REI ENGINEERS

1927 J.N. PEASE PLACE, SUITE 201, CHARLOTTE, NC 28262
PHONE 704.596.0331 FAX 704.596.0533

DATE: April 21, 2016

FROM: REI Engineers

TO: Bidders of Record

REFERENCE: **Addendum No. 1 RFP 11-16**
Buncombe County Schools
Administrative Services Roof
Replacement REI Project No.
016CLT-046

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated April 13, 2016 as noted below.

This addendum consists of 1 page, the attached revised Specification Sections 01 11 00, 07 01 50, 07 22
16, 07 54 23 and the attached revised Drawings B, C1, C2 and
Detail No. 1.

BIDDING CLARIFICATIONS:

1. Bids can be sent via fax or email. Fax number 828-251-1730. Email ron.venturella@bcseamil.org. It is the responsibility of the bidder to confirm receipt of their proposal form by calling 828-255-5891.

2. The budget for this project is below the formal range of $300,000. A bid bond is not required. 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. Bond forms are included with the RFP.

CHANGES TO SPECIFICATIONS:

1. Section 01 11 00-Summary of Work; replace with the attached revised Section 01 11 00.

2. Section 07 01 50-Preparation for Reroofing; replace with the attached revised Section 07 01 50.

3. Section 07 22 16-Roof Insulation; replace with the attached revised Section 07 22 16.

4. Section 07 54 23-Thermoplastic-Polyolefin Roofing; replace with the attached revised Section 07
54 23.

CHANGES TO CONTRACT DRAWINGS:

5. Drawing B – Roof Plan; replace with the attached revised Drawing B.

6. Drawing C1 – Roof System; replace with the attached revised Drawing C1.

7. Drawing C2 – Roof System; replace with the attached revised Drawing C2.

8. Detail No. 1 – Roof Drain; replace with the attached revised Detail No. 1.

ALL OTHER REQUIREMENTS AND PROVISIONS OF THE BIDDING DOCUMENTS REMAIN UNCHANGED. ACKNOWLEDGE RECEIPT OF THIS ADDENDUM ON THE BID FORM. FAILURE TO DO SO MAY BE CAUSE FOR REJECTION OF THE BID.

END OF ADDENDUM #1 RFP 11-16

SECTION 01 11 00

SUMMARY OF WORK (REVISION NO. 1)

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Name: Administrative Services Area D2 Roof Replacement

B. Project Address: 175 Bingham Road, Asheville, North Carolina 28806

C. Owner: Buncombe County Schools

D. Engineer: The Contract Documents, dated April 13, 2016, were prepared by REI Engineers.

E. This work includes the provision of all labor, material, equipment, supervision and administration to integrate the work outlined in this project manual into the total building system such that no leakage into the system occurs. In general, the scope of work in the **Base Bid** will include:

1. Roof Area D2 (Approximately 18,815 square feet): Remove existing roof systems down to the existing steel deck; re-secure steel deck to structural framing members; provide two layers of 2.5" roof insulation; provide tapered insulation crickets between roof drains; mechanically attach cover board; *fully adhere 80- mil TPO, single ply roof membrane*; provide 60-mil TPO flashings and accessories and provide new sheet metal flashings and trim to provide a complete, watertight, 20-year warrantable roof assembly.

    a. Provide fully adhered roof system where and as shown in Contract Drawings. Over properly prepared steel deck, *adhere two layers of 2.5" roof insulation in ribbons of foam adhesive (top of each steel deck flute);* adhere tapered insulation crickets in ribbons of foam adhesive between roof drains; adhere cover board in ribbons of foam adhesive; fully adhere 80-mil TPO, single ply roof membrane; provide flashings, accessories and sheet metal trim as described above.

2. Survey building interior to properly locate conduit on the underside of the steel deck prior to mechanical attachment and/or termination of roof membrane at penetrations or any installation of fasteners penetrating steel deck.

F. Asbestos Containing Roofing Materials (ACRM):

1. No Asbestos Containing Roofing Materials (ACRM) have been detected in test samples of the roof areas in contract.
2. It is the intention of these specifications that no asbestos bearing materials be incorporated into the work. In the event the contractor should determine unanticipated asbestos bearing materials to be present in the existing building components, Contractor is to stop all work in the affected area, notify the

Engineer and Owner, and provide temporary protection as required. Costs incurred, if any, due to the presence of hidden and/or unanticipated asbestos bearing materials will be authorized by Change Order to this contract.

G. The contractor is responsible 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 equipment, curbs, and/or plumbing necessary to comply with the requirements of these documents. All work shall conform to the requirements of the current Building Code approved in the State of the project location.

H. General requirements and specific recommendations of the material manufacturers are included as part of these specifications. The manufacturers' specifications are the minimum standards required for the completed systems. Specific items listed herein may improve the standards required by the manufacturers and will take precedence where their compliance will not affect the manufacturers' guarantee or warranty provisions.

1.3 CONTRACT

A. Project will be constructed under a single prime general construction contract.

1.4 TIME FOR COMPLETION

A. Contractor shall commence work on this project no sooner than June 10, 2016 with all work being substantially complete by August 12, 2016. Contractor is subject to liquidated damages in the amount of $250.00 per calendar day for each day in excess of the substantial completion deadline.

B. Final completion all work shall be obtained by August 26, 2016. Contractor is subject to liquidated damages in the amount of $250.00 per calendar day for each day in excess of the final completion.

C. *Inclement Weather:*

1. *The construction duration includes a total of fifteen (15) inclement weather days.*
2. *Inclement Weather is defined as follows:*

   a. Temperature less than 39 degrees and rising.
   b. Percent chance of rain or actual rain event greater than 30% for more than four hours of the work day. Forecast utilized for determination shall be no sooner than the day before.
   c. Wind speed greater than 15 MPH.

3. *Source for weather forecast and history shall be Ray's Weather Center at UNC-Asheville.*
4. *Claims for additional Contract Time shall be submitted to the Engineer and Owner for review. Claims will only be considered for review for weekdays and if the Critical Path schedule for the project is affected by the inclement weather. Claims shall be submitted weekly; claims not submitted on a weekly basis will not be considered for review.*

1.05 SITE INVESTIGATION

A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the Work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, ground water table or similar physical conditions at

the site, the conformation and condition of the ground, the character, quality and quantity of surface and subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all the available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work. Field measurements shall be taken at the site by the Contractor to verify all data and conditions affected by the Work.

1.06 WORK UNDER OTHER CONTRACTS

A. Separate Contract: Owner may award a separate contract for performance of certain construction operations at Project site.

B. Contractor shall cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract.

1.07 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 49-division format and CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use section numbers and titles to cross-reference Contract Documents. Sections in the Project Manual are in numeric sequence.; however, the sequence is incomplete. Consult the Table of Contents at the beginning of the Project Manual.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 11 00

SECTION 07 01 50

PREPARATION FOR REROOFING (REVISION NO. 1)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparatory work to be completed prior to roof installation including removal of existing roof assemblies down to the structural deck.

