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ADDENDUM #1

May 4, 2016

TRANSMITTED VIA EMAIL: 2 pages

TO: ALL PLAN HOLDERS AND POTENTIAL BIDDERS
FROM: RON VENTURELLA, PURCHASING OFFICER *RV*
SUBJECT: ENKA HIGH SCHOOL RE-ROOF CTE WING & CANOPIES
(RFP# 16-16)

The following changes, revisions, additions, and/or clarifications to the plans and/or specifications are hereby made a part of the original documents. **Be sure to acknowledge this addendum on the proposal sheet.**

Pre-Bid Meeting Minutes
Enka High School
Re-Roof Final Phase
Asheville, NC

At 11:00am on April 29, 2016, a Pre-Bid Conference was conducted for the Final Phase Re-Roof project at Enka High School.

Attending the meeting:

Hugh Clark	Service One Inc.	828.230.3916	hcserviceone@Bellsouth.net
Brian Bartholomew	Bartholomew Construction	828.684.5860	brian@Div7.org
Chris Anderson	Benton Roofing	828.693.3362	chrisanderson@bentonroofing.com
Tom Kelley	Kelley Products / Hickman		TDK27@charter.net
General Putnam	CMRCI		general@Cmrci.biz
Trey Burns	Best Distributing		tburns@bestdistributing.com
Matt Williams	CityScape Roofing, Inc		pwinkler@cityscaperroofing.com
Payton Winkler	CityScape Roofing, Inc		
Bill Horniak	Enka High Assist. Principal		william.horniak@bcsemail.org
Mary Beth Kingston	BCS Facilities	828.255.5916	marybeth.kingston@bcsemail.org

The following questions and clarifications were addressed in the pre-bid meeting:

1. Contractors are to verify all dimensions.
2. At all HVAC units including exhaust, units are to be turned off, protected and/or disconnected in coordination with codes and the school as required to make alterations.
3. Contractor to coordinate work with HVAC intakes and BCS Maintenance department to prevent fumes from being drawn into the school.
4. Removing and replacing stained cementitious wood fiber deck was discussed in the pre-bid meeting. Clarification: Contractor to provide pull testing per the specifications and in coordination with wet and stained areas of deck to verify pull resistance. Contractor to provide additional twin lock fasteners if required. Contractor to provide (6) full sheets of 32" x 96" x 2 1/2" Tectum or Martin Fire Proofing on site during construction to be used only with Owner approval.
5. Construction staging to be coordinated with school staff at the time of the pre-construction meeting.
6. Schedule: The P.O. will be issued to the contractor within a few days of the receipt of certificate of insurance, and if required, bonds. A P.O. will be issued to the low bidder for the preparation of submittals. The P.O. will only be paid after the issuance of bonds and the P.O. for the rest of the project. Construction to start with materials delivery on June 13, 2016. Substantial completion of the project will be August 19, 2016. Final completion: September 2, 2016.
 - a. Normal work summer work hours for Buncombe County Schools are 7:00 am to 5:00 pm, Monday through Thursday. The contractor may work on Friday and the weekends in coordination with the school. Contractor is responsible to check for leaks and make repairs at any time it rains during the project.
7. Contractor is, at no time, to leave the roof membrane unsecured. Contractor will held responsible for consequential damages to the building as a result of leaks during construction.
8. Full system warranty is to include metal edges.
9. This time includes 8 days per month average weather days. Weather days will only be considered beyond 8 calendar weather days per month.
10. The work does not include Roof Area S shown on the plans.
11. The Canopies L, Q and the one in the courtyard attached to Building "C" that is approximately 8' x 10' will be a part of Additive Alternate # 1.
12. Additive Alternate # 2 will be .080 TPO membrane: .060 TPO will be the Base Bid membrane.
13. Additive Alternate # 3 will be the overflow drains, insulation, piping and drainage outlets.
14. BCS may elect to take any or all of the Additive Alternates in no particular order.
15. Submittals: Line Item on the attached Bid Form that will include the cost to assemble and submit the materials required to be approved prior to ordering construction materials for the project.
16. The contractor may stage and work from the loading area adjacent to the building. Materials removed from the roof must be lowered in a controlled manner and the area around the building cleaned of debris daily.
17. The school system will cover equipment inside the building with plastic. When the roofing project is complete, the contractor is responsible to neatly remove the plastic and sweep all spaces to a "broom clean" condition.

ATTACHED: Specifications (27 pages), Revised Proposal Form (2 pages)

END OF ADDENDUM #1

ENKA HIGH SCHOOL RE-ROOF CTE WING & CANOPIES (RFP# 16-16)

SECTION 01110: SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. Project Identification:

1. Project Name: **17-Enka High School Reroof CTE Wing & Canopies**
Location: 475 Enka Lake Road, Candler, NC 28715
2. School Phone: 828-670-5000

B. Contract Documents, Drawings dated 6-03-2014 were prepared by Mary Beth Kingston, AIA, Facilities Department, Buncombe County Schools (828-255-5916).

C. 24 x 36 Drawing list:

Cover, A104.1 Roof Plan and Details, A105.1 Details

Technical Specifications list:

01110: Summary of Work, 01200 Price and Payment Procedures, 01400 Quality Requirements, 07530 Single Ply Membrane Roof

D. Base Bid Scope involves Building I (Roof Area P). The base bid and alternates involved is approximately 18,000 square feet. Contractor is responsible to verify existing conditions including, but not limited to, utilities, site access and dimensions in prior to submitting their bid. Components, accessories, and work normally associated with, or necessary for a complete, watertight and warrantable roof system, shall be included in the proposal if not specifically noted or required in the bid documents including connections to adjacent roofs. Hidden conditions, or existing defects that could not have been anticipated prior to demolition shall be considered adds to the scope of work if not provided for in the drawings, specification or Allowances.

Contractor is to take responsibility for all electrical, plumbing, mechanical and other related trade work necessary to facilitate project operations. Contractor is responsible for re-locating any and all conduit, HVAC units, curbs, and /or plumbing necessary to comply with the requirements of these documents. All work to conform with the requirements of state and local codes, including jurisdictional permitting.

