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GREENVILLE COUNTY SCHOOLS
Where Enlightening Strikes!

SPECIFICATIONS FOR
BEREA ELEMENTARY ROOF REPLACEMENT
100 BEREA DRIVE
GREENVILLE, SOUTH CAROLINA, 29617
FH236232

BID DOCUMENTS
NOT FOR CONSTRUCTION

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SECTION 000102
PROJECT INFORMATION

PART 1 GENERAL

1.1 PROJECT IDENTIFICATION

A. Project Name: Berea Elementary Roof Replacement , located at: 100 Berea Drive | Greenville, South Carolina, 29617.

B. Engineer's Project Number: FH236232.

C. The Owner, hereinafter referred to as Owner: Greenville County Schools

D. Owner's Project Manager: Terresa A. Champion.
   1. Address: 2 Space Drive.
   2. City, State, Zip: Taylors, SC 29687-2710.

1.2 PROJECT DESCRIPTION

A. Summary Project Description:
   1. Base Bid: Replacement of low-slope roof Areas A through G (approximately 81,500 SF) with a new 60 mil TPO membrane roof system, edge metal and gutter replacement, and other miscellaneous work as specified herein.
   2. Alternate 1: Replacement of low-slope roof Areas A through G (approximately 81,500 SF) with a new 80 mil TPO membrane roof system, edge metal and gutter replacement, and other miscellaneous work as specified herein.
   3. Alternate 2: Replacement of low-slope roof Areas A through G (approximately 81,500 SF) with a new 60 mil PVC membrane roof system, edge metal and gutter replacement, and other miscellaneous work as specified herein.
   4. Alternate 3: Installation of a new metal roof coating on roof Areas 1 through 3 (approximatly 6,830 SF), and other miscellaneous work as specified herein.

1.3 PROJECT CONSULTANTS

A. The Engineer, hereinafter referred to as Engineer: Terracon Consultants Inc..
   1. Address: 2701 Westport Rd.
   2. City, State, Zip: Charlotte, NC 28208.
   3. Phone/Fax: 704-594-8939.
   4. E-mail: jhpoe@terracon.com.

1.4 CONTRACTOR'S INSURANCE AND BONDS

A. Contractor must submit to the Owner evidence of insurance, as follows.

B. Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage.

C. Comprehensive General Liability shall include: (1) Contractor's liability, (2) Owner's and Contractor's liability, and (3) Contractual Liability, all having limits of not less than:

Bodily Injury Liability	$500,000 per occurrence
	$1,000,000 aggregate
Property Damage Liability	$500,000 per occurrence
	$1,000,000 aggregate

D. Comprehensive Automobile Liability shall include coverage for all owned, non-owned, and hired automotive equipment, all having limits of not less than:

Bodily Injury Liability	$500,000 per person
Property Damage Liability	$1,000,000 per occurrence
Property Damage:	$200,000 per occurrence

   1. Comprehensive Excess ("umbrella") coverage shall be provided in an amount of not less than $1,000.000.
   2. Workmen's Compensation as required by Federal and State workers' compensation and occupational disease laws.

1.5 START AND COMPLETION

A. Work on the project is to be substantially complete within Two Hundred Thirty (230) calendar days. Upon arrival at substantial completion, Contractor shall have thirty (30) calendar days to arrive at final completion, including submittal of all required closeout documentation.

B. Work on the project may begin after the date of fully executed contracts and after submittals have been approved. Materials may be delivered to the site prior to the start of work.

C. Any extension of contract time considered necessary by the Contractor must be submitted in writing to the Owner with complete details of conditions necessitating extension and specific time of extension requested. Any extension must be specifically authorized by the Owner in writing.

D. Substantial completion is defined for this project as the successful installation of every component required under the contract documents to be installed for this project. A punch list may be issued by the Engineer for work complete at this time.

E. When Owner has certified substantial completion, contractor shall have an additional thirty (30) 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.

F. Contractor shall begin the Work on the commencement date set forth in the Contract and shall perform the Work expeditiously with adequate forces and shall complete the Work within the Contract Time.

G. All time limits stated in the Contract are of the essence with respect to Contractor's obligations hereunder.

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:

Month	Days
January	6
February	5
March	6
April	5
May	5
June	6
July	6
August	6
September	4
October	3
November	3
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 LIQUIDATED DAMAGES

A. Liquidated damages will apply starting the first calendar day after the date established for substantial completion and final completion as defined above and will be assessed at a rate of $500.00 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. 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 may be partially 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.

1.8 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.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 000110
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SECTION 011000
SUMMARY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROJECT

A. Project Name: Berea Elementary Roof Replacement

B. Owner's Name: Greenville County Schools.

C. Engineer's Name: Terracon Consultants Inc..

D. The Project consists of the replacement of low-slope roof Areas A through G (approximately 81,500 SF) with a new TPO membrane roof system, edge metal and gutter replacement, and other miscellaneous work as specified herein.

1.3 DESCRIPTION OF THE EXISTNG SYSTEMS

A. Low-Slope Roof System Areas A through G (from top down):
   1. Aggregate surfaced Built-up roof
   2. ¾” perlite board adhered in asphalt
   3. 3" polyisocyanurate insulation mechanically attached
   4. Type B Metal Deck.

B. Base flashings are composed of modified bitumen

C. Metal Roofing Areas 1-3
   1. Standing seam

D. Metal Flashings
   1. Coated Metal

E. Drainage
   1. Gutters and Downspouts

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.

1.4 OWNER OCCUPANCY

A. Owner intends to occupy the buildings throughout the course of the project.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Contractor shall coordinate with Owner on-site personnel on any building shutdowns; 72 hour prior notice required.

D. Schedule the Work to accommodate Owner occupancy.

E. Contractor will be stopped if construction operations interfere with facility operations. Contractor must coordinate all operations with Owner’s representatives.

1.5 CONTRACTOR USE OF SITE AND PREMISES

A. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Use of site and premises by the public.

B. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

3. The Contractor shall have restricted access to the site during normal working hours. The owner will designate areas of access. It is anticipated that work will occur between 7:00 a.m. and 6:00 p.m. daily. Work hours may be extended once the work begins and will be reviewed by the Owner. Access to the work areas shall be from exterior means such as scaffolding systems. No access to the roof areas will be provided from the interior of the building.
4. 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.
   a. Schedule deliveries per requirements of Owner.

C. 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.

D. Contractor shall abide by all security and badging requirements of the Owner.

1.6 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.

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

1.7 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 <u>not</u> 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.

1.8 WORK SEQUENCE

A. Coordinate construction schedule and operations with Owner.

B. The Contractor shall accomplish the scope of work specified in these documents in such a manner as to minimize traffic disruption. The method and schedule that the Contractor proposes to accomplish the work shall be approved by the Owner prior to beginning the work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Change procedures.

C. Procedures for preparation and submittal of application for final payment.

1.2 RELATED REQUIREMENTS

A. Section 012100 - Allowances: Payment procedures relating to allowances.

B. Section 012200 - Unit Prices: Monetary values of unit prices; Payment and modification procedures relating to unit prices.

C. Section 017800 - Closeout Submittals: Project record documents.

1.3 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Forms filled out by hand will not be accepted.

C. Schedule of Values shall include labor and material line items for all material components with a material value of more than $2,000.00 or 5% of the contract amount (whichever is least). The schedule of values must include, as a minimum, line items for any of the following which is applicable to this project including separate labor and material line items where applicable.

1. Performance and Payment Bonds
2. Demolition
3. Wood Blocking
4. Underlayment, Insulation, and coverboard
5. Insulation adhesive
6. Membrane
7. Membrane Adhesive
8. Base Flashing
9. Metal Flashings
10. Roof membrane
11. Site Cleanup
12. Manufacturer’s Inspections
13. Warranties
14. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

1.4 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.

C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

D. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

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

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. Include a retainage amount of 3.5% for the value of materials stored at the site and work executed.

H. 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.

I. 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.

J. 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.

K. 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.

L. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of subcontractors
   2. Schedule of Values
   3. Contractor's Construction Schedule (preliminary if not final).
   4. List of Contractor's staff assignments.
   5. Copies of authorizations and licenses from authorities having jurisdiction for the performance of the Work.
   6. Initial progress report.
   7. Report of preconstruction conference.
   8. Certificates of insurance and insurance policies.

1.5 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Engineer will issue instructions directly to Contractor.

B. For other required changes, Engineer will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. 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.
   3. Within the time specified in Proposal Request after receipt of Proposal Request, submital quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made.
      b. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated 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.

C. For changes for which advance pricing is desired, Engineer will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change . Contractor shall prepare and submit a fixed price quotation within 14 days.

D. Contractor may propose a change by submitting a request for change to Engineer, describing the proposed change and its full effect on the work, with a statement describing

the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.

E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

F. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

G. The Contractor shall not commence work or purchase materials for such proposed work until written approval is received.

H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

J. Promptly enter changes in Project Record Documents.

K. Change Orders over Agency certification must be approved by the Office of State Engineer (OSE).

1.6 APPLICATION FOR PAYMENT AT SUBSTANTIAL COMPLETION:

A. After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portions of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

1.7 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 017000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012100
ALLOWANCES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contingency allowance.

B. Payment and modification procedures relating to allowances.

1.2 RELATED REQUIREMENTS

A. Section 012000 - Price and Payment Procedures: Additional payment and modification procedures.

1.3 ALLOWANCE PROCEDURES

A. Prior to the conclusion of the project, credit the amount of unused allowance to Owner by change order.

B. Deductive amounts of unit price work included in the Contract Sum will be calculated at 100% of the quoted unit price.

1.4 COORDINATION

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

1.5 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.

1.6 CONTINGENCY ALLOWANCE

A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.

B. Funds will be drawn from the Contingency Allowance only by Change Order.

C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.7 ALLOWANCES SCHEDULE

A. Include the following unit price allowances in the Contract Sum:
   1. Section 070150.19 - Preparation for Re-Roofing: Wire brush and paint 2,500 square feet metal deck.
   2. Section 070150.19 - Preparation for Re-Roofing: Wire brush, paint, and plate 1,000 square feet metal deck.
   3. Section 070150.19 - Preparation for Re-Roofing: Replace 500 square feet metal deck.
   4. Section 070150.19 - Preparation for Re-Roofing: Install 1,000 fasteners to secure metal deck side laps where loose or missing.
   5. Section 070150.19 - Preparation for Re-Roofing: Install 500 fasteners to secure metal deck to structural framing where loose or missing.
   6. Section 061000 - Rough Carpentry: Replace 500 board feet of damaged or deteriorated wood blocking.

