ROOF REPLACEMENT SPECIFICATIONS

TAYLORS ELEMENTARY SCHOOL
809 REID SCHOOL RD.
TAYLORS, SOUTH CAROLINA 29687

PROJECT NO. GSP1010.058

Prepared For
GREENVILLE COUNTY SCHOOLS
2 SPACE DRIVE
TAYLORS, SOUTH CAROLINA 29687

Prepared By
RAYMOND ENGINEERING-GEORGIA, INC.
GREER, SOUTH CAROLINA

April 6, 2020

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SECTION 00 01 10
TABLE OF CONTENTS

Division 00 – Procurement and Contracting Requirements
   Section 00 01 10 – Table of Contents
   The School District of Greenville County – Invitation for Bid

Division 01 – General Requirements
   Section 01 11 00 – Summary of Work
   Section 01 22 13 – Unit Prices and Allowances
   Section 01 26 00 – Modification Procedures
   Section 01 29 73 – Schedule of Values
   Section 01 29 76 – Application for Payment
   Section 01 31 19 – Project Meetings
   Section 01 32 13 – Construction Schedules
   Section 01 33 00 – Submittals
   Section 01 33 23 – Shop Drawing, Product Data, and Samples
   Section 01 42 19 – Reference Standards
   Section 01 45 00 – Quality Control
   Section 01 50 00 – Temporary Facilities and Control
   Section 01 60 00 – Product Requirements
   Section 01 66 00 – Storage and Protection
   Section 01 73 30 – Asbestos Products
   Section 01 74 00 – Cleaning
   Section 01 77 00 – Project Closeout Procedures
   Section 01 78 36 – Warranties
   Section 01 78 39 – Project Record Documents

Division 02 – Existing Conditions
   Section 02 41 13 – Selective Demolition and Preparations

Division 06 – Wood, Plastics, and Composites
   Section 06 10 53 – Miscellaneous Rough Carpentry

Division 07 – Thermal and Moisture Protection
   Section 07 22 16 – Roof Board Insulation
   Section 07 51 05.01 – General Installation Procedures: Cold Applied Modified Bitumen Roofing
   Section 07 52 16 – SBS Modified Bituminous Membrane Roofing
   Section 07 60 00 – Flashing and Sheet Metal

Division 22 – Plumbing
   Section 22 05 29 – Hangers and Supports for Plumbing Piping and Equipment

Drawings

GENERAL

G-001 COVER PAGE
G-002 GENERAL NOTES AND LEGENDS
G-003 PROJECT NOTES AND CODE INFORMATION

Table of Contents 00 01 10 1
ARCHITECTURAL

A-101  EXISTING ROOF PLAN
A-102  NEW ROOF PLAN
A-103  WIND ZONE ROOF PLAN
A-104  TAPERED INSULATION ROOF PLAN
A-501  TYPICAL ROOF DETAILS
A-502  TYPICAL ROOF DETAILS
DIVISION 01

GENERAL REQUIREMENTS
SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 Work Covered by Contract Documents

1.1.1 Work under this Contract consists of furnishing all labor, materials and equipment necessary to perform the quality remedial re-roofing at Taylors Elementary School, as shown on Drawing No. A-101. The work will include, but is not necessarily limited to, the following:

1.1.1.1 Remove all existing roof coating, insulation, and gypsum board down to the existing metal deck, and discard.
   (a) Note: Do not remove any existing fiberglass batt insulation installed in deck flutes. The contractor is responsible for replacing any damaged or removed batt insulation in deck flutes at no additional cost to the owner.
1.1.1.2 Remove all existing membrane flashings, metal flashings, and miscellaneous items as specified herein, and discard.
1.1.1.3 Remove all existing scuppers, conductors, and downspouts, and discard.
1.1.1.4 Remove existing gutter at Roof Area I, and discard.
1.1.1.5 Remove existing condensate lines and condensate line blocking, and discard.
1.1.1.6 Remove all existing abandoned equipment curbs, sleepers, and related abandoned conduit penetrations at Roof Area D, and discard.
   (a) Patch openings in roof deck, as specified herein.
1.1.1.7 Remove existing abandoned plumbing/gas lines at West end of Roof Area D, and discard.
   (a) Terminate and cap remaining plumbing/gas lines on vertical wall.
1.1.1.8 Furnish and install new rigid insulation, tapered insulation, cover board, and modified bitumen membrane roof system, as specified herein.
1.1.1.9 Furnish and install new membrane flashings and metal flashings, as specified herein.
   (a) Apply new fibrated aluminum coatings to all base flashings and all parapet flashings.
1.1.1.10 Furnish and install new perimeter wood blocking as needed to match the height of the new insulation, as specified herein.
1.1.1.11 Furnish and install new scuppers, conductors, and downspouts, as specified herein.
1.1.1.12 Furnish and install new gutters and downspout at Roof Area I, as specified herein.
1.1.1.13 Furnish and install new copper condensate lines and P-traps with new pipe support stands and membrane protection pads, as specified herein.
1.1.1.14 Scrape, wirebrush/sand, and paint existing gas lines, as specified herein.
1.1.1.15 Scrape, prime, and paint all existing roof access hatches, as specified herein.
1.1.1.16 Furnish and install new pipe support stands and membrane protection pads at all existing gas lines, as specified herein.
1.1.1.17 (Alternate #1): Furnish and install new overflow scuppers, including conductors and downspouts, adjacent to each existing primary scupper.
1.1.1.18 Furnish and install any miscellaneous items, as specified herein.

1.1.2 Mechanical work:

1.1.2.1 All work shall be in accordance with applicable and recognized state and federal codes and standards and Greenville County School District (GCSD) standards.
1.1.2.2 All work shall be performed by a licensed contractor for the work involved, including licensed mechanical, electrical, and plumbing contractors approved by GCSD.
1.1.2.3 All mechanical and electrical work shall carry a 24-month "bumper to bumper" parts and labor warranty.
1.1.2.4 Mechanical work includes any modifications to rooftop equipment as part of the reroofing
project, including but not limited to: RTUs, air handlers, fans, condenser units, dust and fume collectors, piping, wiring, ductwork, curbs, stands, mounting rails, and roof and/or wall brackets. This also includes equipment raising (curb extensions), relocations, re-positioning, refrigerant piping, CHW/HHW piping, condensate piping, natural gas piping, electrical disconnects, convenience outlets, rooftop lighting, and HVAC controls.

1.1.2.5 Specific details for each condition shall be developed and submitted to GCSD for review prior to execution. Allow 7 business days for review.

1.1.2.6 Curb mounted units: raising and/or repositioning curb mounted units typically involves a new curb, curb extension, or new curb. This usually breaks the unit duct connections as the ductwork is normally fastened to the existing curb and mates to the RTU with a gravity gasket connection.

1.1.2.7 Prior to reroofing work, roofer and mechanical contractor shall thoroughly inspect existing conditions and provide specific details for matching new work to old work. This shall include as-built inspections for ductwork leaks (inside and outside the building) and any remedial repair or warranty work to correct leaks.

1.2 Description of the Existing Roof System

1.2.1 Information in this Section is provided only to establish general description and is not necessarily accurate. The Contractor is responsible for visiting the site and determining the existing conditions, size of roof and wall areas, etc. before submitting his Bid.

1.2.2 The roof assembly is composed of the following:

1.2.2.1 Roof Areas A - I

(a) Elastomeric roof coating
(b) 3½” closed-cell spray-foam insulation
(c) 1/2” gypsum thermal barrier
(d) Metal deck

1.2.3 The approximate size of each area is as follows:

<table>
<thead>
<tr>
<th>Area</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>18,276 square feet</td>
</tr>
<tr>
<td>B</td>
<td>5,213 square feet</td>
</tr>
<tr>
<td>C</td>
<td>255 square feet</td>
</tr>
<tr>
<td>D</td>
<td>17,363 square feet</td>
</tr>
<tr>
<td>E</td>
<td>12,286 square feet</td>
</tr>
<tr>
<td>F</td>
<td>2,812 square feet</td>
</tr>
<tr>
<td>G</td>
<td>3,896 square feet</td>
</tr>
<tr>
<td>H</td>
<td>3,500 square feet</td>
</tr>
<tr>
<td>I</td>
<td>88 square feet</td>
</tr>
</tbody>
</table>

Total 64,229 square feet

END OF SECTION
General Requirements

1. Mechanical work includes any modifications to rooftop equipment during a re-roof project. Included are Packaged RTU’s, Air Handlers, Fans, Condenser Units, Dust and Fume Collectors, piping, wiring, ductwork, curbs, stands, mounting rails, roof and/or wall brackets. This includes equipment raising (curb extensions) relocations, re-positioning, refrigerant piping, CHW & HHW piping, condensate piping, natural gas piping, electrical disconnects, convenience outlets, rooftop lighting, and HVAC controls.

2. All work shall be in accordance with recognized State and Federal Codes and Standards AND GCSD Design Standards.

3. Specific details for each condition shall be developed and submitted for review by GCSD prior to execution. Allow 7 business days for review.

4. ALL Work shall be performed by a Lic. Mech Contractor approved by GCSD. Attached is a list of GCSD IDC Mechanical Contractors as of March 2020. Likewise, Electrical Work shall be performed by Lic. Electrical Contractor.

5. **ALL Mechanical/Electrical Work shall carry a 24 month ‘bumper-bumper’ parts and labor warranty.**

Curb Mounted Units

1. Raising and/or repositioning curb mounted units usually involves a curb extension, adapter, or new curb. This work usually breaks the unit duct connections. Ductwork is normally fastened to the existing curb and mates to the RTU via a gravity gasket connection. Roofer along with selected Mech Contr shall thoroughly inspect existing conditions and provide specific details for matching new work to old work. This work shall include as-built inspections for ductwork leaks (both outside and inside the building) and any remedial repair or warranty work to correct leaks. Worst case scenario is re-lifting and re-gasket of curb/curb extension. Typical schematic pasted below.
IDC – PACKAGED EQUIPMENT CONTRACTOR SERVICES

BID 116-28-4-20

McCarter Mechanical Inc.
685 John Dodd Rd,
Spartanburg, SC 29303
Scott McCarter
(864) 599-7883

Gregory Electric Company, Inc.
P.O. BOX 170519
SPARTANBURG, SOUTH CAROLINA 29301
Tom Cook
864-283-2785

Jennings-Dill Inc
33 Grand Ave
Greenville, SC 29607
(864) 434-0618
Andy Lockliar

W B Guimarin & Co Inc
1327 Miller Rd # B,
Greenville, SC 29607
Chris Bigalke
864.675-1000

Cullum Services
121 Webb Street
Simpsonville, SC 29681
Esteban Uzarraga
843.747-2900

Service Mechanical, Inc.
1851 Suber Mill Road
Greer, SC 29650
Brent Smith
864.608-2151

Johnson Controls
430 J Roper Mountain Road,
Greenville, SC 29615
Wayne Vafiadis
864.423-9155

Trane Carolinas
Ingersoll Rand
288 Fairforest Way
Greenville, SC 29607
Jim Cree
864.672-6000

MCG Mechanical
2000 Pearman Dairy Road
Anderson, SC 29625
David Cox
864.231-9157

RUTHERFORD HEATING & AIR
737 E. MAIN ST.
SPINDALE, NC 28160
Alan Murray
828-287-2240
PART 1 - GENERAL

1.1 Work Included: All unit prices and allowances as listed in Bid Form.

1.2 Procedures

1.2.1 Unit prices will be exercised at the option of the Owner.

1.2.2 Modify and coordinate related activities as required to complete the work if, and when, acceptance is designated by the Owner in AIA Document A101.

1.2.3 In the event unit prices are exercised, applicable sections of this Specification shall govern. Other sections may be modified as required to address the unit price.

1.2.4 Cost associated with any anomalies identified on plans, on the roof, and/or in the Specification shall be included in the Base Bid.

1.2.5 Cost associated with any necessary removals at scuppers to install scuppers and/or conductors and/or downspouts shall be included in the Base Bid.

1.2.6 Cost associated with the repair of decking at removed abandoned penetrations identified on plans and/or marked on the roof shall be included in the Base Bid.

1.2.7 Bidders shall provide a unit price for the items listed below on the bid form. Bidder shall include a cash allowance in the Base Bid for each unit price in the quantity listed below on the bid form. Payment will be made for unit price work in excess of the cash allowance, which includes all overhead and profit. In the event it is necessary to replace fewer than quantity associated with the cash allowance, the Owner will take a credit at the unit price rate. The Design Professional shall be responsible for verifying the actual quantity and extent of the unit price work.

PART 2 - PRODUCTS

2.1 See applicable specification sections.

PART 3 - EXECUTION

3.1 UNIT PRICE No. (1): Quote a separate unit price (per board foot) for the repair and/or replacement of any damaged or deteriorated wood blocking. This unit price shall include the furnishing and installation of new pressure treated wood blocking to match the wood blocking removed. This unit price shall also reflect any power tools, fasteners, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Section 02 41 13 of the Specification.

Note: The contract includes an allowance for the removal and replacement of 150 board feet of deteriorated wood blocking in the Base Bid.

3.2 UNIT PRICE No. (2): Quote a separate unit price (per square foot) for the remedial priming of rusted metal decking. This unit price shall include the scraping, cleaning, and priming of rusted metal decking. This unit price
shall also reflect any power tools, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Section 02 41 13 of the Specification.

Note: The contract includes an allowance for the remedial priming of 250 square feet of rusted metal decking in the Base Bid.

3.3 UNIT PRICE No. (3): Quote a separate unit price (per square foot) for the remedial priming and installation of 20 ga. galvanized steel plates over deteriorated metal decking. This unit price shall include the scraping, cleaning, and priming of rusted metal decking and the installation of new 20 ga. galvanized steel sheet metal over deteriorated metal decking. This unit price shall also reflect any power tools, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Section 02 41 13 of the Specification.

Note: Contract shall include 100 square feet of sheet metal installation in the Base Bid.

3.4 UNIT PRICE No. (4): Quote a separate unit price (per square foot) for the removal of deteriorated metal decking and the installation of new decking to match the existing. This unit price shall include the removal of existing metal decking and the installation of new metal decking that spans over a minimum of 3 structural supports. This unit price shall also reflect any power tools, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Section 02 41 13 of the Specification.

Note: This work shall include applying new interior grade metal paint on the bottom side of the decking to match the existing.

Note: Contract shall include 100 square feet of deck replacement in the Base Bid.

3.5 UNIT PRICE No. (5): Quote a separate unit price (each) for the installation of new sheet metal side lap screws. This unit price shall include the installation of new sheet metal side lap screws. This unit price shall also reflect any power tools, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Section 02 41 13 of the Specification.

Note: The contract includes an allowance for furnishing and installing 200 sheet metal side lap screws in the Base Bid.

3.6 UNIT PRICE No. (6): Quote a separate unit price (each) for the installation of new deck to joist screws. This unit price shall include the installation of new deck to joist screws. This unit price shall also reflect any power tools, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Section 02 41 13 of the Specification.

Note: Contract shall include furnishing and installing 50 deck-to-joist fasteners in the Base Bid.

END OF SECTION
SECTION 01 26 00
MODIFICATION PROCEDURES

PART 1 - PROCEDURES

1.1 Unit Price Work

1.1.1 Changes to the contract price due to work accomplished based upon unit prices will be initiated by the Contractor. The Designer will complete AIA Document G701 in three copies and submit to the Contractor and Owner for signatures.

1.1.2 The Contractor is to immediately notify Designer of any work to be accomplished based upon unit prices and describe the scope of unit price work to be done prior to proceeding.

1.1.3 In submitting AIA Document G701, Contractor is to fully describe the amount accomplished and the total change to the Contract as a result of this Change Order. Shop drawings and/or roof plans to assist in describing the work scope shall be attached.

1.2 Changes in Scope of Work

1.2.1 Changes to the Contract Price due to work accomplished due to a change in scope of work will be initiated by the Contractor. The contractor-provided information will be used by the Designer in the development of AIA Document G701. The Designer shall prepare the Change Order in three copies and shall submit to the Contractor and Owner for signatures.

1.2.2 The Contractor must notify the Designer of any work that is not part of the Contract but must be accomplished to continue with the project.

1.2.3 Prior to proceeding with such work, the Contractor is to provide the Owner with a description of the work being accomplished and a total cost for such work. Shop drawings and/or roof plans shall be attached, as required.

1.2.4 The Contractor is not authorized to proceed with such work until approved by the Owner. Notification to proceed may be verbal or in writing. If verbal, AIA Document G701 is to be submitted at the earliest opportunity.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION
PART 1 - GENERAL

1.1 Summary

1.1.1 Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.

1.1.2 Related work:

1.1.2.1 Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.1.2.2 Preparation and submittal of a schedule of values in required by the General Conditions.

1.1.2.3 Schedule of values is required to be compatible with the "continuation sheet" accompanying applications for payment, as described in Section 01 29 76. Contractor shall use the current AIA Form G703.