1. Survey building interior to properly locate conduit on the underside of the steel deck prior to mechanical termination of roof membrane at penetrations or any installation of fasteners penetrating steel deck.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section, including but not limited to:

1.	Steel Roof Deck Repair/Securement	Section 05 31 23
2.	Rough Carpentry	Section 06 10 00
3.	Roof Insulation	Section 07 22 16
4.	Thermoplastic Polyolefin Roofing	Section 07 54 23

1.3 DEFINITIONS

A. Removal: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain property of the Owner.

B. Existing to remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

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

1.4 EXISTING ROOF ASSEMBLIES*

A. Roof Area D2

1. Adhered EPDM roof membrane
2. 1/2" wood fiber (mechanically attached)
3. Aggregate surfacing
4. *Coal tar pitch built-up roof membrane*
5. 1" perlite (hot asphalt)
6. 1" polyisocyanurate (hot asphalt)
7. 1" perlite (mechanically attached)
8. *Adhered vapor retarder*
9. Steel deck

*Roof system composition is based on random sampling. Contractor is responsible for verification of roof system composition.

1.05 SUBMITTALS

A. Refer to Section 01 33 00-Submittal Procedures for Submittals.

B. Manufacturer's Product Data Sheets for all materials specified certifying material complies with this specification.

1.06 QUALITY ASSURANCE

A. Qualifications: Previous experience removing existing roof systems.

B. Requirements: Contractor to comply with governing EPA regulations and hauling/disposal regulations of authorities having jurisdiction.

1.07 SCHEDULING

A. Conduct demolition so that Owner's operations will not be disrupted. Provide 72 hours notification to Owner of activities that will affect Owner's operations.

1.08 WARRANTIES

A. Any damage to existing items under warranty shall be repaired/replaced with materials acceptable to the Warrantor.

PART 2 PRODUCTS

2.1 ROOF DECK REPAIR MATERIALS

A. Steel Deck

1. Refer to Specification Section 05 31 23.

PART 3 EXECUTION

3.1 EXAMINATION

A. Survey existing conditions to determine extent of demolition.

B. Record the conditions of items to be removed/reinstalled and items to be removed/salvaged.

C. Contractor shall not remove any element that may result in structural deficiency or collapse of any part of the structure or adjacent structures during demolition.

D. Contractor to inspect substrate for soundness and notify Engineer in writing of any deficiencies. Commencement of work signifies Contractor's acceptance of site conditions.

3.2 UTILITIES/SERVICES

A. Maintain existing utilities that are to remain in service and protect them against damage during selective site demolition unless authorized in writing by the Owner and authorities having jurisdiction.

1. Locate all conduits and equipment attached to the underside of the decking prior to reroofing. Insulation fastener locations are not to disturb existing conduits or interior components/equipment.
2. If utilities serving occupied portions of the site must be shut down, temporary services shall be provided.
3. Provide 72 hours notice to Owner if shut down is required.
4. Where services are to be removed, relocated or abandoned, provide necessary bypass connections to remaining occupied buildings and areas.

3.3 PREPARATION

A. Do not begin demolition until utilities have been disconnected/sealed and have been verified as such in writing.

B. Do not close off or obstruct streets, walks or other adjacent occupied facilities without permission from Owner and authorities having jurisdiction.

C. Provide safe conditions for pedestrians. Erect temporary protection such as walkways, fences, railings and canopies as required by OSHA and other governing authorities.

D. Provide protection for adjacent building, appurtenances and landscaping to remain. Erect temporary fencing around trees to remain.

E. Provide temporary weather protection as required to prevent water leakage and damaged to exterior or interior of adjacent structures.

3.4 POLLUTION CONTROLS

A. Use water, mist, temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with local EPA regulations.

1. Do not use water where damage may occur or where hazardous conditions would be created such as ice or flooding.

3.5 REMOVALS

A. Demolish and remove existing construction only to the extent required by new construction.

B. Remove all existing roofing, roof insulation, membrane and sheet metal and discard.

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

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

E. Lift existing sheet metal flashings to remain to remove all existing materials. After installation of new materials, neatly bend flashing back into place.

F. Remove debris from existing materials to provide clean, dry substrate.

G. Demolish asphalt, concrete and masonry in small sections. Cut concrete and masonry at juncture with construction to remain using powered masonry saw, core drill or hand tools. Do not use powered impact tools.

H. Remove and transport debris in a manner that will prevent damage/spills to adjacent buildings and areas.

I. Dispose of demolished items and materials on a daily basis. On-site storage of removed items is not permitted.

J. Transport demolished materials off-site and dispose of materials in a legal manner.

K. Perform progress inspections to detect hazards resulting from demolition activities.

3.6 FLASHING HEIGHTS

A. Permanently raise roof top equipment as required to achieve 8" minimum flashing height.

B. Provide additional wood blocking to top of parapet walls and expansion joints to achieve minimum 8" flashing height.

C. Extend all existing sanitary vents to height required by the applicable Plumbing Code, but no less than 8 inches and no more than 12 inches above the finished roof system.

3.7 ROOF DRAINS AND LEADERS

A. Prior to commencement of any work on the project the Contractor shall inspect each existing roof drain for damage and water flow.

1. Each drain shall be cleaned of accumulated debris and loose gravel. Drain bowl and drain outlet shall be cleaned of bitumen build-up to bare metal by hand scraping.
2. A power vacuum shall be provided by the Contractor and utilized to vacuum debris, loose gravel, and bitumen scrapping. Vacuum hose shall be of sufficient length to reach the first elbow in the drain line in order to vacuum the line.
3. After cleaning bitumen from the drain bowl, Contractor shall inspect the bowl carefully for cracks, and the drain pipe connection for possible deterioration.
4. Each drain shall be water tested for proper flow utilizing a minimum 3/4-inch hose. Water shall flow into the drain line under maximum pressure available for a period of not less than 15 minutes.
5. Drain inspection and testing operation shall precede any roofing tear-off. If deficiencies or damages are observed, Contractor shall record the deficiency on a Roof Plan and forward to the Engineer. The Engineer will notify the Owner's Maintenance Department accordingly. Contractor shall allow 48 hours after notification for any corrective work by the Owner.
6. If no deficiencies or damages are reported to the Owner prior to commencement of work, Contractor shall assume full responsibility for the condition and operation of the drains.
7. Contractor shall install temporary drain plugs while performing any work at or

near the roof drains. Drain plugs shall be removed at the end of each work day.

3.8 SCUPPER INSTALLATION

A. Locate bottom of overflow scupper 2" inches above surface of the roof system adjacent to the nearest roof drain (excluding sump).

B. Remove existing masonry and store for reuse if in good condition. Reinstall masonry units to extent possible. Provide new brick or concrete masonry units to match existing.

C. Extend opening through entire thickness of parapet. Take precautions to avoid damaging adjacent wall surfaces.

D. Provide finished openings as indicated.

E. Install veneer materials of same type, size and finish to match existing. Set units in full beds of mortar to match adjacent joints in thickness. Tool joints to match.

F. Repair exterior finish to match adjacent surfaces.

3.9 CLEANING

A. Inspect the site daily and clean up debris and hazards at the end of each day. Adjacent roads, drives and walkways shall remain in operation and free from construction materials debris.

B. Clean adjacent structures of dust dirt and debris. Return adjacent areas to original conditions to the satisfaction of the Owner.