B. Contingency Allowance: Include the stipulated sum/price of $30,000.00 for use upon Owner's instructions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012200
UNIT PRICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

C. Defect assessment and non-payment for rejected work.

1.2 RELATED REQUIREMENTS

A. Section 012000 - Price and Payment Procedures: Additional payment and modification procedures.

1.3 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.4 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.5 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Contractor shall maintain a daily log showing dates, location and exact quantities of unit price work. Contractor is responsible for providing photographic evidence of unit price work installed. Copies of log and appropriate change order forms shall be submitted with each application forpayment unless no unit price work is accomplished during the period covered by the application.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

1.6 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Engineer, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected Products.

1.7 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not complying with specified requirements.

B. If, in the opinion of Engineer, it is not practical to remove and replace the Work, Engineer will direct one of the following remedies:
   1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Engineer.
   2. The defective Work will be partially repaired to the instructions of the Engineer, and the unit price will be adjusted to a new unit price at the discretion of Engineer.

C. The authority of Engineer to assess the defect and identify payment adjustment is final.

1.8 SCHEDULE OF UNIT PRICES

A. Item: Wire brush and paint metal deck; Section 070150.19.

B. Item: Wire brush, paint and plate metal deck; Section 070150.19.

C. Item: Replace steel deck; Section 070150.19.

D. Item: Secure metal deck side laps; Section 070150.19.

E. Item: Resecure metal deck; Section 070150.19.

F. Item: Replace damaged or deteriorated wood blocking; Section 061000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012300
ALTERNATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Alternates.

1.2 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

1.3 SCHEDULE OF ALTERNATES

A. Alternate No. [1]:
   1. Replacement of low-slope roof Areas A through G (approximately 81,500 SF) with a new 80 mil TPO membrane roof system, edge metal and gutter replacement, and other miscellaneous work as specified herein. (Replace base bid 60 mil TPO with 80 mil TPO)
   2. Additional Time: None

B. Alternate No. 2:
   1. Replacement of low-slope roof Areas A through G (approximately 81,500 SF) with a new 60 mil PVC membrane roof system, edge metal and gutter replacement, and other miscellaneous work as specified herein. (Replace base bid 60 mil TPO with 60 mil PVC)
   2. Additional Time: None

C. Alternate No. 3:
   1. Installation of a new metal roof coating on roof Areas 1 through 3 (approximatly 6,830 SF), and other miscellaneous work as specified herein.
   2. Additional Time: Thirty (30) days

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.2 RELATED REQUIREMENTS

1.3 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

1.4 REFERENCE STANDARDS

A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.

B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.

D. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.2 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submittal Time Restrictions:

B. Submittal Form (before award of contract):
   1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.3 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submittal Form (after award of contract):
   1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

B. Engineer will consider requests for substitutions only within 15 days after date of Agreement.

C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Engineer, in order to stay on approved project schedule.

3.4 RESOLUTION

A. Engineer may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Engineer will notify Contractor in writing of decision to accept or reject request.

3.5 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.6 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

SECTION 013000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Number of copies of submittals.

D. Submittal procedures.

1.2 RELATED REQUIREMENTS

A. Section 016000 - Product Requirements: General product requirements.

B. Section 017000 - Execution and Closeout Requirements: Additional coordination requirements.

1.3 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 017000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Engineer:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 SUBMITTAL PROCEDURES

A. Coordination: Coordinate the schedule for submittal of shop drawings and samples with progress schedule and the requirements of the Contract. Failure 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.

B. Submittal Schedule: Within two weeks after award of Contract, provide a schedule of the dates for submission of each shop drawing and sample required by the Contract.

C. Processing Time: Allow sufficient time for an orderly review with reasonable time for checking, correction and rechecking corrections, as well as returning the approved or rejected shop drawings and samples to Contractor and, in turn, any Subcontractor.

D. Allow a minimum of 10 working days from the date submittal is received until the date the submittal is required to be returned to the Contractor.

E. If a submittal contains more than 10 shop drawings, indicate which drawings must be returned within the period of 10 working days, and, in such event, allow an additional 10 working days for return of the balance of the submittal.

F. Identification: Provide each submittal with the following information:
   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.
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.
11. Provide a space on each shop drawing for the approval stamps of Contractor, Engineer and Engineer's subconsultants, if any.

G. Transmittal Form: Use form of transmittal contained at the end of this Section, or a similar form containing the same information.

H. Numbering: Number each submittal. Retain numbering system throughout all revisions.

I. Submit all associated shop drawings relating to a complete assembly at the same time, where possible, so that each may be checked in relation to the entire proposed assembly.

J. Prepare composite shop drawings and installation layouts, when required, to depict proposed solutions for tight field conditions. Coordinate composite shop drawings and field installation layouts in the field with Subcontractors for proper relationship to the work of all other trades involved in the work.

K. Prior to submission, review, affix a stamp on, and indicate approval of all shop drawings and samples. Determine and verify field measurements and availability of the material, and coordinate each shop drawing and sample with requirements of the Contract.

L. With respect to standard manufactured items, submit manufacturer's illustrated cuts of the items to be furnished showing details, sizes and dimensions and all other pertinent information.

M. 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.

N. 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.

O. Make corrections required by Engineer and resubmit corrected copies of shop drawings or new samples until approved. 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.

P. In the event that Engineer shall mark shop drawings "approved" or "approved as noted," make such corrections, if any, as may be noted. Correction shall be made on, and prints for final distribution shall be made from, the drawings bearing Engineer's notations and impress stamps. Final distribution of prints shall be made by Contractor.

Q. Do not commence any portion of the work requiring a shop drawing or sample until the submission has been approved by the Engineer. All such portions of the work shall be in accordance with approved shop drawings and samples.

R. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document.
1. It is Contractor's responsibility to submit documents in allowable format.
2. Paper document transmittals will not be reviewed.
3. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.2 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

END OF SECTION

SECTION 014000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittals.

B. Testing and inspection agencies and services.

C. Control of installation.

D. Manufacturers' field services.

E. Defect Assessment.

1.2 SUPERINTENDENT

A. For the purpose of these Specifications the designation "superintendent" is hereby defined as the individual present on the job site at all times work is being performed.

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. Should the superintendent be absent temporarily from the project at any time, he shall designate a competent foreman to assume his duties.

D. The superintendent shall have had a minimum of five (5) years continuous experience as a job superintendent.

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.

F. The Contractor shall provide the Owner, in writing, the name of the proposed project manager, job superintendent and foreman for approval no later than seven (7) days prior to the prework 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 proves to be unsatisfactory to the Owner 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 or Owner's representative, 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. Each day before work begins, superintendent shall indicate on the Roof Plan the area to be reroofed that day. Color markers are appropriate for this purpose. If changes in the work schedule occur, the Owner shall be notified accordingly.

1.3 INSPECTION OF WORK

A. 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.

B. Owner will provide inspection during the work. Such inspection may be periodic or daily.

C. The words "supervise" and "inspect" wherever used herein in connection with the duties or activity of the Owner 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 Owner shall not be responsible for the safety of the workmen, the safeguarding of the work, or the proper performance of the Contractor.

D. 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 observe, object to or 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.

E. 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.

F. Top surfacing will be judged by sight. If Inspector's decision is not acceptable to the Contractor he may, at his own expense, take samples and make tests by methods to which both parties agree.

G. 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 of 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.

H. Substantial Completion Inspection shall be conducted as follows:
   1. When Engineer has certified substantial completion, Contractor shall have an additional thirty (30) 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, release of liens, unit price logs, consents of surety, final pay request, etc.
   2. Substantial completion is defined for this project as the successful installation of every component required under the contract documents to be installed for this project. A punch list may be issued by the Engineer for work complete at this time.

1.4 FINAL COMPLETION

A. When the Contractor believes his work is totally complete, he shall request a final inspection. Upon receipt of the request, the A/E will:
   1. Survey the work to verify that the project is ready for final inspection;
   2. If they disagree with the Contractor’s assessment of the status of the project, notify the Contractor accordingly;
   3. If they agree with the Contractor’s assessment of the status of the project, schedule a final completion inspection with the Agency and Contractor.

1.5 CONTRACT CLOSURE AND FINAL PAYMENT

A. Closure of the construction contract, including final payment to the Contractor, requires the following:
   1. The Contractor’s submission, to the A/E, of the following:
      a. An affidavit, in the form of the AIA G706, that wages, bills for materials and equipment, and other indebteness connected with the work have been paid.
      b. A certificate in the form of AIA G715 issued by an authorized representative of the Contractor’s insurance company certifying completed project insurance coverage as required by the contract document;
      c. A statement that the Contractor knows of no reason that the completed project insurance will not be renewable to cover the period required by the Contract Documents;
      d. Consent of surety, if any, to final payment, in the form of AIA G707.
      e. Other information required by the Agency establishing the Contractor’s payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims and security interests arising out of the contract, all in the forms as designated by the Agency;

f. Inspection reports that may not be a part of the record documents;
g. Redline drawings showing the as-built conditions;
h. Warranties;
i. Operation and maintenance manuals; and
j. A final payment application.

2. Upon final completion and the Agency's receipt and approval of the Contractor's final payment application, the Agency must pay the Contractor all funds remaining due, including all amounts retained from progress payments.

1.6 PERMITS

A. Contractor must provide all protective structures, barriers, or other means of protection necessary to assure the public safety and to fulfill all requirements by governmental authorities.

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 therefore 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.

1.7 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.

B. Contractor must use tradesmen qualified and licensed (if applicable) in the state of South Carolina to perform specialized work as described in the Scope of Work.

1.8 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Designer's Qualification Statement: Submit for Engineer's knowledge as contract administrator, or for Owner's information.
1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
a. Full name.
b. Professional licensure information.
c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Engineer and to Contractor.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Engineer, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Engineer's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

PART 2 MATERIALS (NOT USED)

PART 3 EXECUTION

3.1 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.3 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary sanitary facilities.

B. Temporary Controls: Barriers, enclosures, and fencing.

C. Security requirements.

D. Waste removal facilities and services.

1.2 TEMPORARY UTILITIES

A. Owner will provide the following:
   1. Electrical power, consisting of connection to existing facilities.
   2. Water supply, consisting of connection to existing facilities.

1.3 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.4 PROTECTION OF BUILDINGS AND PROPERTY

A. Note that building will remain occupied during work. Take all precautions necessary to protect building, contents and personnel from damage or injury from operations and from water entry into the building during construction. Keep dust and dirt to a minimum.

B. At conclusion of each day's work, carefully inspect work including temporary daily tie-offs to ensure 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.

C. 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.

D. Prior to starting work, obtain approval from Owner for locations of work operations at ground level, such as material storage, hoisting, dumping, etc. Restrict work to approved locations.

E. Prevent any work which could reasonable be deemed to be hazardous from taking place over or adjacent to occupied areas. Coordinate with the Owner the vacating of such affected areas of all occupants and give the Owner adequate notice to allow time to comply. 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).

