



Francis M. Gomez
Purchasing Agent

Frank J. Picozzi
Mayor

City of Warwick
Purchasing Division
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The following notice is to appear on the City of Warwick's website Wednesday, December 14, 2022.
The website address is <http://www.warwickri.gov/bids>.

**CITY OF WARWICK
BIDS REQUESTED FOR**

Bid2023-305 Thayer Arena Roof Replacement and or Repairs

Specifications

Specifications are available in the Purchasing Division, located at 65 Centerville Road,
Monday through Friday, 8:30 AM until 4:30 PM on or after Wednesday, December 14, 2022. The

Submissions

Sealed bids will be received by the Purchasing Division no later than **11:00 AM, Tuesday, January 10, 2023**. The bids will be opened publicly commencing at 11:00 AM on the same day at 65 Centerville Road, Suite D.

Pre-bid meeting

A *mandatory* pre-bid conference will be held on **Wednesday, December 28, 2022 at 10:00 AM** on-site at Warwick Thayer Arena, 885 Sandy Lane.

Delivery

All bids must be sealed. If delivering in person or sent by delivery service (FedEx/UPS/DHL etc..) use physical address 65 Centerville Road, Warwick, RI 02886, Suite D. If sent via United States Postage Service use mailing address 3275 Post Road Warwick, Rhode Island 02886.

Awards

Awards will be made on the basis of the lowest evaluated or responsive bid price.
Please note that no bids can be accepted via email or fax.

Individuals requesting interpreter services for the hearing impaired must notify the Purchasing Division at 401-738-2013 at least 48 hours in advance of the bid opening date.

Original Signature on File

Francis M. Gomez
Purchasing Agent

PLEASE COMPLETE THIS PAGE & SUBMIT WITH YOUR BID

Acknowledgement of Addendum (if applicable)

Addendum Number

Signature of Bidder

COMPANY NAME: _____

COMPANY ADDRESS: _____

COMPANY ADDRESS: _____

BIDDER'S SIGNATURE: _____

BIDDER'S NAME (PRINT): _____

TITLE: _____ TEL. NO.: _____

EMAIL ADDRESS: _____*

*Please include your email address. Future bids will be emailed, unless otherwise noted.

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II. AWARD AND CONTRACT:

The CITY OF WARWICK, acting as duly authorized through its Purchasing Agent/Finance Director/Mayor, accepts the above bid and hereby enters into a contract with the above party to pay the bid price upon completion of the project or receipt of the goods unless another payment schedule is contained in the specifications. All terms of the specifications, both substantive and procedural, are made terms of this contract.

DATE: _____

Bid2023-305

Purchasing Agent

PLEASE COMPLETE THIS PAGE & SUBMIT WITH YOUR BID

CERTIFICATION & WARRANT FORM*

**This form must be completed and submitted with sealed bid.
Failure to do so will result in automatic rejection.**

Any and all bids shall contain a certification and warrant that they comply with all relevant and pertinent statutes, laws, ordinances and regulations, in particular, but not limited to Chapter 16-Conflicts of Interest, of the Code of Ordinances of the City of Warwick. Any proven violation of this warranty and representation by a bidder at the time of the bid or during the course of the contract, included, but not limited to negligent acts, either directly or indirectly through agents and/or sub-contractors, shall render the bidder's contract terminated and the bidder shall be required to reimburse the City for any and all costs incurred by the City, including reasonable attorney fees, to prosecute and/or enforce this provision.

Signature

Date

Company Name

Address

Address

***This form cannot be altered**

**CITY OF WARWICK
NOTICE TO BIDDERS**

Bid2023-305 Thayer Arena Roof Replacement and or Repairs

If you received this document from our homepage or from a source other than the City of Warwick Purchasing Division, please check with our office prior to submitting your bid to ensure that you have a complete package. The Purchasing Division cannot be responsible to provide addenda if we do not have you on record as a plan holder.

The opening of bids will be in the order established by the posted agenda and the agenda will continue uninterrupted until completion.

Once an item has been reached and any bids on that item has been opened, no other bids on that item will be accepted and any such bid will be deemed late.

The contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap for any position for which the employee or applicant is qualified and that in the event of non-compliance the City may declare the contractor in breach and take any necessary legal recourse including termination or cancellation of the contract.

A bidder filing a bid thereby certifies that no officer, agent, or employee of the City has a pecuniary interest in the bid or has participated in contract negotiations on the part of the City, that the bid is made in good faith without fraud, collusion, or connection of any kind with any other bidder for the same call for bids, and that the bidder is competing solely in his own behalf without connection with, or obligation to, any undisclosed person or firm.

All bids should be submitted with one (1) original and one (1) copy in a sealed envelope, which should read: *YOUR COMPANY NAME* plainly marked on the exterior of the envelope as well as "Bid2023-305 Thayer Arena Roof Replacement and or Repairs."

Bids received prior to the time of the opening will be securely kept, unopened. No responsibility will be attached to an officer or person for the premature opening of a bid not properly addressed and identified. No bids will be accepted via facsimile or email.

All proposals submitted become the property of the City and will not be returned. If the company intends to submit **confidential or proprietary information** as part of the proposal, **any limits on the use or distribution of that material should be clearly delineated in writing. This information should be submitted in a sealed envelope, clearly labeled confidential** and where it should be submitted in the response. Please be advised of the Freedom of Information Act as it may pertain to your submittal.

Should you have any questions, please contact Eric Earls, DPW Director, at eric.j.earls@warwickri.com. Requests for information or clarification must be made in writing. Requests for Information will be due by **Friday, December 30, 2023 by 3:00 PM.**

All bids should be written in ink or typed. If there is a correction with whiteout, the bidder should initial the change.

Negligence on the part of the bidder in preparing the proposal confers no rights for the withdrawal of the proposal after it is open.

Any deviation from the specifications must be noted in writing and attached as part of the bid proposal. The bidder should indicate the item or part with the deviation and indicate how the bid will deviate from specifications.

The IRS Form W-9 is available on www.warwickri.gov should be completed and submitted with the bid if the bidder falls under IRS requirements to file this form.

Prevailing Wages will apply to this bid. Current rates may be viewed at <http://www.dlt.state.ri.us/pw>.

The successful bidder must comply with all Rhode Island Laws, applicable to public works projects, including, but not limited to provisions of Chapter 13 of Title 37 of the Rhode Island General Laws, pertaining to prevailing wage rates, and all other applicable local, state and federal laws.

The contractor must carry sufficient liability insurance and agree to indemnify the city against all claims of any nature, which might arise as a result of his operations or conduct of work.

The contractor must keep himself informed of and comply with all laws, ordinances and regulations of the federal, state and municipal governments which may apply and be in force during the life of the contract, in any manner which may affect himself/employees or the conduct of the work or the materials used or employed in the work. Before submitting bids, prospective bidders should examine the terms, covenants and conditions of all codes, permits and laws which may apply. By submitting a bid, the bidder agrees to comply with all pertinent laws/regulations if awarded a contract.

Every contractor and subcontractor awarded a contract for public works, construction, alteration and/or repair, including painting and decorating, or public buildings or public works must submit completed RI Certified Weekly Payroll forms listing employees employed on the project to the awarding authority on a monthly basis for all work completed in the preceding month. These forms may be found at: www.dlt.ri.gov/pw/pwFormsPubs.htm. Certified Payroll forms concerning RI Department of Transportation projects may be submitted on federal forms. However, when a complaint is being investigated by the RI Department of Labor & Training (DLT), the contractor must resubmit the payroll information on the RI Certified Weekly Payroll forms for the entire project.

Awarding authorities, contractors and subcontractors must provide any and all payroll records to the DLT within ten (10) days of any request that is made by the department.

The awarding authority of any public works project will withhold the next scheduled payment to any contractor or subcontractor who fails to comply with the above provisions, as well as any further payments until they comply. The DLT may also impose a penalty of up to \$500 for each calendar day of noncompliance.

Please refer to Rhode Island state laws Section 37-13 for more information.

Bid surety in the form of a bank check, original bid bond or certified check in the amount of five (5) percent of the total bid price must be submitted with each bid. If a bid bond is submitted, it must be duly executed by the bidder as principal and having as surety thereon a surety company licensed to do business in the State of Rhode Island and approved by the owner.

The successful bidder must provide the City of Warwick with an original **Certificate of Insurance** for General Liability and Automobile Liability in a minimum amount of \$1 million, naming the **City of Warwick as the additional insured** and so stated on the certificate with the bid name and bid number. It is the vendor's responsibility to provide the City of Warwick with an updated Certificate of Insurance upon expiration of the original certificate.

Failure to provide adequate insurance coverage within the specified duration of time as set forth is a material breach of contract and grounds for termination of the contract.

The successful bidder must furnish a performance and payment bond in the amount of 100 percent of the total bid price.

For a bid to be awarded to a corporation, limited liability company or other legal entity, prior to commencing work under the awarded bid, that corporation, company or legal entity may be required to provide to the Purchasing Agent a **Certificate of Good Standing** from **The Rhode Island Secretary of State** dated no more than thirty (30) days prior to the date upon which the bid approval was made. **Please note that no other State's Certificate of Good Standing will be accepted.**

If required, the successful bidder will provide said **Certificate of Insurance, bonds and State of Rhode Island's Certificate of Good Standing** within ten (10) calendar days after notification or the City reserves the right to rescind said award.

Prices to be held firm one (1) year from date of award. Term contracts may be extended for one (1) additional term upon mutual agreement unless otherwise stated.

The City is exempt from the payment of the Rhode Island Sales Tax under the 1956 General Laws of the State of Rhode Island, 44-18-30, Paragraph I, as amended.

The contractor must carry sufficient liability insurance and agree to indemnify the City against all claims of any nature, which might arise as a result of his operations or conduct of work.

The Purchasing Agent reserves the right to reject any and all bids, to waive any minor deviations or informalities in the bids received, and to accept the bid deemed most favorable to the interest of the City.

The City reserves the right to terminate the contract or any part of the contract in the best interests of the City, upon 30-day notice to the contractor. The City will incur no liability for materials or services not yet ordered if it terminates in the best interests of the City. If the City terminates in the interests of the City after an order for materials or services has been placed, the contractor will be entitled to compensation upon

submission of invoices and proper proof of claim, in that proportion which its services and products were satisfactorily rendered or provided, as well as expenses necessarily incurred in the performance of work up to time of termination.

No extra charges for delivery, handling or other services will be honored. All claims for damage in transit will be the responsibility of the successful bidder. Deliveries must be made during normal working hours unless otherwise agreed upon.

All costs directly or indirectly related to the preparation of a response to this solicitation, or any presentation or communication to supplement and/or clarify any response to this solicitation which may be required or requested by the City of Warwick will be the sole responsibility of and will be borne by the respondent.

If the respondent is awarded a contract in accordance with this solicitation and fails or refuses to satisfy fully all of the respondents obligations thereunder, the City of Warwick will be entitled to recover from the respondent any losses, damages or costs incurred by the City as a result of such failure or refusal.

The City reserves the right to award in part or full and to increase or decrease quantities in the best interest of the City.

Any quantity reference in the bid specifications are estimates only, and do not represent a commitment on the part of the City of Warwick to any level of billing activity. It is understood and agreed that the agreement will cover the actual quantities ordered during the contract period.

The City reserves the right to rescind award for non-compliance to bid specifications.

The successful bidder must adhere to all City, State and Federal Laws, where applicable.