Roof Area Building "P" (Approximately 16,000 square feet):

1. Completely remove BUR roof system and fiberglass board insulation down to deck.
2. Inspect and / or replace cementitious wood fiber deck as if approved and per Allowances.
3. Inspect and resecure existing wood nailers in coordination with Owner and per FM1-49 and per Allowance.
4. As shown, install new wood nailers at base flashing conditions and to flush out all nailers with the new roof system using KDAT lumber and stainless steel fasteners.
5. Mechanically fasten base sheet per pull test values.
6. Adhere 2 layers of roof insulation.

SECTION 01110: SUMMARY OF WORK

7. Fully adhere .060 TPO membrane with all cut edges sealed w/ min 4" fully welded unreinforced membrane. Cut edge sealant shall not be used as the sole water sealant on cut edges of reinforced membrane.
8. Install new ANSI-SPRI ES-1 metal with full coverage of nailers and components not intended to be exposed to view.
9. Replace all existing drain clamp bolts with new stainless steel bolts after tapping threads as necessary to provide full clamping. Replace cracked, damaged or missing drain clamps as required with cast iron components to provide full clamping at roof drains. Replace all missing or damaged strainers with new cast iron strainers by the original roof drain mfg. or approved equal.
10. All work shall be completed in accordance with the roof system mfg's published recommendations and details for a 20 year full system and 72mph wind speed. Roof design for uplift pressure shall include 90mph wind speed.
11. Provide a 20 year, NDL, full system warranty by manufacturer, 20 year manufacturer's material warranty and 2 year contractor's warranty.

Canopies Q, L and Courtyard

1. Inspect existing roof for wet areas and inform Owner of any issues.
2. Prepare existing roof surface as required by manufacturer for overlay membrane installation.
3. Mechanically fasten ½" high density polyisocyanurate board.
4. Mechanically fasten any additional tapered insulation as required to provide positive drainage.
5. Notes 8-12 in description for Roof Area Building P roof installation above.

E. ALTERNATES:

See Allowances and Unit Prices specified for project for full description.

F. WORK RESTRICTIONS

1. Contractor's Use of Premises: During construction, Contractor shall have limited use of site and building. Contractor's use of premises is limited by Owner's right to perform work or employ other contractors on portions of Project and by the need for uninterrupted operation of public school activities and instruction.
2. Contractor shall meet with the school principal and Facilities Department prior to start of work or mobilization to determine acceptable access to the roof, staging, parking areas, storage areas, work hours, access to the site, check in and material delivery procedures. Any other use or area of the premises is not allowed unless authorized by the school principal and Facilities Department.
3. Contractors on site shall not interact with school personnel or students except those contact persons expressly identified by the school principal. Tobacco products are not allowed to be consumed, firearms and weapons are not allowed on Board of Education property.

SECTION 01110: SUMMARY OF WORK

4. Contractor to maintain existing building in a weathertight condition throughout construction period and take every precaution against injuries to persons or damage to property.
5. Contractor to record by photos or video existing interior and exterior site conditions prior to start of work. Contractor to protect other roof and site features and will repair any damages or make restitution acceptable to the Owner's satisfaction as required.
6. Contractor shall not overload or permit any part of the structure to be loaded with weights that will endanger its safety or to cause deflection to the roof system.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- A. The Purchase Order will be issued to the low bid contractor within a few days of the receipt of certificate of insurance, and if required, bonds.
- B. Construction start date: June 13, 2016.
- C. Substantial Completion date: August 19, 2016.
- D. Final Completion date: September 2, 2016.
- E. Weather days will only be considered at the end of the month for which they are requested in.
- F. The completion date is determined by acceptance of the roof by the membrane manufacturer as documented in writing.

END OF SECTION 01110

SECTION 01200 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.2 UNIT PRICES

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased. Unit prices are also the basis for quantities described in Allowances portion of the work. Work which requires the use of Unit prices and Allowances is to be installed only after approval by the Owner of the specific use.
- B. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

1.3 ALTERNATES

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

SECTION 01200 - PRICE AND PAYMENT PROCEDURES

1.4 SUBSTITUTION PROCEDURES

- A. Substitutions include changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor after award of the Contract.
 - 1. Submit three copies of each request for product substitution.
 - 2. Submit requests within 10 days after the Notice of Award.
 - 3. Do not submit unapproved substitutions on Shop Drawings or other submittals.
 - 4. Identify product to be replaced and show compliance with requirements for substitutions. Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified, a list of changes needed to other parts of the Work required to accommodate proposed substitution, and any proposed changes in the Contract Sum or the Contract Time should the substitution be accepted.
 - 5. Architect will review the proposed substitution and notify Contractor of its acceptance or rejection.

1.5 CONTRACT MODIFICATION PROCEDURES

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.
- B. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work.
 - 1. Proposal Requests are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time.
- C. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
- D. Architect may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in the Purchase Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- E. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

SECTION 01200 - PRICE AND PAYMENT PROCEDURES

1.6 PAYMENT PROCEDURES

- A. Application for Payment Forms: Use forms acceptable to Architect and Owner as form for Applications for Payment.
- B. Submit one copy of each application for payment according to the schedule established in Owner/Contractor Agreement.
 - 1. With each Application for Payment, submit notarized sales tax forms.
 - 2. Project Closeout: Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien and BCS "Re-Roofing Administrative & Close Out Requirements" provided at the end of this section which includes the following requirements:
 - a. Completion of punch list and final walk through with Owner.
 - b. Accepted Warrantees.
 - c. Documentation of project acceptance by Authorities Having Jurisdiction.
 - d. Final change order with BCS "Resolution of Allowances and Change Orders" completed (form provided at the end of this Section).
 - e. Repair bag.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALLOWANCES

A. Reference Unit Prices for declared costs of comparable work. Allowances scheduled and related costs are included in the base bid and apply to Alternates. Unused Allowances will be credited to the Owner in the amount of the declared Unit Prices or the dollar amount noted in the Allowance:

- 1) **Allowance #1:** Per Unit Price #1 (Deck replacement):
32" x 96" (6 Units) of 2 ½" thick cementitious wood fiber roof deck in 4 locations. Contractor shall have the 6 units of deck on site at the beginning of work to be used for replacement to avoid delays and exposure of the building to the weather. If not used or partially used, the contractor will turn over the deck to the owner if requested and credit the owner for labor, overhead and profit only.
- 2) **Allowance #2:** Per Unit Price #4 (Nailer Replacement):
100 bd ft replacement of KDAT nailers beyond that required in the documents. Nailers required to flush out the existing nailers to the new roof system are included in the base bid.