F. Contractor shall protect adjacent existing and new roof areas from damage. In the event roofing is damaged, Contractor is to restore to the original condition at no cost to the Owner.

G. Remove debris and other material from the site in a timely manner to minimize accumulation.

H. Owner reserves the right to judge whether or not debris is being removed in a timely manner. In the event debris is not removed from the site as required to maintain the site in a manner acceptable to the Owner, the Owner reserves the right to engage other contractor(s) or its own forces to clean the areas and deduct costs of such operations from this Contract.

I. Protect grounds and landscaping from damage. In the event of damage, restore damaged property to a condition equivalent to that at time of start of operations.

J. Document all existing damage to facility prior to beginning work and produce documentation acceptable to Engineer/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/Owner 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.

K. Isolate equipment from non-Contractor personnel by whatever means necessary, including the construction of a six-foot tall chain link fence (which completely surrounds the equipment, bitumen storage and personnel necessary to maintain the equipment) with integral lockable gate. Owner reserves the right to judge adequacy of Contractor's methods to isolate equipment and may, at any time, demand construction of the fence as compliance with this requirement. Should the Owner demand the construction of the fence, such shall be accomplished at no additional cost to the Owner.

L. Implement related safety provisions imposed by local fire marshals, etc. Determine what procedures will be acceptable prior to submitting a bid or proposal.

M. Initiate, maintain and supervise all safety precautions and programs in connection with the work. Take all necessary precautions for the safety of, and provide the necessary precaution 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.
   3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
   4. 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. Erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. Remedy 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.

1.5 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.6 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.7 SECURITY - SEE SECTION 013553

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.8 SCAFFOLDING AND PLATFORMS

A. Contractor shall provide all necessary platforms and scaffolds of ample strength. Inclusive are all hoisting machinery, all appliances and materials such as ladders, planks, ropes, wedges, centers and other tools and materials including the carriage thereof to and from the buildings as required for proper handling and installation and/or erection of materials and equipment included in the work.

B. Prior to starting work, Contractor shall obtain approval of the Owner for locations of work operations at ground level such as material storage, hoisting, dumping, etc. Work will be restricted to approved locations.

C. Access to the roof will be by external means only. Access by ladder or scaffolding will be the responsibility of the Contractor.
   1. Ladders must be taken down daily and locked in storage or removed from site.
   2. Scaffolding must be barricaded to deter unauthorized usage by the public.

1.9 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

C. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 GROUNDS RESTORATION

A. Upon completion of required work, contractor is to restore grounds to a level equivalent to the condition prior to the start of the project. This includes but is not limited to:
   1. Cleaning grounds of trash and debris.
   2. Smoothing ruts and discontinuities in the soil.
   3. Reseeding grass.
   4. Pavement restoration.
   5. Concrete restoration.

1.12 TOBACCO AND VAPORIZING PRODUCTS

A. Tobacco and vaporizing products will not be allowed on site at any time. Enforce the tobacco and vaporizing 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.

1.13 TEMPORARY TREE AND PLANT PROTECTION

A. The Contractor shall be responsible for furnishing and maintaining all necessary material and installations to protect all existing plant life from damage incurred during construction, per USC requirements.

1.14 EROSION AND SEDIMENT CONTROL

A. The Contractor shall be responsible for strict compliance with all sediment and erosion control measures as specified in any applicable South Carolina DHEC Erosion and Sediment Control Permit and as indicated on the Drawings.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Re-use of existing products.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations.

1.2 RELATED REQUIREMENTS

A. Section 012500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

1.3 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.2 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
   1. Containing lead, cadmium, or asbestos.

2.3 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 3 EXECUTION

3.1 SUBSTITUTION LIMITATIONS

A. See Section 012500 - Substitution Procedures.

3.2 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.3 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 017000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Cutting and patching.

C. Cleaning and protection.

D. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.2 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

1.3 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.4 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 016000 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.4 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 078400, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.5 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.6 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.7 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.8 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.9 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Engineer and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Engineer when work is considered ready for Engineer's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Engineer's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Engineer's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Engineer.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Engineer when work is considered finally complete and ready for Engineer's Substantial Completion final inspection.

H. Complete items of work determined by Engineer listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 017800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Project record documents.

B. Operation and maintenance data.

C. Warranties and bonds.

1.2 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 017000 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS

A. Project Record Documents: Submit documents to Engineer with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
   3. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Materials Transparency Manual:
   1. Compile and submit a digital version of information disclosing materials content for interior finishes, furnishings (including workstations), built-in furniture. Meet IWBI (BS) requirements for format and content.

D. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

3.2 OPERATION AND MAINTENANCE DATA

A. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

B. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

C. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

B. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

3.5 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

3.6 COMPLETION DOCUMENTS

A. Submit the following documents at project completion:
   1. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
   2. AIA Document G707, "Consent of Surety to Final Payment."
   3. AIA Document G715, "Supplemental Attachment for ACORD Certificate of Insurance."
   4. AIA Document G704 "Certificate of Substantial Completion"

END OF SECTION

SECTION 024100
DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.2 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.3 DEFINITIONS

A. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

C. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

D. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Site Plan: Indicate:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 REMOVAL

A. Remove all aggregate, aggregate surfaced membrane, insulation, expansion joint covers, gutters, downspouts, flashings and metal flashings, and metal wall panels and discard.

B. Lift or remove all existing equipment so that existing flashings can be totally removed, and new flashings installed.

C. Carefully relocate all electrical, co-axial, telephone, fiber optic, lightning, 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.

D. Remove or correct any obstruction which might interfere with the proper application of new materials.

E. At abandonded curb, remove and reinstall the existing curb cover after raising curb as required to achieve a minimum flashing height of 8 inches.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Use of explosives is not permitted.
   3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   6. Conduct operations to minimize effects on and interference with the structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
   8. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
   9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements to remain in place and not removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. Hazardous Materials:
   1. If hazardous materials are discovered during removal operations, stop work and notify Engineer and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

3.3 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
   1. Verify construction and utility arrangements are as indicated.
   2. Report discrepancies to Engineer before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.

C. Remove existing work as indicated and required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
   2. Remove items indicated on drawings.

D. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
   1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure. Provide shoring and bracing as required.
   2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch to match new work.

3.5 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 024200
ASBESTOS PRODUCTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.2 SECTION INCLUDES

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

1.3 RELATED REQUIREMENTS

A. Section 024100: Demolition.

1.4 PROCEDURES

A. See the attached Asbestos Testing Report.

B. 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 Owner and 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.

1.5 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)

END OF SECTION

72 Pointe Circle
Greenville, SC 29615
P (864) 292-2901
Terracon.com

January 12, 2024

Ms. Terresa Champion
Greenville County Schools
c/o Facilities Dept.
2 Space Drive
Taylors, SC 29687

Re: Asbestos Survey Report
Berea Elementary School – Roof Replacement Project
100 Berea Drive
Greenville, South Carolina
Terracon Project No. FH236232
Survey Conducted: December 7, 2023

Dear Ms. Champion:

Terracon Consultants, Inc. (Terracon) is pleased to present the results of the asbestos survey performed as part of the above referenced project. We appreciate the opportunity to provide environmental consulting services to Greenville County Schools. If you should have any questions regarding this report, please contact the undersigned at (864) 292-2901.

Sincerely,

Terracon Consultants, Inc.

Thomas H. Tripp
Project Manager

George K. Flores, P.E.
Office Manager

Asbestos Survey Report

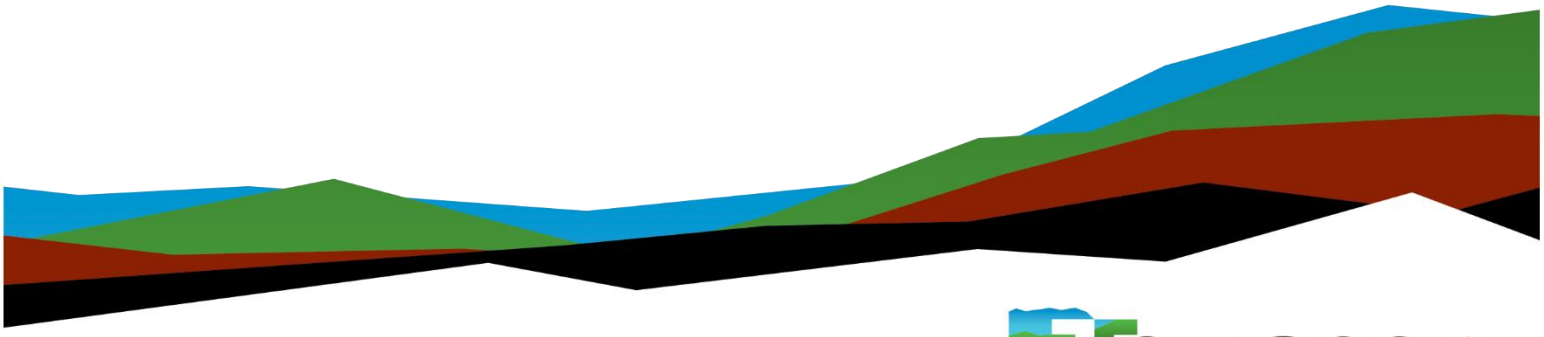
Berea Elementary School

– Roof Replacement Project

January 12, 2024 | Project Number: FH236232

Prepared for:

Greenville County Schools
Greenville, SC



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EXECUTIVE SUMMARY

This executive summary is intended as an overview for the convenience of the reader. The report should be reviewed in its entirety prior to making any decisions regarding this site.

Terracon Consultants Inc. (Terracon) conducted an asbestos survey of roofing and roof-top materials present on the Berea Elementary School in Greenville, South Carolina. The purpose of this survey was to identify and sample suspect asbestos-containing materials (ACM) which may be disturbed during the upcoming roofing replacement project.

The survey was performed on December 7, 2023 by a South Carolina Department of Health and Environmental Control (SCDHEC) licensed asbestos building inspector in general accordance with the sampling protocols established in EPA 40 CFR 763 (Asbestos Hazard Emergency Response Act, "AHERA") and the SCDHEC Regulation 61-86.1 *Standards of Performance for Asbestos Projects*.

A total of 18 bulk samples of suspect ACM were collected from homogeneous areas of suspect ACM on the structure.

Findings

Asbestos was not identified in samples of suspect ACM collected during the survey described herein.

Recommendations

Based on the scope of services, limitations, and findings of this survey, Terracon recommends the following:

- A copy of this report must be submitted to SCDHEC at least ten (10) working days prior to demolition when applying for a demolition permit. Under SCDHEC Regulation 61-86.1 *Standards of Performance for Asbestos Projects*, "demolition" is defined as, '...the wrecking, taking out, or removal of any load-supporting structural member…'.
- If the scope of the planned roofing replacement project expands to include additional, un-surveyed areas or roofing systems, Terracon should be contacted so that we may update the findings presented herein.