ROOFING PROJECT MANUAL

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SPECIFICATIONS

**City of Warwick – Thayer Arena 975 Sandy Ln,
Warwick, RI 02889**



Roof Areas: **Thayer Arena**

Pre-Bid Date: **Wednesday, December 28, 2022 10:00am**

Bid Due Date: **Tuesday, January 10, 2023 11:00am**

THIS DOCUMENT MUST REMAIN INTACT - DO NOT DETACH

SECTION 01010

SUMMARY OF WORK

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2. DESCRIPTION:

A. Furnish and install labor, roofing materials, insulation, flashings, and incidentals on the following designated roof areas; **The City of Warwick – Thayer Arena.**

B. Base Bid - 30 Year Warranty - Roof work includes:

- 1 Refer to specification sections for additional information and installation guidelines.
- 2 Remove existing gravel by sweeping and power brooming existing substrate. All surfaces should be clean, dry, free of dirt, dust, debris, oils, loose gravel.
- 3 Refer to IR scan survey: remove existing roofing and insulation in areas indicated as wet.
- 4 Infill removed with like-kind materials and thicknesses. Tie-in to the existing roof using one ply of base sheet and one ply of cap sheet, set in specified cold adhesive at specified application rates, prior to application of the new roof system. Tie-in all new laps to the existing roof by trowel applying flashing cement and reinforcement mesh in a three-course method.
- 5 Roll apply specified primer over the entire prepared surface at application rate of 0.75-1 gallons per square.
- 6 Adhere ½” per foot tapered cricket, between existing drain locations, and 4 x 4’ drain sumps to Roof D.
- 7 Adhere 1/2" gypsum coverboard, to the properly prepared and primed BUR substrate, in the specified foam insulation adhesive ribbon bead patterns: Zone 1: ¾” beads 12” o.c., Zone 2: ¾” beads 6” o.c., Zone 3: ¾” beads 4” o.c.,
- 8 Adhere one (1) ply of specified base sheet over the entire substrate in specified adhesive at two and half (2.5) gallons per square using a weighted roller and 1/8” notched squeegee.
- 9 Adhere one (1) ply of specified mineral surfaced cap sheet over the entire substrate in specified adhesive at two and half (2.5) gallons per square using a weighted roller and 1/8” notched squeegee. Heat weld all seams.
- 10 At all base flashings, apply two (2) plies of specified membrane (one base + one cap).
- 11 Roll apply two (2) coats of specified aluminized coating at application rate of .75 gallons per square.
- 12 Raise all curbs and sleepers to match new insulation height, achieving an 8” minimum flashing height.
- 13 Install new pitch pockets at existing locations.
- 14 Attach wood blocking at perimeter to accommodate new finished height if needed.

- 15 Attach new .040 aluminum kynar drip edge and 6 x 6" box gutters at existing gutter locations on roof E & B. Strip in all perimeter metal with 6" base ply strip flashing and 9" cap ply strip flashing set in specified flashing mastic.
- 16 Install new pre-manufactured coping and metal components with .040 Kynar coated aluminum, to include but not limited to: counter flashing and fascia at roofs E,D,&B where Color to be selected by owner
- 17 Furnish, raise, and install new drain assemblies at existing locations.
- 18 Replace all metal flashing components at stack penetration(s).
- 19 It is the contractor's responsibility to verify measurements and tapered insulation plan.
- 20 All roof areas will be secured in a watertight condition each day before the Contractor vacates the site. There will be no exceptions!
- 21 Unless otherwise noted, contractor shall provide and pay for all labor, materials, equipment, tools, construction machinery, water, heat, utilities, transportation and other facilities and services necessary for proper execution and completion of the work as required by The Contract Documents.

C. Add Alternative #1: - 40 Year Warranty

1 Same scope as base bid other than utilizing the 40-year cap ply in lieu of the 30-year cap ply.

1.3. INTENT OF THE SPECIFICATIONS:

A. The intent of these specifications is to describe the materials and methods of construction required for the performance of the work. In general, it is intended that the drawings shall delineate the detailed extent of the work. When there is a discrepancy between drawings, referenced specifications, and standards and this specification, this specification shall govern.

1.4. PROTECTION:

- A. The Contractor shall use every available precaution to provide for the safety of property owner, visitors to the site, and all connected with the work under the specification.
- B. All existing facilities both above and below ground shall be protected and maintained free of damage. Existing facilities shall remain operating during the period of construction unless otherwise permitted. All access roadways must remain open to traffic unless otherwise permitted.
- C. Barricades shall be erected to fence off all construction areas from operations personnel.
- D. Safety Requirements
 - 1 All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
 - 2 Contractor to provide Owner with a detailed safety plan before the start of project.
 - 3 Comply with federal, state, local and owner fire and safety requirements.
 - 4 Advise owner whenever work is expected to be hazardous to owner employees and/or operations.
 - 5 Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.

- 6 Maintain proper fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used.
- 7 ALL SAFETY REQUIREMENTS OF THE BUILDING OWNER MUST BE FOLLOWED. NO EXCEPTIONS WILL BE PERMITTED. SAFETY ORIENTATION MEETING REQUIRED PRIOR TO PERFORMING ANY WORK.

1.5. HOUSEKEEPING:

- A. Keep materials neat and orderly.
- B. Remove scrap, waste and debris from project area.
- C. Maintenance of clean conditions while work is in progress and cleanup when work is completed shall be in strict accordance with the "General Requirements" of this contract.

* * * END OF SECTION 01010 * * *

SECTION 01015 CONTRACTOR'S USE OF PREMISES

2. PART 1 - GENERAL

2.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

2.2. DESCRIPTION

- A. Work included:

1 This Section applies to situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon Owner's property.

2.3. QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Owner may require all personnel who will enter upon the Owner's property certify their awareness of and familiarity with requirements of this Section.

2.4. TRANSPORTATION FACILITIES

- A. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach job site. If any damage occurs the contractor is responsible for repairs.
- B. Contractor's vehicles:
 - 1 Require Contractor's vehicles, vehicles belonging to employees of Contractor, and all other vehicles entering upon Owner's property in performance of Work of Contract, to use only the Access Route approved in advance by Owner.
 - 2 Do not permit such vehicles to park on any street or other area of Owner's property except in the area approved by Owner as "Contractor's Parking Area."

2.5. LANDSCAPING

- A. Provide adequate protection for trees, grass, shrubs and all other landscaping during set-up or construction. If any damage occurs the contractor is responsible for repairs as designated by the Owner.

2.6. FACILITY USAGE

- A. Provide adequate protection for all interior and exterior portions of the building during set-up and construction. If any damage occurs the contractor is responsible for repairs as designated by the Owner.
- B. Restrooms and other amenities of the building will only be used with permission of the Owner. If such authorization is given, the Contractor is responsible for maintaining cleanliness and repairs as designated by the Owner.

2.7. SECURITY

- A. Restrict access of all persons entering upon the Owner's property to the Access Route and to the actual site of the work.

* * * END OF SECTION 01015 * * *

SECTION 01400 QUALITY CONTROL

3. PART 1 - GENERAL

3.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

3.2. QUALITY CONTROL

A. Contractor shall:

- 1 Be experienced in hot multi-ply roofing and modified bitumen roofing.
- 2 Be acceptable by owner and roofing material manufacturer/supplier.

B. Roofing manufacturer shall:

- 1 Be an Associate Member in good standing with National Roofing Contractor's Association (NRCA).
- 2 Be recognized in roofing, waterproofing and moisture survey industry.
- 3 Be approved by owner.
- 4 Material manufacturer/supplier must supply representative to perform periodic inspections throughout the course of the project. Written reports must be submitted to the owner's representative and copies to the contractor.
- 5 Material supplier providing the roofing warranty shall be ISO 9001: 2000 Certified.

a Certificate of Registration shall have listed: Design, Manufacturer and Distribution in the Scope of Approval and/or Activity.

- C. Any deficiencies noted during inspections must be corrected by the contractor and approved in writing by the material manufacturer/supplier's representative.

3.3. FIELD QUALITY CONTROL

- A. Dimensions in the construction documents are approximate and are used to describe the scope of work.
- B. The contractor shall field measure in (in US measurement) all roof areas to verify the dimensions to order adequate material quantities to complete the work specified in these documents.
- C. Any discrepancies found by the contractor during the bid process must be submitted in writing to the owner's representative. Start of the project is notice to the owner that the contractor as verified all field dimensions and material quantities to complete the project.

3.4. RANDOM SAMPLING

- A. During course of work, owner/owner's representative may secure samples of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.
- B. If test results prove that a material is not functionally equal to specified material:

- 1 Contractor shall pay for all testing.
- 2 Owner will charge Contractor a penalty up to 20 percent of contract price when all work has been completed before test results become known.
- 3 Owner will charge Contractor a penalty in proportion to amount of work completed before test results become known. Remaining work shall be completed with specified materials.

4. PART 2 - PRODUCTS

4.1. GENERAL

- A. Comply with Quality Control, References, Specification, and Manufacturer's data. Where conflict may exist, more stringent requirements govern.
- B. Provide primary products, including each type of roofing sheet (felt), bitumen, base flashings, miscellaneous flashing materials, and sheet metal components from a single manufacturer, which has produced that type of product successfully for not less than three (3) years. Provide secondary products (insulation, mechanical fasteners, lumber, etc.) only as recommended by manufacturer of primary products for use with roofing system specified.

5. PART 3 - EXECUTION

5.1. SUBMITTALS

- A. Provide building owner's representative a letter from the roof material manufacturer indicating that applicator is approved to install their products and will provide warranty for this installation.

* * * END OF SECTION 01400 * * *

SECTION 01421 ROOFING INSPECTION SERVICES

6. PART 1 - GENERAL

6.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

6.2. DESCRIPTION

- A. Work included:

1 Provide roofing inspection services as specified herein and as needed for a complete and proper installation.

6.3. SUBMITTALS

- A. Secure the designated Owner's representative's advance approval of date and time for roof substrata inspection and pre-roofing meeting.

- 1 Notify the roofing inspection service, the roofing contractor, and other interested parties, and secure their agreement to attend.
- 2 At least three calendar days prior to the prerooting meeting, notify the designated Owner's representative of the names of persons expected to attend.

- B. Records:

- 1 Maintain a complete and legible file, in chronological order, containing a copy of each report, certificate, and other communication received relative to the work of this Section.
- 2 Upon completion of the work of this Section, deliver a copy of the complete file to the designated Owner's representative.

7. PART 2 - PRODUCTS

7.1. ROOFING INSPECTION SERVICES

- A. For the work of this Section, retain the roofing inspection services of company approved in advance by the designated Owner's representative.

8. PART 3 - EXECUTION

8.1. PRE-ROOFING MEETING

- A. Not less than three nor more than ten calendar days prior to scheduled start of roofing installation, conduct a roofing substrata inspection and pre-roofing meeting at the job site.

- 1 Designated Owner's representative will be chairperson of the meeting, will take minutes of the meeting, and will record all agreements reached as a result of the inspection and meeting.
- 2 Visually inspect all substrata upon which roofing is scheduled to be applied.
 - a Determine general acceptability, and determine areas requiring further

preparation.

- b Determine acceptable remedies for unacceptable areas.
- 3 Discuss proposed schedule for installation of the roofing, and reach agreement as to dates of start and finish of installation of the roofing.
- 4 Discuss proposed methods for installation of the roofing, and equipment and personnel to be used.
- 5 Discuss inspection methods to be used, reports to be issued by the roofing inspector, responsibilities and limits of responsibilities of the roofing inspector, and potential problems arising from use of methods not agreed to in the pre-roofing meeting.

8.2. INSPECTION DURING ROOFING INSTALLATION

- A. Verify that materials delivered to the job site are those approved by the designated Owner's representative for use on this Work.
- B. Visually observe installation of roofing including, but not necessarily limited to:
 - 1 Verify use of installation procedures agreed upon in the pre-roofing meeting.
 - 2 Call attention of the contractor's representative on the job to unacceptable methods and unacceptable results.
 - 3 Report to the Contractor and to the designated Owner's representative if the contractor fails to correct unacceptable methods or unacceptable results.
- C. Make Final visual inspection of the entire roofing installation.
 - 1 Compile a list of items required to be revised or replaced.
 - 2 Deliver a copy of the list to the contractor's representative on the job and to others as appropriate.
 - 3 Verify proper revision or replacement of all items on the list.