SECTION 01200 - PRICE AND PAYMENT PROCEDURES

- 3) **Allowance #3:** Per Unit Price #5 (Threaded Rod):
Eighty (80) ½" stainless steel threaded rods x 10" length. Threaded rods are to supplement to the existing nailers to ensure compliance with FM1-49 for perimeter nailer securement.

3.2 SCHEDULE OF UNIT PRICES

A. UNIT PRICES QUOTATION SCHEDULE:

- 1) **Unit Price #1** (Deck replacement):
Replace 32" x 96" (6 Units) of 2 ½" thick cementitious wood fiber roof deck
- 2) **Unit Price #2** (Nailer Replacement):
Replacement of wood blocking or nailers with new KDAT treated lumber, per specification, and stainless steel fasteners per FM1-49. Cost per board ft. Note that nailers added for required securement or to flush out the perimeter edges to the new roof system are included in the base bid and shall not involve the Allowance or Unit Price.
- 5) **Unit Price #3** (Threaded Rod):
Install ½"x 10" stainless steel threaded rod anchors thru perimeter wood nailers epoxy grouted into masonry per FM1-49. Allowance per individual rod.

3.3 SCHEDULE OF ALTERNATES

Additive Alternate # 1: **Canopy Roof Areas:** L, Q and Courtyard at C Building.

Additive Alternate # 2: **.080 TPO Membrane**

Additive Alternate # 3: **Overflow drains:** Including insulation, piping and drainage outlets

END OF SECTION 01200

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Testing and inspecting services shall be performed by independent testing agencies.
- B. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to Architect for a decision.

1.2 SUBMITTALS

- A. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, notices, receipts for fee payments, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.3 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum. The actual installation may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision.
- B. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated; and where required by authorities having jurisdiction, that is acceptable to authorities.
- C. No later than 10 days prior to the pre-roofing conference, Contractor shall provide the Owner, in writing, the names of the proposed project manager, job superintendent, and foreman for approval. The Owner, without giving cause, may request an additional name, or names to be submitted for approval. Once approved, the superintendent will not be changed except with the consent of the Owner.
- D. Contractor's superintendent shall maintain one complete set of the contractor documents and submittals on the job site.
- E. Installer qualifications:
 - 1. Acceptable contractor to have a minimum of 3 years experience in successfully installing the same or similar materials and be certified by the roofing materials manufacturer to install the primary roofing products.

SECTION 01400 - QUALITY REQUIREMENTS

2. Have a minimum of five years experience in installing roofing systems under the same firm name as submitted in the bid and certified by the manufacturer.
3. All crew members on site to be experienced and have a working knowledge of the system being installed.
4. Contractor shall provide a full time onsite superintendent who meets the following qualifications:
 - a. "Superintendent" is the person on the job site at all times while work is being performed whose primary responsibility is to supervise and direct the performance of the Work.
 - b. Able to demonstrate knowledge of roofing systems being installed.
 - c. In possession of a cell phone at all times.
 - d. Meet Owner approval.
 - e. The superintendent shall have had a minimum of five years continuous experience as a re-roofing job superintendent.

1.4 QUALITY CONTROL

A. Contractor's Responsibilities:

1. Repair and protection of work and materials are Contractor's responsibility.
2. Should any work or materials not conform with requirements of the Specifications or become damaged during the progress of the work, such work or materials shall be removed and replaced, together with any work disarranged by such alterations, at any time before completion and acceptance of the project. All such work shall be done at the expense of the Contractor.
3. Contractor will coordinate documents with manufacturer and perform such testing, reporting and communication incidental to projections of the warranty procedures.

B. Manufacturer's Field Services:

1. Manufacturer's technical representative shall also perform quality assurance visits to ensure materials are being properly installed and as required to obtain the specified warranty.
2. Manufacturer's final inspection shall be performed with BCS personnel in attendance. A minimum of five days' written notice is required.
3. Manufacturer's Field Services for Johns Manville: During construction and until substantial completion, manufacturer's representative shall perform monthly quality assurance site visits to ensure materials are being properly installed and as required to obtain the specified warranty.
 - a. The first site visit shall be performed within the first three (3) days of operations.
 - b. Coordinate all site visits with Owner. Submit reports of findings within one week of inspection. Payment applications will be rejected until applicable reports are received.
 - c. Inspections to be performed by an employee of Johns Manville that is assigned full time to their technical services department. Sales personnel will not be acceptable for this function and may result in rejection of the work installed that does not fulfill this requirement.
 - d. Manufacturer's final inspections shall be performed only with the Owner in attendance. A minimum of seven days' written notice is required. Any manufacturer's final inspection conducted without Owner personnel in attendance will be repeated at no additional cost to the Owner.

SECTION 01400 - QUALITY REQUIREMENTS

- e. Any violation of this requirement will result in the removal of that manufacturer for a period of not less than one year from the Owner's accepted materials list.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Promptly notify Architect and Contractor of irregularities or deficiencies in the Work observed during performance of its services.
 - 2. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 - 3. Do not perform any duties of Contractor.
- E. Associated Services: Cooperate with testing agencies and provide reasonable auxiliary services as requested. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Security and protection for samples and for testing and inspecting equipment.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- G. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as indicated in Statement of Special Inspections attached to this Section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01400

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Use Charges: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated.
- B. Water and Electric Power: Available from Owner's existing system without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Provide field offices, storage and fabrication sheds, and other support facilities as necessary for construction operations. Store combustible materials apart from building.