- A complete copy of this report should be maintained on the site for the duration of the upcoming project.

ASBESTOS SURVEY REPORT

BEREA ELEMENTARY SCHOOL – ROOF REPLACEMENT PROJECT
GREENVILLE, SOUTH CAROLINA
Project No. FH236232
Inspection date: December 7, 2023

1.0 INTRODUCTION

Terracon conducted an asbestos survey of roofing and roof-top materials present on the campus of the Berea Elementary School in Greenville, South Carolina. The survey was conducted on December 7, 2023, by an SCDHEC-licensed asbestos building inspector in general accordance with AHERA sampling protocols.

We understand the asbestos survey was requested prior to an upcoming roofing replacement project.

2.0 BUILDING DESCRIPTION

The areas under study for this work scope consisted only of roofing and rooftop system components associated with the Berea Elementary School building. Consequently, our observation of building construction was limited to roofing components in the study areas and did not include any other exterior or interior building features.

The Berea Elementary School is a single-story, structure with a brick veneer. The primary roofing system, which covers the central core, wings, and gymnasium, consists of metal decking overlain by a tar paper, non-suspect foam insulation, non-suspect perlite insulation, and built-up roofing materials. The office and portico roofs consist of non-suspect metal standing seam roofing with no suspect caulk or sealants observed.

3.0 ASBESTOS SURVEY

The asbestos survey was conducted by Mr. Thomas Tripp, an SCDHEC-licensed Asbestos Building Inspector (License No. BI-00814, exp. 7/12/24). A copy of Mr. Tripp's asbestos license is included in Appendix C. The survey was conducted on December 7, 2023, in general accordance with the sampling protocols established by EPA Regulation 40 CFR 763

Subpart E 763.86, AHERA and SCDHEC R61-86.1. A summary of survey activities is provided below.

3.1 Regulatory Overview

United States Environmental Protection Agency (EPA) regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP), prohibits the release of asbestos fibers to the atmosphere during renovation/demolition activities. NESHAP requires that potentially regulated asbestos-containing building materials be identified, classified and quantified prior to planned disturbances or demolition activities. An ACM is defined as any material containing asbestos of any type in an amount greater than one percent (1%). The asbestos NESHAP regulates asbestos fiber emissions and asbestos waste disposal practices. Under NESHAP, asbestos-containing building materials are classified as either friable, Category I non-friable or Category II non-friable ACM. Friable materials are those that, when dry, may be crumbled, pulverized or reduced to powder by hand pressure. Non-friable materials contain asbestos fibers which have been "locked in" by a bonding agent, coating, binder or other materials so that the asbestos is bound and will not readily release fibers during normal handling or use. Category I non-friable ACM includes packing materials, gaskets, resilient floor coverings and asphalt roofing products containing more than one percent (%) asbestos. Category II non-friable ACM are non-friable materials other than Category I materials that contain more than 1% asbestos.

Friable ACM, Category I and Category II non-friable ACM which is in poor condition and has become friable or which will be subjected to drilling, sanding, grinding, cutting or abrading and which could be crushed or pulverized during anticipated renovation/demolition activities are considered regulated ACM (RACM). RACM must be removed prior to renovation or demolition activities.

In the State of South Carolina, asbestos activities are regulated by SCDHEC under SCDHEC Regulation 61-86.1 Standards of Performance for Asbestos Projects. SCDHEC requires that any asbestos-related activity conducted in a public building be performed by personnel licensed by SCDHEC. The owner or operator must provide SCDHEC with written notification of planned abatement and removal activities prior to the commencement of those activities. SCDHEC requires four-day notification for non-friable projects and 10-day notification for RACM projects. Asbestos abatement must be performed by SCDHEC-licensed asbestos abatement contractors. A SCDHEC-licensed Project Designer shall prepare a written abatement design for each abatement renovation project involving the removal of greater than 3,000 square, 1,500 linear, or 656 cubic feet of RACM. Third-party air monitoring must be conducted during the abatement of friable (regulated) ACM. The SCDHEC asbestos regulations can be found at https://scdhec.gov/environment/your-home/asbestos/asbestos-regulations.

SCDHEC defines a renovation as "altering a facility or one or more facility components in any way, including the stripping or removal of RACM from any facility component." A demolition is defined as "Wrecking or taking out any load-supporting structural member of a facility together with any related handling operations, the burning of any facility, or moving of a structure."

The Occupational Safety and Health Administration (OSHA) Asbestos Standard for Construction Industry (29 CFR 1926.1101) regulates workplace exposure to asbestos. The OSHA standard requires that employee exposure to airborne asbestos fibers be maintained below 0.1 asbestos fibers per cubic centimeter of air (0.1 f/cc). The OSHA standard classifies construction and maintenance activities, which could disturb ACM, and specifies work practices and precautions which employers must follow when engaging in each class of regulated work. A full copy of the OSHA asbestos standard for general industry may be found at OSHA's website (www.osha.gov) and should be referenced for specific information.

3.2 Prior Report Review

Terracon was not provided with reports or drawings pertaining to prior asbestos inspections and/or removal actions for the site.

3.3 Visual Assessment

Our survey activities began with visual observation of roofing materials to identify apparent homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials, which appear similar throughout in terms of color, texture and apparent date of application. Building materials which were not identified as concrete, glass, wood, masonry, metal or rubber were considered suspect ACM. Exterior materials (excluding the aforementioned) and interior components of the structure were not assessed and are outside of the scope of work for this project.

3.4 Physical Assessment

A physical assessment of each homogeneous area of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the EPA as a material which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Non-friable materials contain asbestos fibers which have been "locked in" by a bonding agent, coating, binder or other materials so that the asbestos is bound and will not readily release

fibers during normal handling or use. Friability was assessed by physically touching suspect materials.

3.5 Sample Collection

Based on the results of the visual observations, bulk samples of suspect ACM were collected in general accordance with the sampling protocols outlined in EPA Regulation 40 CFR 763 Subpart E763.86 (Asbestos Hazard Emergency Response Act, "AHERA") and SCDHEC sample collection protocols. Random samples of suspect materials were collected from each homogeneous area. Bulk samples were collected using wet methods, as applicable, to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker. The selection of sample locations and frequency of sampling was based on Terracon's observations and the assumption that like materials in the same area are homogeneous in content.

A total of 18 bulk samples were collected from six HAs on the roof of the structure. Summaries of the suspect ACM samples collected during the surveys are presented in Table 1. Approximate sample locations are depicted on Figure 1.

3.6 Sample Analysis

Bulk samples were submitted under chain of custody to Scientific Analytical Institute, Inc. (SAI) of Greensboro, North Carolina for analysis by Polarized Light Microscopy (PLM) with dispersion staining techniques per EPA/600/R-93/116. The percentage of asbestos, where applicable, was determined by microscopical visual estimation. SAI is accredited under the National Voluntary Laboratory Accreditation Program NVLAP (#200664-0).

In accordance with the SCDHEC Regulation 61-86.1 *Standards of Performance for Asbestos Projects*, negative results for non-friable organically bound (NOB) materials such as mastics and roofing were verified with at least one TEM analysis. TEM analysis was performed by SAI in general accordance with Chatfield SOP 1988-02 Rev.1.

3.7 Findings

Asbestos was not detected in the samples analyzed.

Table 1 summarizes the results of the survey, including estimated quantities and laboratory analyses. Asbestos laboratory analytical reports are included in Appendix B.

3.8 Recommendations

Based on the scope of services, limitations, and findings of this assessment, Terracon recommends the following:

- A copy of this report must be submitted to SCDHEC at least ten (10) working days prior to demolition when applying for a demolition permit. Federal, state and local regulations should be referred to in order to verify compliance before any actions are initiated on an ACM.

- A complete copy of this report should be maintained at the site for the duration of the roofing replacement project.

It should be noted that suspect materials, other than those identified during the December 7, 2023 survey may exist in the study area. Should suspect materials other than those which were identified during this survey be uncovered during or prior to the upcoming roofing repair/replacement project or if the scope or work changes to include other exterior materials beyond those discussed herein, those materials should be assumed to be asbestos-containing until the results from sampling and analysis can be utilized to refute the positive assumption.

4.0 LIMITATIONS / GENERAL COMMENTS

This survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our survey. The information contained in this report is relevant to the date on which this survey was performed and may not be representative of conditions at a later date.

This report has been prepared on behalf of and exclusively for use by the Greenville County Schools for specific application to their project, as discussed. Terracon does not warrant the work of regulatory agencies, laboratories or other third parties supplying information, which may have been used in the preparation of this report. No warranty, express or implied is made.

This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary.

TABLE

TABLE 1
ASBESTOS RESULTS SAMPLE SUMMARY

BEREA ELEMENTARY SCHOOL - ROOF REPLACEMENT PROJECT
100 BEREA DRIVE
GREENVILLE, SOUTH CAROLINA
TERRACON PROJECT NO. FH236232

Sample Number	Analysis Method	Analytical Results	Material Location	Material Description	Homogeneous Area	Classification	Friable / Non-Friable	Current Condition	Potential for Disturbance	Estimated Quantity
A-1	PLM	NAD	Throughout	Built-up Roof Field	A	Miscellaneous	Non-Friable	Good	LPD	80,000 SF
A-2	PLM									
A-3	TEM									
B-1	PLM	NAD	Throughout	Base Flashing	B	Miscellaneous	Non-Friable	Good	LPD	6,000 SF
B-2	PLM									
B-3	TEM									
C-1	PLM	NAD	Center Expansion Main Roof	White Sealant	C	Miscellaneous	Non-Friable	Good	LPD	15 SF
C-2	PLM									
C-3	TEM									
D-1	PLM	NAD	Throughout	Black Penetration Flashing	D	Miscellaneous	Non-Friable	Good	LPD	10 SF
D-2	PLM									
D-3	TEM									
E-1	PLM	NAD	HVAC Racks	Gray Penetration Flashing	E	Miscellaneous	Non-Friable	Good	LPD	25 SF
E-2	PLM									
E-3	TEM									
F-1	PLM	NAD	Large HVAC Unit Main Roof	Pitch pocket	F	Miscellaneous	Non-Friable	Good	LPD	10 SF
F-2	PLM									
F-3	TEM									