1.2 Submittals

1.2.1 Prior to the first application for payment, submit a proposed schedule of values to the Designer.

1.2.2 Meet with the Designer, if necessary, and determine additional data required to be submitted.

1.2.3 Secure the Designer's approval of the schedule of values prior to submitting first application for payment.

1.3 Quality Assurance

1.3.1 Use required means to assure arithmetical accuracy of the sums described.

1.3.2 When so required by the Designer, provide copies of the subcontracts or other data acceptable to the Designer substantiating the sums described.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 The following schedule of values shall be shown on AIA Form G703, unless otherwise specified or directed:

3.2 General and Supplementary Conditions

3.3 Payment and Performance Bonds

3.4 Division 01

3.5 Division 02 - Labor and Materials
3.6  Division 06 - Labor and Materials

3.7  Division 07 - Labor and Materials

3.8  Division 22 – Labor and Materials

END OF SECTION
SECTION 01 29 76
APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.1 Procedures

1.1.1 Monthly pay estimates shall be submitted to Designer in quadruplicate on the current AIA Form G702. Form shall include the contract's Schedule of Values form, which shall be completed using AIA Form G703 unless otherwise specified.

1.1.2 Ninety percent of the value of materials stored at the site and ninety percent of work accomplished, less previous payments, shall be paid by Owner to Contractor in monthly installments upon Designer's certification. Final payment shall be made 30 days after Designer has certified completion to the Owner.

1.1.3 A payment or payments made to the 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.

1.1.4 All sums received by the Contractor for any part or parts of the work furnished or performed by a Subcontractor or material supplier shall be paid promptly to the latter by Contractor and while in the hands of the Contractor shall constitute trust funds held for the use and benefit of Owner. Contractor shall submit with payment requests lien releases from subcontractors and material suppliers which state that subcontractors and suppliers have been paid for services and materials supplied to the project. All dates on the lien releases provided with payment applications from the Contractor shall be common. Payment requests may be delayed if not received in a timely manner.

1.1.5 At final payment, the Contractor shall submit a final conditional release of liens contingent upon the receipt of the remainder of the contract amount, including any approved change order, unit price work, and retainage. At final payment, the Contractor shall submit a zero-dollar final release of liens from all subcontractors and materials suppliers through the date of material completion.

1.1.6 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, such payments shall be conditioned upon submission by Contractor of bills of sale or other documents satisfactory to the 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 to the Site.

1.1.7 The Contractor shall submit with each application for payment a calendar showing work days and weather days for the monthly application for payment. Weather days shall be considered days that work cannot be performed due to inclement weather, as reported from the National Weather Service, or approved equal.

1.2 Quality Assurance

1.2.1 Prior to start of construction, secure the Designer's approval of the schedule of values required to be submitted in accordance with the General Conditions, and further described in Section 01 29 73 of these Specifications.

1.2.2 During progress of the Work, modify the schedule of values as approved by the Designer to reflect changes in the Contract Sum due to Change Orders or other modifications of the Contract.

1.2.3 Base requests for payment on the approved schedule of values.

END OF SECTION
SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.1 Description: To provide for an orderly review during progress of the work and to provide for the systematic discussion of problems that may arise throughout the construction period.

1.2 Presentation: Each Contractor and major Subcontractor shall be represented at every meeting by a representative member of his organization. The Owner and/or his authorized representative shall also attend.

1.3 Submittals

1.3.1 The proceedings of these meetings shall be recorded by the Designer, if required. One copy of the proceedings shall be furnished to Owner and each representative.

1.3.2 Conducting the meeting, recording and distributing meeting minutes shall not be construed that the Designer is scheduling or coordinating Contractor's work.

1.4 Decision Interpretations: All decisions and interpretations given by the Designer at project meetings shall be made on behalf of the Owner and shall be conclusive on each contractor affected.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 A pre-bid meeting shall be held with Owner, Owner's Representative and Bidders at the Project Site at the time and date stated in the advertisement.

3.2 A pre-construction conference shall be scheduled with the Owner and/or his representative, Contractor’s project manager/superintendent, Contractor's project foreman, and manufacturer's representative prior to start of work.

3.3 Agenda

3.3.1 Contract Documents

3.3.2 Communication channels and procedures

3.3.3 Field change orders and decisions

3.3.4 Project meeting schedules

3.3.5 Construction schedule

3.3.6 Rules and regulations affecting the work

3.3.7 Safety requirements
3.3.8 Organization of Contractor, Subcontractors, and Suppliers

3.3.9 Shop drawings and submittals

3.3.10 Project record documents

3.4 Progress Meetings

3.4.1 The Designer will schedule project meetings at his discretion, based upon the progress and quality of the work performed by the Contractor.

3.4.2 Agenda for progress meetings will include, but is not limited to:

3.4.2.1 Construction schedule
3.4.2.2 Change orders
3.4.2.3 Quality Control
3.4.2.4 Problems encountered, and actions taken

3.5 Location: Meetings shall be held at the job site to the maximum extent possible.

END OF SECTION
SECTION 01 32 13
CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 Description

1.1.1 To assure adequate planning and execution of the work to complete the project within the time period allowed in the Contract and to assist the Designer in evaluating work progress.

1.1.2 "Day" used throughout the Contract shall mean "Consecutive Calendar Days" unless otherwise stated.

1.2 Schedule Adherence

1.2.1 Should any activity not be completed within 7 days after the scheduled completion date, Owner shall have the right to order the Contractor to expedite completion of work by whatever means the Owner deems appropriate and necessary without additional expense.

1.2.2 Should any activity be 15 or more days behind schedule, the Owner shall have the right to complete the activity or to have the activity completed by whatever means the Owner deems appropriate and necessary.

1.2.3 Any costs incurred by the Owner in connection with expedition of the construction activity under this article shall be reimbursed to the Owner by the Contractor. This may take the form of deductions from payments due Contractor.

1.2.4 Failure by the Owner to exercise the option to either order the Contractor to expedite any activity or to expedite an activity by other means shall not be considered precedent setting for any other activity.

1.2.5 Inclement Weather

1.2.5.1 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.

1.2.5.2 Normal Inclement Weather for each calendar month shall be considered:

<table>
<thead>
<tr>
<th>(a)</th>
<th>Month</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>January</td>
<td>6</td>
</tr>
<tr>
<td>(c)</td>
<td>February</td>
<td>5</td>
</tr>
<tr>
<td>(d)</td>
<td>March</td>
<td>6</td>
</tr>
<tr>
<td>(e)</td>
<td>April</td>
<td>5</td>
</tr>
<tr>
<td>(f)</td>
<td>May</td>
<td>5</td>
</tr>
<tr>
<td>(g)</td>
<td>June</td>
<td>6</td>
</tr>
</tbody>
</table>
1.2.5.3 No consideration or extension shall be allowed for inclement weather days that fall outside any working restrictions.

1.2.5.4 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.

1.2.5.5 No financial compensation shall be made due to inclement weather, and any changes to the contract shall be no-dollar time extensions.

1.2.5.6 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 weather days outside normal consideration, this shall be considered non-compliance with the contract and the Designer may act in accordance with the Contract Documents.

1.3 Schedule: Within 7 days after receipt of notice to proceed, the Contractor shall submit one reproducible and two prints of the construction schedule to the Designer.

1.4 Diagrams

1.4.1 Graphically show the sequence and interdependence of all activities necessary to complete the work and the order in which such activities are to be accomplished as planned by the Contractor and his project field supervisor in coordination with all subcontractors whose work is shown on the diagram. Activities shown on the diagram shall include, but are not limited to:

1.4.1.1 Submittals and approvals of shop drawings and samples.
1.4.1.2 Project mobilization
1.4.1.3 Demolition/Roof preparation
1.4.1.4 Construction
1.4.1.5 Sheet Metal
1.4.1.6 Miscellaneous work
1.4.1.7 Final Cleanup
1.4.1.8 Final Inspection
1.4.1.9 All activities by the Designer which affects progress, required completion dates, or both, for all and each part of the Work.

1.4.2 The detail of information shall be such that duration times of activities shall normally range from 1 to 30 days. The selection and number of activities shall be subject to approval by the Designer.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 Construction Schedule
3.1.1 Within 10 days after the effective date of Agreement, the Contractor shall complete the analysis described in Article 1.4 of this Section in preliminary form. Meet with the Designer to review the contents of the proposed schedule and make all revisions agreed upon. Submit in accordance with Paragraph 1.4.1 of this section.

3.1.2 Revisions

3.1.2.1 Contractor shall make only those revisions to the construction schedule as are approved in advance by Designer.

END OF SECTION
PART 1 - GENERAL

1.1 Procedures

1.1.1 Submit certain items with Bid and within 7 calendar days after receipt of signed Contract. The successful Contractor shall submit the required information to the Designer in 3 copies or in digital format as allowed by the Owner.

1.1.2 Each transmitted document shall identify the project name and Contractor. Material submittals shall also identify the type and trade name of materials, material manufacturer, intended use and specification number. The successful bidder shall request an electronic copy of the attached “Submittal Checklist” to complete and include with the submittals.

1.1.3 Submittals shall bear the Contractor's stamp and indicate approval and date.

1.1.4 After Designer's review of materials, revise and resubmit, as required, identifying changes made since previous submittal.

1.1.5 Upon approval by Designer, submittals will be forwarded to the Owner for review and approval.

1.2 Bid Submittals

1.2.1 Refer to Bid Form

1.2.2 Safety Plan (Generic)

1.2.3 Letter from Manufacturer and RoofNav Number concerning Factory Mutual Approvals

1.3 Site Specific Safety Plan – Refer to Section 01 66 00.

1.4 Construction Schedules: Refer to Section 01 32 13 of this Specification

1.5 Shop Drawings, Samples and Product Data: Refer to Section 01 33 23 of this Specification.

1.6 Foreman's Statement: Submit on or before pre-construction conference.

1.7 Emergency phone number of principals, superintendent, foreman, project manager: Submit to Owner and Designer at Pre-Construction Conference.

1.8 Pre-Construction Submittals

1.8.1 Prior to the start of the project, the following items need to be submitted within 7 calendar days after the receipt of signed Contract. The contractor shall fill out the attached Submittal checklist form, ensuring that all items listed in this section, referenced for submittal in the specification, and/or items to be used on this project are properly submitted. Items submitted must conform to the standards and expectations of that material, detail, and/or procedure expressed in this specification. If not, that item may be rejected for use by the Designer.
1.8.2 The following literature shall be submitted.

1.8.2.1 Contractor’s Letter of Good Standing with Manufacturer.
1.8.2.2 Manufacturer’s Sample 20-year warranty
1.8.2.3 Contractor’s 2-year warranty
1.8.2.4 Manufacturer’s Application Instructions
1.8.2.5 Contractor’s Foreman’s Statement
1.8.2.6 Contractor’s Construction Schedule
1.8.2.7 Contractor’s Schedule of Values
1.8.2.8 Manufacturer’s Certificates
   i Submit separate letters from the membrane manufacturer and the insulation manufacturer stating he has examined the plans, specifications and details for this project and approves the use of his products and systems on this project.
   ii Submit a letter from the membrane manufacturer acknowledging the brand name and type of insulation proposed for use and his approval of the use of this insulation with his products.
   iii Submit a letter from the insulation manufacturer acknowledging the brand name and type of roof membrane being proposed and his approval of the use of the roof membrane and system with his product.
   iv Submit a copy of the licensed membrane applicator agreement.
   v If any membrane components are not packaged by the membrane manufacturer, submit a letter from the membrane manufacturer clearly identifying the component and acknowledging approval to use this component on this project.
   vi Submit for each bulk shipment of asphalt a manufacturer’s certificate clearly stating type of asphalt and compliance with reference standard.

1.8.3 Submit all materials as outlined in Part 2 of the Specification sections. Group and label material submittals by Specification Section.

1.8.4 Submit metal flashing color charts.

1.8.5 Submit shop drawings in accordance with Section 01 33 23.

1.9 Close-out Submittals

1.9.1 At the end of the project and prior to final payment, the following documents shall be submitted to the Designer:

   1.9.1.1 Copies of all punch lists prepared by the Designer and documentation of completion.
   1.9.1.2 Contractor's Warranty to Owner.
   1.9.1.3 Manufacturer’s Guarantee
   1.9.1.4 Contractor’s Final Payment Application
   1.9.1.5 Consent of Surety for Final Payment
   1.9.1.6 Final Lien Waiver
   1.9.1.7 Contractor’s Affidavit of Payment of Debts and Claims
   1.9.1.8 Contractor’s Affidavit of Release of Liens

PART 2 - PRODUCTS

2.1 Membrane and associated membrane flashings are to be manufactured and labeled by the membrane materials manufacturer or, if supplied by a different manufacturer, approved for use by membrane manufacturer in compliance with warranty requirements.
PART 3 - EXECUTION

3.1 Timing

3.1.1 Make all submittals in accordance with schedules specified herein.

3.1.2 Designer will be allowed a minimum of 10 calendar days following receipt of submittals for review.

3.1.3 Delays caused by tardiness in receipt of submittals shall not be an acceptable basis for extension of the Contract completion date.

3.2 Review

3.2.1 The notations "No Exceptions Taken" or "Exceptions as Noted" shall authorize the Contractor to proceed with fabrication, purchase, or both subject to the revisions, if any, required by the Designer's review comments.

3.2.2 The Contractor shall make all revisions, as required. If the Contractor considers any revisions to constitute a change, he shall notify the Designer under the provisions of the General Conditions.

3.2.3 Only those revisions directed or approved by the Designer shall be shown on the re-submittal.

3.2.4 After a submittal has been approved by the Designer, substitution of materials, equipment and/or procedures shall not be considered unless accompanied by an acceptable explanation for the substitution.

3.3 Foreman's Statement


STATEMENT
Taylors Elementary School
Roof Replacement

I, (Name), an employee of (Contractor) hereby state that I have my own personal copy of the project specifications and drawings, have thoroughly read them and have visited the work site.

By____________________________________

Date____________________________________

END OF SECTION
SECTION 01 33 23
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 Shop Drawings

1.1.1 Shop drawings, diagrams, illustrations, schedules, performance charts, brochures and other data prepared by the Contractor, Subcontractor, manufacturer, supplier or distributor which illustrate some portion of the Work.

1.1.2 Submit shop drawings by transmittal letter with the following information:

1.1.2.1 Designer's Project Number
1.1.2.2 Submittal Date
1.1.2.3 Submittal Number
1.1.2.4 Project Title
1.1.2.5 Name of Contractor, Approval Date and Contractor's approval stamp/signature.
1.1.2.6 Reference to Specification Section, Paragraph and/or Drawing.
1.1.2.7 The location of the work covered by the shop drawing.
1.1.2.8 Any qualification, deviation or departure from Contract.
1.1.2.9 Any additional information required by the Specifications for the particular material being furnished.

1.1.3 Each shop drawing shall be numbered. The same numbering system shall be retained through all revisions. Each drawing shall have a clear space for the approval stamps of contractor and Designer.

1.1.4 In submitting shop drawings for approval, all associated shop drawings related to a complete assembly shall, where possible, be submitted at the same time so that each may be checked in relation to the entire proposed assembly.

1.1.5 Contractor shall prepare composite shop drawings and installation layouts, when required, to depict proposed solutions for tight field conditions. The composite shop drawings and field installation layouts shall be coordinated in the field by the Contractor for proper relationship to the work of other trades involved in the work.

1.1.6 With respect to standard manufactured items, Contractor shall submit to Designer manufacturer's illustrated cuts of the items to be furnished showing details, sizes and dimensions and all other pertinent information. Sufficient copies of cuts shall be furnished so that Designer may maintain a minimum of two copies and return to Contractor the number required for Contractor's use.

1.1.7 Contractor shall submit one reproducible print and three copies of each drawing.

1.1.8 Submit shop drawings for the following details:

1.1.8.1 Curb detail
1.1.8.2 Counterflashing details
1.1.8.3 Tapered insulation layout
1.1.8.4 Insulation fastening pattern details
1.1.8.5 Drip edge details
1.1.8.6 Primary through-wall scupper details
1.1.8.7 Overflow through-wall scupper details
1.1.8.8 Expansion joint cover and closure details
1.1.8.9 Coping and closure details
1.1.8.10 Gutter and downspout details
1.1.8.11 Conductor and downspout details
1.1.8.12 Other details, as specified

1.2 Product Data

1.2.1 Submit a complete description of the roofing systems listing all components and their respective manufacturer.

1.2.2 Submit each manufacturer's technical specifications and installation procedures for each major roofing component required.

1.2.3 Minimum required components include, fasteners, insulation, cover board, roof membrane, membrane flashing and metal flashing material.

1.3 Samples: Submit a 6-inch long sample of each metal shape to be used on this project to Designer for approval. Metal shapes are to be constructed in accordance with approved shop drawings and will be used for establishment of quality standards during installation.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Timing

3.1.1 A minimum of 10 days shall be allowed for review by the Designer following his receipt of the submittal.

3.1.2 If a submittal contains more than 10 shop drawings, Contractor shall indicate which drawings must be returned within 10 days. Designer shall have an additional 10 days to return the balance of submittals.