8.3. REPORTS

- A. Make daily written reports of roofing inspection activities, delivering copies to the roofing contractor and others as agreed in the pre-roofing meeting.
- B. Upon completion of the roofing installation, compile a comprehensive report covering activities performed under this Section, and deliver a copy of the report to the:
 - 1 Designated Owner's representative;
 - 2 Owner;
 - 3 Roofing contractor; and
 - 4 Others as agreed in the project meetings.

8.4. LIMITS OF ROOFING INSPECTOR'S RESPONSIBILITIES

- A. During progress of the roofing installation, the roofing inspector is required to:
 - 1 Make visual observations and compile reports described in this Section;
 - 2 Advise the roofing contractor's representative on the job as to unacceptable methods and unacceptable results when so observed by the roofing inspector.
 - B. In connection with the roofing installation, "unacceptable methods and unacceptable results" mean methods and results other than:

- 1 Those recommended by the manufacturer of the approved roofing system materials.
 - 2 Those required by pertinent regulations of governmental agencies having jurisdiction;
 - 3 Those required by these Specifications; and
 - 4 Those agreed upon in the pre-roofing meeting.
- C. The roofing inspector is not empowered to:
- 1 Act for, or in lieu of, representatives of the governmental agencies having jurisdiction;
 - 2 Give directions to the Contractor or workmen on the job;
 - 3 Revise any part of the Contract Documents; or
 - 4 Approve any change in the methods agreed upon in the pre-roofing meeting.
- D. Failure of the roofing inspector to observe unacceptable methods or unacceptable results during progress of the Work will not absolve the Contractor from his responsibility to complete the Work in accordance with the specified requirements and the agreed methods.

* * * END OF SECTION 01421 * * *

SECTION 01600 MATERIAL AND EQUIPMENT

9. PART 1 - GENERAL

9.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

9.2. DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials

- 1 Deliver materials to job-site in new, dry, unopened and well-marked containers showing product and manufacturer's name.
- 2 Deliver materials in sufficient quantity to allow continuity of work.

B. Storage of Materials

- 1 Store bitumen and ply sheets in dry area protected from water or extreme humidity.
- 2 Store ply sheets on ends only where possible; on sloped roofs, store flat parallel to joists. Discard rolls which have been flattened, creased, or otherwise damaged.
- 3 Stack insulation on pallets.
- 4 Remove plastic packing shrouds. Cover all stored materials with canvas tarpaulin top to bottom. Secure tarpaulin.
- 5 Rooftop storage: Disperse material on roof to avoid structure overloading.

C. Material Handling

- 1 Handle all materials on site to avoid bending, tearing, or other damage during transportation and installation.
- 2 Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

D. Environmental Requirements

- 1 Do not work in rain, snow or in presence of water.

*** END OF SECTION 01600 ***

SECTION 01700 CONTRACT CLOSE-OUT

10. PART 1 - GENERAL

10.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

10.2. DESCRIPTION

- A. Work included:

- 1 Provide an orderly and efficient transfer of the completed Work to the Owner.

10.3. QUALITY ASSURANCE

- A. Prior to requesting inspection by the Project Manager, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

10.4. PROCEDURES

- A. Substantial Completion:

- 1 All roofing materials and components are in place and water tight according to specifications with alternates approved by Designated Owner's representative and Building Owner.
- 2 Roofing Contractor will notify designated Owner's representative of substantial completion. Within a reasonable time after receipt of notification, the designated Owner's representative will inspect to determine status of completion.
- 3 Should the designated Owner's representative determine that the Work is not substantially completed:
 - a The Designated Owner's representative will promptly notify the Contractor, giving the reasons therefore.
 - b Roofing Contractor will remedy the deficiencies and notify the Designated Owner's representative when ready for reinspection.
 - c The Designated Owner's representative will reinspect the Work.

- B. Final Completion:

- 1 Designated Owner's representative will prepare and submit a written statement at final completion.
- 2 Certify that:
 - a Contract Documents have been reviewed;
 - b Work has been inspected for compliance with the Contract Documents;
 - c Work has been completed in accordance with the Contract Documents;
 - d Equipment and systems have been tested as required, and are operational;
 - e Work is completed and ready for final inspection.

- 3 The Designated Owner's representative will make an inspection to verify status of completion.
 - 4 Should the Designated Owner's representative determine that the Work is incomplete or defective:
 - a The Designated Owner's representative will promptly notify the Contractor, in writing, listing the incomplete or defective work.
 - b Remedy the deficiencies promptly, and notify the Designated Owner's representative when ready for reinspection.
 - 5 When the Designated Owner's representative determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make close-out submittals.
- C. Close-out submittals include, but are not necessarily limited to:
- 1 Project Record Documents described in Section 01720, if part of specification;
 - 2 Operation and maintenance data for items so listed in pertinent other Sections of these Specifications, and for other items when so directed by the Project Manager;
 - 3 Warranties and bonds;
 - 4 Evidence of payment and release of liens;
 - 5 List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- D. Final adjustment of accounts:
- 1 Submit a final statement of accounting to the Project Manager, showing all adjustments to the Contract Sum.
 - 2 If so required, the Designated Owner's representative will prepare a final Change Order showing adjustments to the Contract Sum which were not made previously by Change Orders.

10.5. INSTRUCTION

- A. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work.

* * * END OF SECTION 01700 * * *

SECTION 02050

SELECTIVE DEMOLITION AND SALVAGE

11. PART 1 GENERAL

11.1. RELATED DOCUMENTS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

11.2. DEMOLITION AND SALVAGE

A. SUMMARY

1 This portion of the specification governs the demolition, salvaging (to the extent specified by building owner), and disposal of materials resulting from the demolition.

B. APPLICABLE ROOF SECTIONS:

1 Roof Areas to be covered under this section:

12. PART 2 - PRODUCTS (NOT APPLICABLE)

13. PART 3 - EXECUTION

13.1. DEMOLITION

- A. Demolition operations shall be performed in such a manner that no damage to existing facilities or injury to persons will result from the performance of the Work.
- B. The contractor shall review and visually survey areas marked for demolition before beginning demolition.
- C. The use of equipment or wrecking devices shall be subject to the approval of building owner; however, such approval does not relieve the contractor of responsibilities described above.

13.2. PREPARATION

A. Protection:

- 1 Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to owner.
- 2 Multi-ply roofing, flashings, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
- 3 At start of each workday, drains within daily work area shall be plugged. Plugs to be removed at end of each workday or before arrival of inclement weather.
- 4 At end of each working day, partial installation shall be sealed with water stops along edges to prevent water entry.
- 5 Preparation work shall be limited to those areas that can be covered with installed roofing material on same day or before arrival of inclement weather.
- 6 Provide at site, prior to commencing removal of debris, a dumpster or dump truck to be located where directed by owner. Construct an enclosed chute from roof for removal of debris from roof area. Protect building surfaces at chute/set-up areas with tarpaulin.

Remove dumpster from premises when full and empty at approved dumping or refuse area. Deliver empty dumpster to site for further use. Upon job completion, dumpster/chute shall be removed from premises. Spilled or scattered debris shall be cleaned up immediately.

Removed material to be disposed from roof as it accumulates.

- 7 Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.

B. Surface Preparation

- 1 Clean roof of loose gravel and dirt with closed vacuum system.
- 2 Designated roof materials are to be removed.
- 3 Remove designated roofing and insulation.
- 4 Remove all base flashings.
- 5 Remove vapor retarder from concrete deck only if it is not fully adhered.
- 6 Remove metal counter flashings as required.
- 7 Remove, cut off, metal wall panels or other wall coverings as required for access to flashings.
- 8 Remove unused equipment as designated by building owner's representative.
- 9 Dispose of all materials unless designated by building owner's representative for re-installation or salvage.
- 10 Sweep roof deck clean. Dirt, gravel, and foreign materials within flutes of metal deck is not acceptable.

13.3. HAZARDOUS MATERIALS

- A. Meet all rules and regulations pertaining to the handling and disposal of roof material which contain hazardous materials.

13.4. SALVAGE

- A. Material as specified and recovered from demolition operations shall remain the property of building owner. With the owner's permission, other materials shall become the property of the contractor. Material salvaged for building owner shall be placed in storage areas designated by building owner. Material that is not salvaged for building owner shall be removed from the site or discarded in an on-site disposal area designated by building owner.

* * * END OF SECTION 02050 * * *

SECTION 07220
ROOF DECK AND INSULATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

1.2 SUMMARY

- A. Section includes roof insulation over the properly prepared deck substrate.

- B. Related Sections:
 - 1. Section 07 05 00 – Common Work Procedures for Thermal and Moisture Protection.
 - 2. Section 07 62 00 – Sheet Metal Flashing and Trim.

1.3 REFERENCES

- A. American Society for Testing and materials (ASTM):
 - 1. ASTM A167 Standard Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip.
 - 2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
 - 3. ASTM B29 Standard Specification for Refined Lead.
 - 4. ASTM B32 Standard Specification for Solder Metal.
 - 5. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulation.
 - 6. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board.
 - 7. ASTM C209 Standard Test Method for Cellulosic Fiber Insulating Board.
 - 8. ASTM C272 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
 - 9. ASTM C1396 Standard Specification for Gypsum Wallboard.
 - 10. ASTM C518 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 11. ASTM C578 Standard Specification for Perlite Thermal Insulation Board.
 - 12. ASTM C728 Standard Test Methods for Fire Test of Roof Coverings.
 - 13. ASTM C1289 Standard Specification for Faced Rigid Polyisocyanurate Thermal Insulation.
 - 14. ASTM D5 Standard Test Method for Penetration of Bituminous Materials.
 - 15. ASTM D36 Standard Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
 - 16. ASTM D312 Standard Specification for Asphalt Used in Roofing.
 - 17. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
 - 18. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 19. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - 20. ASTM D1863 Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
 - 21. ASTM D2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal Humid Aging.
 - 22. ASTM D2178 Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.
 - 23. ASTM D4601 Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
 - 24. ASTM D5147 Standard Sampling and Testing Modified Bituminous Sheet Material.

- B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)

- C. Factory Mutual Research (FM):

1. Roof Assembly Classifications.
- D. National Roofing Contractors Association (NRCA):
 1. Roofing and Waterproofing Manual.
- E. Underwriters Laboratories, Inc. (UL):
 1. Fire Hazard Classifications.
- F. Warnock Hersey (WH):
 1. Fire Hazard Classifications.
- G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- H. Steel Deck Institute, St. Louis, Missouri (SDI)
- I. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)
- J. Insulation Board, Polyisocyanurate (FS HH-I-1972)

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Division 01 Section Submittal Procedures. 01300.
- B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.
- C. Provide a sample of each insulation type.
- D. Shop Drawings
 1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, including identification of each insulation block, sequence of installation, layout, drain/scupper locations, roof slopes, thicknesses, crickets and saddles.
 2. Shop drawing shall include: Outline of roof, location of drains/scuppers, complete board layout of tapered insulation components, thickness and the average "R" value for the completed insulation system.
- E. Certification
 1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.
 2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.5 QUALITY ASSURANCE

- A. Fire Classification, ASTM E-108.

- B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.
- C. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM.
- D. Pre-installation meeting: Refer to Division 07 roofing specifications for pre-installation meeting requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.
- C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).
- D. Store materials off the ground. Any warped, broken, or wet insulation boards shall be removed from the site.

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Basis of Design: Hunter H-Shield, supplied by Viking Products Group, Cleveland, OH. Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Meet or exceed all manufacturer and contractor/fabricator quality and performance criteria specified.
- B. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements.
 - 1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.
 - 2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
 - 3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
 - 4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.
 - 5. Substitutions must be submitted ten (10) days prior to bid opening.

