E. Refer to SMACNA Architectural Sheet Metal Manual Figure 2-1, Detail 1 for cleat and coping hem dimensions.
- F. Join sections with 1 inch vertical single-lock standing seams and caulk with approved sealant. Refer to SMACNA Architectural Sheet Metal Manual Figure 3-3, Seam 22.
- G. Where copings terminate at walls, turn end up approximately 4 inches. Install new counterflashing to cover upturned coping section.

3.7 GUTTER INSTALLATION

- A. Install new gutters at locations as specified herein and on Drawings. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-2 Style A and Drawings.
- B. Refer to sheet metal schedule for gauge and metal type.

- C. Gutter sizing:
 - 1. Size gutters to be 7 inches wide by 5 inches deep unless otherwise noted on drawings.
 - 2. Size gutters to be 9 inches wide by 7 inches deep at locations indicated by "Oversize Gutter Size" on drawings.
- D. Provide butt-type expansion joints in gutters at 30 foot maximum intervals. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-7 and Drawings.
- E. Provide gutter brackets sized at 1/8 inch by 1 inch spaced 3 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-13A and drawings. Gutter brackets are to be wrapped with galvalume metal to match the color of the gutters.
- F. Secure gutter brackets to fascia using appropriate fastener at 3 feet on center. Refer to SMACNA Architectural Sheet Metal Manual 1-13A.
- G. Provide galvalume gutter spacers sized at 1 inch by 1/8 inch spaced 3 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-13A.

3.8 DOWNSPOUT INSTALLATION

- A. Install new downspouts at primary scuppers as specified herein. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-32B and drawings
- B. Refer to sheet metal schedule for gauge and metal type.
- C. New downspouts shall be 5.5 inch by 5.5 inch.
- D. Install downspouts at locations shown on drawings.
- E. Form downspout hangers from the same material as downspouts using material not less than two gauges heavier than downspouts.
- F. Secure downspouts to wall with hangers spaced not more than 5 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-32F and drawings.
- G. Connect downspouts to existing conductor heads. Refer to SMACNA Architectural Sheet Metal Manual Figures 1-25C.
- H. Provide new concrete splash blocks and protective membrane below each splash block where downspouts terminate at roof.
- I. Tie in downspouts to existing subgrade piping where downspouts discharge onto a roof or at grade.

3.9 SCUPPER LINER INSTALLATION

- A. Install new scupper liners at all new and existing primary and overflow scuppers within area G. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-26.

- B. Refer to sheet metal schedule for gauge and metal type.
- C. Cover all concrete surfaces to be in contact with scupper with a bed of roofing cement.
- D. Install scupper. Install closure flanges at both sides of wall, lock and seal closure flange seams.

3.10 OVERFLOW SCUPPER LINER INSTALLATION:

- A. Install new scupper liners at locations identified on areas G, K, and Q.. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-30A.
- B. Locate bottom of scupper no more than two inches above primary scupper.
- C. Refer to sheet metal schedule for gauge and metal type.
- D. Install scupper. Install closure flanges at both sides of wall, lock and solder closure flange seams.
- E. Extend opening through entire thickness of eave blocking. Take precautions to avoid damaged adjacent wall surfaces.
- F. Provide finished openings as indicated on drawings.

3.11 CONDUCTOR HEADS

- A. Install new conductor heads at primary scuppers.
- B. Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape per SMACNA Detail 1-25F as required, complete with outlet tubes.
- C. Dimensions: Face width: 12 inches; Face depth: 8 inches; Height: 12 inches.

3.12 METAL ROOFING SEALANT

- A. Install sealant along the perimeter and expansion joint of metal roof areas. Spot seal in roofing field as necessary.
- B. Install PMMA liquid flashing at cricket locations indicated on plans. Extend up base flashings of adjacent roofs and terminate underneath coping. Extend to valley and overlap 4 inches onto existing valley flashing.

END OF SECTION 076200