3.1.3 Delays caused by tardiness in receipt of submittals shall not be an acceptable basis for extension of the contract completion date.

3.2 Review

3.2.1 Review by the Designer shall be directed to the general method of construction and shall not be construed as a complete check nor shall the review relieve the contractor from responsibility for errors and/or omissions which may exist.

3.2.2 The notations "Reviewed" or "Make Corrections as Noted" shall authorize Contractor to proceed with fabrication, purchase, or both, subject to the revisions, if any, required by the Designer's review comments.

3.2.3 The Contractor shall make all revisions, as required. If the Contractor considers any required revisions to constitute a change, he shall notify the Designer under the provisions specified in the General Conditions.
3.2.4 Only those revisions directed or approved by the Designer shall be shown on the re-submittal.

3.2.5 After a submittal has been approved by the Designer, substitution of materials or equipment shall not be considered unless accompanied by an acceptable explanation as to the necessity for the substitution.

END OF SECTION
SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 Products specified by association or trade standards, must comply to those standards, except when more rigid requirements are specified herein or are required by applicable codes.

1.2 Brand or manufacturer names are used as standards of quality where no other appropriate reference is available. The Designer will consider substitution of materials of equal quality and properties provided a written request accompanied by substantiating data is received at least 10 days prior to Bid Date.

1.3 The date of the standard is that which is in effect as of the bid date, except when a specific date is stated.

1.4 Should there be a discrepancy between the referenced standards and these Contract documents, the latter shall govern unless written interpretation is obtained from the Designer.

1.5 Should there be discrepancies among the referenced standards, the more stringent requirements govern.

1.6 Definitions:

1.6.1 ASTM - American Society of Testing and Materials. A society formed for the development of standards on characteristics and performance of materials, products, systems and services; and the promotion of related knowledge.

1.6.2 U. L. - Underwriters' Laboratories. A non-profit, independent organization which tests devices, systems and materials to determine their performance to life, fire, casualty hazards and crime prevention.

1.6.3 F. M. - Factory Mutual or Factory Mutual Research Corporation. Has a charter similar to Underwriters' Laboratories.

1.6.4 SMACNA - Sheet Metal and Air Conditioning Contractors National Association.

1.6.5 AIA - American Institute of Architects

1.6.6 NRCA - National Roofing Contractors Association.

1.6.7 IBC - International Building Code

1.6.8 OSHA – Occupational Safety and Health Administration

1.6.9 NFPA – National Fire Protection Association

END OF SECTION
SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 Quality Control – Contractor: Maintain quality control over products, services, site conditions, and workmanship, to produce work of specified quality.

1.2 Quality Control – Owner

1.2.1 Cuts may be made to determine the quantity and quality of material and workmanship using the following procedures:

   1.2.1.1 Cuts will be made after all roofing felts are in place, but they will be done before final surfacing is accomplished.
   1.2.1.2 Cuts will be made across felts 4” x 40”, at locations selected by the Designer.
   1.2.1.3 No more than one cut for each 50 squares will be made, except that a cut may be made in any separate, well defined area, regardless of size.
   1.2.1.4 Where possible, samples will be weighed and inspected at the site and replaced in openings.

1.2.2 Work found in violation of the Specifications, or not in conformance with acceptable roofing practices/standards, shall be subject to rejection including removal and replacement with new materials at Contractor’s expense.

1.2.3 Failure of Owner or Designer 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 with the Contract, nor shall it be deemed a waiver by Owner or any of Owner's rights pursuant to this Contract or otherwise.

1.2.4 Owner intends to conduct inspections of the work by in-house personnel and/or the Owner's representative on a full/part-time basis. Such work is in addition to the Designer’s inspections which may be conducted to verify that work completed is comparable to contractor’s monthly application for payment.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 Description

1.1.1 Contractor shall provide for temporary facilities and controls required for the performance of the project except as otherwise noted. Such items include, but are not necessarily limited to, utilities such as heat, water, electricity and telephone; sanitary facilities; contractor's facilities; and enclosures such as tarpaulins, barricades, and canopies.

1.1.2 Contractor shall provide protective netting and/or other means of protection to minimize airborne debris being scattered on the grounds during the removal of the existing spray polyurethane roof system.

1.1.3 All equipment furnished by Contractor shall comply with all pertinent safety requirements.

1.1.4 Ladders, planks, hoists, and all similar items furnished by individual trades in the execution of their own portions of the work are not part of this Section.

1.1.5 All temporary facilities will be subject to the Owner's approval.

1.2 Product Handling

1.2.1 The Contractor shall exercise all means necessary to maintain temporary facilities and controls in proper and safe condition throughout the progress of the project.

1.2.2 All required connections to existing utility systems shall be made with minimum disruption. If disruption of existing service is required, notice shall be given to the Owner and connections shall not be made without Owner's approval. If necessary, Contractor shall provide for alternate temporary service.

1.2.3 If the required utility is not available from the Owner, the Contractor shall provide for alternate temporary service for the duration of the project.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Electricity

3.1.1 Owner will furnish electricity to the Contractor during this project only at available electrical outlets located on the exterior of the building. Any additional electrical requirements required by the Contractor shall be provided by the Contractor at no additional cost to the Owner.

3.1.2 All wiring needed to facilitate construction of the project shall be temporary in nature and shall be furnished and installed by the Contractor at no additional cost to the Owner. Upon completion of the work, the Contractor shall remove all such temporary wiring and restore service to its original condition at no additional cost to the Owner.
3.2 Water: The Owner will furnish water required for construction through available hose bibs. Any additional water requirements by the Contractor shall be provided by the Contractor at no additional cost to the Owner.

3.3 Telephone: The project Superintendent will be required to have a working mobile phone during the work. Such costs shall be included in the Base Bid.

3.4 Sanitary Facilities: Contractor shall provide toilet and washroom facilities at the project site at no additional cost to the Owner. The use of the facility’s toilet and/or washroom facilities is not approved.

3.5 Enclosures

3.5.1 Contractor shall furnish, install and maintain for the duration of the project, all scaffolds, ladders, tarpaulins, barricades, warning signs, platforms, bridges, canopies, steps, and other temporary construction required to properly facilitate completion of the project in compliance with all safety and other regulations.

3.5.2 Contractor shall provide all necessary safeguards to warn and prevent pedestrians and Owner's personnel from being exposed to dangers or hazards created by this project.

3.6 Signs: No signs or advertising of any kind shall be allowed on the project site unless approved in advance by Owner.

3.7 Construction Aids

3.7.1 A disposal chute shall be constructed by Contractor to prevent damage to buildings and grounds. Disposal chute shall be enclosed-type and shall be located such that demolition debris will be discharged from the roof at the designated staging area directly into disposal vehicles or containers.

3.7.2 Contractor shall provide for debris removal services and containers. Placement and servicing of containers shall be coordinated with the Owner.

3.7.3 Residue and debris from all operations shall not be allowed to accumulate on the project site. Debris shall be removed and properly disposed of daily in accordance with all Federal, state and local regulations.

3.7.4 Dust, dirt and debris created by project construction shall be properly contained or controlled by the Contractor. Method(s) of control shall be approved by the Designer.

3.8 Parking: Contractor's construction vehicles shall enter the project site and park in areas as directed by the Owner. The Contractor shall be responsible for coordination of traffic by his subcontractors, suppliers, etc., so as not to disrupt ongoing operations of the Owner.

3.9 Field Office: The Contractor may provide his own Field Office. The location is subject to the approval of the Owner.

3.10 Ventilation

3.10.1 Provide, as required, facilities to maintain specific storage conditions as described within this Specification and as recommended by the material's manufacturer for use in construction.

3.10.2 Provide adequate ventilation of enclosed areas to prevent the accumulation of fumes, vapors, and gases.
3.11 Connects and Disconnects

3.11.1 In the event it is necessary to disconnect any electrical wiring or connections, plumbing lines or other building services, notify the Owner. Contractor shall not disconnect or connect services unless authorized in writing by Owner.

3.11.2 Modification of existing service piping, wiring and duct work required in connection with the lifting, removal or relocation of roof-mounted equipment shall be accomplished by the Contractor as part of his Contract.

3.11.2.1 Contractor shall not disconnect existing P-traps from HVAC units until new copper P-traps are ready to be installed. Contractor shall protect the existing roof deck, new insulation system, new roof system from water entry and/or damage at existing P-trap locations during roof replacement.

END OF SECTION
SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 Summary

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

1.1.2 See Section 01 77 00 for submitting warranties for Contract closeout.

1.1.3 See Divisions 02 through 07 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 Definitions

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

1.2.1.1 Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.

1.2.1.2 Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.2.2 Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. It may be in certain instances but is not necessarily the intent of product Specifications to limit the use of product manufacturers and model numbers to those listed by name. As a minimum, all requirements of the Specifications must be met, including but not limited to in regard to appearance, function, quality, durability, and source reliability. Actions and approvals regarding products and product substitutions will occur in a manner that suits and is in the best interest of the Owner.

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

1.2.4 All material must comply with specifications and referenced standards as minimum requirements. The latest edition of referenced standards apply, unless specifically stated otherwise.

1.2.5 Do not use materials and equipment removed from the existing structure, except as specifically required or allowed by the Contract documents.

1.3 Submittals
1.3.1 Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles. Substitutions under this paragraph shall only be considered when the specified product has become unavailable at no fault of the Contractor.

1.3.1.1 Substitution Request Form: Use CSI Form 13.1A.
1.3.1.2 Documentation: Show compliance with requirements for substitutions and the following, as applicable:
1.3.1.3 Statement indicating why specified material or product cannot be provided, or an explanation why Contractor wishes to provide an alternate material or product.
1.3.1.4 Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
1.3.1.5 Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
1.3.1.6 Product Data, including drawings and descriptions of products and fabrication and installation procedures.
1.3.1.7 Samples, where applicable or requested.
1.3.1.8 List of similar installations for completed projects with project names and addresses and names and addresses of Designer and owners.
1.3.1.9 Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
1.3.1.10 Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
1.3.1.11 Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
1.3.1.12 Cost information, including a proposal of change, if any, in the Contract Sum.
1.3.1.13 Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
1.3.1.14 Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results, or because of adverse unforeseen conditions or expenses resulting from the substitution.
1.3.1.15 Designer's Action: If necessary, Designer will request additional information or documentation for evaluation of a request for substitution. Designer will notify Contractor of acceptance or rejection of proposed substitution within 1 day of receipt of request, or 1 day of receipt of additional information or documentation, whichever is later.
1.3.1.16 Form of Acceptance: Change Order.
1.3.1.17 Use product specified if Designer cannot decide on use of a proposed substitution within time allocated.

1.3.2 Comparable Product Requests: Must be submitted a minimum of 10 days prior to bid. Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number, product data sheets, and title and Drawing numbers and titles.

1.3.2.1 Designer's Action: If necessary, Designer will request additional information or documentation for evaluation within 48 hours of receipt of a request for substitution. Designer will notify all Contractors of acceptance or rejection of proposed substitution within 3 days of receipt of
1.3.2.2 Form of Approval: Addendum.

1.3.2.3 Use product specified if Designer cannot decide on use of a comparable product request within time allocated.

1.4 Quality Assurance

1.4.1 Contractor shall be responsible for all aspects of material and equipment transportation, delivery, unloading, handling, storage, etc., necessary to get materials and equipment to the roof.

1.4.2 Deliver all materials with manufacturer's labels intact and legible.

1.5 Product Options

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

1.6 Product Delivery, Storage, and Handling

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

1.6.2 Delivery and Handling:

1.6.2.1 Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

1.6.2.2 Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

1.6.2.3 Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

1.6.2.4 Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

1.6.3 Storage:

1.6.3.1 Store products to allow for inspection and measurement of quantity or counting of units.

1.6.3.2 Store materials in a manner that will not endanger Project structure.

1.6.3.3 Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.

1.6.3.4 Store cementations products and materials on elevated platforms.

1.6.3.5 Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.

1.6.3.6 Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

1.6.3.7 Protect stored products from damage and liquids from freezing.

1.7 Product Warranties

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

1.7.1 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
1.7.1.2 Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.7.2 Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1.7.2.1 Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
1.7.2.2 Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
1.7.2.3 Refer to Divisions 02 through 07 Sections for specific content requirements and particular requirements for submitting special warranties.

1.7.3 The material manufacturer(s) providing warranties or guarantees as a part of this contract shall provide a letter with the pre-construction submittals stating that they have examined the plans, details, and specifications and have the intent to provide the warranty or guarantee required under this contract. The letter shall also state that the installing contractor is of adequate level and is in good standing to obtain the warranty or guarantee requested.

1.7.4 If the material manufacturer shall have any exceptions to the work as shown or described in the plans, details, or specification, that manufacturer shall provide written documentation to the Designer by way of a bidder a minimum of 10 days prior to bid with a list of any work described or shown on the plans, details, or specification that do not meet the manufacturer(s) minimum requirements to obtain the specified warranty or guarantee, or that do not meet minimum industry standards. No exceptions or modifications to the terms of warranties or guarantees shall be made after the bid.

1.7.5 All warranties that are normally available from manufacturers, vendors, Subcontractors, etc. shall be provided to the Owner, even if these warranties are not specifically called for in the Contract Documents.

1.7.6 Submittal Time: Comply with requirements in Section 01 77 00.

PART 2 - PRODUCTS

2.1 Product Selection Procedures

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

2.1.1.1 Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2.1.1.2 Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
2.1.1.3 Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
2.1.1.4 Where products are accompanied by the term "as selected," Designer or Owner will make selection.
2.1.1.5 Where products are accompanied by the term "match sample," sample to be matched is Designer’s.

2.1.1.6 Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

2.1.2 Product Selection Procedures:

2.1.2.1 Product: Where Specification names a single product and manufacturer, provide the named product that complies with requirements.

2.1.2.2 Manufacturer/Source: Where Specification names a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.

2.1.2.3 Available Products: Where Specification includes a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements, as determined by the Designer. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product.

2.1.2.4 Available Manufacturers: Where Specification includes a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements, as determined by the Designer. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product.

2.1.2.5 Product Options: Where Specification indicates that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product or system.

2.1.2.6 Basis-of-Design Product: Where Specification names a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specification indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

2.1.2.7 Visual Matching Specification: Where Specification requires matching an established Sample, select a product that complies with requirements and matches Designer's sample. Designer's decision will be final on whether a proposed product matches.

2.1.2.8 If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

2.1.2.9 Product: Where Specification names a single product and manufacturer, provide the named product that complies with requirements.

2.1.2.10 Standard Range: Where Specification includes the phrase "standard range of colors, patterns, textures" or similar phrase, Designer will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.

2.1.2.11 Full Range: Where Specification includes the phrase "full range of colors, patterns, textures" or similar phrase, Designer will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 Product Substitutions

2.2.1 Timing: Designer will consider requests for substitution if received within 5 days after the Proceed Order. Requests received after that time may be considered or rejected at the discretion of the Designer.

2.2.2 Conditions: Designer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Designer will return requests without action, except to record noncompliance with these requirements:
2.2.2.1 Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Designer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

2.2.2.2 Requested substitution does not require extensive revisions to the Contract Documents.

2.2.2.3 Requested substitution is consistent with the Contract Documents and will produce indicated results.

2.2.2.4 Substitution request is fully documented and properly submitted.

2.2.2.5 Requested substitution will not adversely affect Contractor's Construction Schedule.

2.2.2.6 Requested substitution has received necessary approvals of authorities having jurisdiction.

2.2.2.7 Requested substitution is compatible with other portions of the Work.

2.2.2.8 Requested substitution has been coordinated with other portions of the Work.

2.2.2.9 Requested substitution provides specified warranty.

2.2.3 Should, subsequent to the approval or implementation of a substitution, there occur a discovery of an unforeseen circumstance or condition that is attributable to the substitution, the Contractor shall be responsible to bear any additional costs or to return to the Owner any cost savings resulting from the discovery.

2.3 Comparable Products

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

2.3.1.1 Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents, and will produce the indicated results, and that it is compatible with other portions of the Work.

2.3.1.2 Product data sheets of proposed materials

2.3.1.3 Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

2.3.1.4 Evidence that proposed product provides specified warranty.

2.3.1.5 List of similar installations for completed projects with project names and addresses and names and addresses of Designers and owners, if requested.

2.3.1.6 Samples, if requested.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION
SECTION 01 66 00
STORAGE AND PROTECTION

PART 1 - GENERAL

1.1 General Protections

1.1.1 Limit size of work sections to safeguard adjacent materials, structures, etc., and to minimize dust and noise.

1.1.2 Protect existing facilities from damage during work. Do not overload existing paving, curbs, sidewalks, etc. with vehicle traffic. Do not overload new or existing construction with demolition debris, equipment, etc.