2.2 INSULATION MATERIALS

- A. Thermal Insulation Properties and Approved Insulation Boards.
 - 1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
 - a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
 - b. Board Size: Four by four feet (4' x 4') or four by eight feet (4' x 8')
 - c. Thickness: Infill removed wet insulation to match existing thickness(es)
 - d. Compliances: Factory Mutual
 - e. Acceptable Product: Johns Manville ENRGY 3 / Hunter H-Shield / or approved equal
 - 2. Tapered Polyisocyanurate Roof Insulation; ASTM C1289:
 - a. Qualities: Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy-duty glass fiber mat facers.
 - b. Field: 1/4" slope. See tapered drawing for specific layout. Contractor to verify all structural/tapered slopes and quantities.
 - c. Crickets/Saddles: 1/2":12" slope (Roof D)
 - d. Drain Sumps: 4 x 4" (Roof D)
 - e. Install tapered crickets and saddles between all drains and scuppers, and on the upslope side of all curbs to ensure positive drainage. Use a 2:1 length to width ratio per NRCA recommendations.
 - f. Compliances: Factory Mutual
 - g. Acceptable Product: Johns Manville ENRGY 3 / Hunter H-Shield / or approved equal
 - 3. Gypsum Roof Board:
 - a. Qualities: Nonstructural, noncombustible, homogenous composition panel.
 - b. Board Size: Four by four feet (4' x 4'). or four by eight feet (4' x 8')
 - c. Thickness: 1/2"
 - d. Compliances: Factory Mutual
 - e. Acceptable Product: USG Corp. - SECUROCK / Georgia Pacific - Dens-Deck Prime / National Gypsum - DEXcell

2.3 RELATED MATERIALS

- A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite or organic fiberboard, as per the approved manufacturer. Use tapered edge along perimeter wood blocking to create an acceptable transition, as necessary.
- B. Roof Deck Insulation Adhesive: Dual-component, high-rise foam adhesive as recommended by insulation manufacturer.
 - 1. Tensile Strength (ASTM D412).....250 psi
 - 2. Density (ASTM D1875).....8.5 lbs./gal.
 - 3. Viscosity (ASTM D2556).....22,000 to 60,000 cP.
 - 4. 2 `Peel Strength (ASTM D903).....17 lb/in.
 - 5. 3 `Flexibility (ASTM D816).....Pass @ -70F
 - 6. Refer to the specific Factory Mutual RoofNav(s) associated with each deck type/elevation for specific adhesives, ribbon sizes and installation requirements.

PART 3 – EXECUTION

3.1 EXECUTION, GENERAL

- A. Comply with requirements of Division 01 Section "Common Execution Requirements."

3.2 INSPECTOR OF SURFACES

- A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
 - 1. Verify that work which penetrates roof deck has been completed.
 - 2. Verify that wood nailers are properly and securely installed.
 - 3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
 - 4. Do not proceed until defects are corrected.
 - 5. Do not apply insulation until substrate is sufficiently dry.
 - 6. Broom clean substrate immediately prior to application.
 - 7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.

3.3 INSTALLATION

A. Preparation & Selective Demolition

- 1. Remove and power broom gravel down to the existing BUR substrate.
- 2. Remove and replace areas of wet insulation detailed on the IR Scan report. Infill with like-kind materials and thicknesses and tie-in to the existing roof using one ply of base sheet and one ply of cap sheet prior to application of the new roof system. Tie-in all new laps to the existing roof using flashing cement and reinforcement mesh in a three-course method.
- 3. Prime the existing, properly prepared BUR substrate using Garla-Prime ASTM D41 primer.
- 4. Adhere ½" gypsum coverboard to primed substrate in the specified foam insulation adhesive ribbon pattern.
- 5. Apply one ply of specified base ply, cap ply, and aluminized surface coating per manufacturers requirements.

B. Attachment of Coverboard with Insulation Adhesive

- 1. Ensure all surfaces are clean, dry, free of dirt, debris, oils, loose ore embedded gravel, unadhered coatings, deteriorated membrane and other contaminants that may inhibit adhesion.
- 2. Apply insulation adhesive directly to the substrate using a ribbon pattern with using either the manual applicator or an automatic applicator, at a rate of one (1) gallon per one hundred fifty (150) square feet per cartridge. The ribbon pattern spacing is as follows:
 - Zone 1: ¾" **inch wide beads 12 inches o.c.**
 - Zone 2: ¾" **inch wide beads 6 inches o.c.**
 - Zone 3: ¾" **inch wide beads 4 inches o.c.**
- 3. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.
- 4. Briefly step each board into place to ensure contact with the adhesive. Temporary weights must be utilized to ensure complete and proper adhesion. Substrates with irregular surfaces may prevent the insulation board from making positive contact with the adhesive. Relief cuts may be required to ensure proper contact.
- 5. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.
- 1. All adhesives and adhesive patterns must meet the specific Factory Mutual requirements, as described in the Factory Mutual RoofNav and manufacturer's Wind Uplift Calculations referenced.

3.4 CLEANING

- A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

3.5 CONSTRUCTION WASTE MANAGEMENT

- A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 07550
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cold Applied 2-Ply Asphalt Roofing

1.2 RELATED SECTIONS

- A. Section 07220 - Insulation & Coverboard: Insulation and fastening.
- B. Section 07620 - Sheet Metal Flashing and Trim: Weather protection for base flashings.

1.3 REFERENCES

- A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.
- C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
- D. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
- E. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
- F. ASTM D 2822 Standard Specification for Asphalt Roof Cement.
- G. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
- H. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- I. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
- J. Factory Mutual Research (FM): Roof Assembly Classifications.
- K. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
- L. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- M. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.
- N. Warnock Hersey (WH): Fire Hazard Classifications.
- O. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
- P. ASCE 7, Minimum Design Loads for Buildings and Other Structures
- Q. UL - Fire Resistance Directory.
- R. FM Approvals - Roof Coverings and/or RoofNav assembly database.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.

- B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
 - 1. Factory Mutual Class A Rating.
 - 2. Underwriters Laboratory Class A Rating.
 - 3. Warnock Hersey Class A Rating.

- C. Design Requirements:
 - 1. Uniform Wind Uplift Load Capacity
 - a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
 - 1) Design Code: ASCE 7-16 ASD
 - 2) Importance Factor of: IV
 - 3) Wind Speed: 137 mph
 - 4) Ultimate Pullout Value: N/A
 - 5) Exposure Category: C
 - 6) Design Roof Height: 25 feet.
 - 7) Minimum Building Width: 95 feet.
 - 8) Roof Pitch: 1/4:12
 - 9) Roof Area Design Uplift Pressure:
 - a) Zone 1' - Field of roof 37.1 psf
 - b) Zone 1 - Field of roof 57.5 psf
 - c) Zone 2 – Perimeter (Eaves, ridges, hips and rakes) 72.9 psf
 - d) Zone 3 - Corners 72.9 psf
 - e) Zone 4 – Wall Perimeter 38.0 psf
 - f) Zone 5 - Wall Corner 44.9 psf
 - g) Zone 2 Width – 24 feet
 - h) Zone 3 Width – 8 feet

- D. FM RoofNav Assembly #: 16785-224938-0 – Deduct Alternate

- E. FM RoofNav Assembly #: 37250-388076-0 – Base Bid

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.

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

- C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation, including notation of roof slopes and adhesion patterns of insulation and base modified bitumen membrane, prior to job start.

- D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.

- E. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

- F. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

- G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

- H. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by

Factory Mutual (FM), Underwriters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

- I. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Contractor with manufacturer specified. Installer shall produce evidence of completing 5 projects of similar scope within a 50 mile radius of this project.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section.
- B. Review installation procedures and coordination required with related Work.
- C. Inspect and make notes of job conditions prior to installation:
 - 1. Record minutes of the conference and provide copies to all parties present.
 - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.

- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 40 degree F (4 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

- A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed NDL Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
 - 1. Warranty Period: **(Base Bid)**
 - a. 30 years from date of acceptance.
 - 2. Warranty Period: **(Add Alternate #1)**
 - a. 40 years from date of acceptance.
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a. 2 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The Garland Company, Inc.: 3800 E. 91st St.; Cleveland, OH 44105; Tel: 401-500-2901; Email: dwall@garlandind.com
- B. Substitutions/pre-approved equals: Products proposed, as equal to the products specified in this Section shall be submitted in accordance with the specifications. Any substitutions must be submitted to the Owner ten (10) days prior to bid date.
- C. A copy of the manufacturer's standard specification section shall accompany proposals. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.
- D. Include a list of three (3) projects of similar type and extent, located within a fifty-mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
- E. Equivalency of performance criteria, warranty terms, inspection services, submittal procedures, and contractual terms will constitute the basis of acceptance. The burden of proof of equivalency is the responsibility of the submitting contractor.

- F. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 COLD APPLIED 2-PLY MODIFIED BITUMINOUS ASPHALT ROOFING

- A. Base (Ply) Sheets: One ply bonded to the prepared substrate with cold adhesive.
- B. Cap (Ply) Sheet: One ply bonded to the prepared substrate with cold adhesive.
- C. Flashing Base (Ply) Sheet: One ply bonded to the prepared substrate with cold adhesive.
- D. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with cold adhesive.
- E. Surfacing: Requires 30 day wait before applying.
 - 1. Surface Coatings: two (2) coats of aluminized coating

2.3 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Pitch pans, Rain Collars and Plumbing Sleeves shall be fabricated from 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
- B. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- C. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
 - 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.
- C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. General: Clean surfaces thoroughly prior to installation.
 - 1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
 - 3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
 - 4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
 - 5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
 - 6. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.
- B. Poured reinforced concrete
 - 1. Shall be smooth, dry, clean and free of ice/frost, projections and depressions. Concrete shall be fully cured and the surface shall be broom cleaned and free of release/curing agents prior to

commencement of work.

2. Prepared concrete surfaces for roofing or insulation by priming with asphalt/concrete primer conforming to ASTM D 41. Apply at a rate of approx. 1 gallon/100 sq. ft. (.4 L/m²). All primed areas shall be fully dried before proceeding with the application of the roof system.

3.3 INSTALLATION - GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
 1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
 2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
 3. Use weighted lawn roller to fully embed all modified membrane field sheets to the substrate.
- C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

- A. Base Ply: Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in cold adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
 1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
 4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
 6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.
- B. Cap Ply: Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in cold adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
 1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
 4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
 6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as

shown on the Drawings.

7. All side and end lap seams are to be hot air welded.
- C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
 2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
 3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
 4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
- E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.
- F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
 4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
 5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
 6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
 7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
 8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
- H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
 4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
 5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system

- work.
6. All stripping shall be installed prior to flashing cap sheet installation.
 7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
 8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
 9. All side and end lap seams are to be hot air welded.
- I. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's recommended procedures.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Surface Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
 3. Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
 6. Secure counterflashing set on butyl tape above flashing at 8 inches (203 mm) o.c. and caulk top of counterflashing.
- B. Reglet Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
 3. Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
 6. Cut reglet in masonry one joint above flashing.
 7. Secure reglet counterflashing with expansion fasteners and caulk reglet opening.
- C. Base Flashing For Non-Supported Deck:
1. Inspect the nailer to assure proper attachment and configuration. The wood cant strip should be mechanically attached to the vertical and horizontal wood nailers.
 2. Install compressible insulation in neoprene cradle between wall and vertical wood nailer.
 3. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 4. Install base flashing ply covering entire wall and wrapped to top of wood nailer with 6 inches (152 mm) on to field of the roof. Nail membrane at 8 inches (203 mm) o.c.
 5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 6. Attach counterflashing through wall flashing at a spacing of 24 inches (609 mm) o.c.
- D. Exhaust Fan:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches (50 mm).
 3. Install base flashing ply covering curb with 6 inches (152 mm) on to field of the roof.
 4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches (228 mm)

- on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.
- E. Passive Vent/Air Intake:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches (50 mm).
 3. Install base flashing ply covering curb with 6 inches (152mm) on to the field of the roof.
 4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches (228 mm) on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Install passive vent/air intake over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendations.
- F. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
 2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
 3. Run roof system plies over drain. Cut out plies inside drain bowl.
 4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
 5. Install base flashing ply (40 inch square minimum) in bitumen.
 6. Install modified membrane (48 inch square minimum) in bitumen.
 7. Install clamping ring and assure that all plies are under the clamping ring.
 8. Remove drain plug and install strainer.
- G. Plumbing Stack:
1. Minimum stack height is 12 inches (609 mm).
 2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
 3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
 4. Install base flashing ply in bitumen.
 5. Install membrane in bitumen.
 6. Caulk the intersection of the membrane with elastomeric sealant.
 7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.
- H. Heat Stack:
1. Minimum stack height is 12 inches (609 mm).
 2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
 3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
 4. Install base flashing ply in bitumen.
 5. Install modified membrane in bitumen.
 6. Caulk the intersection of the membrane with elastomeric sealant.
 7. Install new collar over cape. Weld collar or install stainless steel draw brand.
- I. Pitch Pocket Umbrella:
1. Run all plies up to the penetration.
 2. Place the pitch pocket over the penetration and prime all flanges.
 3. Strip in flange of pitch pocket with one ply of base flashing ply. Extend 6 inches (152 mm) onto field of roof.
 4. Install second layer of modified membrane extending 9 inches (228 mm) onto field of the roof.
 5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
 6. Caulk joint between roof system and pitch pocket with roof cement.
 7. Place a watershedding type bonnet over the top of the pitch pocket and clamp the top with a

drawband collar. Caulk the upper edge of the band with an elastomeric sealant.