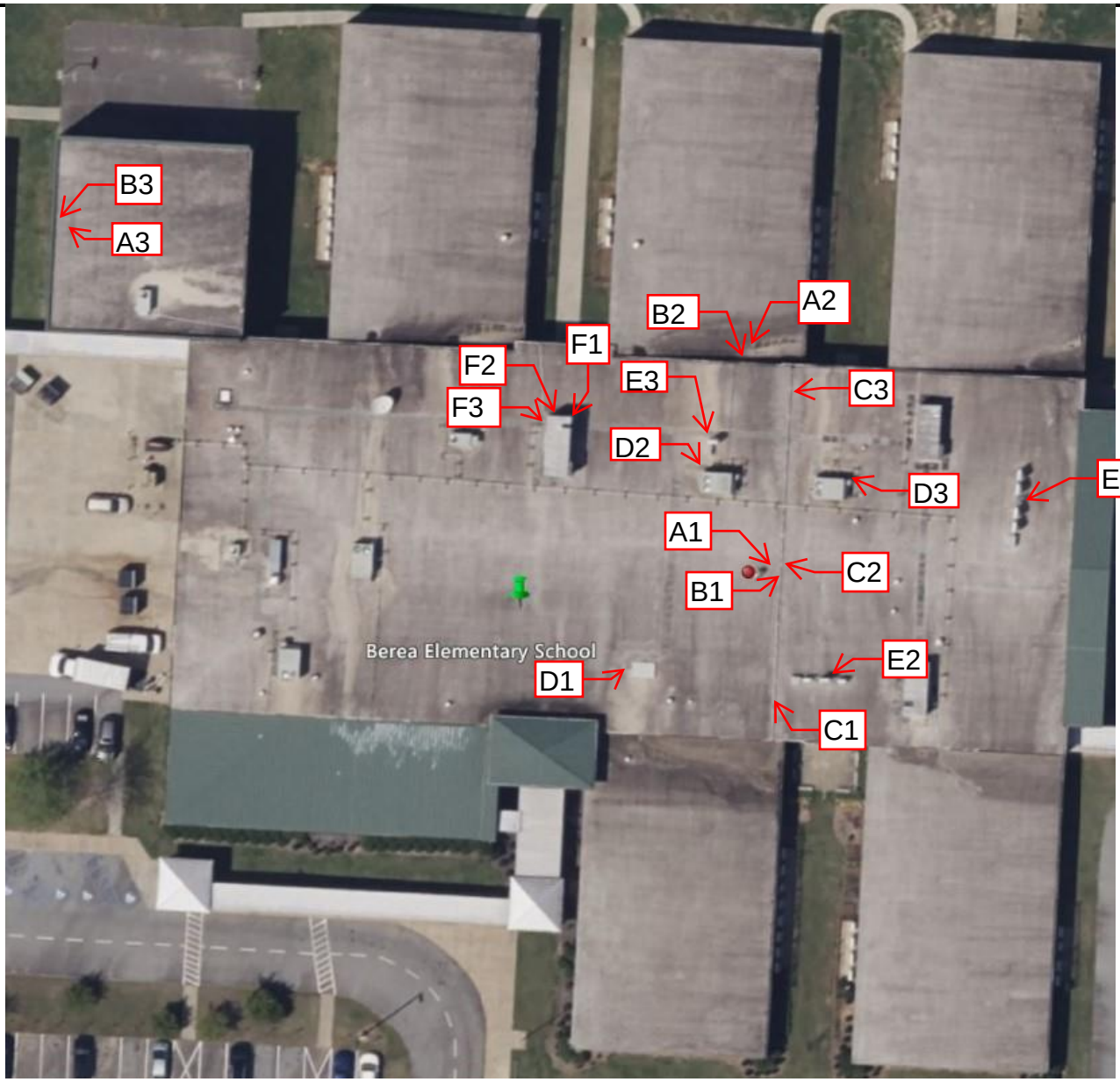
Notes:
1) Quantities listed above are estimates to be used for inspection purposes only and should be field-verified for all other uses.
2) An aerial view of the roof with approximate sample locations is depicted on Figure 1.

NA - Not Analyzed
NAD - No Asbestos Detected
PLM - Polarized Light Microscopy
TEM - Transmission Electron Microscopy

LPD - Low potential for disturbance
PD - Potential for disturbance
PSD - Potential of significant disturbance

SF - square feet
LF - linear feet
CF - cubic feet

FIGURE



N

Building layout and sample locations are approximated.

Project Manager:	THT
Drawn By:	THT
Checked By:	GKF
Approved By:	GKF
Project No.	FH236232
Scale:	N.T.S.
File Name:	N/A
Date:	1/3/2024

Terracon
72 Pointe Circle Greenville, SC 29615
PH. (864) 292-2901

General Layout / Sample Locations

Berea Elementary School - Roof Replacement
100 Berea Drive
Greenville, South Carolina

Figure 1

APPENDIX A

Photo Documentation

Photo 1: View of built-up roofing field.

Photo 2: View of base flashing

Photo 3: View of white sealant on main roof expansion.

Photo 4: View of black penetration flashing.

Photo 5: View of gray penetration flashing elevated HVAC racks.

Photo 6: View of pitch pockets.

APPENDIX B

Laboratory Reports

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Terracon
72 Pointe Circle
Greenville, SC 29615

Attn: Thomas Tripp

Project: Berea Elementary School Roof Replacement - Greenville, SC

Lab Order ID: **10038759**
Analysis: PLM
Date Received: 12/08/2023
Date Reported: 12/13/2023
Date Amended: 12/18/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
A-1	Built-up Roof Field	**None Detected**	**10% Fiber Glass** **5% Cellulose**	**85% Other**	Black Non-Fibrous Heterogeneous
10038759_0001					Dissolved, Crushed
A-2	Built-up Roof Field	**None Detected**	**10% Fiber Glass** **5% Cellulose**	**85% Other**	Black Non-Fibrous Heterogeneous
10038759_0002					Dissolved, Crushed
A-3	Built-up Roof Field	**Not Analyzed**			
10038759_0003	*TEM*				
B-1	Base Flashing	**None Detected**	**10% Fiber Glass**	**90% Other**	Black Non-Fibrous Heterogeneous
10038759_0004					Crushed, Dissolved
B-2	Base Flashing	**None Detected**	**10% Fiber Glass**	**90% Other**	Black Non-Fibrous Heterogeneous
10038759_0005					Crushed, Dissolved
B-3	Base Flashing	**Not Analyzed**			
10038759_0006	*TEM*				
C-1	White Sealant	**None Detected**		**100% Other**	White Non-Fibrous Homogeneous
10038759_0007					Ashed
C-2	White Sealant	**None Detected**		**100% Other**	White Non-Fibrous Homogeneous
10038759_0008					Ashed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Lachlan Krenz (18)
Analyst

Approved Signatory

Scientific Analytical Institute, Inc. 4604 Dundas Dr. Greensboro, NC 27407 (336) 292-3888

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Customer: Terracon
72 Pointe Circle
Greenville, SC 29615

Attn: Thomas Tripp

Project: Berea Elementary School Roof Replacement - Greenville, SC

Lab Order ID: **10038759**
Analysis: PLM
Date Received: 12/08/2023
Date Reported: 12/13/2023
Date Amended: 12/18/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
C-3	White Sealant	**Not Analyzed**			
10038759_0009	*TEM*				
D-1	Black Penetration Flashing	**None Detected**	**20% Cellulose**	**80% Other**	Black Non-Fibrous Homogeneous
10038759_0010					Dissolved, Ashed
D-2	Black Penetration Flashing	**None Detected**	**20% Cellulose**	**80% Other**	Black Non-Fibrous Homogeneous
10038759_0011					Ashed, Dissolved
D-3	Black Penetration Flashing	**Not Analyzed**			
10038759_0012	*TEM*				
E-1	Gray Penetration Flashing	**None Detected**	**15% Synthetic Fibers**	**85% Other**	Black Non-Fibrous Homogeneous
10038759_0013					Ashed
E-2	Gray Penetration Flashing	**None Detected**	**15% Synthetic Fibers**	**85% Other**	Black Non-Fibrous Homogeneous
10038759_0014					Ashed
E-3	Gray Penetration Flashing	**Not Analyzed**			
10038759_0015	*TEM*				
F-1	Pitch pocket	**None Detected**		**100% Other**	Black Non-Fibrous Homogeneous
10038759_0016					Ashed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Lachlan Krenz (18)
Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Terracon
72 Pointe Circle
Greenville, SC 29615

Attn: Thomas Tripp

Project: Berea Elementary School Roof Replacement - Greenville, SC

Lab Order ID: **10038759**
Analysis: PLM
Date Received: 12/08/2023
Date Reported: 12/13/2023
Date Amended: 12/18/2023

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
F-2	Pitch pocket	**None Detected**		**100% Other**	Black Non-Fibrous Homogeneous
10038759_0017					Ashed
F-3	Pitch pocket	**Not Analyzed**			
10038759_0018	*TEM*				

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Lachlan Krenz (18)
Analyst

Approved Signatory

Scientific Analytical Institute, Inc. 4604 Dundas Dr. Greensboro, NC 27407 (336) 292-3888

10038759

Version 1-15-2012

Client:	Terracon	*Instructions:*
Contact:	Thomas Tripp	*Use Column "B" for your contact info*
Address:	72 Pointe Circle, Greenville, SC 29615	
Phone:	864-414-4883	*To See an Example Click the bottom Example Tab.*
Fax:		
Email:	thomas.tripp@terracon.com	*Enter samples between "<<" and ">>"*
Project:	Berea Elementary School Roof Replacement - Greenville, SC	*Begin Samples with a "<< "above the first sample and end with a ">>" below the last sample.*
Client Notes:	Positive Stop	*Only Enter your data on the first sheet "Sheet1"*
P.O. #:	FH236232 Task 2.1	
Date Submitted:	12/7/2023 1600	*Relinquished by:*
Analysis:	PLM EPA 600/TEM Chatfield	*Thomas Tripp*
TurnAroundTime:	5day TAT	

Scientific Analytical Institute

4604 Dundas Drive
Greensboro, NC 27407
Phone: 336.292.3888
Fax: 336.292.3313
Email: lab@sailab.com

<<		
A-1	Built-up Roof Field	PLM
A-2	Built-up Roof Field	PLM
A-3	Built-up Roof Field	TEM
B-1	Base Flashing	PLM
B-2	Base Flashing	PLM
B-3	Base Flashing	TEM
C-1	White Sealant	PLM
C-2	White Sealant	PLM
C-3	White Sealant	TEM
D-1	Black Penetration Flashing	PLM
D-2	Black Penetration Flashing	PLM
D-3	Black Penetration Flashing	TEM
E-1	Gray Penetration Flashing	PLM
E-2	Gray Penetration Flashing	PLM
E-3	Gray Penetration Flashing	TEM
F-1	Pitch pocket	PLM
F-2	Pitch pocket	PLM
F-3	Pitch pocket	TEM
>>		