1.1.3 Plywood, minimum ¾" thick, or other suitable materials shall be used to protect roof areas from damage that may be caused by concentrated equipment loads and foot traffic.

1.1.4 Roof traffic shall be confined to work areas. Contractor shall be responsible for leaks that develop in traffic areas during and after project completion.

1.1.5 Self-supporting ramps shall be used where expansion joints, area dividers, etc. are to be crossed.

1.1.6 Contractor shall protect interior operations from adverse weather during roofing operations.

1.1.7 At the end of each work day, the contractor shall apply nightly temporary tie-ins to ensure that the building is weather tight, and that newly installed materials are free from moisture and debris. Newly install materials coming in contact with moisture and debris is grounds for rejection of materials and shall constitute the replacement of the materials with like materials at no additional cost to the Owner.

1.1.8 The Contractor will be held liable for any damages to the building, building contents, its occupancy, grounds or landscaping resulting from work under the Contract. In the event of damage, Contractor will restore property to a condition equivalent to that at the time the project started.

1.1.9 The Contractor shall keep existing drainage facilities and associated leaders/downspouts clear of debris and bitumastic materials during construction. The Contractor will be required to use elastomeric plugs to protect leaders/downspouts during demolition and re-roofing operations.

1.1.10 Prior to the start of re-roofing operations, the Contractor has the option to water test all drain leaders and lines for clogs prior the start of work. All findings shall be immediately reported to the Owner/Designer in writing for direction prior to proceedings.

1.1.10.1 Failure to perform this option and proceeding with work shall serve as the acceptance of the existing drain leaders and lines to be functioning at one-hundred percent (100%) capacity prior to the start of re-roofing operations.

1.1.10.2 Furthermore, with this acceptance, the Contractor shall be responsible to ensure that drain leaders and lines are functioning at one-hundred (100%) capacity prior to the Final Payment at no additional cost to the Owner.

1.1.11 Prior to the start of re-roofing operations, the Contractor shall provide Owner personnel with plastic bags/tarps which will be used by personnel to protect televisions, computers, and other associated
Storage and Protection 01 66 00 2

equipment during the period of time that re-roofing operations are occurring. Bags/tarps shall be provided a minimum of one week prior to the start of re-roofing operations. Costs for providing such materials shall be included in the Base Bid.

1.1.11.1 Contractor will still be required to provide any other additional protection to interior items as may be deemed necessary to comply with the requirements of the Contract Documents.

1.1.12 Schedule of Interior Protections

1.1.12.1 The contractor bears the responsibility to locate any conduits that are in the decking flutes prior to the start of the work. The contractor shall to the full extent possible, not engage these conduits with screws, fasteners, etc. Should power be lost due to penetrate a conduit, the Contractor bears the responsibility to locate and repair the conduit and/or enclosed wiring to the original condition to restore power to the Owner. Cost associated with these repairs shall be borne by the Contractor at no additional cost to the Owner.

Repairs to wiring, electrical equipment, and accessories under this paragraph shall be performed by an electrical contractor licensed to perform such work in the state of South Carolina with a minimum of 5 years experience in this type of work.

1.1.13 Exterior Protections

1.1.13.1 Provide construction trailer, if desired, and material staging at location provided by the Owner at the pre-bid meeting.

1.1.13.2 Maintain a clean construction area in fencing. Maintain a clean material staging area in fencing. No spills, splatter, or residue shall remain on tarmac, roads or grounds.

1.2 Safety Site Plans

1.2.1 The Contractor shall install and maintain temporary fall protection systems for this type of work in accordance with the following standards:

1.2.1.1 29 CFR 1910 - OSHA
1.2.1.2 29 CRF 1926 - OHSA
1.2.1.3 ANSI/IWCA I-14.1
1.2.1.4 ANSI/ASSE Z359.0-2007
1.2.1.5 ASME A120.01-2008

1.2.2 The Contractor shall submit a site-specific safety plan that shall outline safety precautions that shall be in place to protect workers, buildings, persons, vehicles, structures, and any other items that may be affected or otherwise endangered during the work. This shall list techniques, materials, safety personnel, and precautions that shall be used to achieve a safe working environment. Include sketches, plans, and diagrams, as necessary, for assessment with the safety plan. This safety plan shall be submitted to the Owner for approval with the bid. Failure to submit a safety plan shall result in disqualification of the bid and the bid shall be labeled “non-responsive”. At a minimum, this safety plan shall include:

1.2.2.1 General Safety requirements.
1.2.2.2 Protocol for providing a safe working environment for Contractor Employees, in accordance with Paragraph 1.1.3 above.

i  Temporary fall restraint systems and anchorages,

ii Warning lines and barricades,

iii Safety meetings and minutes.

1.2.2.3 Wind speed working conditions, and protections for temporary roofing in high speed events.

1.2.2.4 Protocol for fire safety,

i  Equipment checklist for proper operation,

ii  Fire extinguisher locations for every open flame,

iii Wind requirements for open flames,

iv Monitoring any open flame work for subsequent combustion.

1.2.2.5 Protocol for night/pre-dawn work, including foot-candle lighting, safety monitor per number of workers, barricades encapsulating work areas, 100% tie-in outside of barricaded work area, etc.

1.2.2.6 Protocol for deviations from submitted safety plan on a temporary, as needed basis.

Note: This safety plan schedule outlines minimum requirements, and this plan is subject to expansion and approval by the Owner.

1.2.3 Protect existing facilities from fire as a result of construction operations. Contractor shall provide suitable and adequate fire extinguishers conveniently located at staging areas, storage areas and at areas or equipment where an open flame is being used. Competent operators shall be in attendance at all times and shall be properly trained or instructed in fire protection.

1.2.3.1 At each location where an open flame is used, Contractor shall provide a watchman with a suitable fire extinguisher.

1.3 Material Protection

1.3.1 Products shall be transported by methods which avoid damage. Damaged material shall be subject to rejection by the Designer.

1.3.2 Store materials off the ground covered with tarps. Factory-applied wrappings are not acceptable.

1.3.3 Wet materials shall be removed from the project site.

1.3.4 Asphalt products may be stored on the ground but covered. Materials that are temperature sensitive are to be stored in strict accord with manufacturer's written instructions.

1.4 Storage
1.4.1 Contractor shall be responsible for proper storage of equipment, materials and devices furnished by himself and/or his subcontractors and suppliers.

1.4.2 To the maximum extent possible, the Contractor shall not store combustible or flammable materials inside the facility.

1.4.3 All storage areas are subject to approval by the Owner or his authorized representative.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION
PART 1 - GENERAL

ASBESTOS PRODUCTS

1.1 Related Documents:

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

1.2 Summary:

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

1.3 Procedures:

1.3.1 Refer to attached report for asbestos in existing roofing materials.

1.4 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 Designer, 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:

1.5.1 Upon completion of the work, and before final payment and/or release of retainage, submit, and obtain from each contractor, 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)
2/4/2020

Dylan Johnson
Raymond Engineering
1224 Royal Drive
Conyers, GA 30094

RE: Sample Analysis
GSP1010.058
Taylor ES

Enclosed is a summary and the analysis of samples delivered to MAS, LLC on 1/28/2020.

It was requested that we analyze the samples using Asbestos in Building Materials PLM.

The samples were analyzed in accordance with EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials.

These analysis results relate only to the specific items analyzed. Any partial reproduction of the attached report may not be made without the consent of MAS, LLC. The attached report may not be used to imply product endorsement or certification by MAS, LLC, the National Voluntary Laboratory Accreditation Program, the EPA, or the U.S. Government.

Materials Analytical Services appreciates this opportunity to have been of service to you. We look forward to working with you on future projects.

Sincerely,
MAS Microscopy Department
EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Dylan Johnson  
Raymond Engineering  
1224 Royal Drive  
Conyers, GA 30094

Order #: T2000098  
Date Received: 1/28/2020  
Date Analyzed: 2/3/2020  
Date Reported: 2/4/2020

Customer Project: GSP1010.058, Taylor ES

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Approved By: Paul Hess  
PLM Analyst  

Analyst: cdubour

© The samples were analyzed in accordance with EPA document 600/R-93/116, "Method for the Determination of Asbestos in Bulk Building Materials" and/or EPA document 40 CFR Appendix E to Subpart E of Part 763, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples". The method detection limit is 1% unless otherwise stated. This report relates only to items tested as received, and may not be used to claim endorsement or certification by MAS, LLC, the National Voluntary Laboratory Accreditation Program, EPA, or the U.S. Government. This report may not be reproduced except in full without the approval of MAS, LLC, (NVLAP Lab Code 101235-0).
BULK SAMPLING CHAIN OF CUSTODY

COMPANY NAME: Raymond
ADDRESS: 1224 Royal DR SW
Conyers, GA 30013
PHONE: 404-345-8201

PROJECT NUMBER: GSP 1010.058
PROJECT NAME: Taylor ES
Email: dylan.johnson@raymondllc.com
PROJECT REPRESENTATIVE: Dylan Johnson
SAMPLING DATE: 1-21-20

TURNAROUND TIMES: ___ 1 DAY ___ 3 DAYS X STANDARD 5-7 DAYS

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CHAIN OF CUSTODY

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ASBESTOS FREE WARRANTY

Owner: ____________________________________________

Location of Building: ____________________________________________

Name of Building: ____________________________________________

Know all men by these presents that we, ____________________________________________ having furnished labor, materials, equipment and/or supplies; removed roofing, roof insulation, vapor retarder, flashings and/or miscellaneous roof system components; accomplished certain repairs to existing roof system; installed new roofing, roof insulation vapor retarder, flashing and/or miscellaneous roof system components; from, to and/or on ____________________________________________ as shown on the roof plan below, under contract between ____________________________________________ and ____________________________________________.

(Counselor, Subcontractor, Material Supplier or Equipment Manufacturer)

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

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

Exceptions: ____________________________________________

(If there are no exceptions, state “No Exceptions” here)

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

WITNESS:

________________________________________

Company

________________________________________

By

Notary Public

END OF SECTION
SECTION 01 74 00
CLEANING

PART 1 - GENERAL

1.1 Description

1.2 To maintain the buildings and site in a clean condition throughout the duration of the project. The Contractor shall comply with all requirements for cleanliness described in other sections of these Specifications.

PART 2 - PRODUCTS

2.1 The Contractor shall provide all required manpower, material and equipment to maintain the specified standard of cleanliness.

2.2 Contractor shall use only those materials and equipment which are compatible with the surface being cleaned as recommended by the manufacturer or approved by the Designer.

PART 3 - EXECUTION

3.1 Progress Cleaning

3.1.1 Stored items shall be kept in an orderly arrangement allowing maximum access and shall not impede drainage or traffic.

3.1.2 Scrap, debris, waste material and other items shall not be allowed to accumulate and shall be removed from the roof daily.

3.1.3 Contractor shall protect new roofing membrane from dirt and debris during the demolition of the remainder of the roofing. Areas with new roofing membrane shall be kept clean and free of debris during the duration of the re-roofing.

3.1.4 Contractor shall provide storage containers for all items awaiting removal from the site. Storage containers shall be approved by the Designer.

3.1.5 The Contractor shall conduct daily inspections to ensure that the requirements for cleanliness are met.

3.1.6 At locations where the Contractor accesses the site or designated changing areas, the Contractor shall maintain a clean site. The Contractor shall protect the Owners’ building from damage, staining, soiling, roofing materials, and roofing debris. This shall also include, at a minimum, the weekly cleaning of these areas. "Clean" shall be interpreted as meaning the level of cleanliness generally attainable by skilled cleaners using commercially available building maintenance equipment and materials.

3.1.7 Work may be stopped or delayed by the Owner should the Contractor fail to take appropriate measures to clean the site daily. Extensions to the project completion date for such delays will not be approved.

3.2 The Contractor shall inspect all arrangements of materials stored on the project site on a weekly minimum basis and shall service all arrangements in accordance with the requirements of Paragraph 3.1.1 of this section.

3.3 Final Cleaning
3.3.1 Except as specifically provided otherwise, "clean" shall be interpreted as meaning the level of cleanliness generally attainable by skilled cleaners using commercially available building maintenance equipment and materials.

3.3.2 All tools, equipment, materials, scrap, debris and waste shall be removed from the project site and a final progress cleaning conducted in accordance with this Section.

3.3.3 Unless otherwise directed by the Designer, the Contractor shall clean all adjacent areas on the site and completely remove all resultant debris.

3.3.4 The Contractor shall clean out all gutters and associated downspouts of any debris prior to final acceptance by the Owner. Such work shall be performed at no additional cost to the Owner.

3.3.5 Restore grass or planted areas by filling ruts, raking, seeding, planting, sodding, and fertilizing. Sweep paved areas.

3.3.6 Contractor shall visibly inspect all exterior surfaces and remove all traces of dirt, waste materials, smudges, splashed materials and other foreign matter. The Designer may require that light sandblasting or other cleaning be performed at no cost to the Owner. If such cleaning is required, the Contractor shall take all necessary precautions to prevent damage to adjacent materials, property and vegetation.

3.3.7 Prior to final inspection, the surface of the membrane shall be cleaned of all debris, dust, and foreign material. This may require the use of water, detergents, and other cleaning agents approved by the roofing system manufacturer. Contractor will be responsible for providing the necessary items to perform this task. Do not use any abrasive pads that can score the polymer.

3.3.7.1 During the work, the Contractor or subcontractor shall not be allowed to stage materials on newly installed roofing. The Contractor shall phase work and stage necessary materials at existing roofing areas. Any damage to new membrane during construction shall result in repairs to the membrane at no additional cost to the Owner, and large areas shall result in the removal and replacement of new membrane at no additional cost to the Owner.

END OF SECTION
SECTION 01 77 00
PROJECT CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 Description: To provide a specific format for substantial completion and final inspection.

1.2 Related Requirements Specified Elsewhere

1.2.1 Completion: Waiver of Claims, General Conditions

1.2.2 Cleaning: Section 01 74 00

1.2.3 Project Record Documents: Section 01 78 39

1.2.4 Warranties: Section 01 78 36

1.2.5 Closeout Submittals Required for Trades: Respective Section of Specification

1.2.6 Substantial Completion: Conditions of the Contract.

1.2.7 Final Payment: General Conditions

1.3 Quality Assurance: All documents submitted to the Owner shall be signed by a person authorized to endorse Contracts on behalf of the Contractor

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Substantial Completion

3.1.1 The Contractor shall submit written certification to the Owner when the project or designated portion of the project is substantially complete. A list of major items to be completed or corrected shall be stated.

3.1.2 The Owner will make an inspection within ten (10) days after receipt of certification and issue a Certificate of Substantial Completion containing:

3.1.2.1 The Date of Substantial Completion.

3.1.2.2 The Contractor's list of items to be completed or corrected and any amendments by the Owner or Designer.

3.1.2.3 The time to be allowed for the Contractor to complete or correct listed items.

3.1.2.4 The time and the date Owner will assume possession of the work or designated portion thereof.

3.1.2.5 The signatures of the Owner, Designer and Contractor.

3.1.3 The Contractor shall then complete or correct those items so listed within the designated time and inform the Owner upon completion.

3.1.4 Should the Owner determine that the work is not substantially complete, the Owner shall immediately
notify the Contractor in writing stating reasons. The Contractor shall then complete the work and send a second written notice to the Owner certifying that the project, or designated portion thereof, is substantially complete. The Owner will re-inspect the work within ten (10) days after receipt of certification.

3.2 Final Inspection

3.2.1 The Contractor shall submit written certification to the Owner that:

3.2.1.1 The Contract Documents have been reviewed.
3.2.1.2 Work has been completed in accordance with the Contract Documents.
3.2.1.3 The project has been inspected for compliance with the Contract Documents.
3.2.1.4 The project is ready for final inspection.

3.2.2 The Owner will make a final inspection within ten (10) days after receipt of certification.

3.2.3 Should the Owner determine that the work is finally complete in accordance with the requirements of the Contract Documents, the Owner will request that the Contractor submit the appropriate project closeout documentation.

3.2.4 Should the Owner determine that the work is not finally complete, the Owner will immediately notify the Contractor in writing stating reasons. The Contractor shall then take immediate measures to remedy the stated deficiencies and send an additional written notice to the Owner certifying that the work is complete. The Owner will re-inspect the work within ten (10) days after receipt of certification.

3.3 Re-Inspection Costs: Should the Owner be required to perform additional inspections due to noncompliance of work with the certifications of the Contractor, the Contractor shall compensate the Owner for such additional services. Such costs will be deducted from final payment to the Contractor.

3.4 Closeout Submittals

3.4.1 Project Record Documents: As required by Section 01 78 39

3.4.2 Warranties: As required by Section 01 78 36

3.4.3 Evidence of payment and release of liens: Waiver and Release Upon Payment – Final.

3.4.4 Consent of Surety

3.4.5 Contractor’s Affidavit of Payment of Debts and Claims: AIA G706.

3.4.6 Contractor’s Affidavit of Release of Liens: AIA G706A.

3.4.7 The Contractor shall be responsible for proper execution of all submittals required by this Section prior to delivery to the Owner through the Designer.