END OF SECTION 07 01 50

SECTION 07 22 16

ROOF INSULATION (REVISION NO. 1)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide two layers of 2.5" roof insulation; provide tapered insulation crickets between roof drains; *mechanically attach cover board*

1. At fully adhered roof system, adhere *two layers of 2.5" roof insulation in ribbons of foam adhesive (top of each steel deck flute);* adhere tapered insulation crickets in ribbons of foam adhesive between roof drains; adhere cover board in ribbons of foam adhesive.
2. Provide watertight condition at roof system transition as shown in detail drawings.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section, including but not limited to:

1.	Steel Roof Deck Repair/Securement	Section 05 31 23
2.	Rough Carpentry	Section 06 10 00
3.	Preparation for Reroofing	Section 07 01 50
4.	Thermoplastic Polyolefin Roofing	Section 07 54 23

1.3 REFERENCES

A. Refer to the following references for specification compliance:

1. 2012 North Carolina State Building Code
2. National Roofing Contractors Association – NRCA
3. FM Global
4. Underwriters Laboratories, Inc. – UL
5. ASHRAE Standard 90.1

1.4 DESCRIPTION

A. R Value

1. The minimum continuous "R-value" for the above deck insulation system shall be 30 and in accordance with the current Energy Conservation Code and ASHRAE 90.1.
2. R value to be based on Long-Term Thermal Resistance (LTTR) for polyisocyanurate insulation and manufacturer's published data for all other insulation components, as tested in accordance with ASTM C177, C236, C518 or C976.

1.5 SUBMITTALS

A. Refer to Section 01 33 00-Submittal Procedures for requirements.

B. Manufacturer's Product Data Sheets for all materials specified certifying material complies with all specified requirements.

C. Tapered insulation plan from material supplier with minimum R-value for each roof area.

D. Latest edition of the Manufacturer's current material specifications and installation instructions.

1.6 QUALITY ASSURANCE

A. Insulation to be installed in accordance with their respective manufacturer's requirements.

B. Insulation(s) not bearing UL label at point of delivery shall be rejected.

C. Insulation damaged or wetted before, during, or after installation shall be removed from the job site no later than the next working day from the day such damage or moisture contamination is noted.

D. Wind Design: Install insulation system to meet the required wind uplift pressures as specified in Section 07 54 23.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Material shall be delivered in the manufacturer's original sealed and labeled shrouds and in quantities to allow continuity application.

B. Storage: Materials shall be stored out of direct exposure to the elements on pallets or dunnage at least 4 inches above ground level at site location acceptable to Owner.

1. Utilize tarps that will completely cover materials to prevent moisture contamination. Remove or slit factory shrouds and/or visqueen; do not use these materials as tarps.
2. Install vapor retarders under material storage areas located on the ground.
3. Remove damaged or deteriorated materials from the job site.

C. Handling: Material shall be handled in such a manner to preclude damage and contamination with moisture or foreign matter.

1.8 PROJECT CONDITIONS

A. Insulation shall not be applied during precipitation. Contractor assumes all responsibility for starting installation in the event there is a probability of precipitation occurring during application.

B. Contractor will take necessary action to restrict dust, asphalt, and debris from entering the structure.

C. No more roofing will be removed than can be replaced with insulation, membrane and base flashings in the same day to create a watertight installation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Insulation Boards:

1. Roof Insulation: Shall be rigid polyisocyanurate roof insulation board with factory applied coated polymer bonded glass fiber mat facers on the top and bottom. Boards to comply with ASTM C1289 Type II, Class 2, Grade 2 and meet the following requirements:

    a. Curing time shall be 24 hours minimum, plus an additional 24 hours minimum per inch thickness, at a minimum of 60 degrees F before shipment from the manufacturer.
    b. Dimensional stability shall be 2 percent maximum linear change when conditioned at 158 degrees F and 97 percent relative humidity for seven days.
    c. Maximum permissible insulation board size for mechanical attachment is 4’ x 8’ and for foam adhesive and hot asphalt attachment is 4’ x 4’. Field cutting of larger boards is not acceptable.
    d. Thickness shall be 2.5"

2. Tapered Insulation Crickets and Saddles: Shall be rigid polyisocyanurate roof insulation board with factory applied coated polymer bonded glass fiber mat facers on the top and bottom. Boards to comply with ASTM C1289 Type II, Class 2, Grade 2 and meet the following requirements:

    a. Curing time shall be 24 hours minimum, plus an additional 24 hours minimum per inch thickness, at a minimum of 60 degrees F before shipment from the manufacturer.
    b. Dimensional stability shall be 2 percent maximum linear change when conditioned at 158 degrees F and 97 percent relative humidity for seven days.
    c. Board size shall be 4 foot by 4 foot.
    d. Slope shall be 1/2” per foot and minimum thickness shall be 1/2".
    e. Fill Insulation: Shall be rigid polyisocyanurate meeting the above requirements with board size of 4 foot by 4 foot and thickness of 2”.

3. Cover Board: Shall be lightweight, high-density polyisocyanurate roof board with coated fiberglass facers; compressive strength shall be a minimum of 90 psi; R-value of 2.5 and thickness shall be 1/2".

B. Insulation Accessories

1. Asphalt impregnated wood fiber tapered edge strips be the sizes detailed or required by field conditions meeting ASTM C 208.

    a. Tapered Edge Strips

        i. Shall be installed at edges to make transitions as detailed in Contract Drawings.
        ii. Use 1.5" by 18" tapered edge strips to form crickets in front of curbs wider than 12”.
        iii. Use 1/2" by 6" tapered edge strips in front of tapered insulation crickets to provide smooth transition.

C. Insulation Attachment Materials:

1. Steel Deck Mechanical Fasteners and Stress Plates: Shall be corrosion resistant 3” galvalume stress plate and corrosion resistant screw type fasteners for use with

steel decks; approved by the insulation manufacturer for the insulation type, thickness and board size specified; fastener length as required by the fastener manufacturer for the insulation thickness specified, and to penetrate the deck a minimum of 3/4 inch and a maximum of 1 inch.

a. *Fasteners to be blue or black to match closely the exposed painted roof deck.*

2. Foam Adhesive: Shall be a one or two part, VOC compliant, moisture-cured polyurethane foamable adhesive designed as roof insulation adhesive and approved by insulation manufacturer.

D. NOC Roof System Transition Components

1. Self-Adhering Membrane: 40-mil minimum thickness sheet; slip-resistant surfacing, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; suitable for high temperature applications up to 250 degrees.
2. Pourable Sealer: Two-part pourable polyurethane sealant conforming to ASTM D 429, and designed to seal around penetrations.
3. Water Cut-off Mastic: Shall be gun grade, non-skinning, non-hardening, flexible blend of butyl rubber and polyisobutylene sealant.
4. Termination Bar: /8" X 1" aluminum or stainless steel flat bar with pre-drilled oversized or slotted holes 6" on center.
5. Termination Bar Fasteners: 1/4" x 7/8" carbon steel, self-drilling point, self-tapping, zinc alloy hex head screws with bonded EPDM tubular washer under head of fastener.

PART 3 EXECUTION

3.1 EXAMINATION

A. Contractor to inspect substrate for soundness and notify Engineer in writing of any deficiencies.

B. Commencement of work signifies Contractor's acceptance of substrate. Any defects in roofing work resulting from such accepted substrates shall be corrected to Owner's satisfaction at no additional expense.