Accepted ☑

Rejected ☐

CS 12/18 3pm

Bulk Asbestos Analysis
by Transmission Electron Microscopy

Semi-Quantitative
Chatfield SOP 1988-02 Rev. 1

Customer: Terracon
72 Pointe Circle
Greenville, SC 29615

Attn: Thomas Tripp

Project: Berea Elementary School Roof Replacement - Greenville, SC

Lab Order ID: **10038759**
Analysis: TBS
Date Received: 12/13/2023
Date Reported: 12/18/2023
Date Amended: 12/18/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Organic (Wt %)	Acid Soluble (Wt. %)	Asbestos (Wt %)	LCL-UCL (Wt. %)
A-3	**Built-up Roof Field**	**94%**	**0%**	None Detected	
10038759_0003					
B-3	**Base Flashing**	**95%**	**0%**	None Detected	
10038759_0006					
C-3	**White Sealant**	**52%**	**0%**	None Detected	
10038759_0009					
D-3	**Black Penetration Flashing**	**82%**	**0%**	None Detected	
10038759_0012					
E-3	**Gray Penetration Flashing**	**79%**	**0%**	None Detected	
10038759_0015					
F-3	**Pitch pocket**	**61%**	**0%**	None Detected	
10038759_0018					

Daniel Schwartz (6)
Analyst

Approved Signatory

10038759

Version 1-15-2012

Client:	Terracon	*Instructions:*
Contact:	Thomas Tripp	*Use Column "B" for your contact info*
Address:	72 Pointe Circle, Greenville, SC 29615	
Phone:	864-414-4883	*To See an Example Click the bottom Example Tab.*
Fax:		
Email:	thomas.tripp@terracon.com	*Enter samples between "<<" and ">>"*
Project:	Berea Elementary School Roof Replacement - Greenville, SC	*Begin Samples with a "<< "above the first sample and end with a ">>" below the last sample.*
Client Notes:	Positive Stop	*Only Enter your data on the first sheet "Sheet1"*
P.O. #:	FH236232 Task 2.1	
Date Submitted:	12/7/2023 1600	*Relinquished by:*
Analysis:	PLM EPA 600/TEM Chatfield	*Thomas Tripp*
TurnAroundTime:	5day TAT	

Scientific Analytical Institute

4604 Dundas Drive
Greensboro, NC 27407
Phone: 336.292.3888
Fax: 336.292.3313
Email: lab@sailab.com

<<		
A-1	Built-up Roof Field	PLM
A-2	Built-up Roof Field	PLM
A-3	Built-up Roof Field	TEM
B-1	Base Flashing	PLM
B-2	Base Flashing	PLM
B-3	Base Flashing	TEM
C-1	White Sealant	PLM
C-2	White Sealant	PLM
C-3	White Sealant	TEM
D-1	Black Penetration Flashing	PLM
D-2	Black Penetration Flashing	PLM
D-3	Black Penetration Flashing	TEM
E-1	Gray Penetration Flashing	PLM
E-2	Gray Penetration Flashing	PLM
E-3	Gray Penetration Flashing	TEM
F-1	Pitch pocket	PLM
F-2	Pitch pocket	PLM
F-3	Pitch pocket	TEM
>>		

Accepted ☑

Rejected ☐

CS 12/18 3pm

APPENDIX C

Inspector's Credential

SCDHEC ISSUED

Asbestos ID Card

Thomas H Tripp

		Expiration Date:
AIRSAMPLER	AS-00247	01/10/24
CONSULTBI	BI-00814	07/12/24
CONSULTPD	PD-00178	01/11/24

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof-mounted curbs.

B. Roofing nailers.

C. Preservative treated wood materials.

D. Miscellaneous framing and sheathing.

E. Concealed wood blocking, nailers, and supports.

1.2 RELATED REQUIREMENTS

A. Section 076200 - Sheet Metal Flashing and Trim: Sill flashings.

B. Section 077200 - Roof Accessories: Prefabricated roof curbs.

1.3 REFERENCE STANDARDS

A. AWPA U1 - Use Category System: User Specification for Treated Wood; 2022.

B. PS 2 - Performance Standard for Wood Structural Panels; 2018.

C. PS 20 - American Softwood Lumber Standard; 2021.

D. SPIB (GR) - Standard Grading Rules; 2021.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

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

C. Moisture Content: Kiln-dry or MC15.

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

2.3 CONSTRUCTION PANELS

A. Wall Sheathing, For metal panel substrate over masonry.: PS 2 type.
   1. Bond Classification: Exterior.

2. Grade: Sheathing.
3. Span Rating: 24.
4. Performance Category: 5/16 PERF CAT.
5. Edge Profile: Square edge.

2.4 ACCESSORIES

A. Fasteners and Anchors:
1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
2. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.5 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
1. Products:
a. Lonza Group: www.wolmanizedwood.com/#sle.
b. Koppers Performance Chemicals, Inc: www.koppersperformancechemicals.com/#sle.
c. Viance, LLC; Preserve ACQ: www.treatedwood.com/#sle.
d. Substitutions: See Section 016000 - Product Requirements.
2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber exposed to weather.
c. Treat lumber in contact with roofing, flashing, or waterproofing.
d. Treat lumber in contact with masonry or concrete.
3. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
a. Kiln dry plywood after treatment to maximum moisture content of 15 percent.
b. Treat plywood in contact with roofing, flashing, or waterproofing.
c. Treat plywood in contact with masonry or concrete.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.2 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

D. Furnish and install new nominal 6-inch wide wood blocking at all eaves, edges and openings as required for blocking to finish flush with the top of the roof cover board.

E. Secure wood blocking over existing blocking with screws in two rows staggered and spaced not over 24 inches in each row.

F. Secure new wood blocking to steel deck at spacings of 12 inches on center in a staggered pattern.

G. At tops of concrete walls, secure wood to walls with Tapcon fasteners at 12 inches on center.

H. Stagger fasteners when securing nominal 6-inch wide lumber or wider.

3.3 EXISTING WOOD

A. Inspect all existing wood blocking and curbs carefully. If, in Contractor's opinion, there is existing wood which requires replacement, notify the Engineer. Do not proceed with removals or replacement until directed by the Engineer. Install new wood blocking and curbs the same size and thickness as the existing where removed.

B. 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.

3.4 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

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

C. Install blocking under integral equipment curbs as required to maintain full cant face above roof level and/or to allow installation of new cant strips.

D. Install new wood blocking at all expansion joint and control joint curbs as required to provide a minimum flashing height of 8 inches above new finished roof level.

E. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.

F. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

3.5 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.6 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension spanning horizontally over substrate, with ends over firm bearing and staggered, using screws.

3.7 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.8 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

END OF SECTION

SECTION 070150.19
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Replacement of existing roofing system in preparation for entire new roofing system.

B. Removal of existing flashing and counterflashings.

C. Temporary roofing protection.

1.2 RELATED REQUIREMENTS

A. Section 075400 - Thermoplastic Membrane Roofing.

B. Section 076200 - Sheet Metal Flashing and Trim: Replacement of flashing and counterflashings.

1.3 PRICE AND PAYMENT PROCEDURES

A. See Section 012100 - Allowances, for cash and quantity allowances affecting this section.

B. See Section 012200 - Unit Prices, for additional unit price requirements.

C. See Section 012200 - Unit Prices, for additional unit price requirements.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with affected mechanical and electrical work associated with roof penetrations.

B. Preinstallation Meeting: Convene two weeks before starting work of this section.
   1. Attendees:
      a. Engineer.
      b. Contractor.
      c. Owner.
   2. Meeting Agenda: Provide agenda to participants prior to meeting in preparation for discussions on the following:
      a. Removal and installation schedule.
      b. Necessary preparatory work.
      c. Protection before, during, and after roofing system installation.
      d. Removal of existing roofing system.
      e. Installation of new roofing system.
      f. Temporary roofing and daily terminations.
      g. Transitions and connection to and with other work.
      h. Inspections and testing of installed systems.

C. Schedule work to coincide with commencement of installation of new roofing system.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit for each type of material.

C. Shop Drawings: Indicate size, configuration, and installation details.

D. Preconstruction Test Reports.

1.6 FIELD CONDITIONS

A. Existing Roofing System: Aggregate surfaced Built-up asphalt roofing.

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

C. Maintain continuous temporary protection prior to and during installation of new roofing system.

D. Provide notice at least three days before starting activities that will affect normal building operations.

E. Verify that occupants have been evacuated from building areas when work on structurally impaired roof decking is scheduled to begin.

F. Owner will occupy building areas directly below re-roofing area.
   1. Provide Owner with at least 72 hours written notice of roofing activities that may affect their operations and to allow them to prepare for upcoming activities as necessary.
   2. Do not disrupt Owner's operations or activities.
   3. Maintain access of Owner's personnel to corridors, existing walkways, and adjacent buildings.

PART 2 PRODUCTS

2.1 COMPONENTS

A. See the following sections for additional information on components relating to this work:
   1. Replacement and removal of existing roofing system in preparation for entire new roofing system, see Section 075400.
   2. Remove existing flashing and counterflashings in preparation for replacement of these materials as part of this work, see Section 076200 for material requirements.

2.2 MATERIALS

A. Patching Materials: Provide necessary materials in accordance with requirements of existing roofing system.

B. Temporary Roofing Protection Materials:
   1. Contractor's responsibility to select appropriate materials for temporary protection of roofing areas as determined necessary for this work.

C. Steel Deck Repair and Framing Materials
   1. Metal Deck Primer
   2. Structural Steel Primer
   3. Steel high performance coating to match existing color
   4. Sheet Metal for Steel Decks: 20 gauge galvanized steel
   5. Steel Deck: ASTM A 653, galvanized, G-90 deck, manufactured in accordance with the requirements of the Steel Deck Institute, Inc. for narrow rib (Type A) and wide rib (Type B). (Contractor to field verify deck type.) Minimum section properties:
      a. Yield strength = 33 ksi.
      b. Section Modulus: 0.111in3.
      c. Moment of Inertia: 0.124in4.
      d. Thickness: 22 gauge.

2.3 ACCESSORIES

A. Fasteners: Type and size as required and compatible with existing and new roofing system to resist local wind uplift.

B. Single Component Polyurethane Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, A and O.

C. Roof Vent Pipe Extension: Solid-wall PVC fitting consisting of pipe and splice sleeve inserts, configured for insertion and sealing to existing plumbing vent piping, sized to fit inside diameter of plumbing vent piping, enabling extension of piping to field-determined height to meet local building code requirements for plumbing vent pipe height above existing roof level.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.2 PREPARATION

A. Remove loose refuse and dispose of properly off-site.

B. Prior to commencement of any work, inspect and thoroughly water test all existing subgrade leaders for free flow operation with Owner's Maintenance personnel present. Report restrictions to Engineer and Owner. Owner's maintenance personnel shall perform repairs to remove any restrictions found. Should drains become clogged at any time after the start of

work, correct the condition at no additional expense to the Owner. Contractor is responsible for thoroughly water testing all drains at the conclusion of the project.