3.4.8 The Contractor shall submit a final statement of accounting to the Owner. The statement shall reflect all adjustments including, but not limited to:

3.4.8.1 Original Contract sum.
3.4.8.2 Change Orders noting such items as:
   i Unit Prices
ii Cash Allowances  
iii Deductions for Uncorrected Work  
iv Deductions for Re-Inspection Payments  
v Other Adjustments  

3.4.8.3 Total adjusted Contract sum  
3.4.8.4 Previous payments  
3.4.8.5 Remaining amount due  

3.4.9 The Owner will prepare a final Change Order reflecting approved adjustments not previously noted.  

3.5 Final Application for Payment  

3.5.1 The Contractor shall submit final application for payment in accordance with the specifications.  

3.5.2 The Owner will issue a final certificate in accordance with the specification.  

END OF SECTION
SECTION 01 78 36
WARRANTIES

PART 1 - GENERAL

1.1 Upon completion of the work and prior to the final payment, the Contractor shall submit the required contractor’s warranty and/or manufacturer’s guarantee, as required by this Section.

1.2 Submit all items required by this Section as part of project record documents, Section 01 78 39.

1.3 Warranties and Bonds

1.3.1 Comply with the General Conditions of the Contract concerning warranties and bonds. The Contractor shall agree that the work covered under this Contract shall remain free from any water penetration and physical defects caused by defective workmanship or materials for a period of two (2) years from the date of final acceptance by Owner. Warranty shall be executed on Contractor's company letterhead and signed by an authorized officer of the company.

1.3.2 Prior to final payment, Contractor shall submit one original and three copies of the roofing system manufacturer’s twenty (20) year, No Dollar Limit Guarantee, with flashing endorsement, to the Owner.

Note: There have been instances where a problem has arisen with the material performance of a product that has been approved by the roofing system manufacturer, but is not manufactured by the roofing system manufacturer. In those instances where a product defect or failure occurs, even if the failure/defect does not result in leaks through the membrane and/or facility, the roofing system manufacturer shall work in concert with the roofing contractor to resolve such issues to the satisfaction of the Owner at no additional cost to the Owner.

1.3.3 Prior to final payment, the contractor shall furnish one original and three copies of the metal flashing manufacturer’s 20-year finish warranty for factory applied finishes.

1.3.4 Emergency repairs to defects and leaks shall be performed within 24 hours of receiving notice from Owner. As soon as weather permits, permanent repairs and restoration of affected areas shall be accomplished in a manner in conformance with the original Contract requirements. This work shall be done without additional cost to the Owner, except if it is determined that such leaks and effects were caused by abuse, lightning, hurricane, tornado, hail storm, or other unusual phenomena.

1.3.5 The warranties shall also state that the Owner has the right, at any time during the two-year Contractor's warranty period to make emergency repairs to protect the contents of the building or the building itself from damage due to leaking. The cost of emergency repairs made during the two-year period of the warranty shall be borne by the Contractor and action by the Owner shall not invalidate the warranty.

1.3.6 Starting dates of all warranties shall be the date of the final inspection and Owner acceptance.

END OF SECTION
(Print Warranty Body on Contractor’s Company Letterhead)

WARRANTY

1. Known all men by these presents, that we, Contractor shall insert company name here (Contractor), having installed insulation, roofing, flashings, and sheet metal work, and having accomplished certain other work on Taylors Elementary School, Roof Areas A – I, under Contract between Greenville County Schools and (Contractor) warrant to Greenville County Schools, with respect to said work that for a period of two years from date of final acceptance of said work by Greenville County Schools, 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:

   a. Defects or failure resulting from abuse by the Owner.
   b. Defects in design involving failure of the structure, load-bearing walls, and/or foundations.
   c. Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, and/or civil commotion.

2. We 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/or general practice.

3. We further agree that for a period of two years from date of final acceptance 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.

4. We also agree that the Owner has the right, at any time during the two -year warranty period, to make emergency repairs to protect the contents of the building or the building itself from damage due to leaking. The cost of emergency repairs made during the two years of the warranty period shall be borne by the Contractor and action by the Owner shall not invalidate the warranty.

IN WITNESS WHEREOF, we have caused this instrument to be duly executed, this __day of ________, 2020.

__________________________________ by___________________________________
Contractor  President

__________________________
Notary Public
PART 1 - GENERAL

1.1 Summary: To maintain an accurate record of the project throughout its duration. Items to be noted include, but are not necessarily limited to:

1.1.1 Contract Documents
1.1.2 Addendum
1.1.3 Change Orders
1.1.4 Field Orders and Instructions.
1.1.5 Construction Schedule.
1.1.6 Shop Drawings
1.1.7 Product Samples
1.1.8 Progress Reports

1.2 Quality Assurance:

1.2.1 The Contractor shall delegate responsibility for maintenance of the record documents to one person on the Contractor's staff as approved by the Designer.

1.2.2 All entries shall be made within 24 hours after receipt of information.

1.3 Submittals: The Contractor shall submit the final record documents to the Designer for approval prior to submitting a request for final payment. Submit two copies of "as-built" documents to Designer with letter of transmittal indicating date, project title, Contractor's name and address, list of documents, and signature of Contractor.

1.4 Product Handling: Contractor shall take all necessary precautions to protect the record documents from deterioration loss and damage until completion of the work and transfer of the recorded data to the final record documents.

PART 2 – PRODUCTS: Not Used.

PART 3 – EXECUTION: Not Used.

END OF SECTION
DIVISION 02

EXISTING CONDITIONS
SECTION 02 41 13
SELECTIVE DEMOLITION AND PREPARATIONS

PART 1 - GENERAL

1.1 Work Included: Unit price repairs, curb modifications, pipe modifications, HVAC piping removal.

1.2 Related Work Specified Elsewhere

1.2.1 Temporary Facilities and Controls - Section 01 50 00

1.2.2 Product Requirements - Section 01 60 00

1.2.3 Storage and Protection - Section 01 66 00

1.2.4 Miscellaneous Rough Carpentry - Section 06 10 53

1.3 Protection: Refer to Section 01 66 00.

PART 2 - PRODUCTS

2.1 Sheet Metal: 20-gauge galvanized steel.

2.2 Metal Deck Primer: Kem Kromik as manufactured by Sherwin Williams, or approved equal.

2.3 Metal Deck: ASTM A 653, galvanized G-90 deck, manufactured in accordance with the requirements of the Steel Deck Institute, Inc. for wide rib (Type B). Minimum section properties:

2.3.1 Yield strength = 33 ksi.

2.3.2 Thickness: 22 gauge.

2.3.3 Panel Coverage: minimum 36 inches.

2.4 Deck-to-Joist Fastener: ASTM A240, 410 stainless steel, self-drilling minimum #12 stainless steel screw with a nominal head diameter of 0.430 inches. Screws shall penetrate the substrate a minimum of 1-1/2 inch.

2.5 Deck Side Lap Screws: ASTM A240, 410 stainless steel, self-drilling minimum #10 stainless steel screw with a nominal head diameter of 0.415 inches. Screws shall penetrate the substrate a minimum of 1 inch.

2.6 Wood Screws: #12 double-coated galvanized steel screws or stainless steel self-tapping wood screws that shall be able to resist any galvanic action that may be able to develop between the nail and the pressure treatment. The use of a lesser quality screw will not be approved. Screws shall be of sufficient length to penetrate a minimum of 1-1/2 inches into the substrate.

2.7 Wood Nails: For securing new lumber to new lumber or new plywood/OSB to new lumber, double-coated galvanized steel or stainless-steel ring shank nails to penetrate a minimum of 1-1/2 inches into the substrate but not smaller than 8d nails. Use 16d nails where material being secured is 1½ to 2 inches thick.
PART 3- EXECUTION

3.1 Demolition

3.1.1 Refer to Section 01 11 00 Summary of Work.

3.1.2 The removal of roof-mounted equipment and/or curbs, as identified either on plans and/or marked on the roof, shall be included in the Base Bid.

3.1.3 The Designer and Contractor shall document the actual quantities removed for materials bid on a unit price basis.

3.1.4 All existing roof mounted equipment shall be lifted or removed so that existing flashings can be totally removed.

3.1.5 Remove only as much material as can be totally replaced in the same day.

3.1.6 Demolition shall be performed by personnel familiar with the replacement of materials being used.

3.1.7 Demolition adjacent to areas to remain shall be performed in a neat manner with straight lines to facilitate tie-ins of replacement materials. Contractor shall review tie-in methods with the Designer for approval. Designer has final approval of such methods.

3.1.8 Excessive demolition, as determined by the Owner's representative, shall be replaced with equal materials at the Contractor's expense in accordance with the General Conditions of the Contract.

3.1.9 No demolition shall be performed if the chance of precipitation is 40% or more as reported by the nearest office of the National Weather Service.

3.2 Preparations

3.2.1 Prior to the installation of any new roofing, flashings, metal flashings, any other miscellaneous items, the Contractor shall clean surfaces of all dust, dirt, and other foreign materials.

3.2.2 Inspect the deck carefully. If, in Contractor's opinion, there are metal deck areas that require repair and/or replacement, notify the Designer. Do not proceed with any repairs or replacement until directed by the Designer.

3.2.3 Prior to the installation of any new roofing materials, extend all existing soil pipe vents through the roof to a minimum height of 8 inches (or as required by local plumbing codes) above the finished roof surface. Furnish a piece of PVC piping that will fit snugly into the existing soil pipe vent and shall extend into the pipe a minimum of 12 inches. Provide a second PVC pipe that fits snugly around the smaller PVC pipe and shall provide a minimum 8" height above the finished roof surface. The smaller pipe height shall match the outer pipe. Cement the two PVC pipes together with an approved pipe solvent/glue. Insert the extension into the existing soil pipe vent.

Note: The placement of a PVC pipe extension directly on top of the existing soil pipe vent without the support method described above shall be removed by the Contractor and new extensions approved by the Designer shall be installed at no additional cost to the Owner.
3.2.4 **(Unit Price No. 1)** Where wood blocking or curbs are damaged or deteriorated, remove existing wood blocking to a point 6 inches beyond the damage and/or deterioration, and repair and/or replace with new wood blocking to match existing. Secure new blocking to the substrate using specified screws at spacing’s not to exceed 12 inches on-center, staggered pattern. Contract shall include 150 board feet of wood blocking replacement in the Base Bid.

3.2.5 **(Unit Price No. 2)** Where steel decking is rusted but remains structurally sound, wire brush deck units so that all rust is removed. Paint with specified metal primer, or approved equal, and allow to dry before proceeding with the installation of new materials. Contract shall include 250 square feet of metal deck priming in the Base Bid.

3.2.6 **(Unit Price No. 3)** Where steel decking is damaged or rusted through in small areas, clean deck of rust with a wire brush. Paint with specified metal primer or approved equal. Install over the damaged area the specified sheet metal that shall be secured to the existing steel deck with specified deck screws located 1 inch from the perimeter of the plate, and 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. Contract shall include 100 square feet of sheet metal installation in the Base Bid.

3.2.7 **(Unit Price No. 4)** 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 36/7 patterns each available framing member and not more than 24 inches on center at side laps using specified side lap screws. At the perimeter, specified deck fasteners shall be applied at spacing’s not to exceed 6 inches on-center along the parapet framing. Contract shall include 100 square feet of metal deck replacement in the Base Bid.

3.2.8 **(Unit Price No. 5)** At those locations where side lap screws have not been installed or side lap screws exceed 30 inches on-center, furnish and install new self-tapping sheet metal screws at spacing’s not to exceed 30 inches on-center. Contractor shall submit technical data on the proposed screws before the start of this phase of the work. Contract shall include the installation of 200 side laps screws in the Base Bid.

3.2.9 **(Unit Price No. 6)** At those locations where existing welds have broken from the top of the supporting members or have not been installed, furnish and install new screws in accordance with Drawing 10. Welding is not an acceptable means of attaching/re-attaching the deck to the supporting member. Fasteners shall penetrate the structural membrane a minimum of 1-1/2 inches. Contract shall include 50 deck to joist fasteners in the Base Bid.

3.2.10 Contractor shall include allowances as indicated on the Bid Form in the Base Bid. Contract will be increased at unit price rates for unit price work that exceeds allowances. Contract will be reduced for unused unit price work at the bid unit price rate. Owner reserves the right to negotiate lump sum modifications to the contract for bulk unit price work.

3.2.11 Cost associated with any anomalies areas identified on plans, on the roof, and/or in the Specification shall be included in the Base Bid.

3.2.12 Abandoned Penetrations at Metal Roof Decks:

3.2.12.1 At all abandoned roof penetrations less than 6 inches in diameter, secure a piece of 20 ga. galvanized steel to the existing deck at spacing’s not to exceed 6 inches on center and located approximately one inch from the edge of the opening. Sheet metal shall be secured to the deck with specified deck screws. The sheet metal shall extend onto the existing deck a minimum of 6
3.2.12.2 At abandoned openings larger than 12 inches on any side but less than 24 inches, furnish and install new steel decking which matches the existing and install so that the ends and sides extend past the edges of the existing deck a minimum of 12 inches. The ends of the new steel deck shall extend over a structural member. Secure the new deck to the existing deck with specified deck screws at spacing’s not to exceed 6 inches on-center located approximately 6 inches from the opening on all sides. The ends of the new deck shall be secured to the existing structural supports using specified deck screws at Steel Deck Institute 36/7 patterns. Install specified side lap screws along the side laps at spacing’s not to exceed 30 inches on-center.

3.2.12.3 At abandoned openings larger than 24 inches on any side, furnish and install new steel decking which matches the existing and install so that the new deck unit is supported by a minimum of three structural supports. Insure that the new deck section is “nested” tightly in the existing, which may require the removal of existing deck fasteners or grinding down existing welds. Secure the new deck to each structural member with specified deck screws at Steel Deck Institute 36/7 patterns. At side laps, furnish and install a minimum of 3 specified side lap screws between each structural member.

3.2.13 Wire brush all existing roof access hatches to remove all scaling rust and existing paint. Prime all existing roof access hatches using Sherwin Williams Kem Kromik metal primer, or approved equal, and allow to dry. Apply two coats of Sherwin Williams All Surface Enamel Latex Base, or approved equal, over all existing roof access hatches using safety yellow paint.

END OF SECTION
DIVISION 06

WOOD, PLASTICS, AND COMPOSITES
SECTION 06 10 53
MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 Work Included: Installation of blocking and/or curbs, as specified herein.

1.2 Related Work

1.2.1 Selective Demolitions and Preparations – Section 02 41 13

1.2.2 SBS Modified Bituminous Membrane Roofing – Section 07 52 16

1.3 Submittals: In accordance with Section 01 33 00 of this Specification.

1.4 Environmental Conditions: Material installation shall proceed only when weather conditions are in compliance with the applicable manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Owner.

1.5 Warranty: In accordance with Section 01 78 36 of this Specification.

PART 2 - PRODUCTS

2.1 Non-structural wood blocking: Nominal 1” x 6”, 2” x 2”, 2” x 4”, 2” x 6” and 2” x 10” pine, shop pressure-treated for above ground contact.

Note: Do not use oil-based preservatives.

2.2 Wood Fiber Tapered Edge Strips: ASTM C208, Type II, Grade 1 (Built-Up Roofs), C209. Approved for use by approved roofing system manufacturer.

2.3 CD-X Exterior Grade Plywood. Nominal ¾” and 1” thick.

2.4 Screws: #12 double-coated galvanized steel screws or stainless steel self-tapping wood screws that shall be able to resist any galvanic action that may be able to develop between the nail and the pressure treatment. The use of a lesser quality screw will not be approved. Screws shall be of sufficient length to penetrate a minimum of 1-1/2 inches into the substrate.

2.5 Nails: For securing new lumber to new lumber or new plywood/OSB to new lumber, double-coated galvanized steel or stainless-steel ring shank nails to penetrate a minimum of 1-1/2 inches into the substrate but not smaller than 8d nails. Use 16d nails where material being secured is 1½ to 2 inches thick.

2.6 Masonry Fastener:

2.6.1 Masonry Anchor, minimum 1-1/4 inch into substrate, as manufactured by OMG Roofing Products
2.6.2 Tapcon ¼” x minimum 1-1/4” in the substrate, as manufactured by Buildex.
2.6.3 Roofing Spike, minimum 1-1/4 inch into substrate, as manufactured by Powers Fasteners.
2.6.4 approved equal prior to bid.
PART 3- EXECUTION

3.1 General

3.1.1 Furnish and install new wood blocking at all roof mounted equipment as required to provide a minimum flashing height of 8 inches above roof level.

3.1.2 Blocking shall be installed under integral equipment curbs as required to maintain full cant face above roof level and secured to the deck with appropriate fasteners through the deck at spacings not to exceed 12 inches on-center, staggered pattern.