- J. Liquid Flashing:
 1. Mask target area on roof membrane with tape.
 2. Clean all non-porous areas with isopropyl alcohol.
 3. Apply 32 wet mil base coat of liquid flashing over masked area.
 4. Embed polyester reinforcement fabric into the base coat of the liquid flashing.
 5. Apply 48-64 wet mil top coat of the liquid flashing material over the fabric extending 2 inches (51 mm) past the scrim in all directions.
 6. Apply minerals immediately or allow the liquid flashing material to cure 15-30 days and then install reflective coating.

3.6 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's daily field observations and a final inspection upon completion of the Work.
 1. Daily field observations shall be performed by a Technical Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve roofing installations for the manufacturer.
 2. Daily roofing progress reports must include; photographic documentation of work in-progress and written statements of compliance with details/shop drawings, weather conditions, and any discrepancies found during inspection.
 3. Progress reports must be published to an online database accessible to the Owner/Architect at no additional cost.
 4. Provide a final report from the Technical Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.
 5. Warranty shall be issued upon manufacturer's acceptance of the installation.

3.8 SCHEDULES

- A. Base (Ply) Sheet:
 1. 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%

- d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34.4 deg. C)
- B. Cap (Ply) Sheet (30 Year Cap): **(Base Bid)**
 - 1. 160 mil SBS and SIS (Styrene-Butadiene-Styrene and Styrene-Isoprene-Styrene) rubber modified membrane incorporating post-consumer recycled rubber, fire retardant additives and reinforced with a fiberglass and polyester composite scrim. Surfaced with the highly reflective Sunburst white mineral. ASTM D 6162, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 700 lbf/in XD 750 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 122.5 kN/m XD 131.25 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 1300 lbf XD 1400 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 5783 N XD 6227 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% XD 6.0%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 6.0% XD 6.0%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)
- C. Modified Cap (Ply) Sheet (40 Year Cap): **(Add Alternate #1)**
 - 1. 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 38 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1334 N XD 1334 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)
- D. Interply Adhesive:
 - 1. Rubberized, polymer modified cold process asphalt roofing bitumen V.O.C. compliant ASTM D 3019. Performance Requirements:
 - a. Non-Volatile Content ASTM D 4479 70%
 - b. Density ASTM D1475 8.9 lbs./gal.
 - c. Viscosity Stormer ASTM D562 400-500 grams
 - d. Flash Point ASTM D 93 100 deg. F min. (37 deg. C)
 - e. Slope: up to 3:12
- E. Base (Ply) Sheet:
 - 1. 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34.4 deg. C)
- F. Flashing Ply Adhesive:
 - 1. Brush grade flashing adhesive.
 - a. Non-Volatile Content ASTM D 4479 70 min.
 - b. Density ASTM D 1475 8.6 lbs./gal. (1kg/l)

- c. Flash Point ASTM D 93 100 deg. F (37 deg. C)

G. Flashing Cap (Ply) Sheet (30 Year Cap): (Base Bid)

- a. 160 mil SBS and SIS (Styrene-Butadiene-Styrene and Styrene-Isoprene-Styrene) rubber modified membrane incorporating post-consumer recycled rubber, fire retardant additives and reinforced with a fiberglass and polyester composite scrim. Surfaced with the highly reflective Sunburst white mineral. ASTM D 6162, Type III Grade G
 - 1) Tensile Strength, ASTM D 5147
 - a) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 700 lbf/in XD 750 lbf/in
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 122.5 kN/m XD 131.25 kN/m
 - 2) Tear Strength, ASTM D 5147
 - a) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 1300 lbf XD 1400 lbf
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 5783 N XD 6227 N
 - 3) Elongation at Maximum Tensile, ASTM D 5147
 - a) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 6.0% XD 6.0%
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 6.0% XD 6.0%
 - 4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

H. Flashing Modified Cap (Ply) Sheet (40 Year Cap): (Add Alternate #1)

- 1. 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 38 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1334 N XD 1334 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%
 - 3) Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)

I. Surfacing:

1. Surface Coatings:

a. Surfacing:

- 1) Garla-Brite: ASTM D 2824 aluminum coating non-fibered aluminum roof coating non-fibered aluminum roof coating having the following characteristics:
 - a) Flash Point 103 deg. F (39 deg. C) min.
 - b) Weight/Gallon 7.9 lbs./gal. (1.0 g/cm³)

END OF SECTION

EDGE METAL, SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this section.

1.2 SUMMARY

- A. Provide all labor, equipment, and materials to fabricate and install the following.
 - 1. Edge strip and flashing
 - 2. Fascia, scuppers, and trim
 - 3. Coping cap at parapets
 - 4. Expansion joint and area divider covers
 - 5. Fascia and edge material
 - 6. Gutters, scuppers and down spouts
- B. Related Sections:
 - 1. Division 07 Section Common Work Results for Thermal and Moisture Protection
- C. Related Work Specified Elsewhere:
 - 1. Division 06 Section - Rough Carpentry
 - 2. Division 07 Section - Modified Bituminous Membrane Roofing
 - 3. Division 07 Section - Roof Accessories

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 2. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- B. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI)
 - 1. ANSI/SPRI ES-1 Testing and Certification Listing of Shop Fabricated Edge Metal
- C. Warnock Hersey International, Inc., Middleton, WI (WH)
- D. Factory Mutual Research Corporation (FMRC)
 - 1. FM 1-49 Loss Prevention Data Sheet
- E. Underwriters Laboratories (UL)
- F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 - 1. 1993 Edition Architectural Sheet Metal Manual
- G. National Roofing Contractors Association (NRCA)
 - 1. Roofing and Waterproofing Manual
- H. American Society of Civil Engineers (ASCE)
 - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures

1.4 SUBMITTALS FOR REVIEW

- A. Product Data:
 - 1. Provide manufacturer's specification data sheets for each product.
 - 2. Metal material characteristics and installation recommendations.

3. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.
- B. Samples: Submit two (2) samples, illustrating typical metal edge, coping, gutters, fascia extenders for material and finish.
 - C. Shop Drawings
 1. For manufactured and ANSI/SPRI ES-1 compliant shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
 2. Indicate material profile, jointing details, fastening methods, flashing, terminations, and installation details.
 3. Indicate type, gauge and finish of metal
 - D. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

1.5 SUBMITTALS FOR INFORMATION

- A. Design Loads: Any material submitted as equal to the specified material must be accompanied by a report signed and sealed by a professional engineer licensed in the state in which the installation is to take place. This report shall show that the submitted equal meets the wind uplift and perimeter attachment requirements according to ASCE 7 and that the submitted equal edge metal system is compliant with the ANSI/SPRI ES-1 standard. Substitution requests submitted without licensed engineer approval will be rejected for non-conformance.
- B. Factory Mutual Research Corporation's (FMRC) wind uplift resistance classification: The roof perimeter flashing shall conform to the requirements as defined by the FMRC Loss Prevention Data Sheet 1-49.
- C. A letter from the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.
- D. Mill production reports certifying that the steel thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.
- E. Certification of work progress inspection. Refer to Quality Assurance Article below.
- F. Certifications.
 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.6 CONTRACT CLOSEOUT SUBMITTALS

- A. General: Comply with Requirements of Section 01 78 00 – Closeout Submittals
- B. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.
- C. Roofing Maintenance Instructions. Provide a manual of manufacturer's recommendations for maintenance of installed roofing systems.
- D. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.7 QUALITY ASSURANCE

- A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years experience.

- B. Maintain a full-time supervisor/foreman who is on the job-site at all times during installation. Foreman must have a minimum of five (5) years experience with the installation of similar system to that specified.
- C. Source Limitation: Obtain components from a single manufacturer. Secondary products which cannot be supplied by the specified manufacturer shall be approved in writing by the primary manufacturer prior to bidding.
- D. Upon request fabricator/installer shall submit work experience and evidence of financial responsibility. The Owner's representative reserves the right to inspect fabrication facilities in determining qualifications.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.9 PROJECT CONDITIONS

- A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.

1.10 DESIGN AND PERFORMANCE CRITERIA

- A. Thermal expansion and contraction:
 1. Completed metal edge flashing system, shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.11 WARRANTIES

- A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.
 1. Pre-finished metal material shall require a written thirty (30)- year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D2244 or chalking excess of 8 units per ASTM D659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
 2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for a warranty.
 3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.
 4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.
 5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer's recommendations.
 6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer's printed details and specifications.
 7. One manufacturer shall provide a single warranty for all accessory metal for flashings, metal edges and copings, along with the warranty for metal roof areas, membrane roof areas, and any transitions between two different material types.

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Division 01 Section “Common Product Requirements.”
- B. Basis of Design: Materials, manufacturer’s product designations, and/or manufacturer’s names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.
- C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
 - 1. Proposals shall be accompanied by a copy of the manufacturer’s standard specification section.
 - 2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner’s Representative.
 - 3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
 - 4. The Owner’s decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 ACCEPTABLE MANUFACTURERS

- A. The design is based upon roofing systems engineered and manufactured by

The Garland Company
3800 East 91st Street
Cleveland, Ohio 44105
Telephone: (800) 762-8225
Website: www.garlandco.com

2.3 MATERIALS

- A. General: Product designations for the materials used in this section shall be based on performance characteristics of the R-Mer Edge/Force/Gutter metal edge system manufactured by The Garland Company, Cleveland, OH, and shall form the basis of the contract documents.
- B. Materials: Minimum gauge thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor’s National Association, Inc. recommendations.
- C. R-Mer Force Flash-less Snap-On Fascia Extruded Base Anchor
 - 1. Aluminum Kynar, ASTM B209, alloy 3105-H14, in thickness of .040” nom. nom.
 - 2. Base Anchor and Anchor Splice Plates: 6005A-T61 extruded aluminum
 - 3. Compression Seal for top of anchor: TPE thermoplastic elastomer.
 - 4. Sealant for Flange: Green-Lock Sealant XL: Single-component high performance 100% solids, interior and exterior polyether joint sealant
- E. R-Mer Edge Drip Edge and Splice Plate
 - 1. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .040” nom.
- F. Pre-manufactured Metal Gutters & Downspouts; The Garland Co. Cleveland, OH
 - 1. .040 aluminum 6 x 6” gutters

2. Accessories; 5 x 5" downspouts, hangers, fasteners, gutter straps

G. R-Mer Coping

1. Fascia, copings and wall panels shall be .040" Kynar coated aluminum. Cant dam, coping chairs and hat channels shall be 22 ga. galvanized and continuous for the entire roof edge.
2. All submittals for approved equals shall conform to Sections 1.5 Quality Assurance and 1.8 Design & Performance Criteria.
3. Provide a manufacturer's Edge-to-Edge roof warranty. Warranted materials shall be free of defects in material and workmanship for five years after shipment. The manufacturer will also furnish their standard decorative finish warranty.
4. Fascia extenders, conductor heads, downspouts and all other accessories shall be fabricated from 0.040" aluminum with Kynar finish or approved equal.
5. Color to be selected by Owner from manufacturer's standard color range.