C. Over all openings, install new steel plate. Secure to deck using specified fasteners fasteners spaced not over 6 inches on center at all edges.

D. All vents, hatches and mechanical units must be raised to provide an 8 inch base flashing height above the finished roof system.

E. Furnish and install new primer and paint at all exhaust vents, power ventilators and stack vents as specified herein:
   1. Remove all loose rust by wire brushing. Sweep away all dirt, dust and debris prior to paint and primer application.
   2. Apply one coat of rust-inhibitive primer and two coats of fibrated aluminum roof coating to match roof surface.

3.3 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials the same day.

B. Remove metal counter flashings.

C. Scrape roofing gravel from membrane surface without causing serious damage to membrane felts.

D. Remove roofing membrane, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.

E. Remove insulation and fasteners, cant strips, and blocking.

F. Repair existing metal deck surface to provide smooth working surface for new roof system.

3.4 INSTALLATION

A. Coordinate scope of this work with requirements for installation of new roofing system, see Section 075400 for additional requirements.

B. Steel Deck Repairs
   1. 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.
   2. Where steel deck is damaged or rusted through in small areas, smaller than 2’ by 2’, 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.
   3. Where steel decking is severely damaged or has deteriorated over large areas, remove the entire existing deck unit and install new specified decking. Lap new deck units over the existing in the same manner as originally installed. Secure to structural framing with specified screws at Steel Deck Institute 36/4 patterns each available framing member and not more than 36 inches on center at side laps using specified side lap screws. At the perimeter, specified deck fasteners shall be applied at spacings not to exceed 6 inches on-center along the parapet framing.
   4. Secure all existing loose steel deck to roof framing members using specified fasteners placed 12 inches on center at each available framing member.
   5. 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.
   6. At all changes in direction, install specified steel plate 6 inches across change in direction on each side and secure using specified fasteners at 6 inches on center around the perimeter.

3.5 FIELD QUALITY CONTROL

A. Independent agency inspection will be provided under provisions of Section 014000.

3.6 PROTECTION

A. Turn sheeting up and over parapets and curbing. Retain sheeting in position with temporary fasteners.

B. Provide for surface drainage from sheeting to existing drainage facilities.

END OF SECTION

SECTION 070150.61
ROOF RE-COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Field applied, heat reflective and emissive coatings for existing metal panel and concrete or clay tile roofs.

1.2 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating coating materials and _____.

C. Specimen warranty.

1.3 QUALITY ASSURANCE

A. Maintain one copy of each referenced document that applies to application on site.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least three years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with at least three years of documented experience and approved by manufacturer.

1.4 FIELD CONDITIONS

A. Do not install materials when temperature is below 45 degrees F or above 100 degrees F.

B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coatings.

C. Restrict traffic from area where coating is being applied or is curing.

1.5 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for bond to substrate and degradation of chemical resistance. Complete forms in Owner's name and register with manufacturer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 ROOF RE-COATINGS

A. Acrylic Urethane Coating System for Metal Roofs: Two components, epoxy urethane primer with acrylic polyurethane topcoat, with chemical resistance and low VOC.
   1. Approved by manufacturer for application on metal surfaces.
   2. Dry Film Thickness: 3 mil, 0.003 inch, nominal.
   3. Volatile Organic Compounds (VOC): 0.81 lb/gal, nominal.
   4. Color: As selected by Owner from standard catalog.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

3.2 PREPARATION

A. Clean surfaces of loose foreign matter.

B. Remove substances that would bleed through finished coatings.

C. Remove mildew, dirt, grease, oil, chalk and other contaminants that would interfere with adhesion and bonding of coating.

D. Existing Painted and Sealed Surfaces:
   1. Remove loose, flaking, peeling and oxidized paint; feather edge and sand smooth edges of chipped paint.

E. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.3 APPLICATION

A. Apply primer to applicable surfaces in accordance with coating manufacturer's written installation instructions.

B. Apply coatings in accordance with manufacturer's instructions, to thicknesses specified.

C. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.4 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.5 PROTECTION

A. Protect finished work from damage.

END OF SECTION

SECTION 075400
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Adhered system with thermoplastic roofing membrane.

B. Insulation, flat and tapered.

C. Deck sheathing.

D. Cover boards.

E. Flashings.

1.2 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Wood cant strips.

B. Section 077100 - Roof Specialties: Prefabricated roofing expansion joint flashing.

1.3 REFERENCE STANDARDS

A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022a.

C. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2021.

D. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing; 2021.

E. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011 (Reapproved 2019).

F. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2022).

G. NRCA (RM) - The NRCA Roofing Manual; 2022.

H. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

I. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, surfacing, and fasteners.

C. Shop Drawings: Submit drawings that indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and mechanical fastener layout.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions.

F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Specimen Warranty: For approval.

J. Warranty Documentation:

1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
2. Submit installer's written verification that installation complies with warranty conditions for waterproof membrane.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this section with at least five years of documented experience and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact, unless otherwise indicated.

B. Store materials in weather protected environment, clear of ground and moisture.
   1. All board goods are to be elevated off the ground and covered in a breathable tarp.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.8 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F.

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

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

E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.9 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Installer’s Warranty: Installer’s warranty, on form at end of this Section, signed by roofing Installer, properly executed and printed on Installer’s letterhead form.
   1. Warranty Period: Five years from date of Substantial Completion.

C. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within five years after installation.

D. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 20 years.
   2. For repair and replacement include costs of both material and labor in warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Thermoplastic Polyolefin (TPO) Membrane Roofing Materials:
   1. Carlisle SynTec Systems; Sure-Weld TPO: www.carlisle-syntec.com/#sle.
   2. GAF; EverGuard TPO 80 mil: www.gaf.com/#sle.
   3. Johns Manville: www.jm.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Thermoplastic Polyvinyl Chloride (PVC) Membrane Roofing Materials:
   1. Johns Manville: www.jm.com/#sle.
   2. Sika Corporation Roofing; Sarnafil PVC: usa.sika.com/sarnafil/#sle.
   3. Soprema; Sentinal P150.
   4. Substitutions: See Section 016000 - Product Requirements.

C. Insulation:
   1. As recommended by roofing membrane manufacturer.

2.2 ROOFING - UNBALLASTED APPLICATIONS

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Roofing Assembly Requirements:
   1. Solar Reflectance Index (SRI): Minimum of 64 based on three-year aged value; if three-year aged data is not available, minimum of 82 initial value.
      a. Calculate SRI in accordance with ASTM E1980.
      b. Field applied coating may not be used to achieve specified SRI.
   2. Roof Covering External Fire Resistance Classification: UL (FRD) Class A.
   3. Factory Mutual Classification: Class 1 and windstorm resistance of 1-90, in accordance with FM DS 1-28.
   4. Insulation Thermal Resistance (R-Value): 5 per inch, minimum; provide insulation of thickness required.

C. Acceptable Insulation Types - Constant Thickness Application: Any of types specified.
   1. Minimum 2 layers of polyisocyanurate board.
   2. Bottom layer of polyisocyanurate board covered with single layer of polyisocyanurate board.

D. Acceptable Insulation Types - Tapered Application:
   1. Tapered polyisocyanurate board.

2.3 MEMBRANE ROOFING AND ASSOCIATED MATERIALS

A. Membrane Roofing Materials:
   1. PVC (Alternate): Polyvinyl chloride (PVC) complying with ASTM D4434/D4434M, Type III, sheet contains reinforcing fibers or reinforcing fabrics.
      a. Thickness: 60 mil, 0.060 inch, minimum.
   2. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrims.
      a. Thickness (Base Bid): 60 mil, 0.060 inch, minimum.
      b. Thickness (Alternate): 80 mil, 0.080 inch, minimum.
   3. Sheet Width: Factory fabricated into widest possible sheets.
   4. Color: White.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashing Material: Material recommended by membrane manufacturer.

2.4 DECK SHEATHING

A. Deck Sheathing: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
   1. Thickness: 5/8 inch, Type X, fire-resistant.

2.5 COVER BOARDS

A. Cover Boards: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
   1. Thickness: 1/2 inch, fire-resistant.

2.6 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type II: Faced with either cellulosic facers or glass fiber mat facers on both major surfaces of the core foam.
         1) Class 1 - Faced with glass fiber reinforced cellulosic facers on both major surfaces of the core foam.
         2) Compressive Strength: Classes 1-2-3, Grade 2, 20 psi (138 kPa), minimum.
         3) Thermal Resistance, R-value: At 1-1/2 inches thick; Class 1, Grades 1-2-3, 8.4 (1.48), minimum, at 75 degrees F.
   2. Board Size: 48 by 96 inches (fastened), 48 by 48 inches (adhered).

3. Board Thickness: 2.0 inches (base layer), 1.5 inches (top layer).

2.7 ACCESSORIES

A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

B. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; tapered edge strips.

C. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of ribs in deck substrate, with metal washers.

D. Membrane Adhesive: As recommended by membrane manufacturer.
   1. Water based adhesives are not acceptable.

E. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

F. Insulation Adhesive: As recommended by insulation manufacturer.

G. Sealants: As recommended by membrane manufacturer.

H. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
   1. Composition: Roofing membrane manufacturer's standard.
   2. Surface Color: White or Yellow.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips are in place.

3.2 PREPARATION - METAL DECK

A. Install deck sheathing on metal deck:
   1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
   2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.

3.3 INSTALLATION, GENERAL

A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.

B. Do not apply roofing membrane during cold or wet weather conditions.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

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

3.4 INSTALLATION - INSULATION, UNDER MEMBRANE

A. Attachment of Insulation:
   1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions Based on the ultimate wind uplift pressures identified on

the plans.

2. Embed second layer of insulation into adhesive in accordance with roofing and insulation manufacturers' instructions.

B. Cover Boards: Adhere cover boards in accordance with roofing manufacturer's instructions Based on the ultimate wind uplift pressures identified on the plans.

C. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.

D. On metal deck, place boards perpendicular to flutes with insulation board edges bearing on deck ribs.

E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

F. Do not install more insulation than can be covered with membrane in same day.

3.5 INSTALLATION - MEMBRANE

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate recommended by the manufactuer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints or membrane laps. Fully adhere one roll before proceeding to adjacent rolls.

D. Overlap edges and ends and seal seams by heat welding, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

E. At intersections with vertical surfaces:
   1. Fully adhere flexible flashing over membrane and up to nailing strips.
   2. Secure flashing to nailing strips at 4 inches on center.

F. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Install roofing expansion joints where indicated. Make joints watertight.

I. Coordinate installation of roof gutters and related flashings.

3.6 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Owner will provide inspection services, and Contractor to provide temporary construction and materials for testing in accordance with requirements.

C. Provide 3 on-site inspections of roofing and insulation by manufacturer's representative during installation of this work.

3.7 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Remove bituminous markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

D. Repair or replace defaced or damaged finishes caused by work of this section.

3.8 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 076200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, and other items indicated in Schedule.

B. Sealants for joints within sheet metal fabrications.

C. Sheet metal splash pans.

1.2 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

F. CDA A4050 - Copper in Architecture - Handbook; current edition.

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

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

B. Prevent contact with materials that could cause discoloration or staining.

1.6 WARRANTY

A. Finish Warranty: Provide 20-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Aluminum-zinc alloy-coated steel complying with ASTM A792/A792M; minimum AZ50 coating; minimum 24-gauge, 0.0239-inch thick base metal, shop pre-coated with PVDF coating.
   1. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As selected by Owner from manufacturer's standard colors.

B. Stainless Steel: ASTM A666, Type 304 alloy, soft temper, 28 gauge, 0.0156 inch thick; smooth No. 4 - Brushed finish.

2.2 FABRICATION

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

B. Fabricate cleats of same material and one gauge heavier as sheet, continuous, interlocking with sheet.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch; miter and seam corners.

E. Form material with standing seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.

G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

2.3 GUTTERS AND DOWNSPOUTS

A. Gutters: SMACNA (ASMM) Rectangular profile.

B. Downspouts: Round profile.

C. Gutters and Downspouts: Gutters to be 6" Wide and 8" Deep. Downspouts to be 5" Dia.

D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Straps.

E. Splash Pans (roof surface): Same metal type as downspouts, Refer to SMACNA Architectural Sheet Metal Manual Figure 1-36, Second Alternate Section. Provide elbows at base of downspouts which turn out at 45°.

F. Splash Pads (grade): Precast concrete type, of size and profiles indicated; minimum 3,000 psi at 28 days, with minimum 5 percent air entrainment.

G. Seal metal joints.

2.4 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.

B. Primer Type: Zinc chromate.

C. Concealed Sealants: Non-curing butyl sealant.

D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Verify roofing termination and base flashings are in place, sealed, and secure.

C. 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.

3.2 PREPARATION

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

B. Follow recommendations of Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) Architectural Sheet Metal Manual (most recent edition) 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.

E. Fabricate cleats to be a minimum of one gauge heavier than fascia metal.

F. Secure cleats to substrate with fasteners specifically manufactured for the purpose at spacings of 6 inches on center. Provide ring shank fasteners or screws at wood substrates. Locate fasteners as close to hem of cleat as practical but no more than 2 inches from hem unless specifically indicated otherwise herein or on Drawings.

3.3 INSTALLATION, GENERAL

A. Comply with drawing details.

B. Insert flashings into existing recievers, where present, to form tight fit; secure in place with rivets; seal flashings into reglets with sealant.

C. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

D. Install metal to be water- and weathertight with lines, arrises and angles sharp and true and with plane surfaces free of waves or buckles. Hem all raw edges of exposed or finish sheet metal.

E. Apply plastic cement compound between metal flashings and felt flashings.

F. Do not place dissimilar metals in direct contact or in positions where water sheds across both metals.

G. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

H. 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.

I. At all corners, shop form corner pieces of coping cap with 18 inch legs (joints no more than 18 inches from corner). Seal joint of corner piece.

J. Form faces of gravel stop-fascia and coping cap with vertical faces of sufficient width to extend a minimum of 1 1/2-inch below wood blocking.

K. Exterior Flashing Receivers: Install in accordance with manufacturer's recommendations, and in proper relationship with adjacent construction, and as follows:
   1. Secure receiver at perimeter of wall opening with adhesives or fasteners.
   2. Place flashing into receiver channel.
   3. Secure flashing with receiver clip.

L. Seal metal joints watertight.

M. Secure gutters and downspouts in place with concealed fasteners.

N. Connect downspouts to downspout boots, and seal connection watertight.

O. Set splash pads under downspouts, and set in place with sealant over walkpad.

3.4 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.5 SCHEDULE

A. Fascia:
   1. Material: Aluminum-zinc alloy-coated steel.
   2. Thickness: 24 gauge.
   3. Finish: [Polyvinylidene Fluoride (PVDF) Coating].

B. Gutters:

1. Material: Aluminum-zinc alloy-coated steel.
2. Thickness: 24 gauge.
3. Finish: [Polyvinylidene Fluoride (PVDF) Coating].
4. Installation:
   a. Install new gutters at locations indicated on plans as specified herein. Refer to SMACNA Architectural Sheet Metal Manual Figure Figure 1-2, Style A.
   b. Size gutters as indicated on drawings.
   c. Provide Pre-finished steel gutter brackets sized at 1 inch wide by 1/8 inch thick spaced 3 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-12.
   d. Provide Pre-finished steel gutter spacers sized at 1 inch by 1/8 inch spaced 3 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-12.
   e. Provide butt-type expansion joints in gutters at **at locations shown on Drawings**.
   f. Laps are to be a minimum of 1 inch with continuous sealant. Rivet along athe lap at 1 inch on center.

C. Downspouts:
1. Material: Aluminum-zinc alloy-coated steel.
2. Thickness: 24 gauge.
3. Finish: [Polyvinylidene Fluoride (PVDF) Coating].
4. Installation:
   a. Install new downspouts at primary drainage outlets and at locations shown on the drawings as specified herein. Refer to SMACNA Architectural Sheet Metal Manual.
   b. Install downspouts at locations shown on Drawings.
   c. Form downspout hangers from the same material as downspouts using material not less than 2 gauges heavier than downspouts.
   d. Secure downspouts to wall with hangers spaced not more than 5 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-35G.
   e. Where downspouts terminate at lower roof areas, provide new splash pans over walkpad. Size walkpad to be 6 inches longer and wider than splash pan. Adhere splash pan to walkpad using materials consistent with roof membrane installation. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-36, Second Alternate Section. Provide elbows at base of downspouts which turn out at 45°.
   f. Where downspouts terminate at grade, provide new precast concrete splash blocks. Set blocks on grade with uniform solid support. Provide elbows at base of downspouts which turn out at 45°.

D. Counterflashings:
1. Material: Aluminum-zinc alloy-coated steel.
2. Thickness: 24 gauge.
3. Finish: Polyvinylidene Fluoride (PVDF) Coating.
4. Installation:
   a. Install new counterflashings at locaitions identified on the drawings as specified herein.
   b. 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.
   c. Insert upper edge of counterflashing in metal receiver. Bend receiver neatly and snugly to face of counterflashing.
   d. Secure counterflashing to vertical surface with appropriate fasteners.
   e. Notch and lap joints and inside corners. Notch and seam outside corners. Do not rivet or otherwise secure joints and corners.
   f. Lap ends of counterflashing 4 inches. Crimp hem of overlapping section around hem of underlapping section.

E. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:

F. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports:
   1. Manufacturer provided fluid applied flashing
      a. Fluid applied flashing to be included in manufactuers roof warranty.
   2. Install fluid applied flashing in strict accordance with manufacturers requirements.

G. Metal Fascia Extension:
   1. Insert metal flahing extend behind edge metal or gutter brackets.
   2. Fascia is to return to return to the facade and cover the wood substrate.
   3. A drip edge is to be formed in the bottom of the metal, angled away from the place of the fascade.

END OF SECTION

SECTION 077100
ROOF SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manufactured roof specialties, including copings and fascias.

1.2 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2017.

C. NRCA (RM) - The NRCA Roofing Manual; 2022.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

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

C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

D. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Roof Edge Flashings and Copings:
   1. ATAS International, Inc: www.atas.com/#sle.
   2. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
   3. Metal-Era Inc: www.metalera.com/#sle.
   4. Metal Roofing Systems, Inc: www.metalroofingsystems.biz/#sle.
   5. Substitutions: See Section 016000 - Product Requirements.

B. Pipe and Penetration Flashings:
   1. Provided by roofing system manufacturer.

C. Counterflashings:
   1. Shop fabricated as indicated herein.

2.2 COMPONENTS

A. Roof Edge Flashings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
   1. Configuration: Fascia, and edge securement for roof membrane.
   2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
   3. Exposed Face Height: As indicated on drawings.
   4. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch thick, minimum.
   5. Finish: 70 percent polyvinylidene fluoride.
   6. Color: As selected by Engineer from manufacturer's standard range.

B. Copings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
   1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness, and finish as cap; concealed stainless steel fasteners.
   2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.

3. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch thick, minimum.
4. Finish: 70 percent polyvinylidene fluoride.
5. Color: As selected by Engineer from manufacturer's standard range.

C. Fluid Applied Pipe and Penetration Flashing:
1. Provided by roof membrane manufacturer
2. Included in the roof system warranty.
3. Fabric reinforcing: As recommended by roof manufacturer.

D. Counterflashings: Factory fabricated and finished sheet metal that overlaps top edges of base flashing by at least 4 inches, and designed to snap into through-wall flashing with lapped joints.
1. Finish: PVDF Coating (Superior Performance).

2.3 FINISHES

A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

2.4 ACCESSORIES

A. Sealant for Joints in Linear Components: As recommended by component manufacturer.

B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Seal joints within components when required by component manufacturer.

C. Anchor components securely.

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

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

END OF SECTION

SECTION 077200
ROOF ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

1.2 RELATED REQUIREMENTS

A. Section 077100 - Roof Specialties: Other manufactured roof specialty items.

1.3 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

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

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
   1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings.

D. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
   3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.6 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for roof hatches. Complete forms in Owner's name and register with manufacturer.

C. Extended Correction Period: Correct defective work within 5-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
   1. Design Loadings and Configurations: As required by applicable codes.
   2. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
   3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.

4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
5. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.

B. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.
1. Attachment/Support Fixtures: As recommended by manufacturer; corrosion resistant material.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

C. See Section 077100 for information on roof specialties.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.4 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean installed work to like-new condition.

3.5 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION

LOW SLOPE ROOFING INSTALLERS WARRANTY

Owner: _____

Installer: _____

Location of Building: _____

Name of Building: _____

Roof Areas: _____

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 five 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 five 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 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

_____

_____

FLUID APPLIED COATING WARRANTY

Owner: _____

Installer: _____

Location of Building: _____

Name of Building: _____

Roof Areas: _____

Date of Substantial Completion: _____

Know all men by these presents, that we, Installer as defined above, having installed fluid applied coatings, 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 five years from date of Substantial Completion of said work, the roofing including the fluid applied coating 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 five 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 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