PART 3 - EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

3.2 SUPPORT FACILITIES INSTALLATION

- A. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

- B. Provide measures to prevent airborne dust and debris to undisturbed areas and to adjacent properties and walkways.
- C. Furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

3.4 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion.

END OF SECTION 01500

SECTION 07530 – FULLY ADHERED SINGLE-PLY MEMBRANE ROOFING – TPO

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division-1 Specification sections, apply to this section.

1.02 SUMMARY

- A. Furnish and install elastomeric sheet roofing system, including:
 - 1. Roofing manufacturer's requirements for the specified warranty.
 - 2. Removal of entire existing roof membrane and flashings.
 - 3. Removal of all existing insulation down to the Tectum deck.
 - 4. Preparation of roofing substrates.
 - 5. Wood nailers for roofing attachment.
 - 6. Insulation.
 - 7. Cover boards.
 - 8. Elastomeric membrane roofing.
 - 9. Metal roof edging and copings.
 - 10. Flashings.
 - 11. Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete weatherproof roofing system.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. The roof system has been tested for Asbestos-containing materials and "None-Detected" were the results. If the contractor finds ACM present in the existing roofing system the Owner is to be notified and arrangements made to remove, handle, and dispose of asbestos-containing material in manner complying with all applicable federal, state, and local regulations.
- D. Comply with the published recommendations and instructions of the roofing membrane manufacturer.

1.03 SCHEDULE

- A. Per Section 01110 Summary.

1.04 SUBMITTAL REQUIREMENTS

- A. Product Data:
 - 1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
 - a. Technical data sheet for roof membrane.
 - b. Technical data sheets for splice tape and adhesives.
 - c. Technical data sheet for batten strips and fasteners.
 - d. Technical data sheet for each insulation type.

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SECTION 07530 – FULLY ADHERED SINGLE-PLY MEMBRANE ROOFING – TPO

- e. Technical data sheet for each cover board type.
 - f. Technical data sheet for each type of metal edging.
- 2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable; include data itemizing the components of the classified or approved system.
- 3. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.
- B. Samples: Submit samples of each product to be used.
 - 1. Sample of roof membrane.
 - 2. Sample of batten strips and fasteners.
 - 3. Sample of walkway pads.
 - 4. Sample of each insulation type.
- C. Shop Drawings: Provide:
 - 1. Design Calculations: Provide formulas, variables, diagrams and calculations demonstrating compliance of roof system design to the code required to uplift and wind pressure. Warranty shall recognize uplift design pressure and shall recognize 72 MPH min wind speeds.
 - 2. The roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.
 - 3. Test data for pullout resistance of fastening systems. Pull tests shall be conducted in presence of the owner's Facilities Department representative. Provide a minimum 72-hour notice.
 - 4. Tapered insulation layout with board sizes and adhesive beading requirements.
- D. One copy of the Job Foreman's Manual.
- E. Specimen Warranty: Submit prior to starting work.
- F. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.
- G. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.
- H. Executed Warranties.

1.05 QUALITY ASSURANCE

- A. Applicator Qualifications: Roofing installer shall have the following:
 - 1. Current approval, license, or authorization as applicator by the manufacturer.
 - 2. Fully staffed office within 125 miles of the job site.
 - 3. At least five years experience in installing specified system.
 - 4. Capability to provide payment and performance bond to building owner.
- B. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
 - 1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
 - 2. Notify Owner well in advance of meeting.
 - 3. Technical Representatives from roof system manufacturer and polyurethane adhesive

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FULLY ADHERED SINGLE-PLY MEMBRANE ROOFING

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manufacturer to provide job start up training.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering. Unvented polyethylene tarpaulins are not accepted. Moisture trapped underneath an unvented covering may affect membrane weldability.
- C. Keep combustible materials away from ignition sources.
- D. All adhesives shall be stored at temperatures as required for the manufacturer.

1.07 PROJECT CONDITIONS

- A. Roofing shall not be applied during precipitation and shall not be started in the event there is a probability of precipitation during application.
- B. Complete waterstops shall be installed at the end of each day's work and shall be removed before proceeding with the next day's work.
- C. The existing building interior is to be protected against risks of inclement weather during construction. Should moisture occur, the applicator shall provide the necessary equipment to dry the surface prior to application.
- D. Prior to and during application, all dirt, debris, moisture and dust shall be removed from surfaces, by vacuuming, sweeping, blowing with compressed air and / or similar methods. All surfaces to receive new insulation, membranes and flashings to be dry. Should moisture occur, the applicator shall provide the necessary equipment to dry the surface prior to application.
- E. If any usual or concealed condition is discovered, the contractor shall stop work and notify Owner of the condition immediately.
- F. Work that involves Unit Prices / Allowances to be approved and verified by Owner prior to commencement.

1.08 WARRANTIES

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.
- B. Warranty: 20 year full system warrantee covering membrane, roof insulation, edge metal, and membrane accessories.
 - 1. Limit of Liability: No dollar limitation.
 - 2. Scope of Coverage: Repair leaks in the roofing system caused by:
 - a. Ordinary wear and tear of the elements.
 - b. Manufacturing defect in Firestone brand materials.
 - c. Defective workmanship used to install these materials.
 - d. Damage due to winds up to 72 mph.
 - 3. Warranty period is **20 years** after date of completion and acceptance by Owner and

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Manufacturer (whichever is later). The warranty shall recognize a minimum 90 lbs/square foot uplift force design which shall be calculated based upon the formula and variables of Chapter 16 of the N.C. Building Code latest edition. The warranty may recognize a maximum wind speed which relates to the uplift force as demonstrated by the submitted design calculations required in other specification sections, but in no case shall be less than 72 MPH. Unless otherwise noted use the following values:

$$V_{3s}=90/V_{fm}=75$$

Exposure Category = C

Importance Factor = II

Building Height = Field Verify

Warranty shall be non-prorated for water-tightness and extended coverage.