- B. Pitch pockets and plumbing sleeves shall be 20 oz. copper, and have all corners soldered, and a continuous 4" wide minimum deck flange at corners.

C. Miscellaneous Metals and Flashings:

1. Surface Mounted Counterflashings: Kynar finished Aluminum, 0.040 inch thick.
2. Equipment Slip Flashing: Mill finished Aluminum, 0.040 inch thick.
3. Flat Stock - Custom Fabricated Trim: Kynar finished Aluminum, 0.040 inch thick.
4. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.
5. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
6. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened. Exposed fasteners shall have a neoprene or other suitable weatherproofing washer.
7. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.
8. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
9. Sealing Tape: Pressure sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
10. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
11. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.
12. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

G. Finishes

1. Exposed surfaces for coated panels:

- a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA).

PROPERTY	TEST METHOD	FLUOROCARBON*
Pencil Hardness	ASTM D3363 NCCA II-2	HB-H
Bend	ASTM D-4145 NCCA II-19	O-T
Cross-Hatch Adhesion	ASTM D3359	no loss of adhesion
Gloss (60° angle)	ASTM D523	25+/-5%
Reverse	ASTM D2794	no cracking or loss of Impact adhesion
Nominal Thickness	ASTM D1005	
Primer		0.2 mils
Topcoat		0.7 mils min
Clear Coat (optional, only to be used with 22 gauge steel)		0.3 mils

*Subject to minimum quantity requirements

- b. Color shall be as specified

2. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, shall be as shipped from the mil

2.4 RELATED MATERIALS AND ACCESSORIES

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: Specified in Section 07900 or on drawings.
- D. Underlayment: ASTM D2178, No 15 asphalt saturated roofing felt.
- E. Self-Adhering Underlayment, one of the following:
 - 1.60 mil minimum transition strip
 - 2.45 mil high temperature underlayment with cross laminated polymer surface
- F. Slip Sheet: Rosin sized building paper.
- G. Fasteners:
 - 1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.

2. Fastening shall conform to Factory Mutual requirements or as stated on section details, whichever is more stringent.

H. Gutter and Downspout Anchorage Devices: Material as specified for system

PART 3 – EXECUTION

3. EXECUTION, GENERAL

A. Refer to Division 07 Section Common Work Results for Thermal and Moisture Protection.

4. PROTECTION

A. Isolate metal products from dissimilar metals, masonry or concrete with bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive reactions.

5. GENERAL

A. Secure fascia to wood nailers at the bottom edge with a continuous cleat.

B. Fastening of metal to walls and wood blocking shall comply with building code standards.

C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.

D. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using fasteners as required by the system. Exposed face fastening will be rejected.

6. INSPECTION

A. Verify that curbs are solidly set and nailing strips located.

B. Perform field measurements prior to fabrication.

C. Coordinate work with work of other trades.

D. Verify that substrate is dry, clean and free of foreign matter.

E. Commencement of installation shall be considered acceptance of existing conditions.

7. MANUFACTURED SHEET METAL SYSTEMS

A. Furnish and install manufactured fascia and coping cap systems in strict accordance with manufacturer's printed instructions.

B. Provide factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc. refer to Source limitation provision in Part 1.

8. SHOP-FABRICATED SHEET METAL

A. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

B. Hem exposed edges.

C. Angle bottom edges of exposed vertical surfaces to form drip.

D. Lap corners with adjoining pieces fastened and set in sealant.

E. Form joints for gravel stop fascia system, coping cap with a 3/8" opening between sections. Back the opening with an internal drainage plate formed to the profile of fascia piece.

F. Install sheet metal to comply with referenced ANSI/SPRI, SMACNA and NRCA standards.

9. FLASHING MEMBRANE INSTALLATION

A. Scupper Through Roof Edge

1. Install scupper box in a one fourth (1/4) inch bed of mastic. Assure all box seams are soldered and have minimum four (4) inch flange. Make sure all corners are closed and soldered.
2. Prime metal edge at a rate of one hundred (100) square feet per gallon and allow to dry.

B. Flash-less Snap-On Fascia Detail with Extruded Aluminum Base Anchor

1. Position base ply of the Built-Up and/or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations. Cap sheet shall stop at the edge of the roof and shall not turn over the edge of the nailer.
2. Prior to installing the base anchor, assure a level plane is present. If not, shim the roof edge surface as required.
3. Extruded base anchor: Apply two 1/4" beads of Green-Lock Sealant XL or equal on the bottom surface of the top flange of the extruded anchor.
4. Set the extruded anchor on the edge and face fasten through pre-punched slots every 18 inches o.c. for 5.75 inch face fascia, and 18 inches o.c. staggered for any fascia size greater than 5.75 inches. Begin fastening 6 inches from ends.
5. Install Green-Lock Sealant XL or equal at the ends of the base frame to prevent water from running between base anchor joints.
6. Install compression seals every 40 inches on center in the slots located at the top of the extruded anchor.
7. Install fascia cover setting the top flange over the top flange and compression seals of the base anchor. Assure compression seals are in place during this process. Beginning on one end and working towards the opposite end, press downward firmly (do not rotate) until "snap" occurs and cover is engaged along entire length of miter.
8. Install splice plate at each end of the base anchor and fascia cover prior to the installation of the next adjacent ten foot piece.

C. Drip Edge Detail

1. Position base plies of the Built-Up and/or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
2. Install continuous cleat on face of nailer and fasten six (6) inches on center.
3. Install new Drip Edge hooked to continuous cleat. Set metal flange into roofing cement, nail every three (3) inches on center, and prime at a rate of one hundred (100) square feet per gallon.
4. Drip Edge flange with base flashing membrane extending six (6) inches into roof field, followed with a cap sheet extending nine (9) inches onto roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

D. Edge Metal With Gutter

1. Position base plies of the Built-Up and/or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install manufacturer's membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
2. Install gutter and strapping fastening six (6) inches on center.
3. Install continuous cleat on face of nailer and fasten six (6) inches on center.
4. Install new edge metal hooked to continuous cleat. Set metal flange into roofing cement, nail every three (3) inches on center, and prime at a rate of one hundred (100) square feet per gallon.
5. Strip in edge metal with base flashing membrane extending six (6) inches into roof field, followed with a cap sheet extending nine (9) inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

10. CLEANING

A. Clean installed work in accordance with the manufacturer's instructions.

B. Replace damaged work than cannot be restored by normal cleaning methods.

11. CONSTRUCTION WASTE MANAGEMENT

- A. Remove and properly dispose of waste products generated. Comply with requirements of authorities having jurisdiction.

12. FINAL INSPECTION

- A. At completion of installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.
- B. Inspect work and flashing of roof penetrations, walls, curbs, and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- D. Notify the Architect & Owner upon completion of corrections.
- E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.
- F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

13. DEMONSTRATION AND TRAINING

- A. At a time and date agreed to by the Owner, instruct the Owner's facility manager, or other representative designated by the Owner, on the following procedures:
 - 1. Troubleshooting procedures
 - 2. Notification procedures for reporting leaks or other apparent roofing problems
 - 3. Maintenance
 - 4. The Owner's obligations for maintaining the warranty in effect and force
 - 5. The Manufacturer's obligations for maintaining the warranty in effect and force.

END OF SECTION 07 62 00

CITY OF WARWICK

BID AND CONTRACT FORM

TITLE OF SPECIFICATION: Bid2023-305 Thayer Arena Roof Replacement and or Repairs

I. BID:

WHEREAS, the CITY OF WARWICK has duly asked for bids for performance of services and/or supply of goods in accordance with the above-indicated specifications.

The person or entity does irrevocably offer to perform the services and/or furnish the goods in accordance with the specifications, which are hereby incorporated by reference in exchange for the bid price.

This offer will remain open and irrevocable until the CITY OF WARWICK has accepted this bid or another bid on the specifications or abandoned the project.

The bidder agrees that acceptance by the CITY OF WARWICK will transform the bid into a contract. This bid and contract will be secured by Bonds, if required by the specifications.

Pricing as follows

SECTION 00313
 BID PROPOSAL FORM

Date: _____

To: Eric Earls

Email: eric.j.earls@warwickri.com

For: City of Warwick – Thayer Arena – Roof Retrofit

From:

The undersigned hereby proposes to furnish labor and materials necessary for re-roofing in full compliance with these contract documents. The undersigned, as bidder, declares; that the parties in this contract proposal as principals are named herein; that this proposal is made without collusion with any other person, firm or corporation; that no officer or agent of the Owner is directly or indirectly interested in this proposal; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, the contract drawings, the specifications and other Contract Documents therein referred to; and he proposes and agrees that if the proposal is accepted, he will contract with the Owner in the form of the Contract attached hereby to construct completely, in the manner and time prescribed, the items bid upon, including all work incidental to such items as well as those in all addenda issued prior to the date of opening of proposals, according to the contract drawings and specifications, and that he will accept in full payment therefore the following sum:

Proposed System, manufacturer and description:

Mod-Bit
The Garland Co., Cleveland, OH

Note: Bids shall be both written in words and shown in figures.

A – BASE BID: THAYER ARENA – 30- YEAR WARRANTY

\$ _____
 Words _____ Figures _____

B – ADD ALTERNATE #1: THAYER ARENA– 40 YEAR WARRANTY

\$ _____
 Words _____ Figures _____

Unit price: Removal and replacement of wet insulation and tie-in assembly\$ _____ per sq ft.

Unit price: Removal and replacement of rotted wood blocking\$ _____ per sq ft.

 Contractor Owner / Officer

Title _____

 Address

City, State Zip _____

(AFFIX CORPORATE SEAL)

The bidder hereby acknowledges receipt of the following addenda:

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

*** END OF SECTION 00313 - BID FORM ***



THE GARLAND COMPANY, INC.