3.1.3 At small units (largest dimension up to 30”) where wood blocking cannot be installed beneath the units, new pressure-treated wood blocking may be installed on top of the existing curb. The wood blocking shall match the curb in width and shall not exceed 2 inches in thickness, per layer. New wood blocking shall be attached to the curb using specified wood screws at spacings not to exceed 12 inches on-center and a minimum of 2 fasteners per side. Subsequent layers of wood blocking shall be secure using appropriate nails at spacings not to exceed 12 inches on-center and a minimum of 2 nails per side.

3.1.4 At large units (smallest dimension over 30”) where wood blocking cannot be installed beneath the units, furnish and install new pre-manufactured galvanized steel curb extensions at units where required to meet a minimum 8” flashing height. Curb extensions shall be made from minimum 14 ga. galvanized steel, shall be one piece, and shall fit on top of the existing curb. All joints shall be welded to provide a watertight, one-piece assembly. The contractor shall furnish and install insulation at the exterior side of the extensions, as necessary, to provide a smooth, consistent surface to apply base flashings. The base flashing shall be able to make a smooth transition over the juncture of the existing curb and the curb extension.

3.1.5 Extending and/or modifying wiring, and/or plumbing as part of this work shall be included in the Base Bid. This work shall be accomplished by a mechanical, electrical, or plumbing contractor, as applicable, licensed to perform this work in the state of the South Carolina for no less than 5-years.

3.1.6 The cost for raising curbs or installing curb extensions shall be included in the Base Bid.

3.2 Wood Blocking Installation

3.2.1 Furnish and install new wood blocking at all roof mounted equipment as required to provide a minimum flashing height of 8 inches above roof level.

Note: Blocking shall be installed under integral equipment curbs as required to maintain full cant face above roof level and secured to the deck with appropriate fasteners through the deck at spacings not to exceed 12 inches on-center, staggered pattern.

3.2.2 Furnish and install new pressure-treated tapered wood fiberboard as required to insure positive shedding of water off the coping. Finished slope of wood blocking to have a minimum slope of 1 inch across the width of the parapet. Secure wood fiberboard to the existing with appropriate nails at spacings not to exceed 12 inches on-center, staggered pattern. Refer to Drawings.

3.2.3 Furnish and install new pressure-treated tapered wood blocking at roof-to-roof expansion joint curbs, as required, to maintain a minimum height of 8 inches above the roof surface. Wood blocking shall be secured through the top with screw type fasteners at spacings not to exceed 12 inches on-center. Screws
shall penetrate the top of the existing curb a minimum of 1-1/2 inches. The entire length of the screw shall not exceed 4 inches. It may be necessary to drill into the new blocking to maintain adequate penetration into the existing curb. Furnish and install new ¾” CD-X plywood. Fasten using appropriate fasteners at spacings not to exceed 12 inches on-center. Refer to Drawings.

Note: Insure that the top of the wood is tapered so that water does not pond on top of the cover, when installed.

3.2.4 Furnish and install new pressure-treated tapered wood blocking at roof-to-wall expansion joint curbs, as required, to maintain a minimum height of 8 inches above the new finished roof surface. Wood blocking shall be secured through the top with screw type fasteners at spacings not to exceed 12 inches on-center. Screws shall penetrate the top of the existing curb a minimum of 1-1/2 inches. The entire length of the screw shall not exceed 4 inches. It may be necessary to drill into the new blocking to maintain adequate penetration into the existing curb. Refer to Drawings.

Note: Insure that the top of the wood is tapered so that water does not pond on top of the cover, when installed.

3.2.5 At eave drip edge, furnish and install new pressure-treated wood blocking on top of the existing wood blocking to match the height of the new insulation. Secure to the substrate with appropriate fasteners at spacings not to exceed 12 inches on center, staggered pattern. Refer to Drawings.

3.2.6 Where the fan unit is either too large or too small relative to the existing curb, remove the existing curb and discard. Furnish and install a new wood or pre-fabricated curb that matches the size of the fan cover that sits on top of the curb. If a pre-fabricated curb is used, secure the flange to the deck using appropriate fasteners at spacings not to exceed 12 inches on center. If a wood curb is fabricated, furnish and install the first layer of nominal 2” x 6” wood blocking and secure to the deck with appropriate fasteners at spacings not to exceed 12 inches on center. Add additional layers of wood blocking until the top of the blocking matches the thickness of the roof insulation. Secure each succeeding layer to the preceding with appropriate fasteners at spacings not to exceed 12 inches on center, staggered pattern. The vertical leg of the curb shall have a minimum height of 8 inches above the finished roof surface. Furnish and install a wood cant with a nominal 4-inch face, securing the top and bottom to the curb and blocking with appropriate nails at spacings not to exceed 6 inches on center.

Note: Contractor shall submit a shop drawing to the Owner’s Representative of the proposed curb for review and approval prior to the start of this work. The size of the curb must take into account the additional space required to install base flashings prior to the installation of the curb. Extending and/or modifying ductwork at curbs as part of this work shall be included in the Base Bid.

END OF SECTION
DIVISION 07

THERMAL AND MOISTURE PROTECTION
SECTION 07 22 16
ROOF BOARD INSULATION

PART 1 - GENERAL

1.1 Work Included: Installation of new thermal barrier and roof insulation on Roof Areas A through I at Taylors Elementary School, as specified herein.

1.2 Related Work

1.2.1 Rough Carpentry - Section 06 10 53.

1.2.2 SBS Modified Bitumen Membrane Roofing – Section 07 52 16.

1.3 Submittals

1.3.1 Refer to Section 01 33 00 of this Specification.

1.4 Environmental Conditions: Materials installation shall proceed only when weather conditions are in compliance with the applicable manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Owner.

1.5 Warranty: Refer to Section 01 78 36 of this Specification.

PART 2 – PRODUCTS

2.1 Polyisocyanurate Roof Insulation: Flat and tapered, as specified, ASTM C1289, Type II, Class I. Board size shall not exceed 4’ x 8’ for mechanically attached insulation. Board size of tapered insulation shall not exceed 4’ x 4’. The Long-Term Thermal Resistance shall be a minimum of 5.7 per inch. Insulation compressive strength shall be minimum 20 psi. Insulation density shall be 2 pcf minimum. Thermal insulating factor as specified; however, thicknesses of each layer of insulation shall not exceed 2 inches.

2.2 Cover Board: Nominal 1/2” thick, ASTM C 1177 or ASTM C1278, 0 - 5 Flame Spread and 0 Smoke developed when tested in accordance with ASTM E 84, nominal 900 psi minimum compressive strength, Class A, non-combustible, 4’ x 4’ board size.

2.3 Wood Fiber Tapered Edge Strips: ASTM C208, Type II, Grade 1, C209. Approved for use by approved roofing system manufacturer.

2.4 Cant Strips: Perlite cut to fit at 45 degrees with minimum 4” face. ASTM C728. Approved for use by approved roofing system manufacturer.

2.5 Black Plastic Roof Cement (Asphalt): ASTM D2822-91(1997), Class I. Class II cement will be used if applied to damp or wet surfaces. Approved for use by approved roofing system manufacturer.

2.6 Fasteners & Plates:

2.6.1 #12 Insulation Fastener: Minimum 0.235” thread diameter. Steel screw roof insulation fastener for steel decking: As approved by the roofing materials manufacturer. Fasteners must pass a minimum of 15 cycles in the Kesternich SFW 2.0s DIN 50018 test with less than 15% red rust.

2.6.2 Insulation Fastener Plate: 3” ribbed, Galvalume coated steel plate. As approved by the roofing materials manufacturer requirements.
2.6.3 Adhesive:

2.6.3.1 Low-Rise Adhesive Fastener: double or single-component low-rise polyurethane adhesive as approved by the roofing system manufacturer.

PART 3 - EXECUTION

3.1 Coordination and Inspection

3.1.1 The substrate shall be clean, smooth, dry, and free of debris and all foreign matter prior to receiving insulation and cover board. Application of new materials shall constitute approval of the substrate by the Contractor.

3.1.2 The contractor bears the responsibility to locate any conduits that are in the decking flutes prior to the start of the work. The contractor shall to the full extent possible, not engage these conduits with screws, fasteners, etc. Should power be lost due to penetrate a conduit, the Contractor bears the responsibility to locate and repair the conduit and/or enclosed wiring to the original condition to restore power to the Owner. Cost associated with these repairs shall be borne by the Contractor at no additional cost to the Owner.

3.1.2.1 Repairs to conduit, writing, electrical equipment, and accessories under this paragraph shall be performed by an electrical contractor licensed to perform such work in the state of South Carolina with a minimum of 5 years experience in this type of work.

3.2 General Installation: Roof Insulation and Cover Board

3.2.1 Apply insulation with end joints staggered approximately one-half the length of the units.

3.2.2 Offset insulation joints from the preceding layer a minimum of six (6) inches.

3.2.3 Fit insulation units snugly to each other and to all vertical surfaces.

3.2.4 Loose lay the first layer of two-inch-thick isocyanurate insulation and stagger end joints a minimum of six (6) inches.

3.2.5 Mechanical Attachment: Secure the second layer of insulation board to the metal deck using plates and fasteners in accordance with the manufacturer’s requirements to resist the uplift pressures and/or ratings shown on drawings for each zone. However, there shall be a minimum of 1 fastener/plates per 4 square feet for the field (Zone 1), 1 fastener/plates per 2 square feet at the perimeter (Zone 2), and 1 fastener/plates per 1 square feet at the corners (Zone 3). Zone definition is indicated on drawings. Partial units less than 4 square feet shall be secured with a minimum of 4 fasteners/plates.

3.2.6 Low-Rise Foam Adhesive: Secure each tapered insulation board and cover board using low-rise adhesive beads at spacings in accordance with the manufacturer’s requirements to resist the uplift pressures and/or ratings shown on drawings for each zone and. However, spacings shall not to exceed 12 inches on-center in the field (Zone 1), 6 inches on center for the perimeter (Zone 2), and 4 inches on center for the corner (Zone 3). Zone definition is indicated on drawings. Ensure insulation contact with adhesive by weighting units. Prior to applying adhesive bead, apply one continuous bead of adhesive around the perimeter of the of the insulation board not further that 4 inches from the edge.

3.2.7 Replace damaged units as required to provide a smooth surface and uniform insulation thickness.

3.3 General Requirements: Crickets/Saddles
3.3.1 Cricket/Saddles shall have a minimum finished slope of ½ inch per foot and also meet the requirements of Paragraph 3.2 above.

3.3.2 Start cricket construction by striking chalk lines for outer edges of tapered units. Install the first row along the chalk lines, mitering and fitting at the points where lines break.

3.3.3 Complete the cricket assembly using tapered isocyanurate and isocyanurate fill units.

3.3.4 Remove and replace damaged units with new insulation or repair to provide a smooth surface and uniform insulation thickness.

3.3.5 Utilize tapered wood fiber edge strips that transition from 0” to 1/2” as the first layer of tapered insulation to provide a smooth transition. Set wood fiber on top of the insulation in one continuous band of low-rise foam adhesive.

3.4 Installation at Roof Areas A - I:

3.4.1 Apply one layer of 2-inch-thick isocyanurate insulation loose laid.

3.4.2 Apply one layer of 2-inch thick isocyanurate insulation over the first layer of insulation and secure through both layers with mechanical fasteners to the metal deck.

3.4.3 At the primary scuppers shown on the plans, apply ¼ inch per foot tapered isocyanurate and isocyanurate fill units that extend from the scupper opening to a width that matches the size of the sump. Prior to installing the tapered insulation, furnish and install new flat isocyanurate insulation that ends approximately ¾ inch below the scupper. Secure each flat board to the substrate in accordance with Paragraphs 3.2.5 of this Section. The thin edge of the tapered insulation shall be located adjacent to the scupper. Fill units shall not exceed 1 inch in thickness. Increase the thickness of the tapered insulation until it matches the thickness of the new isocyanurate insulation. Remove and replace damaged units with new insulation or repair to provide a smooth surface and uniform insulation thickness. Apply the tapered insulation to the flat insulation and secure using low-rise adhesive.

3.4.4 Furnish and install tapered insulation to move water from walls, form valleys/crickets, as shown on roof plans, using factory-tapered isocyanurate units and isocyanurate fill units. Secure using low-rise foam adhesive.

3.4.5 Furnish and install one layer of nominal ½ inch thick cover board over all isocyanurate insulation and secure using low-rise foam adhesive.

3.4.6 Install perlite or wood fiber cants at locations where membrane changes from horizontal to vertical. Secure the cant at both contact surfaces using roofing cement.

END OF SECTION
DIVISION 07
THERMAL AND MOISTURE PROTECTION

SECTION 07 51 05.01
GENERAL INSTALLATION PROCEDURES: COLD APPLIED MODIFIED BITUMEN ROOFING

PART 1 - GENERAL

1.1 Do not proceed with roofing until all vents, curbs, cants, blocking, nailing strips and projections through the roof deck have been installed.

1.2 Do not apply materials on wet or damp surfaces, over dust, dirt or other foreign matter.

1.3 Do not apply emulsions when ambient air temperature is below 40°F or is expected to be below freezing within 24 hours of application.

1.4 Protect edges and incomplete flashings against water entry at all times. Remove cutoffs and temporary protection prior to resumption of work.

1.5 Prime all metal, masonry and concrete surfaces to receive cold adhesive using approximately one gallon of asphalt primer per 100 square feet of surface. Allow primer to dry thoroughly before applying bituminous materials.

1.6 Use the following minimum quantities of cold adhesive:

1.6.1 SBS Membrane (Smooth) 1.5 – 2.5 gal. per 100 ft².

1.6.2 SBS Membrane (Granulated Cap Sheet) 1.5 – 2.5 gal. per 100 ft².

Note: In the event quantities of cold adhesive in excess of the above minimum are specified by the manufacturer for compliance with requirements in systems to be covered by the Manufacturer's Roof System Guarantee or Warranty, such quantities shall be provided.

1.7 Apply cold adhesive with a ¼” notched neoprene squeegee or airless sprayer.

1.8 Hand-broom or roll membrane so that no voids between plies exist and so membrane edges are tightly cemented.

1.9 Remove no more existing roofing than can be dried-in with new materials in the same day. Contractor shall strictly conform to this requirement.

1.10 Do not leave cold adhesive exposed longer than 10 – 15 minutes prior to installing membrane.

1.11 Do not apply cold process adhesive in membrane laps.

1.12 Complete the side and end laps by heat fusing with a propane torch or an automatic heat welder.

1.13 Heat membrane on both the top and bottom surfaces until it develops a sheen or glossy appearance and the burn-off film is removed.

1.14 The welding temperature is correct when a ¼” flow of modified bitumen is extruded from the side or end laps.
Note: Bleed out of more than ½” indicates that excessive heat has been applied and the membrane sheet has been damaged.

1.15 During cap sheet installation, apply granules to areas of adhesive and/or modified bitumen bleed out as installation progresses.

PART 2 – PRODUCTS: Not Used.

PART 3–EXECUTION: Not Used.

END OF SECTION
SECTION 07 52 16
SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 Work Included: Installation of SBS modified bitumen membrane at Areas A - I, as specified herein.

1.2 Related Work:

1.2.1 General Installation Procedures: Modified Bitumen Roofing - Section 07 51 05.01.

1.2.2 Roof Board Insulation - Section 07 22 16

1.3 Submittals: In accordance with Section 01 33 00 of this Specification

1.4 Environmental Conditions: Material installation shall proceed only when weather conditions are in compliance with the applicable manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Owner.

1.5 Warranty:

1.5.1 Comply with the General Conditions of the Contract concerning warranties and bonds. The Contractor shall agree that the work covered under this Contract shall remain free from any water penetration and physical defects caused by defective workmanship or materials for a period of two (2) years from the date of final acceptance by Owner. Warranty shall be executed on Contractor's company letterhead and signed by an authorized officer of the company. This warranty is in effect for Taylors Elementary School.

1.5.2 Prior to final payment, Contractor shall submit one original and three copies of the roofing system manufacturer’s twenty year, No Dollar Limit Guarantee, with flashing endorsement, to the Owner for Mauldin High School.

PART 2 - PRODUCTS


2.2 Black Plastic Roof Cement (Asphalt): ASTM D2822-91(1997), Class I. Class II cement will be used if applied to damp or wet surfaces.

2.3 Flashing Cement (Asbestos Free): ASTM D4586-00

2.4 Bituminous Adhesive: One-part, elastomeric adhesive. At a minimum, adhesive shall meet ASTM D3019, Type III, Grade 2.

2.5 Styrene-butadiene-styrene (SBS) sheet with smooth surface, polyester reinforcement. Membrane sheet shall conform to ASTM D6164-05, Grade S, Type I.

2.6 Styrene-butadiene-styrene (SBS) sheet with white mineral granules, polyester reinforcement. Membrane sheet shall conform to ASTM D6164-05, Grade G, Type II.
2.7 Aluminum Coating: ASTM D 2824, Type III. Approved for use by approved roofing system manufacturer.