This warranty shall be fully paid for by the roofing contractor.

4. This warranty shall cover both labor and materials necessary to effect water-tightness, including standing water on the roof membrane. Warranty shall cover entire installation including rigid roof insulation, flashing, etc. Flashing material must be compatible with the respective system.
 5. Warrantee must allow disputes to be settled in the courts of Buncombe County, NC.
 6. Warranties shall not require a roof access log or maintenance log by owner.
- C. Membrane Warrantee: The membrane manufacturer shall further warrant that the membrane will not prematurely deteriorate to the point of failure because of weathering, **whether or not leaks are apparent**, for a period of twenty (20) years from the date of acceptance by the Owner or the membrane manufacturer's representative (whichever is later). This warrantee is to include labor and materials to replace the defective membrane.
- D. Special Project Warranty: The Contractor shall guarantee the materials and workmanship associated with the roofing, flashing, and sheet metal work incidental to the roofing, against defects due to faulty material, workmanship and/or negligence by contractors for a period of twenty-four (24) months following final acceptance of the work. The substitution of an equal or longer-term manufacturer's warranty in lieu of this requirement will not be acceptable.
- E. Repair-only Project Warranty: For projects or portions of projects where only limited repairs or seam stripping are made, the Contractor's Special Project Warranty as described above shall serve as the project warranty or for that portion of the project.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Performance: Provide roofing materials recognized to be of generic type indicated and tested to show compliance with indicated performances, or provide other similar materials certified in writing by manufacturer to be equal to, or better than, materials specified in every significant respect, and acceptable to Consultant.
- B. Compatibility: Provide products that are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

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- C. THERMOPLASTIC MEMBRANE (Owner's Standard for new and recovery roofs)
1. General: Reinforced Thermoplastic Olefin (TPO) formed into uniform, flexible sheets, complying with ASTM D 6878. Widest sheets available or manufactured to minimize field seams.
 - a. Class SR, Scrim or fabric internal reinforced.
 - b. Thickness: 60 mils, nominal – unless noted otherwise.
 - c. Exposed Face Color: White – unless noted otherwise. Gray shall be used where the roof surface is visible or may result in glare to adjacent buildings or neighbors. Verify with Owner.
 - d. Fully Adhered TPO Membrane: Manufacturer's standard installation, except as otherwise noted. Peel and stick product is acceptable.
 - e. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 1. Carlisle Syntec Systems, "Sure Weld" or equal by:
 2. Firestone Building Products
 3. Versico
 4. Johns Manville (with special inspections noted in other parts of these specifications).

2.02 AUXILIARY MATERIALS

- A. Bonding Adhesive: Nitrile rubber based fluid, formulated for compatibility with the membrane backing and insulation surfaces, specific existing roof surfaces, and other substrates including wood, metal, and masonry.
- B. T-joint Patch: Shall be membrane manufacturer's circular patch welded over T-joints formed by overlapping thick membranes.
- C. Corner Flashing: Shall be membrane manufacturer's pre-formed inside and outside flashing corners that are heat welded to membrane or polymer clad metal base flashings.
- D. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches (457 mm) wide.
- E. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.
- F. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
 1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent.
 2. Tensile Strength: 1550 psi (10.7 MPa), minimum, when tested in accordance with ASTM D 638 after heat aging.
 3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D 638 after heat aging.
 4. Tearing Strength: 12 lbf (53 N), minimum, when tested in accordance with ASTM D 1004 after heat aging.
 5. Color: White.

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- H. Mechanical Fasteners: Metal Plates, caps, battens, accessory components, fastening devices, and adhesives to suit substrate and deck type and complying with current building code, fire and insurance uplift rating requirements. Place all fasteners in a fastening pattern as recommended by the roofing system manufacturer to withstand minimum 90 psf uplift force. Provide calculations demonstrating values and formulas used in the uplift design.
1. Provide fasteners suitable for substrates to which fasteners are to be secured and fasteners acceptable to the insulation and roof membrane system manufacturer to meet minimum specified warranty requirements. As necessary, provide withdrawal resistance testing for the proposed fastener(s) to ensure minimum fastener withdrawal resistance as required by the manufacturer to meet the specified uplift and warranty requirements. Invite the owner's representative to witness testing with minimum 72-hour notice.
 2. Spacing and pattern of fasteners shall be in accordance with manufacturer's recommendations for uplift specified.
 3. Membrane manufacturer's standard fasteners may be used where certification can be provided that demonstrates to owner's representatives satisfaction that the proposed fasteners/pattern will satisfy the specified uplift and warranty requirements.
 - a. Termination bar: 1/8" by 1" mill finish extruded aluminum bar with pre-punched slotted holes.
 - b. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
 - c. Counter Flashing Bar: Prefabricated extruded aluminum metal counter flashing and termination bar. 0.10"-0.12" thick bar with 2 1/4" profile, pre-drilled holes 6" o.c. or 8" o.c. and sealant kickout at top edge.
- I. Primary membrane cleaner: High quality solvent cleaner provided by membrane manufacturer.
- J. Pre-weld Cleaner: High quality solvent based seam cleaner with moderate evaporation rate provided by membrane manufacturer.
- K. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing.
- L. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed.
- M. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed.
- N. Coated Metal Flashing and Edgings: Galvanized steel with roofing manufacturer's bonded TPO coating.
- O. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with coated or uncoated 100% glass reinforced mat laminated to faces, complying with ASTM C1289, Type II, Class 2 requirements. Provide submittal of manufacturer's specifications.
1. Thickness: 2" and 3" flat stock in 4'-0" x 8'-0" sheets
 2. Size: 4'-0" x 4'-0" taper system pieces
 3. 25 psi minimum density when adhered to roof membrane.
 4. 20 psi infill layers of insulation or under cover board.
 5. 100 psi minimum high density polyiso board complying with ASTM Test C518 with a high performance fiberglass facer. 1/2" thickness.