3.2 PREPARATION

A. General

1. Roof deck to be dry and broomed clean of debris and foreign matter prior to installation of insulation system.

3.3 APPLICATION

A. General

1. Application shall be in accordance with the insulation/membrane manufacturer's instructions and these specifications.
2. All insulation to be in full sheets, carefully fitted and pushed against adjoining sheets to form tight joints. Gaps exceeding 1/4 inch will not be accepted.

3. Insulation and overlayment boards that must be cut to fit shall be saw cut or knife-cut in a straight line, not broken. Chalk lines shall be used to cut insulation. Uneven or broken edges are not acceptable.
4. Remove insulation dust and debris that develops during insulation cutting operations.
5. Joints between successive and adjacent layers of insulation to be offset a minimum of six (6") inches.
6. Stagger joints of gypsum overlayment/overlayment insulation one (1') foot (vertically and laterally) to ensure that joints do not coincide with joints from the previous or adjacent layer.
7. On steel decks, apply insulation boards with long dimension of units across deck ribs. Ends of insulation boards must be bearing on top flange of steel deck.
8. Crickets, saddles and tapered edge strips shall be installed before the overlayment insulation.
9. Adhere tapered edge strips at transitions, terminations and/or penetrations as detailed or required in ribbons of foam adhesive or a full mopping of hot asphalt to ensure smooth transitions are provided for the roof membrane and flashings.
10. Provide necessary modifications to insulation system or nailers at roof edges as required to ensure a flush and smooth transition is provided for the roof membrane and flashing.
11. Field modifications of insulation, tapered insulation, tapered edge strips and cants shall be made by the Contractor where required to accommodate roof and flashing conditions, prevent water dams and ponding water. Ponding water at scuppers and cricket valleys shall not be accepted.
12. Provide necessary modifications to prevent standing water which is defined as 1/4" of water in a 4 square foot or larger area 24 hours or more after precipitation.

B. Tapered Insulation

1. Install tapered insulation system to provide positive slope for complete roof drainage.
2. Crickets shall be sized as shown in the Contract Drawings. Modifications shall be provided to ensure positive slope and prevent standing water along the cricket valley.

    a. Minimum length to width ratio shall be 2:1. Fabricate partial crickets with dimensions which would result in a minimum length to width ratio of 2:1 if they were extended to full size.
    b. Unless otherwise noted, fabricate all crickets from tapered stock as required to provide the specified minimum slope. For example, when roof slope is indicated as 1/4" per foot minimum, fabricate crickets with slope of 1/2" per foot minimum.
    c. Construct crickets on up slope side of all curbs to ensure positive drainage.
    d. Install tapered edge strips at cricket edges to provide a smooth transition between the cricket and insulation system below.

3. Insulation boards may require mechanical fasteners and stress plates at slope transition of crickets to minimize bridging.

C. Roof Drainage:

1. Drainage sumps shall be installed as detailed.

2. The Contractor shall be responsible for carefully laying out the tapered insulation, sumps, drain bowls and scuppers to ensure the finished roof provides complete drainage with no standing water.
3. Contractor shall fabricate miter-cut sumps at scuppers to provide smooth transitions between the insulation system and the drains/scuppers.
4. Sumps shall ensure complete roof drainage and prevent water dams.
5. Contractor shall adjust insulation, drains and scuppers to ensure complete roof drainage and satisfactory substrates for membrane and flashings.
6. Drain sump components shall be fastened to the deck using specified insulation fasteners or adhesives.
7. Circular sumps and sumps that do not provide smooth transition or that create standing water at the drains shall be rejected and shall require removal and replacement.

D. Insulation Mechanical Attachment

1. Fastener quantity and spacing shall be as indicated in the Contract Drawings.
2. Fasteners shall be installed using manufacturer's recommended equipment and in accordance with the manufacturer's requirements.
3. Fasteners and stress plates shall be set secure and tight against the insulation surface, and shall not be over-driven.
4. Fasteners shall engage the top flange of steel decks only.

E. Foam Adhesive Application

1. Adhesive beads shall be positioned and spaced at a minimum as indicated in the Contract Drawings. Comply with the requirements of the membrane manufacturer's tested assembly for adhesive spacing and positioning.
2. Adhesive beads shall be sized in accordance with the adhesive manufacturer's guidelines.
3. Insulation boards shall be placed onto the beads and immediately "walked" and/or "weighted" into place. Insulation boards must be placed into the adhesive in strict accordance with the adhesive manufacturer's guidelines.
4. Ensure full adhesion of all layers of insulation and take whatever steps necessary to achieve full adhesion, including but not limited to temporary ballasting of insulation until adhesive sets.
5. Contractor to survey underside of steel deck where adhesive is utilized over the deck and remove any foam adhesive expanded through holes, laps, etc. in the deck. Properly touch up paint on underside of steel deck.

END OF SECTION 07 22 16

SECTION 07 54 23

THERMOPLASTIC-POLYOLEFIN ROOFING (REVISION NO. 1)

PART 1 GENERAL

1.1 WORK INCLUDED

A. Install a fully adhered thermoplastic-polyolefin (TPO) membrane and flashings to provide a permanently watertight system.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section, including but not limited to:

1.	Steel Roof Deck Repair/Securement	Section 05 31 23
2.	Rough Carpentry	Section 06 10 00
3.	Preparation for Reroofing	Section 07 01 50
4.	Roof Insulation	Section 07 22 16
5.	Sheet Metal Flashing and Trim	Section 07 62 00
6.	Manufactured Gravel Stops and Fascias	Section 07 71 19

1.3 REFERENCES

A. Refer to the following references, current edition for specification compliance:

1. 2012 North Carolina State Building Code
2. American Society of Testing Materials (ASTM)
3. National Roofing Contractors Association (NRCA)
4. Underwriters Laboratory (UL)
5. FM Global
6. Single Ply Roofing Institute

1.4 SUBMITTALS

A. Refer to Section 01 33 00-Submittal Procedures for Submittals.

B. Latest edition of the Manufacturer's current material specifications and installation instructions.

C. Manufacturer's Product Data Sheets for all materials specified.

D. Certifications by manufacturers that all materials supplied comply with all requirements of the identified ASTM and other industry standards or practices.

E. Submit documentation of approved, tested roof system to meet the specified requirements for the following:

1. Wind uplift pressures
2. UL Fire Resistance Rating

1.5 DELIVERY, STORAGE AND HANDLING

A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.

B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

C. Follow manufacturer's requirements for storing of membrane rolls. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.

D. All adhesives shall be stored at temperatures required by the manufacturer.

E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/ supplier.

F. All materials which are determined to be damaged by the Engineer, Owner's Representative or membrane manufacturer are to be removed from the job site and replaced at no cost to the Owner.

1.6 PROJECT CONDITIONS

A. Roofing shall not be applied during precipitation. Contractor assumes all responsibility for starting installation in the event there is a probability of precipitation occurring during application.

B. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned and heat welded before leaving the job site that day.

C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

D. All surfaces to receive new insulation, membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.

E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.

F. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.

G. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A protection layer of plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.

H. Prior to and during application, all dirt, debris and dust shall be removed from surfaces, either by vacuuming, sweeping, blowing with compressed air and/or similar methods.