HIGH-PERFORMANCE BUILDING ENVELOPE SOLUTIONS

3800 EAST 91ST. STREET • CLEVELAND, OHIO 44105-2197
 p. (216) 641-7500 • f. (216) 641-0633 • 800-321-9336 • www.garlandco.com

Preliminary Pressure Calculations

Date 10/7/2022

Sales Rep Bryan Stetson

City Warwick

State RI

Project Name Warwick - Thayer Arena

Roof Sections Roof B

Design Code	ASCE 7-16	ASD
Exposure Category	C	
Risk Cat. , Importance Factor	IV , 1	
Wind Speed	139	mph
Design Roof Height:	20	
Minimum Building Width	215	ft
Roof Pitch (X, Y)	0.13	12
Roof Angle	0.62	deg
Parapet ≥ 36" Entire Roof	No	

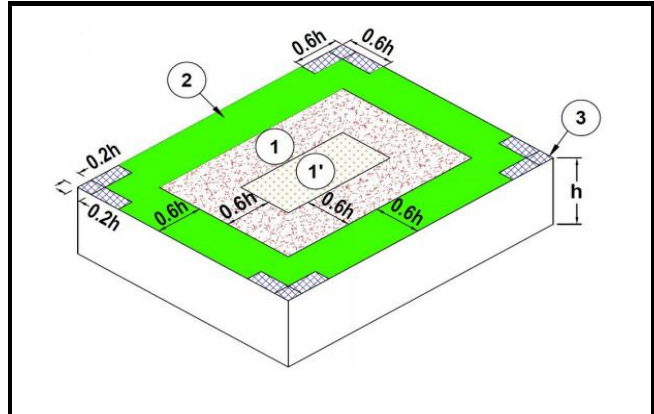
Base Velocity Pressure	22.8	psf	Gcpi = 0.55
Roof Type	Gable		
Edge Zones	Zone 2 width = 12'-0" Zone 3 width = 4'-0" Zone 3 length = 12'-0" = = =		

Deck Type Tectum

Notes:



Zone Image



Zone Pressures (psf)

ZONE 1'	ZONE 1	ZONE 2	ZONE 3			Zone 4	Zone 5
33.0	51.2	64.8	85.3			33.8	39.9

FM 1-75 FM 1-105 FM 1-135 FM 1-180

Notes:





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Coping

Date: 10/7/2022
Sales Rep: Bryan Stetson
City: Warwick
State: RI

Project Name: Warwick - Thayer Arena

Roof Sections: Roof B

ANSI/SPRI ES-1 COPING PRELIMINARY DESIGN

Project Data

Design Wind Speed: 139 mph
Metal Edge Height: 20.00 feet
Exposure Category: C
Importance Classification: IV

Design Wind Pressure ASCE 7-16 ASD

Basic Velocity Pressure: 22.75 psf
Horizontal Design Pressure: 39.93 psf
Vert. Design Pressure: 85.31 psf

ES-1 Tested Coping System

Product Designation: ES-C050-16-60-16

System Description: R-Mer Edge Snap on Coping 16" x 0.050" Alum w/ 16 GA Anchor Chairs at 60" o.c.

Maximum Tested Front Load: 86 psf
Max. Vertical Front Dim.: 6 inches
Maximum Tested Top Load: 220 psf
Max. Vertical Width: 16.00 inches
Maximum Tested Rear Load: 129.1 psf
Max. Vertical Rear Dim.: 4.00 inches



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Fascia

Date	10/7/2022
Sales Rep	Bryan Stetson
City	Warwick
State	RI

Project Name Warwick - Thayer Arena

Roof Sections Roof B

ANSI/SPRI ES-1 FASCIA PRELIMINARY DESIGN

Project Data

Design Wind Speed:	139	mph
Metal Edge Height:	20.00	feet
Exposure Category:	C	
Importance Classification:	IV	

Design Wind Pressure ASCE 7-16 ASD

Basic Velocity Pressure:	22.75	psf
Horizontal Design Pressure:	39.93	psf

ES-1 Fascia Load

Vertical Face Dimension:	7.25	inches
Fascia Design Load:	66.68	psf

ES-1 Tested Fascia System

Product Designation: MEA-RMF-Fascia725-A40

System Description: R-Mer Force Fascia 7.25" x 0.040" Aluminum w/ RMEBF-700 Base Frame

Maximum Tested Load:	470	psf
Max. Vertical Face Dim.:	7.25	inches



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Preliminary Pressure Calculations

Date 10/7/2022

Sales Rep Bryan Stetson

City Warwick

State RI

Project Name Warwick - Thayer Arena

Roof Sections Roof D

Design Code	ASCE 7-16 ASD
Exposure Category	C
Risk Cat. , Importance Factor	IV , 1
Wind Speed	139 mph
Design Roof Height:	15
Minimum Building Width	215 ft
Roof Pitch (X, Y)	0.13 : 12
Roof Angle	0.62 deg
Parapet ≥ 36" Entire Roof	No

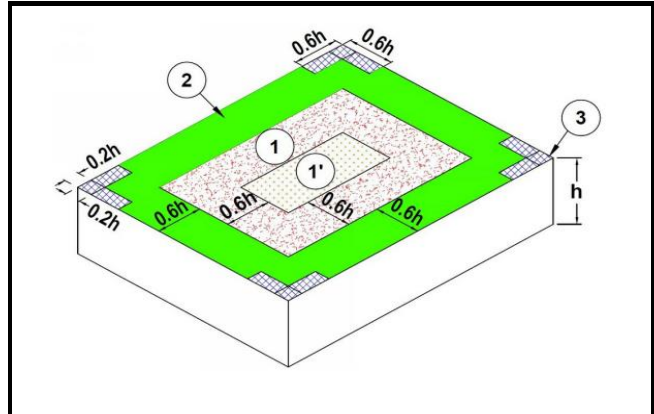
Base Velocity Pressure	21.4 psf	Gcpi = 0.55
Roof Type	Gable	
Edge Zones		
Zone 2 width =	9'-0"	
Zone 3 width =	3'-0"	
Zone 3 length =	9'-0"	
	=	
	=	
	=	

Deck Type Steel

Notes:



Zone Image

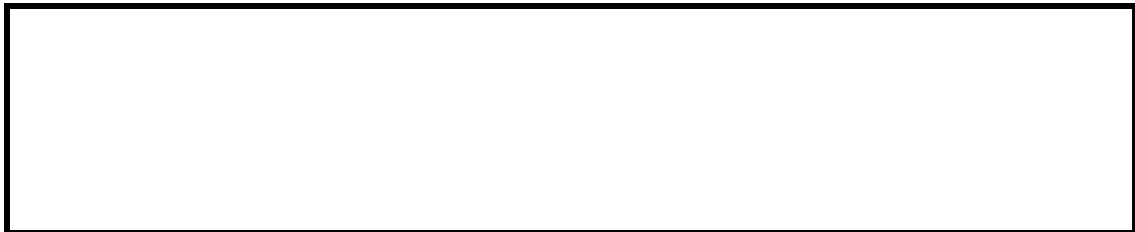


Zone Pressures (psf)

ZONE 1'	ZONE 1	ZONE 2	ZONE 3			Zone 4	Zone 5
31.0	48.2	61.0	80.3			31.8	37.6

FM 1-75 FM 1-105 FM 1-135 FM 1-165

Notes:





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Coping

Date	10/7/2022
Sales Rep	Bryan Stetson
City	Warwick
State	RI

Project Name	Warwick - Thayer Arena
Roof Sections	Roof D

ANSI/SPRI ES-1 COPING PRELIMINARY DESIGN

Project Data

Design Wind Speed:	139	mph
Metal Edge Height:	15.00	feet
Exposure Category:	C	
Importance Classification:	IV	

Design Wind Pressure ASCE 7-16 ASD

Basic Velocity Pressure:	21.41	psf
Horizontal Design Pressure:	37.58	psf
Vert. Design Pressure:	80.30	psf

ES-1 Tested Coping System

Product Designation: ES-C050-16-60-16

System Description: R-Mer Edge Snap on Coping 16" x 0.050" Alum w/ 16 GA Anchor Chairs at 60" o.c.

Maximum Tested Front Load:	86	psf
Max. Vertical Front Dim.:	6	inches
Maximum Tested Top Load:	220	psf
Max. Vertical Width:	16.00	inches
Maximum Tested Rear Load:	129.1	psf
Max. Vertical Rear Dim.:	4.00	inches



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Fascia

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Date	10/7/2022
Sales Rep	Bryan Stetson
City	Warwick
State	RI

Project Name Warwick - Thayer Arena

Roof Sections Roof D

ANSI/SPRI ES-1 FASCIA PRELIMINARY DESIGN

Project Data

Design Wind Speed:	139	mph
Metal Edge Height:	15.00	feet
Exposure Category:	C	
Importance Classification:	IV	

Design Wind Pressure ASCE 7-16 ASD

Basic Velocity Pressure:	21.41	psf
Horizontal Design Pressure:	37.58	psf

ES-1 Fascia Load

Vertical Face Dimension:	7.25	inches
Fascia Design Load:	62.76	psf

ES-1 Tested Fascia System

Product Designation: MEA-RMF-Fascia725-A40

System Description: R-Mer Force Fascia 7.25" x 0.040" Aluminum w/ RMEBF-700 Base Frame

Maximum Tested Load:	470	psf
Max. Vertical Face Dim.:	7.25	inches



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Preliminary Pressure Calculations

Date 10/7/2022

Sales Rep Bryan Stetson

City Warwick

State RI

Project Name Warwick - Thayer Arena

Roof Sections Roof E

Design Code	ASCE 7-16	ASD
Exposure Category	C	
Risk Cat. , Importance Factor	IV , 1	
Wind Speed	139	mph
Design Roof Height:	20	
Minimum Building Width	215	ft
Roof Pitch (X, Y)	0.13 : 12	
Roof Angle	0.62	deg
Parapet ≥ 36" Entire Roof	No	

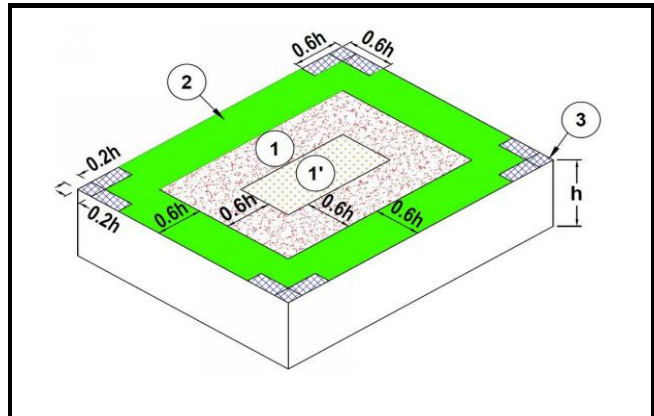
Base Velocity Pressure	22.8	psf	Gcpi = 0.55
Roof Type	Gable		
Edge Zones			
Zone 2 width =	12'-0"		
Zone 3 width =	4'-0"		
Zone 3 length =	12'-0"		

Deck Type Tectum

Notes:



Zone Image

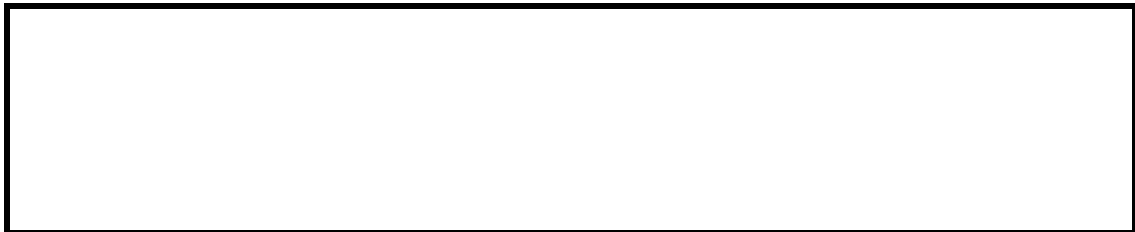


Zone Pressures (psf)

ZONE 1'	ZONE 1	ZONE 2	ZONE 3			Zone 4	Zone 5
33.0	51.2	64.8	85.3			33.8	39.9

FM 1-75 FM 1-105 FM 1-135 FM 1-180

Notes:





THE GARLAND COMPANY, INC.
HIGH-PERFORMANCE BUILDING ENVELOPE SOLUTIONS

3800 EAST 91ST. STREET • CLEVELAND, OHIO 44105-2197
p. (216) 641-7500 • f. (216) 641-0633 • 800-321-9336 • www.garlandco.com

Coping

Date: 10/7/2022
Sales Rep: Bryan Stetson
City: Warwick
State: RI

Project Name: Warwick - Thayer Arena

Roof Sections: Roof E

ANSI/SPRI ES-1 COPING PRELIMINARY DESIGN

Project Data

Design Wind Speed: 139 mph
Metal Edge Height: 20.00 feet
Exposure Category: C
Importance Classification: IV

Design Wind Pressure ASCE 7-16 ASD

Basic Velocity Pressure: 22.75 psf
Horizontal Design Pressure: 39.93 psf
Vert. Design Pressure: 85.31 psf

ES-1 Tested Coping System

Product Designation: ES-C050-16-60-16

System Description: R-Mer Edge Snap on Coping 16" x 0.050" Alum w/ 16 GA Anchor Chairs at 60" o.c.