2.8 Polyurethane-Bituminous Liquid Flashing: One or Two-component, elastomeric, liquid applied flashing material and stitch-bonded polyester scrim, as provided or approved for use by the approved roofing system manufacturer to be included in the roofing system warranty.

2.9 PMMA/PMA Liquid Flashings: Two-component, with catalyst, cold fluid-applied reinforced low-odor polymethyl-methacrylate (PMMA) or polymethacrylate (PMA) flashing/vertical grade waterproofing membrane. Membrane installation shall consist of PMMA/PMA resin; polyester fleece reinforcement; PMMA/PMA resin application for a finished dry film membrane thickness of .105-inch nominal per ply; conforming to ASTM C 836. Provide membrane flashing. Provide products manufactured and supplied, or approved for use to be included in the roofing system warranty.

2.9.1 Primer: Two-component, high solids polymethyl methacrylate resin and/or 100% epoxy resin for use in improving adhesion of membrane to wood, asphalt, cementitious, and concrete substrate surfaces, as appropriate. As recommended by the approved membrane manufacturer, and installed at rates recommended by the membrane manufacturer depending on substrate absorbency.

2.9.2 Accessories: Surface Leveling/Pitching Mortar Resin; Patching, Filling and Smoothing Resin; Leveling and Patching Aggregate; Backer Rod; Miscellaneous Fasteners; Caulking; Temporary and Night Sealant; tools, other accessories, and cleaners as recommended or required by membrane manufacturer to provide a warrantable roofing system.

2.10 Walkway Pads: As manufactured by approved roofing system manufacturer. Nominal 30" wide x 50' long. Black color (modified bitumen roofing). Approved for use by approved roofing system manufacturer.

PART 3 - EXECUTION

3.1 Inspection:

3.1.1 The substrate shall be clean, smooth, dry, and free of debris and all foreign matter prior to installation of the roof membrane. Application of new materials shall constitute approval of the substrate by the Roofing Contractor.

3.1.2 Insulation joints with gaps greater than ¼” shall be filled with roof insulation to provide a smooth surface.

3.2 Roof Membrane Installation:

3.2.1 Sweep the substrate with a stiff broom to remove materials that will interfere with the proper installation of the membrane.

3.2.2 Beginning at the low point of the roof area, 1 ply of smooth polyester base membrane shall be applied shingle fashion, uniformly cemented with bituminous adhesive to the cover board and to each other without voids.

3.2.3 Pour the bituminous adhesive over the substrate and spread adhesive to an even and uniform thickness using notched squeegees in accordance with manufacturer written instructions. The adhesive shall be applied to the substrate so that the constant rate of coverage is one and one half to two (1-1/2 – 2.5) gallons per square, unless manufacturer has more stringent requirements. Care shall be taken not to apply adhesive over an area that is to be later cleaned and spliced to another membrane sheet.

Note: No adhesive is to be applied to the back side of the membrane.
3.2.4 While the adhesive is still wet, carefully roll the membrane into the adhesive, being sure to lap membrane in accordance with the roofing system manufacturer’s written instruction. However, laps shall be wide enough to allow for at least a 1-1/2-inch weld when automatic machine welding and a 2-inch weld when hand-welding, unless manufacturer has more stringent requirements.

Note: The formation of film on top of the adhesive shall not be allowed to occur, and the adhesive shall not be applied if the application temperature is below 40°F or expected to be below 40°F during drying time.

3.2.5 Using a manufacturer’s approved smooth drum roller, firmly press the membrane to ensure full contact with the adhesive layer by frequent rolling in two directions.

3.2.6 Bituminous adhesive shall not be used on vertical surfaces. Extend membrane to the edge of wood blocking.

3.2.7 Whenever possible, the entire roll shall be applied in a continuous manner. If rolls are allowed to set while partially rolled out, the roll shall be rolled back sufficiently to expose the area where the roll had stopped so that asphalt may be applied to this area.

3.2.8 All membrane shall be cut off neatly along top edge of all cants.

3.2.8.1 Hot air weld all membrane seams using either a machine or hand-held hot air welder approved by the roofing system manufacturer. A copy of the operating instructions shall be provided to the Owner’s Representative prior to the start of the project.

3.2.8.2 Monitor the temperature of the hot air welder to minimize the amount of smoke that should develop and to ensure that the material from the bottom of the sheet begins to soften and flow from the seam. Hand held welders shall insure that membrane welding is immediately followed by a weighted steel roller to press the heated membrane surfaces together with slow, even movements.

3.2.8.3 All seams shall be manually probed using a blunt rounded instrument daily. Any fish mouths or other seam defects where the seam is not fully adhered shall be repaired in accordance with the roofing system manufacturer’s instructions.

3.2.8.4 After seams have set for approximately 8 hours, the Contractor shall make a minimum of (3) 4” x 12” test cuts across the seam for every day of welding. Test cuts shall be repaired by the Contractor daily and shall be done at no additional cost to the Owner.

3.2.9 Seams shall be tested in accordance with the roofing system manufacturer’s instructions and evaluated for seam integrity. Seams that fail this test shall be subject to additional test cuts, as directed by the Designer and/or roofing system manufacturer, to further quantify the extent of the deficient condition. Repairs to deficient seams and/or test cut locations shall be performed by the Contractor at no additional cost to the Owner.

3.2.10 Furnish and install granule-surfaced modified bitumen cap sheet in accordance with Paragraph 3.3 of this Section.

3.3 Roof Surface Application:

3.3.1 Sweep the substrate with a stiff broom to remove materials that will interfere with the proper installation of the membrane.

3.3.2 Beginning at the low point of the roof area, 1 ply of granule-surfaced polyester cap sheet shall be applied shingle fashion, uniformly cemented with bituminous adhesive to the base membrane and to each other.
without voids. The cap sheet shall be installed perpendicular to the flow of water at all locations and offset ½ of a sheet from the base sheet. At hips and valleys, furnish and install a full width cap sheet over the valley and hip extending 18 inches on either side of the valley/hip.

3.3.3 Pour the bituminous adhesive over the substrate and spread adhesive to an even and uniform thickness using notched squeegees in accordance with manufacturer written instructions. The adhesive shall be applied to the substrate so that the constant rate of coverage is one and one half to two and one half (1.5 – 2.5) gallons per square, unless manufacturer has more stringent requirements. Care shall be taken not to apply adhesive over an area that is to be later cleaned and spliced to another membrane sheet.

Note: No adhesive is to be applied to the back side of the membrane.

3.3.4 While the adhesive is still wet, carefully roll the membrane into the adhesive, being sure to lap membrane in accordance with the roofing system manufacturer’s written instruction. However, laps shall wide enough to allow for at least a 2-inch weld when automatic machine welding and a 3-inch weld when hand-welding, unless manufacturer has more stringent requirements.

Note: The formation of film on top of the adhesive shall not be allowed to occur, and the adhesive shall not be applied if the application temperature is below 40°F or expected to be below 40°F during drying time.

3.3.5 Using a manufacturer’s approved smooth drum roller, firmly press the membrane to ensure full contact with the adhesive layer by frequent rolling in two directions.

3.3.6 Bituminous adhesive shall not be used on vertical surfaces. Extend membrane to the edge of wood blocking.

3.3.7 Whenever possible, the entire roll shall be applied in a continuous manner. If rolls are allowed to set while partially rolled out, the roll shall be rolled back sufficiently to expose the area where the roll had stopped so that asphalt may be applied to this area.

3.3.8 All membrane shall be cut off neatly along top edge of all cants.

3.3.9 Hot air weld all membrane seams using either a machine or hand-held hot air welder approved by the roofing system manufacturer. A copy of the operating instructions shall be provided to the Designer prior to the start of the project. Apply loose granules to match the cap sheet granules at lap bleed-out.

3.3.10 Monitor the temperature of the hot air welder to minimize the amount of smoke that should develop and to ensure that the material from the bottom of the sheet begins to soften and flow from the seam. Hand held welders shall insure that membrane welding is immediately followed by a hand roller to press the heated membrane surfaces together with slow, even movements.

3.3.11 All seams shall be manually probed using a blunt rounded instrument daily. Any fish mouths or other seam defects where the seam is not fully adhered shall be repaired in accordance with the roofing system manufacturer’s instructions.

3.3.12 After seams have set for approximately 8 hours, the Contractor shall make a minimum of (3) 4” x 12” test cuts across the seam for every day of welding. Test cuts shall be repaired by the Contractor daily and shall be done at no additional cost to the Owner.

3.3.13 Seams shall be tested in accordance with the roofing system manufacturer’s instructions and evaluated for seam integrity. Seams that fail this test shall be subject to additional test cuts, as directed by the Designer.
and/or roofing system manufacturer, to further quantify the extent of the deficient condition. Repairs to deficient seams and/or test cut locations shall be performed by the Contractor at no additional cost to the Owner.

3.4 Liquid Flashing:

3.4.1 Apply liquid flashing at single penetrations previously flashed with pitch pockets.

3.4.2 Remove rust, residual asphalt, or any other surface contaminants. Where necessary, clean the surface with isopropyl alcohol and allow it to flash off prior to flashing installation.

3.4.3 Fill any gaps $\frac{1}{4}$ inch up to $\frac{1}{2}$ inch with adhesive or sealant. For gaps greater than $\frac{1}{2}$ inch, install a backer rod prior to sealant installation.

3.4.4 Install manufacturers four course flashing system to extend 8 inches above roof level. Follow manufacturers installation requirements.

3.5 Base Flashing Installation:

3.5.1 Install bituminous flashings at all curbs, walls and vertical surfaces where other types of flashings are not specified or shown on Drawings.

3.5.2 Apply a strip of base membrane in the manufacturer approved flashing cement without voids, extending at least 4 inches on the roof, up the face of the cant and least 6 inches up the vertical surface. Lap sections a minimum of 2 inches.

3.5.3 Hot air weld all base membrane seams using either a machine or hand-held hot air welder approved by the roofing system manufacturer. A copy of the operating instructions shall be provided to the Designer prior to the start of the project.

3.5.4 Apply a strip of SBS modified bitumen cap sheet base flashing in flashing cement, without voids, extending at least 6 inches on the roof, up the face of the cant and at least 6 inches up the vertical surface. Lap sections at least 3 inches. Offset cap sheet flashing laps a minimum of 12 inches from smooth flashing laps.

Note: Certain SBS modified bitumen materials are not compatible with flashing cement. Follow the manufacturer's written instructions regarding the use of membrane with flashings cements.

3.5.5 Hot air weld all base membrane seams using either a machine or hand-held hot air welder approved by the roofing system manufacturer. A copy of the operating instructions shall be provided to the Designer prior to the start of the project.

3.5.6 Fasten the flashing flashings with flashing nails or appropriate fasteners on a line approximately 1 inch below the top edge and spaced not over 4 inches apart.

3.5.7 Cover the top edges and fasteners with a nominal 1/8-inch-thick trowelling of cement. At vertical laps, apply a trowelling of nominal 1/8-inch-thick cement, embed a fiber glass mat, and then cover with another 1/8-inch-thick trowelling of cement. Apply cement on either side of the vertical lap a minimum of 3 inches.

3.5.8 Apply a uniform coating of a fibrated aluminum roof coating over all base flashings and parapet flashings
using not less than 1-½ to 2 gallons per 100 square feet.

3.6 Walkway Pad Application:

3.6.1 Check roof surface carefully for damage and application defects and make appropriate repairs and corrections prior to application of walkway pads.

3.6.2 Roll out walkway pads and allow to “relax” in accordance with roofing system manufacturer’s written instructions.

3.6.3 Apply one full width row of walkway pads around HVAC units, and two rows at the unit access doors. Install walkway pads in accordance with the roofing system manufacturer’s written instructions.

3.6.4 Apply two full rows of walkway pads at roof access doors extending a minimum 1 foot beyond the width of the door opening in both directions.

3.6.5 Apply two rows of walkway pads at all roof access ladders.

END OF SECTION
PART 1 - GENERAL

1.1 Summary: Includes the fabrication and installation of sheet metal and related accessories associated with roofing membranes, providing physical protection to membrane, base flashings and membrane terminations, as specified herein.

1.2 Related Work:
   1.2.1 Rough Carpentry - Section 06 10 53
   1.2.2 SBS Modified Bituminous Membrane Roofing – Section 07 52 16

1.3 Submittals: In accordance with Section 01 33 00 of this Specification

1.4 Environmental Conditions: Material installation shall proceed only when weather conditions are in compliance with the applicable manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Owner.

1.5 Warranty: In accordance with Section 01 78 36 of this Specification.

PART 2 - PRODUCTS

2.1 Galvanized Steel: Structural quality galvanized steel Coating Class G-90, ASTM A653.

2.2 Stainless Steel: Type 316 (16% chromium, 10% nickel, and 2% molybdenum) ASTM A240, mill finished.

2.3 Flat Bar: ¼” x 1” (stiffener for gutter and counter flashing), ⅛” x 1” (gutter spacers) and ⅛” x 2” (gutter brackets) flat stock galvanized steel.

2.4 Termination Bar: ¼” x 1” aluminum.

2.5 Kynar 500-Based Finish: Shall be factory applied, oven-finish. Finish and primer shall be applied in strict accordance with the formulator's specifications and shall meet the performance criteria of AAMA 605.2-90 specification. Finish coat thickness shall be a minimum of 1.0 mil. Primer coat thickness shall be a minimum of 0.3 mil. Color to match the existing color to be selected by owner.

2.6 Solder: ASTM D32-66T with 50% lead and 50% tin unless otherwise specified. Follow manufacturer's recommended soldering procedures.

2.7 Lead: 4 lb. soft lead. Flanges on soil pipe vents shall be a minimum of 24” x 24” in size.

2.8 Non-Shrinking Sealant: ASTM C920, Type S or M, Grade NS, Class 25, for Use NT, M, A, and O.

2.9 Self-Adhering Modified Bitumen Membrane: High-temperature, ASTM D1970, minimum 40 mils, W.R. Grace Ice and Water Shield HT, or approved equal prior to bid.

2.10 Minimum Acceptable Metal Weights (All metal to be finished with Kynar 500 coating, or approved equal prior to bid unless otherwise specified).
Conductor Head: 24-gauge galvanized steel  
Coping: 24-gauge galvanized steel  
Coping Cleat: 22-gauge galvanized steel (mill finish)  
Counterflashing: 24-gauge galvanized steel  
Downspout: 24-gauge galvanized steel  
Expansion Joint Cover: 24-gauge galvanized steel  
Expansion Joint Cleat: 24-gauge galvanized steel  
Gutter: 24-gauge galvanized steel  
L-Style Eave Flashing: 24-gauge galvanized steel  
L-Style Eave Flashing Cleat: 22-gauge galvanized steel  
Overflow Scupper: 24-gauge stainless steel (mill finish)  
Overflow Scupper Exterior Flange: 24-gauge galvanized steel  
Primary Scupper: 24-gauge stainless steel (mill finish)  
Primary Scupper Exterior Flange: 24-gauge galvanized steel

PART 3- EXECUTION

3.1 General Installation Requirements:

3.1.1 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 which might affect the application.

3.1.2 Follow recommendations of the National Roofing Contractors’ Association (NRCA) and Sheet Metal and Air Conditioning Contractors National Association Architectural Sheet Metal Manual (7th Edition) for fabricating in-shop and on-site, and for installation, unless otherwise specified herein.

3.1.3 Follow published instructions of the product manufacturer for installation of extruded or proprietary metal products, unless otherwise specified herein.

3.1.4 Use nails, screws, bolts, cleats or other fasteners of the same material or of material chemically compatible with the contacted metal.

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

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

3.1.7 Install metal to be water and weather tight with lines, arises and angles sharp and true and with paint surfaces free of waves and buckles.

3.1.8 Install shop-formed metal flashings in 10-foot lengths maximum with a minimum number of pieces in each straight run.

3.1.9 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.

3.1.10 At all corners, shop form corner pieces of fascia and drip edge flashing from a single section of metal with minimum 36-inch legs on either side of the corner.

3.1.11 Cleats: Cleats shall be secured with nails that penetrate the wood a minimum of 1 inch at spacings not to exceed 6 inches on center. Nails shall be applied along the vertical face of the wood blocking and located approximately 1-3/4-inch from the bottom of the cleat. Metal flashing drip legs shall be fold snugly over the cleat.
3.1.12 Apply a continuous bead of caulk between any lapped metal sections, except for counterflashing lapped joints. The application of caulk after metal components have been lapped is unacceptable and will be grounds for rejection.

3.1.13 Flat Drive Cleats: Refer to NRCA Detail. Lap vertical sections a minimum of 2-inches and hem the top of the sections. Apply the flat drive cleat and fold down the outside face of both sides of the coping a minimum of 1 inch, snug to the vertical flange of the coping. Trim excess flat drive cleat from the vertical face of the coping.

3.2 Conductor Head Installation

3.2.1 Furnish and install new conductors at all through-wall scupper locations. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 1-27A. The conductor shall be fabricated with overflow openings.