I. Contaminants, such as grease, fats, oils, and solvents, shall not be allowed to come into contact with the roofing membrane. All rooftop contamination that is anticipated or that is occurring shall be reported to the Engineer and membrane manufacturer to determine the corrective steps to be taken.

J. If any unusual or concealed condition is discovered, the contractor shall stop work, notify Engineer of such condition immediately, and in writing within 24 hours.

K. The roofing membrane shall not be installed under the following conditions without consulting the membrane manufacturer's technical department for precautionary steps:

1. The roof assembly permits interior air to pressurize the membrane underside.
2. Any exterior wall has 10% or more of the surface area comprised of opening doors or windows.
3. The wall/deck intersection permits air entry into the wall flashing area.

L. Precautions shall be taken when using membrane adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.

1.7 QUALITY ASSURANCE

A. Manufacturer Requirements:

1. Manufacturer must have written contractor/installer approval program.
2. The product must have a continuous manufacturing history with the current product formulation of no less than ten (10) years in the United States of America.
3. Products manufactured by other manufacturers and private labeled are not acceptable.
4. See materials section for general product description and specified requirements.

B. Contractor Requirements:

1. This roofing system shall be applied only by a Contractor authorized by the membrane manufacturer prior to bid.
2. Application of the roofing system shall be accomplished by a primary roofing contractor, his roofing foreman, and sufficient applicator technicians who all have been trained and approved by the manufacturer of the single ply roofing system. Contractor to submit evidence of qualification from the manufacturer.

C. Upon completion of the installation an inspection shall be made by a representative of the membrane manufacturer to review the installed roof system and list all deficiencies.

D. There shall be no deviation made from the Contract Documents or the approved shop drawings without prior written approval by the Owner, the Owner's Representative and the membrane manufacturer.

E. All work shall be completed by personnel trained and authorized by the membrane manufacturer.

F. Contractor to provide manufacturer written verification indicating all seams have been probed and are watertight.

G. Install roofing system to meet UL 790 Class A Fire Rating.

H. Wind Design: Install roofing system to meet or exceed the requirements of the current adopted version of ASCE-7, and shall be an approved assembly tested to the wind uplift pressures listed below:

1. Field of Roof: - 28 psf.
2. Perimeter of Roof: - 47 psf.
3. Corner of Roof: - 71 psf.

1.8 WARRANTIES

A. Manufacturer's Guarantee: Manufacturer's standard form, non pro-rated, without monetary limitation or deductibles, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks or breaches in the primary roof membrane causing moisture to enter the substrate below (even if visible leaks are not observed inside the facility).

1. Warranty to include but not be limited to membrane, insulation, adhesives, fasteners, sealants, flashings, retrofit roof drains, polymer clad sheet metal, etc.
2. Warranty Period: Twenty years from date of Substantial Completion.
3. Warranty to remain in effect for wind speeds up to 72 mph.
4. Warranties requiring the Owner's signature will not be acceptable.
5. Manufacturer's Representative shall attend a post-construction field inspection no earlier than twenty- three (23) months, and no later than twenty-four (24) months after the Date of Substantial Completion. Submit a written report within seven (7) days of this visit to the Engineer listing observations, conditions and any recommended repairs or remedial action.
6. Jurisdiction and venue for disputes and/or claims shall be in the courts of Buncombe County, North Carolina or the United States District Court, Asheville Division. (Buncombe County Schools only)

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Membrane materials shall be manufactured by the following:

1. Carlisle SynTec, Inc.
2. Firestone Building Products
3. Versico

2.2 MEMBRANE MATERIALS

A. Membrane and Components:

1. Membrane: Shall be an **80-mil** nominal thickness thermoplastic-polyolefin membrane with polyester reinforcement. Membrane shall conform to ASTM D 6878 with thickness measured in accordance with ASTM D 751 and thickness above reinforcement tested in accordance with ASTM D 4637. **Color to be White**.
2. Adhesive: Shall be membrane manufacturer's solvent based reactivating-type

B. Flashing:

1. Reinforced **60 mil**. thick, TPO membrane for walls and curbs.
2. Unsupported **60 mil**. thick, TPO membrane shall be supplied for field-fabricated

vent stacks, pipes, drains and corners.

2.3 RELATED MATERIALS

A. Flashing Adhesive: Shall be membrane manufacturer's solvent based reactivating-type adhesive.

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. Termination Bar: Shall be manufacturer's 1/8" by 1" mill finish extruded aluminum bar with pre-punched slotted holes.

E. Sealant: Shall be manufacturer's multi-purpose sealant.

F. Fasteners:

1. Flashing Membrane Termination Screws: #12 corrosion resistant hex or pan head screws with length required to penetrate substrate a minimum of 1-1/2".
2. Steel Deck Fasteners and Plates: Shall be #12 corrosion resistant pan head screw approved by membrane manufacturer of length required to penetrate top flange of steel deck a minimum of 1" with galvalume plates approved for membrane attachment.

G. Primary Membrane Cleaner: Shall be a high quality solvent cleaner provided by membrane manufacturer and approved by engineer for use as a general membrane cleaner.

H. Pre-weld Cleaner: Shall be a high quality solvent based seam cleaner with moderate evaporation rate provided by membrane manufacturer.

I. Walkway Pad: Shall be walkway pad by manufacturer of membrane.

J. Retrofit Roof Drain: Shall be a prefabricated aluminum drain insert composed of 11 gauge spun aluminum drain body, TPO coated 17.5" diameter flange, cast aluminum clamping ring, cast aluminum strainer, watertight U-Flow seal and stem length and diameter as required by field conditions. Drain shall be approved by roof system manufacturer. Contractor shall field verify drain diameter and required stem length prior to ordering drains.

K. Polymer Clad Metal: Refer to Section 07 62 00-Sheet Metal Flashing and Trim.

PART 3 EXECUTION

3.1 SUBSTRATE PREPARATION

A. Verify that the substrate is dry, clean, smooth, and free of loose material, oil, grease, or other foreign matter. Sharp ridges and other projections and accumulations of bitumen shall be removed to ensure a smooth surface before roofing.

B. Asphalt roofing substrates shall be removed, covered or flashed using compatible, approved materials. PVC shall not come in contact with substrates containing asphalt materials.

C. Any deteriorated substrate shall be repaired.

D. Beginning installation means acceptance of prepared substrate.

E. Provide necessary protection from adhesive vapors to prevent interaction with foamed plastic insulation.

3.2 MEMBRANE INSTALLATION (FULLY ADHERED)

A. The surface of the insulation or substrate shall be inspected prior to installation of the roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged insulation boards shall be removed and replaced.

B. Over the properly installed and prepared substrate, membrane adhesive shall be spread in accordance with the manufacturer's instructions and application rates utilizing equipment as required by the manufacturer.

1. Do not allow adhesive to skin-over or surface-dry prior to installation of roof membrane.
2. Water based membrane adhesive shall not be used if temperatures below 40º F (5º C) are expected during application or subsequent drying time.
3. Adhesive application rates shall comply with the manufacturer's published requirements.
4. The Applicator shall count the amount of pails of adhesive used per area per day to verify conformance to the specified adhesive rate.
5. No adhesive shall be applied in seam areas. All membrane shall be applied in the same manner.
6. Notched squeegees shall be replaced each day or as notches are reduced below ¼".