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- Q. Adhesive for Insulation Attachment: Type as required by roof membrane manufacturer for roofing system and warranty to be provided; use only adhesives furnished by roof membrane manufacturer.
1. Bead-Applied Insulation Adhesive: Insulation manufacturers recommend bead-applied, low-rise, in one or multi-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.
 2. Full-Spread Applied Insulation Adhesive: Insulation manufacturers recommend spray-applied, low-rise two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- R. Tapered Edge Strips: Types recommended by membrane manufacturer, including adhesive tapes, flashing cements, and sealants. Provide 0-1/2" x 6" and 0-1/2" x 12" tapered edge strip at 1/2" side of tapered cricket insulation.
- S. Base Sheet: Asphalt impregnated and coated glass fiber mat reinforced roofing sheet, complying with ASTM D 4601, Type II, formulated for mechanical attachment to substrate and hot asphalt and cold adhesive application to substrate and cap sheet, with the following additional characteristics:
1. Nominal Thickness: 0.040 inch (1.0 mm).
 2. Approved for use in Factory Mutual tested assemblies.
 3. Complying with criteria for UL G-2 base sheet.
 4. Sheet Width: 3.3 feet (1 m), nominal.
- T. Wood Nailers: Provide Above Ground Contact pressure treated wood nailers for securement of the edge of the roof membrane per FM1-49. Wood nailers installed for uses other than membrane securement to be Fire Retardant treated.
1. Wood pressure treatment: Alkaline Copper Quaternary (ACQ) pressure-treatment confirming to AWPS Standard C-2 (above ground) with 0.25 to 0.40 lbs per cubic foot retention rate.
 2. PS 1, APA Exterior Grade plywood; pressure preservative treated.
 3. Width: 5-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
 4. Thickness: Same as thickness of roof insulation.
 5. 18-8 stainless steel fasteners only in pressure treated wood.
- U. Piping supports and condensate drains: At all re-roof areas, the contractor shall provide and install new 4x6 ground contact rated pressure treated piping supports min. 12" long @ 4' oc max to replace existing wood supports. Contractor shall install a secondary 16" x12" adhered .060 membrane under each replacement pipe support. Existing plastic or other dedicated supports, in good condition, may be reused where approved by the Owner. The contractor shall "V" notch wood pipe supports as necessary to coordinate piping height and avoid stress on any piping. PVC condensate drains shall be replaced as necessary with new piping that maintains slope to drain and terminates directly over a roof drain.
- V. THERMOSET MEMBRANE (for repairs @ existing membrane only)
1. Unreinforced EPDM membrane formed into uniform, flexible sheets, complying with ASTM D 5538, ASTM D 883, ASTM D5665, and ASTM 5726. Widest sheets available or manufactured to minimize field seams. 40 mils for repairs and 60 mils for new work.
 2. EPDM membrane shall be used only on projects where it is necessary to match materials to existing conditions, make repairs and/or it is impractical to isolate

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membranes or for new ballasted systems. All seams shall be adhered with seam tape, no exceptions. All cut edges shall be covered with 9" self adhesive cover strips. All "T" joints shall be covered with a min 6x6 self adhesive cover strip. Preformed flashing components shall be utilized in all cases where the manufacturer has product available for the application.

- W. PVC MEMBRANE: Shall not be used unless the system is submitted and approved by the owner prior to bid.
- X. Protective Mats & Slip Sheet: Provide type recommended by membrane manufacturer for protecting membrane from incompatible substrates if shown or not in these documents.
- Y. Walkway Protection: Where indicated on the drawings or where required for access to roof mounted units, provide walkway to and around roof top equipment.
 - 1. Walkway material shall be 30" min. width and can be in sheet rolls or 4' +/- strips. Provide 1" +/- gap between sheets.
 - 2. system manufacturer, compatible with membrane system used and covered by the manufacturer's warranty.
 - 3. Provide at all roof scuttles, access points and HVAC equipment containing filters or other regularly serviced components whether indicated on the drawings or not. Additional walkway requirements may be specified in the Allowance, Summary of Work or on the drawings.

2.05 METAL ACCESSORIES

- A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
 - 1. Wind Performance:
 - a. Membrane Pull-Off Resistance & Fascia Pull-Off Resistance: Test in accordance with ANSI/SPRI ES-1 Test Method RE-2, current edition.
 - 2. Fascia Face Height: To match existing from previous phases.
 - 3. Edge Member Height Above Nailer: 1-1/4 inches (31 mm).
 - 4. Length: 144 inches (3650 mm).
 - 5. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
 - 6. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.
 - 7. Anchor Bar Cleat: 20 gage, 0.036 inch (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
 - 8. Curved Applications: Factory modified.
 - 9. Fasteners: Factory-provided **stainless steel** fasteners, with drivers; no exposed fasteners permitted.
 - 10. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14 inch (355 mm) long legs on corner pieces. Corners to be welded.
 - 11. Scuppers: Welded watertight.
 - 12. Accessories: Provide matching brick wall cap, downspout, extenders, and other special fabrications as shown on the drawings.

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PART 3 – EXECUTION

3.01 GENERAL

- A. Start installation only in presence of manufacturer's technical representative, on projects where wind pressures exceed 90 psf, or is necessary or recommended by the owner or manufacturer.
- B. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- C. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- D. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- E. Perform work using competent and properly equipped personnel.
- F. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- G. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- H. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 - 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
 - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- I. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- J. Consult membrane manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or

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deform deck.

- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.03 PREPARATION

- A. Remove all of the existing roof system down to the roof deck including all existing composition base flashings. Dispose of all materials properly. Perform asbestos removal in accordance with federal, state and local regulations and dispose of waste in legal manner.
 - 1. At penetrations, remove all existing flashings, including lead, asphalt, mastic, etc.
 - 2. At walls, curbs, and other vertical and sloped surfaces, remove loose and unsecured flashings; remove mineral surfaced and coated flashings; remove excessive asphalt to provide a smooth, sound surface for new flashings.
- B. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
- C. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.
- D. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.
- E. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.
- F. Wood Nailers: Provide wood nailers at all perimeters and other locations where indicated on the drawings, of total height matching the total thickness of insulation being used.
 - 1. Install with 1/8 inch gap between each length and at each change of direction.
 - 2. Mechanically fasten to substrate per FM 1-49 with 18-8 stainless steel fasteners. Provide additional fastening to existing nailers as required to meet FM 1-49.
 - 3. Provide EPDM separation between pressure treated wood and adjacent existing metals.