3.2.2 Size the conductor in accordance with the following requirements:

   Face Width: 4 times downspout width
   Face Depth: 2 times downspout width
   Height: 4 times downspout width

3.2.3 Sealant shall be applied between all lapped joints. The application of caulk at lapped joints after sections are joined is not acceptable.

3.2.4 Install conductor so that the top is 1-inch lower than the scupper opening. Secure to the wall with a minimum of 2 specified friction fasteners near the top corners. Outside edges of the scupper shall be turned out onto the back of the conductor a minimum of one inch.

3.2.5 The outlet tube shall be fabricated to extend into the downspout a minimum of 4 inches.

3.3 Coping Cap Installation

3.3.1 Prior to the installation of the coping cap, apply a strip of self-adhering modified bitumen membrane across the top of the blocking and extend down the outside and inside face approximately the length of the vertical sections of the coping cap. Lap the ends 6 inches and cement with flashing cement.

3.3.2 New coping cap to be formed in accordance with SMACNA Architectural Sheet Metal Manual Figure No. 3-4A, and Details 1 and 2 (Sheet A-501). Any deviations to this basic design shall be submitted to the Owner’s Representative for approval along with documentation that the revised detail meets the ANSI/SPRI ES-1 wind uplift requirements.

3.3.3 Use maximum 10-foot lengths and a minimum number of pieces in each straight run.

3.3.4 Secure both vertical legs of the coping with a continuous cleat nailed to the wood blocking. The coping drip edge shall be folded snugly over the cleat. Cleats shall be secured with nails that penetrate the wood a minimum of 1 inch at spacings not to exceed 6 inches on center. Nails shall be applied along the vertical face of the wood blocking.

3.3.5 Join sections with flat drive cleats. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 3-1, Detail 2 and Figure No. 3-2, Detail 4.
3.3.6 At locations where coping intersects at corners, the Contractor shall join sections with flat drive cleats.

3.4 Counterflashing Installation

3.4.1 Form new metal surface-mounted counterflashing and install around all RTU curbs. Refer to SMACNA Architectural Sheet Metal Manual Figure 4-6 and Drawings.

3.4.2 Form new metal surface-mounted or two-piece counterflashing and install at all existing brick through-wall flashing locations. Refer to SMACNA Architectural Sheet Metal Manual Figures 4-4 and Drawings.

3.4.3 Notch and lap sections a minimum of 3 inches.

3.4.4 Set flange against vertical surface in a solid bed of caulk. Furnish and install a nominal 1” x ¼” flat bar and secure over the counterflashing using appropriate fasteners at spacings not to exceed 12 inches on center. At places where the counterflashing is being installed behind a frame or existing sheet metal flashing, slide counterflashing behind frame/existing flashing a minimum of one inch.

3.4.5 Notch and lap joints and inside corners. Notch and seam outside corners. Do not rivet or otherwise secure joints and corner.

3.4.6 Fill the cove at the top of the counterflashing with a non-shrink caulk.

Note: A cove is not required where counterflashing is behind a frame and/or existing sheet metal flashing.

3.5 Miscellaneous Flanged Flashings Installation

3.5.1 Prime both sides of lead flashing flanges.

Note: Provide lead flashings with a minimum 24” x 24” flange for pipe penetrations.

3.5.2 Set flange on top of all roofing plies in a minimum 1/8” thick solid bed of black plastic roof cement.

3.5.3 At sanitary vents using lead sleeve flashing, turn top sleeves neatly into inside of pipe at least one inch. Prefabricated sleeve caps may be used.

3.5.4 Strip in the flange with one ply of the smooth surfaced base sheet, extending a minimum of 6 inches past the edge of the flange.

3.6 Scupper Liner Installation

3.6.1 Form new primary scupper. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-26A and 1-26B. Also refer to Drawings.

3.6.2 Form new overflow scupper (Alternate #1). Refer to SMACNA Architectural Sheet Metal Manual Figure 1-30A and 1-30B. Also refer to Drawings.

3.6.3 Cover all masonry surfaces to be in contact with scupper with a minimum 1/8” thick bed of black plastic roof cement. Set the flange over the roofing membrane and wall in a minimum 1/8” thick bed of black plastic roof cement.

3.6.4 Install scupper, with closure flanges at both sides of wall, lock and solder closure flange seams.
3.6.5 Set the exterior flange against the wall in a bead of non-shrinking sealant. Secure the exterior flange to the wall with a row of fasteners located approximately one inch from the edge, at spacings not to exceed 6 inches on center.

3.6.6 Apply over the exposed surfaces Sherwin Williams Chem Chromex primer or approved equal and allow to thoroughly dry. Apply two coats of the coating manufacturer's approved paint to match the coping in accordance with the written instructions provided by the manufacturer.

3.6.7 Furnish and install a section of surface mounted counterflashing above the exterior scupper flange in accordance with Section 07 60 00 Paragraph 3.4. The counterflashing shall extend a minimum of 1" beyond the ends of the scupper flange.

3.6.8 Flash the interior flange with one ply of membrane, extending it a minimum of 12 inches beyond the edge of the flange, and set in cold applied adhesive. Furnish and install one ply of modified bitumen base flashing in accordance with Section 07 52 16. The flashing strips on the upper portion of the interior flange shall extend beneath the coping.

3.7 Gutter Installation

3.7.1 Gutter size shall box-style and shall be a minimum of 3” x 4”. The back of the gutter shall be a minimum of 1 inch higher than the front. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 1-2, Style A.

3.7.2 Provide butt type expansion joints in gutters at spacings required for the type material used to fabricate gutters. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 1-7.

3.7.3 Provide gutter spacers at 3'-0" on center. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 1-12. Spacers shall be formed from minimum 1/16" x 1" flat stock aluminum. Continuous nominal 1/4" x 1" galvanized steel or aluminum flat bar shall be installed at the front of the gutter and secured with stainless steel bolts and nuts at spacer locations.

3.7.4 Provide gutter brackets at 3'-0" on center, and alternating in location from gutter spacers. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 1-12. Brackets shall be formed from minimum 1/4” x 1 – 1/2” flat stock galvanized steel and secured with stainless steel screws through pre-drilled holes. Brackets should be primed and double coated with an approved field-applied Kynar 500 paint prior to installation.

3.8 Downspout Installation

3.8.1 Downspouts be box-style and shall match existing downspouts in size, unless otherwise specified. Downspouts shall be a minimum 3”x4”. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 1-32B and 1-32F.

3.8.2 Lap sections a minimum of 3 inches and secure sections with a minimum of 2 stainless steel sheet metal screws.

3.8.3 Form 45° elbow where water discharges onto the roof or ground.

3.8.4 Form or provide new round to rectangular downspout metal transition pieces to tie into existing underground drainage system formed from the same material as the downspouts.
Form downspout hangers from the same material as downspouts using material not less than 2 gauges heavier than downspouts. Secure downspouts to wall with hangers spaced not more than 5 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-35G. Apply one coat of metal primer and two coats of field-grade Kynar 500 paint to all hangers. Color shall match the downspouts.

Locate downspout hangers at same locations as existing downspout hangers and to cover existing hanger fastener holes. Seal holes in exterior cladding from existing hanger fasteners.

3.8.6 Furnish and install new concrete splash blocks where water discharges onto new roofing or grounds. Refer to SMACNA Architectural Sheet Metal Manual Figure No.1-36.

Where splash blocks are installed on new roof surfaces, furnish and install new membrane protection pads under all concrete splash blocks. Membrane protection pads shall extend a minimum of 3 inches beyond all sides of the splash block and shall be adhered to the roof surface with roofing cement.

3.8.5 Form downspout hangers from the same material as downspouts using material not less than 2 gauges heavier than downspouts. Secure downspouts to wall with hangers spaced not more than 5 feet on center. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-35G. Apply one coat of metal primer and two coats of field-grade Kynar 500 paint to all hangers. Color shall match the downspouts.

3.8.5.1 Locate downspout hangers at same locations as existing downspout hangers and to cover existing hanger fastener holes. Seal holes in exterior cladding from existing hanger fasteners.

3.8.6 Furnish and install new concrete splash blocks where water discharges onto new roofing or grounds. Refer to SMACNA Architectural Sheet Metal Manual Figure No.1-36.

Where splash blocks are installed on new roof surfaces, furnish and install new membrane protection pads under all concrete splash blocks. Membrane protection pads shall extend a minimum of 3 inches beyond all sides of the splash block and shall be adhered to the roof surface with roofing cement.

3.8.6.1 Where splash blocks are installed on new roof surfaces, furnish and install new membrane protection pads under all concrete splash blocks. Membrane protection pads shall extend a minimum of 3 inches beyond all sides of the splash block and shall be adhered to the roof surface with roofing cement.

3.9 Roof-To-Wall Expansion Joint Cover

3.9.1 Complete any curb modifications, as required in Section 06 10 53 of the Specification.

3.9.2 At all eaves, walls and vertical surfaces, if new or existing wood blocking and/or cants are continuous, cut blocking and/or cants completely through its thickness. Remove a section the same width as the space between the expansion joint curbs, blocking or cants.

3.9.3 Form new metal roof-to-roof expansion joint covers and roof-to-wall expansion joint covers in accordance with SMACNA Architectural Sheet Metal Manual Figure No. 5-6B. Refer to Drawings.

3.9.4 Fill cavity between curb and wall with fiber glass batt insulation in a PVC envelope.

3.9.5 Prior to the installation of the expansion joint cover, apply over the joint a strip of PVC stripping, extending across the joint and terminating at the bottom edge of the joint cover flange. Lap sections a minimum of 3 inches and seal with black plastic roof cement.

3.9.6 Use maximum 10 foot lengths and a minimum number of pieces in each straight run.

3.9.7 Engage horizontal leg of cover to a continuous cleat formed from metal to match the cover, which shall be secured to the top of the curb with appropriate nail fasteners at spacing’s not to exceed 12 inches on center.

3.9.8 Set the vertical flange against the wall in a solid application sealant. Fasten the flange using appropriate fasteners at spacing’s not to exceed 12 inches on center and located approximately 1 inch from the edge of the flange. Install counter flashings in accordance with Paragraph 3.4 above.

3.9.9 Lap sections a minimum of 3 inches. Apply two beads of sealant, such as NP-1 between lapped sections. Application of sealant at the joint after sections have been lapped is not acceptable.

3.9.10 Furnish and install new metal closures using 24 ga. galvanized steel with Kynar 500 finish.

END OF SECTION
DIVISION 22

PLUMBING
PART 1 - GENERAL

1.1 Summary: installation of non-penetrating, rooftop support system for roof-mounted gas piping and copper condensation lines.

1.2 References:


1.2.2 ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.2.3 ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes.

1.2.4 ASTM B88 - Standard Specification for Seamless Copper Water Tube

1.2.5 ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings

1.2.6 ASTM B302 - Standard Specification for Threadless Copper Pipe, Standard Sizes

1.2.7 MSS SP-58 - Pipe Hangers and Supports -- Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry.

1.2.8 MSS SP-69 - Pipe Hangers and Supports -- Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry.

1.3 System Description: Support piping on roof with an engineered prefabricated pipe support system designed for installation without roof penetrations, flashing or damage to the roofing material. The system shall consist of bases, made of high density polypropylene or polycarbonate plastics with UV Protection, a HDG structural steel frame and suitable pipe hangers for the application. Nuts, threaded rods and washers shall be HDG, spring nuts and bolts for spring nuts will be electro-plated. System shall be custom designed to fit piping and conduit to be installed and the actual conditions of service.

1.4 Submittals:

1.4.1 Submit under provisions of Section 01 33 00.

1.4.2 Product Data: Submit for all products proposed for use, describing physical characteristics and method of installation.

1.4.3 Shop Drawings: Show installation layout, sizes of units, and details of installation.

1.5 Quality Assurance: Manufacturer Qualifications: Company specializing in manufacturing pipe support systems, with a minimum of five years of documented experience.

1.6 Delivery, Storage, and Handling:
1.6.1 Deliver all materials to project site in manufacturer's original packaging, marked with manufacturer's name, product model names and catalog numbers, identification numbers, and other related information.

1.6.2 Store materials under cover until needed for installation.

PART 2 – PRODUCTS

2.1 Manufacturers:

2.1.1 Acceptable Manufacturers:

2.1.1.1 Miro Industries, 844 South 430 West Suite 100, Heber City, Utah,
2.1.1.2 CADDY, a registered trademark of Erico International Corporation, 31700 Solon Road, Solon, Ohio,
2.1.1.3 PHP Systems, 5534 Harvey Wilson Drive, Houston, Texas,
2.1.1.4 or approved equal prior to bid.

2.2 Materials:

2.2.1 Support Spacing: 8 feet unless otherwise specified by the manufacturer and within 12 inches of all elbows and junctures.

2.2.2 Copper: ASTM B88, cold rolled temper, 20 oz. Copper to meet Federal Specification QQ-C-576b. Copper to be commercially pure alloy 110. Surfaces shall be free of all water staining and weathering oxides.

2.2.3 Solder: ASTM D32-66T with 50% lead and 50% tin unless otherwise specified. Follow manufacturer's recommended soldering procedures.

2.2.4 3-RAH-12 with polycarbonate base and roller for piping up to 3” in diameter.

2.2.5 6-RAH-12 with polycarbonate base and roller for piping up to 6” in diameter.

2.2.6 Two (2), Model 2.5-Conduit Support-2 for electrical juncture boxes.

2.2.7 Model 1.5 for condensation lines.

2.2.8 Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.

2.2.8.1 Corrugated stainless-steel tubing with polymer coating.

2.2.8.2 Operating-Pressure Rating: as required for existing conditions.

2.2.8.3 End Fittings: Zinc-coated steel.

2.2.8.4 Threaded Ends: Comply with ASME B1.20.1.

2.2.8.5 Maximum Length: 24 inches

2.2.9 Refer to manufacturer recommendations for line and piping support.
PART 3– EXECUTION

3.1 Examination: Verify that roofing system is complete and that roof surfaces are smooth, flat, and ready to receive work of this section.

3.2 Preparation:

3.2.1 Clean surfaces of roof in areas to receive portable support bases.

3.2.2 Use care in handling portable support system components during installation, to avoid damage to roofing, flashing, equipment, or related materials.

3.2.3 Furnish and install new copper condensation lines with P-traps at all HVAC units. Size lines to fit snugly to drainage outlets. P-Trap stem length shall be 2 times the HVAC drainage outlet diameter, and returns shall be equal to half of the stem. Consult HVAC manufacturer for additional recommendations.

3.2.4 Extend line to nearest primary drainage facility.

3.2.5 Using a jelly flux, solder copper lines and fittings in accordance with solder manufacturer recommendations.

3.2.6 Threaded copper lines and fitting may be used in lieu of solder.

3.2.7 Prime new gas lines using Sherwin Williams Kem Kromik metal primer, or approved equal, and allow to dry. Apply two coats of Sherwin Williams All Surface Enamel Latex Base, or approved equal, over all gas lines using safety yellow paint.

3.2.8 Wire brush existing gas lines to remove all scaling rust and existing paint. Prime existing gas lines using Sherwin Williams Kem Kromik metal primer, or approved equal, and allow to dry. Apply two coats of Sherwin Williams All Surface Enamel Latex Base, or approved equal, over all gas lines using safety yellow paint.

3.2.9 Existing and/or new roofing shall be adequately protected during this phase of the work. Should rust stains or paint discolor new roofing the Contractor shall install additional cap sheet at affected areas at no additional cost to the Owner.

3.3 Installation:

3.3.1 Locate bases and support framing as specified herein.

3.3.2 The use of wood for supporting piping is not permitted.

3.3.3 Furnish and install granule surfaced, modified bitumen walkway protection pads. Modified bitumen pads shall be partially adhered with a spot application of flashing cement to the substrate. The pad shall be a minimum of 18" x 18" in size, but shall be a minimum of 12 inches wider than the base.

3.3.4 Adhere support bases in the middle of walkway protection pads using continuous double-sided butyl tape on all four sides of the base. Leave a minimum 1-inch gap at each side for nominal water exit underneath base.

3.3.5 At condensation lines, secure the condensate lines to the plastic bases using steel U-clamps and nails.
Extend all lines to the nearest drainage facility. Set the plastic bases in double-sided butyl tape on a nominal 12” x 12” strip of granule surfaced modified bitumen cap sheet or walkway pad.

3.3.6 Once all supports are in place, adjust the height of supports so that piping is uniformly loaded.

3.3.7 Install pipe supports in accordance with manufacturer written instructions.

3.4 Cleaning and Protection:

3.4.1 Remove all packaging, unused fasteners, adhesive, and other installation materials from the project site.

3.4.2 Remove adhesive from exposed surfaces of supports and bases, and leave the work in clean condition.

3.4.3 Provide protection as required to leave the work in undamaged condition at the time of substantial completion.

END OF SECTION
END OF SPECIFICATION