C. The roof membrane shall be unrolled into the adhesive. Adjacent rolls overlap previous rolls by 3 inches (75 mm). This process is repeated throughout the roof area. Immediately after placement of membrane, each roll shall be pressed firmly into place with the manufacturer's recommended roller by frequent rolling in two directions.

D. Weld membrane coverstrips at all fleeceback membrane seams without a factory selvage edge.

3.3 MEMBRANE TERMINATION

A. Terminate membrane at all walls as shown in the contract drawings.

1. Walls/Curbs: Membrane shall be mechanically terminated using approved screws and plates twelve (12) inches on center.

B. Terminate membrane at all penetrations as shown in the contract drawings.

1. Membrane shall be fastened six inches on center or a minimum of four (4) fasteners per penetration into the structural deck using fasteners and plates as approved by the membrane manufacturer for the deck substrate. Survey building interior to properly locate conduit on the underside of the steel deck prior to mechanical termination of roof membrane at penetrations or any installation of fasteners penetrating steel deck.

C. Membrane shall extend over roof edge a minimum of 2" below the perimeter wood

blocking.

3.4 FLASHING INSTALLATION

A. General

1. **All flashings and details shall be installed concurrently with the roof membrane as the job progresses. This includes the roof system transition detail between the different roof systems.**
2. **No temporary flashings shall be allowed.**
3. **If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Contractor's expense.**
4. **Seams shall not be "taped" as temporary measure but shall be fully completed before the end of each day.**
5. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces.
6. Where substrates are incompatible with adhesives and PVC materials, the Contractor shall remove the incompatible materials and replace it with a compatible substrate, or install compatible PVC flashing materials.
7. Use caution to ensure adhesive fumes are not drawn into the building.

B. Adhesive for Flashing Membrane

1. Over the properly installed and prepared flashing substrate, flashing adhesive shall be applied according to instructions found on the Product Data Sheet. The membrane adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies.
2. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
3. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels required by welding techniques.

C. All flashings shall mechanically terminated a minimum of 8 inches above the finished roofing surface using approved fasteners and counterflashing bar unless otherwise indicated in the Contract Drawings. Flashing heights less than 8" shall be accepted in writing by the Manufacturer's Technical Department.

D. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the (roof) membrane.

E. All flashings shall be hot-air welded at their joints and at their connections with the (roof) membrane.

F. All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult Manufacturer's Technical Department for securement methods.

G. Corners shall be flashed using the membrane manufacturer's pre-formed corners.

H. Polymer Clad sheet metal incorporated into the roofing system shall be sealed off with a heat welded stripping ply. The stripping ply shall extend four inches beyond sheet metal onto roof membrane and fit closely to fit closely to edge of sheet metal.

I. Retrofit Roof Drain

1. Mechanically attach membrane 6” on center into structural deck around drain sump. Fully adhere flashing membrane and hot-air weld to membrane a minimum of 2 inches.
2. Flashing membrane shall be set in a full bed of sealant under the clamping ring.
3. Install retrofit roof drain according to manufacturer’s installation instructions and provide stripping membrane hot-air welded to flange of retrofit roof drain extending onto flashing membrane.
4. Clamping rings shall be secured in place with all bolts at the end of each work day. Contractor shall water test roof drains after every instance the clamping ring is removed and reinstalled. The Contractor shall notify the Owner of the water test schedule.

J. Soil Pipe/Pipe Penetration:

1. Provide field wrapped pipe penetration flashing as shown in detail drawing.
2. Apply aluminum tape to penetration if asphalt contamination is present.
3. Extend existing pipe to obtain a minimum 8" finished flashing height.
4. Cut existing pipe to obtain a maximum 12" finished flashing height.
5. Horizontal flashing membrane shall be hot-air welded a minimum of four inches onto the membrane.
6. Vertical flashing membrane shall be fully adhered to pipe penetration and extend a minimum of 1.5” horizontal at the base of penetration. Hot-air weld vertical flashing membrane to horizontal flashing membrane.
7. Install stainless steel draw band and sealant or hot-air weld flashing cap to terminate top edge of pipe flashing.

3.5 HOT-AIR WELDING OF SEAM OVERLAPS

A. General

1. All seams shall be hot-air welded. Seam overlaps should be 3 inches (75 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details.
2. Welding equipment shall be provided by or approved by the membrane manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by a membrane manufacturer’s technical representative prior to welding.
3. All membrane to be welded shall be clean and dry.

B. Hand-Welding

1. Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
2. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
3. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow," the hand roller is positioned perpendicular to the nozzle and pressed lightly. For straight seams, the 1½ inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the ¾ inch (20 mm) wide nozzle shall be used.

C. Machine Welding

1. Machine welded seams are achieved by the use of automatic welding equipment. When using this equipment, instructions from the manufacturer shall be followed

and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated off the generator.

2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

D. Quality Control of Welded Seams

1. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator to locations as directed by the Engineer or membrane manufacturer's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

E. **Provide unreinforced cover strip over all cut edges of reinforced membrane after seam probing has been completed.**

F. Install T-joint patch at all T-seam locations.

3.6 WALKWAY PAD INSTALLATION

A. Roofing membrane to receive walkway pad shall be clean and dry.

B. Place chalk lines on deck sheet to indicate location of Walkway.

C. Apply a continuous coat of membrane adhesive to the deck sheet and the back of walkway pad in accordance with membrane manufacturer's technical requirements and press walkway pad into place with a water-filled, foam-covered lawn roller.

D. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the walkway to the roofing membrane.

E. Check all welds with a rounded screwdriver. Re-weld any inconsistencies.

F. **Important:** Check all existing membrane seams that are to be covered by walkway with rounded screwdriver and re-weld any inconsistencies before walkway installation.

3.7 TEMPORARY CUT-OFF

A. All flashings shall be installed concurrently, with the membrane in order 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 field 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.

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.