3.04 INSTALLATION OF ASPHALT BASE SHEET OVER DECK

- A. Unroll sheets in the location where they are to be installed, maintaining proper side and end lap widths, and allow to relax completely.
- B. Start at the low point of the roof, using full width sheet.
- C. Install with minimum 2 inch (50 mm) side laps and 4 inch (100 mm) end laps; maintain minimum 12 inch stagger between end laps in adjacent layers.
- D. Mechanical Attachment: Install sheets with specified fasteners, at spacing recommended by roof membrane manufacturer and FM requirements.
- E. Keep sheets free of wrinkles, buckles and fish mouths; "broom in" if necessary to eliminate voids and obtain proper embedment.

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3.05 INSULATION AND COVER BOARD INSTALLATION

- A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.
- B. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch (6 mm). Fill gaps greater than 1/4 inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).
 - 1. Joints to be staggered 12" in each direction from layer below.
 - 2. Provide tapered edge strip at 1/2" side of tapered insulation.
- E. Mechanical Fastening: Using specified fasteners and insulation plates engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.
 - 1. Provide fastening pattern per wind uplift requirements.
 - 2. In no case shall fasteners be installed within 6" of board edge.
- F. Cold Adhesive Attachment: Apply in accordance with membrane manufacturer's instructions and recommendations.
 - 1. Apply only when adhesive and ambient temperature meet manufacturer's requirements or provide manufacturer's additive to allow application at lower temperature.
 - 2. Insulation board size to be 4' x 4' maximum or per manufacturer's requirement.
 - 3. Adhesive is applied in beads or ribbons 4", 6" or 12" o.c. depending on the wind zone, building height and code requirements to produce a strong adhesive bond between the insulation and the substrate. Bead spacing also to meet Factory Mutual and manufacturer's 20 year total system warranty requirements.
 - 4. Place board into adhesive after allowing it to rise 1/2" and develop string/body but before the adhesive reaches a "tack free" state.
 - 5. Apply 150 pounds of pressure with roller and "walking-in" or as recommended by manufacturer to insulation boards to obtain maximum adhesive contact during curing.

3.06 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Install membrane adhered to the substrate, with edge securement as specified.
- E. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.

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- F. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches (1:6) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
 - 1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
 - 2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.
- G. **Special project requirements for membrane cut edges:** TPO membrane seams shall be sealed by heat welding per manufacturer's requirements. In addition, this project will require the following:
 - 1. **Cut edges of scrim reinforced TPO membrane: Shall be covered with a min 4" wide unreinforced fully heat welded .060 TPO flashing.**
 - 2. All "T" joints shall be covered with a min 6"x 6"square or 6" diameter self adhesive cover strip.

3.07 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
 - 1. **Use preformed flashing in all cases, unless not available from the manufacturer and approved by the owner.**
- B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
 - 1. Follow roofing manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
 - 3. Install water block sealant under the membrane anchorage leg.
 - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
 - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
 - 6. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
 - 7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- C. Existing Scuppers: Remove scupper and install new scupper.
- D. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer.
- E. Roofing Expansion Joints: Where existing or new expansion joints abut or are uncovered due to new re-roofing work, install new membrane bellows and 8" min batt insulation in the cavity to avoid condensation. Install new membrane over joints with RUSS strip securement each side of raised EJ. At EJ's where new re-roof work abuts existing EPDM membrane and results in TPO joint with EPDM, provide a 24 ga galv steel, fabricated cover as shown on details.
- F. Roof Area Dividers: Provide new roof area dividers (RAD) at limits of new, re-roof areas

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and existing roof areas. Provide fire retardant wood or metal studs and cement bd. to form a non-combustible RAD. Lap new membrane and existing membrane with mfg approved detail between TPO and other roof types. Provide base securement on both sides using RUSS strips or battens.

- G. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface.
1. Use the longest practical flashing pieces.
 2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
 3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
 4. Provide termination directly to the vertical substrate as shown on roof drawings.
- H. Roof Drains:
1. Existing Drains: Remove all existing flashings, drain leads, roofing materials and cement from the drain; remove clamping ring.
 2. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed manufacturer's recommendations.
 3. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.
 4. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
 5. Apply sealant on top of drain bowl where clamping ring seats below the membrane
 6. Install roof drain clamping ring and **new stainless steel clamping bolts**; tighten clamping bolts to achieve constant compression.
- I. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
 2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches (50 mm) deep, with at least 1 inch (25 mm) clearance from penetration, sloped to shed water.
 3. Structural Steel Tubing: If corner radii are greater than 1/4 inch (6 mm) and longest side of tube does not exceed 12 inches (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.
 4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.
 5. High Temperature Surfaces: Where the in-service temperature is, or is expected to be, in excess of 180 degrees F (82 degrees C), protect the elastomeric components from direct contact with the hot surfaces using an intermediate insulated sleeve as flashing substrate as recommended by membrane manufacturer.

3.08 FINISHING AND WALKWAY INSTALLATION

- A. Install walkways at access points to the roof, around rooftop equipment that may require

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maintenance, and where indicated on the drawings.

- B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch (25 mm) and maximum of 3.0 inches (75 mm) from each other to allow for drainage.
 - 1. If installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches (150 mm) on either side.
 - 2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.09 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide Interim inspection of the roofing system by a Technical Representative, or qualified manufacturer representative of roofing system manufacturer, specifically to inspect installation for warranty purposes. Final Inspection also to be conducted by manufacturer.
- B. Perform all corrections necessary for issuance of warranty.
- C. Destructive tests performed daily and at the beginning and every time there is an interruption in the welding process (i.e. power failure, welder shut down, job site conditions change and after lunch). There should be periodic checks (including at the start of each day) to verify good peel strength. Samples of daily welds to be submitted to owner.