3.8 CLEANING AND PROTECTION

A. The Contractor shall be responsible for protecting the roof from construction related damages during the Work.

B. The Contractor shall ensure trash and debris is removed from the roof daily.

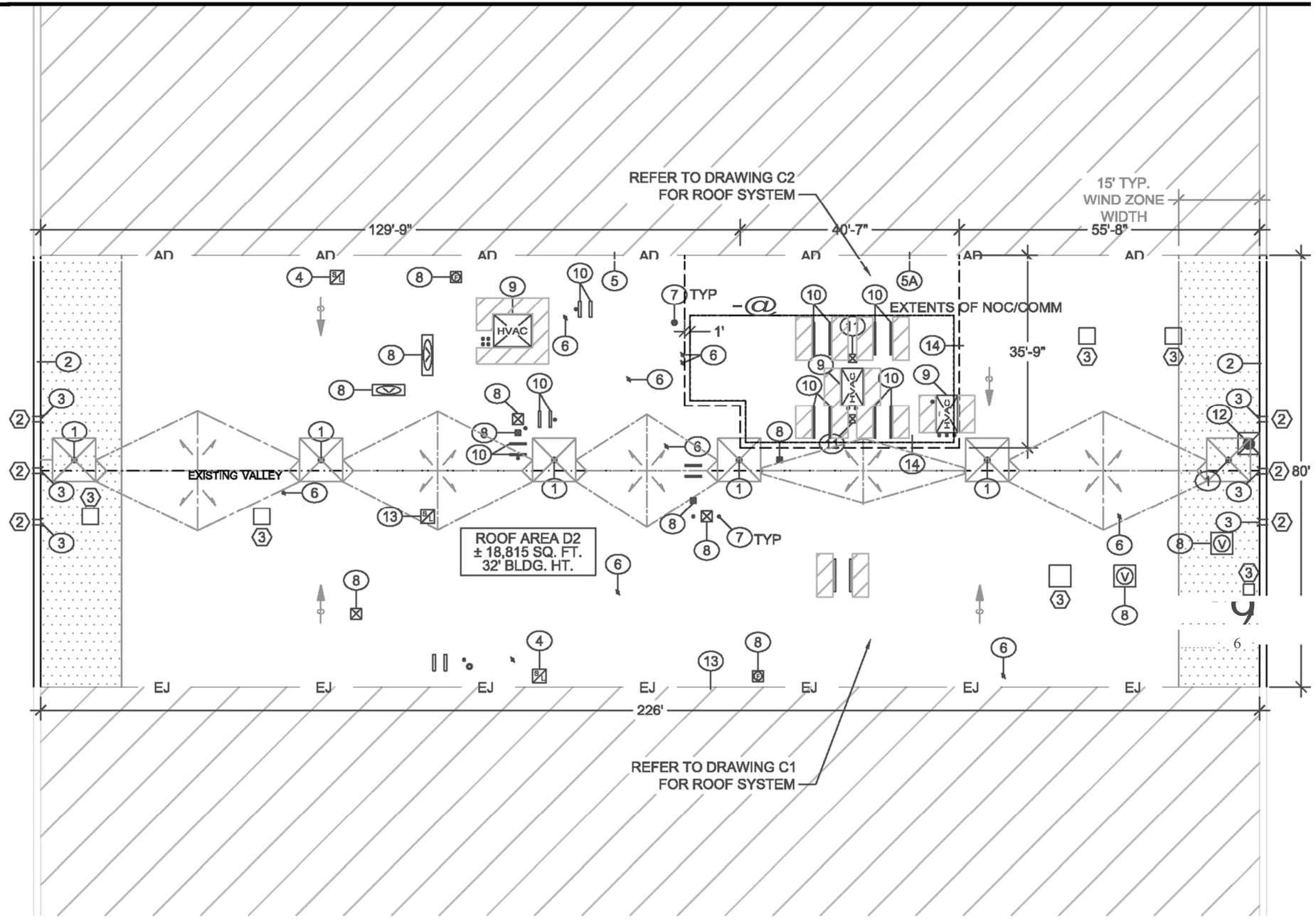
C. Metal scraps, nails, screws and other sharp damaging debris shall be kept off of the roof membrane surface during construction.

D. The Contractor shall clean off/remove excess adhesive, sealant, stains and residue on the membrane and flashing surfaces.

E. The Contractor shall repair or remove and replace damaged membrane, flashings and other membrane components. Repairs shall be in accordance with the membrane manufacturers repair instruction to comply with the specified warranty.

F. The Contractor shall remove temporary coverings and masking protection from adjacent work areas upon completion. Remove construction debris from the project site on a planned and regular basis.

END OF SECTION 07 54 23



KEY

- PARAPET WALL
- -EJ- EXPANSION JOINT
- -AD- AREA DIVIDER
- ROOF DRAIN
- jl! SOIL PIPE
- @ PIPE PENETRATION
- ● HIGH HEAT PENETRATION
- III HIGH HEAT CURB
- OVERFLOW SCUPPER
- 8 HVACUNIT
- MECHANICAL CURB
- EXHAUST FAN
- GRAVITY VENT
- !H! SKYLIGHT
- SLEEPER
- Iii PITCH PAN
- t::j ROOF LADDER
- TAPERED INSULATION
- STRUCTURAL SLOPE
- TAPERED INSULATION
- CRICKET SLOPE
- WALKPAD
- .... ELEVATION CHANGE
- Ⓡ DETAIL NO.
- @ NOTE NO.

WIND ZONES

- D ZONE 1 (FIELD)
- E3 ZONE 2 (PERIMETER)

NOTES:

1. DIMENSIONS/EQUIPMENT PENETRATION LOCATIONS ARE FOR INFORMATION ONLY. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL INFORMATION PROVIDED.
2. PROVIDE NEW OF MODIFY EXISTING OVERFLOW SCUPPER TO BE 4R HIGH BY 27" WIDE.
3. REMOVE ABANDONED PENETRATIONS AND PROPERLY REPAIR ROOF DECK. PAINT UNDERSIDE OR REPLACEMENT DECK PRIOR TO INSTALLATION.
4. REDUCE CRICKET LENGTH TO WIDTH RATIO TO PROVIDE 6" CLEARANCE FROM CRICKET VALLEY TO EQUIPMENT SUPPORT CURB.

LBB

SCN.E:

1" = 20'

REI PRO.ECT NO:

16CLT-046

DRAWING:

B

ROOFING, WATERPROOFING AND BUILDING ENVELOPE ENGINEERS AND CONSULTANTS
www.reiengineers.com
AN EMPLOYEE-OWNED COMPANY
1927 J.N. PEASE PLACE, SUITE 201, CHARLOTTE, NC 28262

REVISIONS

NO.	DATE
	04/21/16
2	
3	
4	

02-19-2016

LBB

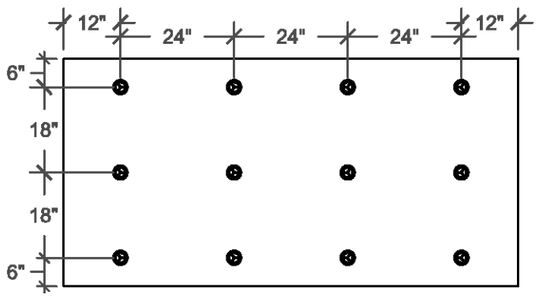
SEE DRAWING

REI PROJECT NO:
16CLT-046

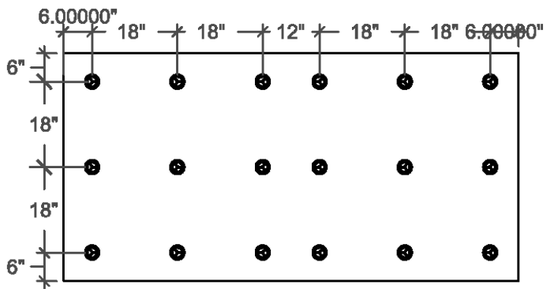
CETAL' C1

INSULATION FASTENING PATTERN

SCALE: N. T. S.

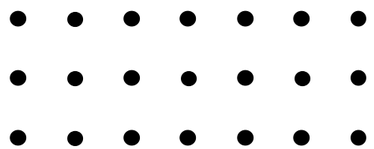


FIELD
12 FASTENERS PER BOARD (4' X 8')



PERIMETER
18 FASTENERS PER BOARD (4' X 8')

.00000"



CORNER
32 FASTENERS PER BOARD (4' X 8')

NOTES:
1. ANY WHOLE OR PARTIAL INSULATION BOARD OR PORTION OF ANY BOARD WHICH FALLS IN THE PERIMETERS & CORNERS OUTLINED ABOVE SHALL BE SUBJECT TO THE FASTENING REQUIREMENTS FOR THE HIGHEST WIND ZONE ENCOUNTERED, ACROSS THE ENTIRE BOARD.
2. REFER TO THE ROOF PLAN FOR PERIMETER AND CORNER DESIGNATION.

ROOF SYSTEM

SCALE: 1/4" = 1"

ROOF MEMBRANE
(FULLY ADHERED)

COVERBOARD

2.5" ROOF INSULATION

EXISTING STEEL DECK

ROOF SYSTEM
BUNCOMBE COUNTY SCHOOLS
ADMINSITRATIVE SERVICES BUILDING
AREA D2 ROOF REPLACEMENT

NO.	DATE
	04/21/16

3

DARK LINES - NEW

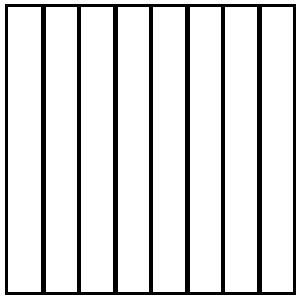
ROOFING, WATERPROOFING AND BUILDING
ENVELOPE ENGINEERS AND CONSULTANTS
www.reiengineers.com
AN EMPLOYEE-OWNED COMPANY
1927 J.N. PEASE PLACE, SUITE 201, CHARLOTTE, NC 28262

REVISIONS

FOAM ADHESIVE ATTACHEMENT
(4' X 4' INSULATION BOARDS)

6" (, lt lt 6ft

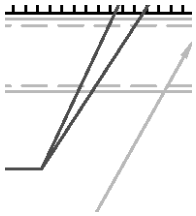
1 1 1



ZONE 1 (FIELD)
12" ON CENTER

ROOF MEMBRANE
(FULLY ADHERED)

COVERBOARD



2.5" ROOF INSULATION

EXISTING STEEL DECK

REV 01:04-21-2016

DARK LINES - NEW
LIGHT LINES- EXISTING

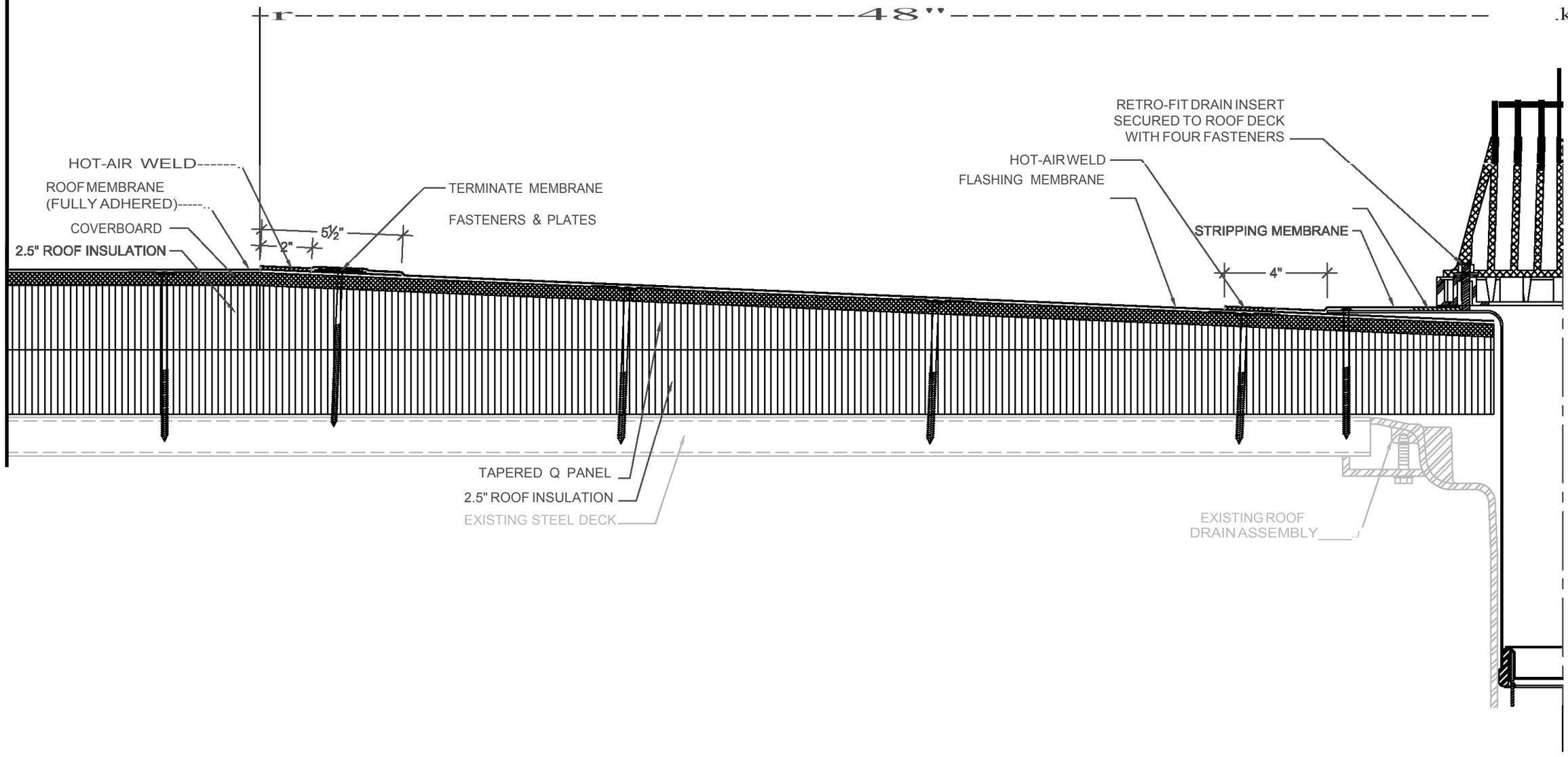
ROOFING, WATERPROOFING AND BUILDING
ENvELoPE ENGINI!ERS AND CONSULTANTS
www.reiengineers.com
AN EMPLOYEE-OWNED COMPANY

1/4"=1"

DATE: 02-19-2016

REI PROJECT NO: 16CLT-046

ROOF SYSTEM
BUNCOMBE COUNTY SCHOOLS
ADMINSITRATIVE SERVICES BUILDING
AREA D2 ROOF REPLACEMENT



DARKLINES - NEW
LIGHT LINES - EXISTING

LBB

1/4" = 1"

REI PROJECT NO:
16CLT-046

DETAL:
1

ROOFING, WATERPROOFING AND BUILDING
ENVELOPE ENGINEERS AND CONSULTANTS
www.reiengineers.com
AN EMPLOYEE-OWNED COMPANY
1927 J.N. PEASE PLACE, SUITE 201, CHARLOTTE, NC 28262

ROOF DRAIN
BUNCOMBE COUNTY SCHOOLS
ADMINSITRATIVE SERVICES BUILDING
AREA D2 ROOF REPLACEMENT

REVISIONS

NO.	DATE
	04121/16
3	

02-19-2016