3.10 CLEANING AND PROTECTION

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.
- D. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

3.11 TEMPORARY CUT-OFF

- A. All flashings shall be installed concurrently with the membrane in to maintain a watertight condition as the work progresses.
- B. When a break in the day's work occurs in the central area of the project install a temporary watertight seal. An 8" strip of flashing membrane shall be welded 4" to the new flashing membrane. The remaining 4" of flashing membrane shall be sealed to the deck and/or the substrate so that water will not be allowed to travel under the new or existing membrane. The edge of the membrane shall be sealed in a continuous heavy application of pourable sealer of 6 inch width. When work resumes, the contaminated membrane shall be removed and disposed of. None of these materials shall be reused in the new work.

SECTION 07530 – FULLY ADHERED SINGLE-PLY MEMBRANE ROOFING – TPO

- C. If inclement weather occurs while a temporary water stop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition.
- D. If any water is allowed to enter under the newly-completed system, the affected area shall be removed and replaced at the Contractor's expense.

3.12 PROJECT COMPLETION

- A. At end of construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner, describing nature and extent of deterioration or damage found.
 - 1. Repair or replace (as required) deteriorated or defective work found at time of final inspection to a condition free of damage and deterioration at time of Substantial Completion and in accordance with requirements of specified warranty.
- B. Provide 72 hours notice to Owner of manufacturer's warrantee inspection.
- C. Provide all warranties to Owner.
- D. REPAIR MATERIALS: Provide the owner with a repair kit and new canvas bag or equal portable packaging suitable for transport and use on the roof by the owner's maintenance personnel. The repair kit shall consist of:
 - 1. 10'-0" x 6" roll of peel and stick semi cured adhesive-applied membrane
 - 2. Prep tools and materials compatible and approved for use by the membrane manufacturer.
 - 3. All necessary tools and materials to perform minor emergency repairs to all membrane conditions, flashings, metal roof edges, details and accessories.
 - 4. One tube of color matched, compatible polyurethane and/or butyl caulk
 - 5. 20' roll reinforcing mesh
 - 6. One quart flashing grade primer
 - 7. One quart universal primer
 - 8. 6 splice wipes
 - 9. 6 peel and stick target patches
 - 10. Scrub pad
 - 11. 2 chip brushes
 - 12. One roll 100'x6" pressure sensitive TPO cover strip
 - 13. One gal cleaner/primer
 - 14. One quart cut edge sealant

END OF SECTION 07530

(NOTE: THIS FORM MUST BE FULLY EXECUTED AND RETURNED FOR CONSIDERATION OF PROPOSAL)

**** REVISED PROPOSAL FORM****

**ENKA HIGH SCHOOL
RE-ROOF CTE WING & CANOPIES
RFP# 16-16**

DUE DATE: MAY 11, 2016 by 4:00 PM

By submitting this proposal, the potential contractor certifies the following:

- ** This proposal is signed by an authorized representative of the firm.
- ** It can obtain and submit to the Owner insurance certificates as required within 5 calendar days after notice of award.
- ** The cost and availability of all equipment, materials, and supplies associated with performing the services described herein have been determined and included in the proposed cost.
- ** All labor costs, direct and indirect, have been determined and included in the proposed cost.
- ** All taxes have been determined and included in the proposed cost.
- ** The offeror has attended the conference (*if applicable*) or conducted a site visit and is aware of prevailing conditions associated with performing these services.
- ** The potential contractor has read and understands the conditions set forth in this RFP and agrees to them with no exceptions.

Therefore, in compliance with this Request for Proposals, and subject to all conditions herein, the undersigned offers and agrees, if this proposal is accepted within 45 days (normally less) from the date of the opening, to furnish the subject services for a cost not to exceed:

OFFEROR: _____

Drawing Submittals: Separate purchase order will be issued for drawings. Include cost in base bid as well.

\$ _____ dollars and _____/100 \$ _____

Base Bid: Removing and replacing approximately 18,500sf of roof at the Building "I" and three canopy areas as shown in the plans and specs. Include cost of drawing submittals.

\$ _____ dollars and _____/100 \$ _____

Unit Price #1: (Deck replacement): Replace 32" x 96" (6 Units) of 2 1/2" thick cementitious wood fiber roof deck

\$ _____ dollars and _____/100 \$ _____

Unit Price #2: (Nailer Replacement): Replacement of wood blocking or nailers

\$ _____ dollars and _____/100 \$ _____

Unit Price #3: (Threaded Rod): Install 1/2"x 10" stainless steel threaded rod anchors

\$ _____ dollars and _____/100 \$ _____

Alternate #1: Canopy Roof Areas: L, Q and Courtyard at C Building

\$ _____ dollars and _____/100 \$ _____

PROPOSAL FORM CONTINUED ON NEXT PAGE

Alternate #2: .080 TPO Membrane

\$ _____ dollars and _____ /100 \$ _____

Alternate #3: Overflow drains: Including insulation, piping and drainage outlets

\$ _____ dollars and _____ /100 \$ _____

Attended Pre-Bid Mtg: YES/NO _____

Addendums received and used in computing bid: YES/NO _____ Number of Addendums received: _____

OFFEROR: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

TELEPHONE NUMBER: _____ FAX: _____

FED ID No: _____ Type & License #: _____

E-MAIL: _____ MBE Status: _____

Principal Place of Business if different from above (See General Information on Submitting Proposals, Item 18.): _____

BY: (Signature) _____ TITLE: _____

DATE: _____ (Typed or printed name) _____

End of Proposal Form

If the winning bid is \$150,000 or greater, the bidder will be required to provide a performance and payment bond before the contract is awarded, and must use the bond forms included with the RFP. A bid bond is not required for this proposal.