Maximum Tested Front Load: 86 psf
Max. Vertical Front Dim.: 6 inches
Maximum Tested Top Load: 220 psf
Max. Vertical Width: 16.00 inches
Maximum Tested Rear Load: 129.1 psf
Max. Vertical Rear Dim.: 4.00 inches



THE GARLAND COMPANY, INC.
HIGH-PERFORMANCE BUILDING ENVELOPE SOLUTIONS

Fascia

3800 EAST 91ST. STREET • CLEVELAND, OHIO 44105-2197
p. (216) 641-7500 • f. (216) 641-0633 • 800-321-9336 • www.garlandco.com

Date	10/7/2022
Sales Rep	Bryan Stetson
City	Warwick
State	RI

Project Name Warwick - Thayer Arena

Roof Sections Roof E

ANSI/SPRI ES-1 FASCIA PRELIMINARY DESIGN

Project Data

Design Wind Speed:	139	mph
Metal Edge Height:	20.00	feet
Exposure Category:	C	
Importance Classification:	IV	

Design Wind Pressure ASCE 7-16 ASD

Basic Velocity Pressure:	22.75	psf
Horizontal Design Pressure:	39.93	psf

ES-1 Fascia Load

Vertical Face Dimension:	7.25	inches
Fascia Design Load:	66.68	psf

ES-1 Tested Fascia System

Product Designation: MEA-RMF-Fascia725-A40

System Description: R-Mer Force Fascia 7.25" x 0.040" Aluminum w/ RMEBF-700 Base Frame

Maximum Tested Load:	470	psf
Max. Vertical Face Dim.:	7.25	inches



Infrared Moisture Survey

Thayer Arena

975 Sandy Lane

Warwick, RI 02889

September 15, 2022

Thayer Arena
975 Sandy Lane
Warwick, RI 02889

Re: Infrared Moisture Survey

Dear Sir/Madam:

Thank you for your consideration in selecting Aerial Insight, LLC to provide an infrared moisture survey of the facility located at the above address. The survey was performed on September 15, 2022, by Brendan Wall. Observations were documented with representative photographs, which are included in this report.

We trust that this report will assist you and your staff in your evaluation of this property. If you should have any questions regarding our report or would like to discuss our findings in further detail, please do not hesitate to contact us directly.

Respectfully submitted,

Brendan Wall, Principal
Aerial Insight, LLC

Executive Summary

Roof A

The existing **2,077 square foot** low slope roof on this facility consists of an EPDM membrane installed over polyisocyanurate insulation, fastened to a steel deck. The roof is approximately 20 years old. Roof drainage is facilitated by internal drains.

An infrared moisture survey was performed on September 15, 2022, and the result of the survey was positive - approximately **24 square feet (1%)** of the roof was wet, and the remaining roof area was dry. Please reference the roof plans for additional information.

The overall condition of this roof area is considered **fair**. The condition is based on the age and the condition of the membrane, wet insulation, open conditions, and other deficiencies.

Roof B

The existing **22,575 square foot** low slope roof on this facility consists of a gravel-surfaced built-up roof, over polyisocyanurate insulation on a tectum deck. The roof is approximately 20 years old. Roof drainage is facilitated by gutters.

An infrared moisture survey was performed on September 15, 2022, and the result of the survey was positive - approximately **978 square feet (4%)** of the roof was wet, and the remaining roof area was dry. Please reference the roof plans for additional information.

The overall condition of this roof area is considered **fair**. The condition is based on the age and the condition of the membrane, wet insulation, open conditions, and other deficiencies.

Roof C

The existing **225 square foot** low slope roof on this facility consists of an asphalt membrane on a wood deck. The roof is approximately 20 years old.

An infrared moisture survey was performed on September 15, 2022, and the result of the survey was negative – none of the roof was wet. Please reference the roof plans for additional information.

The overall condition of this roof area is considered **fair**. The condition is based on the age and the condition of the membrane, wet insulation, open conditions, and other deficiencies.

Roof D

The existing **3,850 square foot** low slope roof on this facility consists of a gravel-surfaced built-up roof, over polyisocyanurate insulation on a steel deck. The roof is approximately 20 years old. Roof drainage is facilitated by internal drains.

An infrared moisture survey was performed on September 15, 2022, and the result of the survey was negative – none of the roof was wet. Please reference the roof plans for additional information.

The overall condition of this roof area is considered **fair**. The condition is based on the age and the condition of the membrane, wet insulation, open conditions, and other deficiencies.

Roof E

The existing **36,340 square foot** low slope roof on this facility consists of a gravel-surfaced built-up roof, over polyisocyanurate insulation on a tectum deck. The roof is approximately 20 years old. Roof drainage is facilitated by gutters.

An infrared moisture survey was performed on September 15, 2022, and the result of the survey was positive - approximately **760 square feet (2%)** of the roof was wet, and the remaining roof area was dry. Please reference the roof plans for additional information.

The overall condition of this roof area is considered **fair**. The condition is based on the age and the condition of the membrane, wet insulation, open conditions, and other deficiencies.

Brendan Wall

Aerial Insight, LLC

9/20/2022 | 15 Photos



Photo Report



Overview



Ponding conditions along the perimeter



Ponding



Ponding conditions



Clogged gutters - typical



Damaged roof top equipment



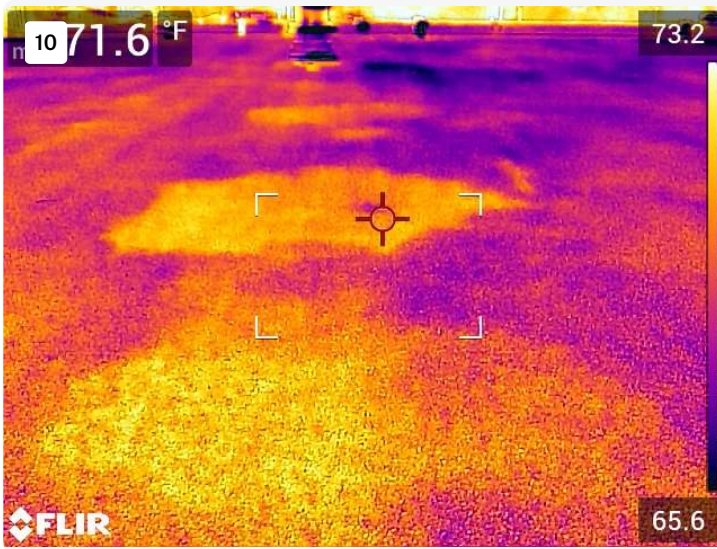
Damaged roof top equipment



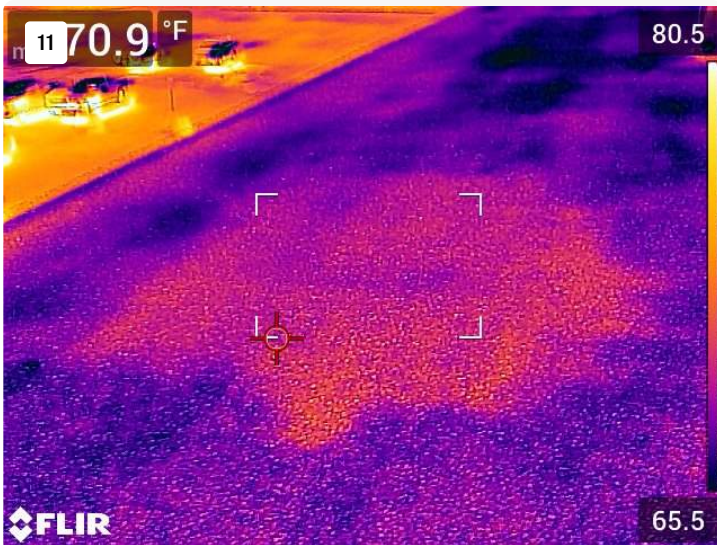
Damaged roof top equipment



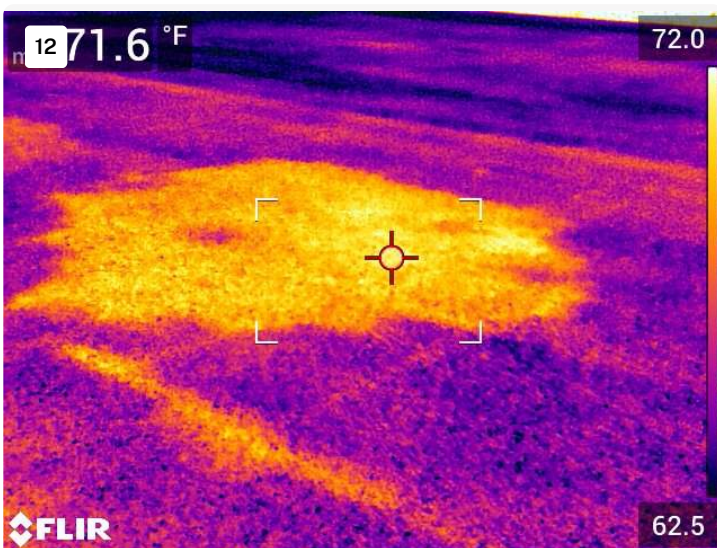
Wet insulation @ Test Cut #6



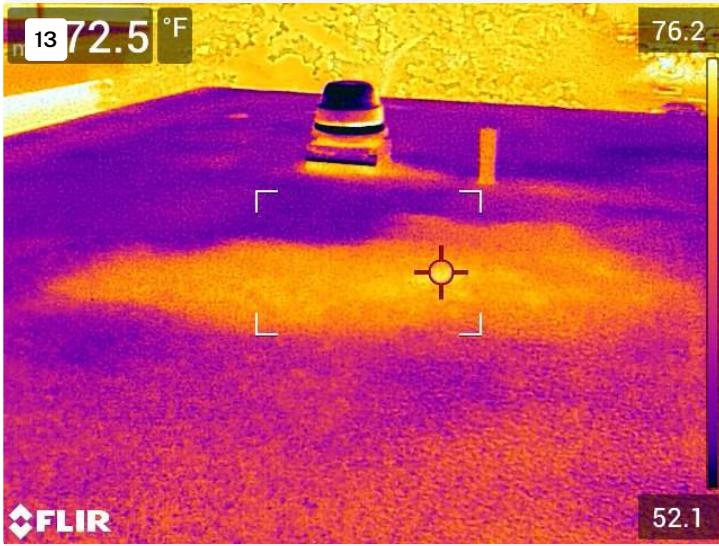
Thermogram identifying anomaly (wet insulation) in the roof assembly.



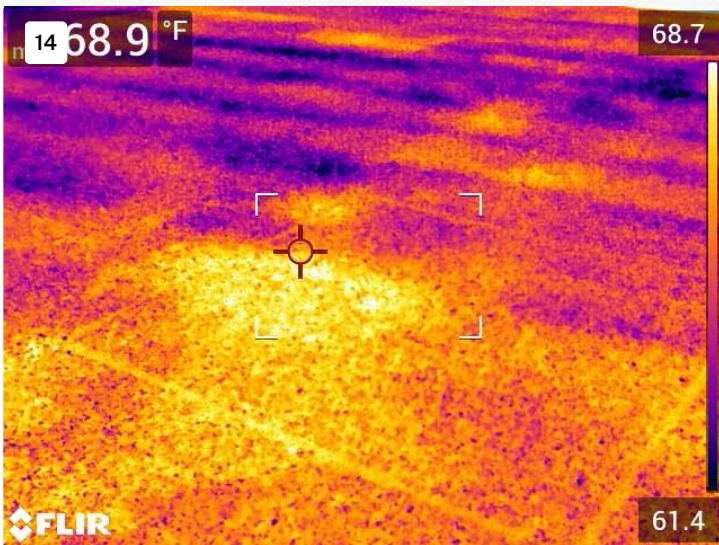
Thermogram identifying anomaly (wet insulation) in the roof assembly.



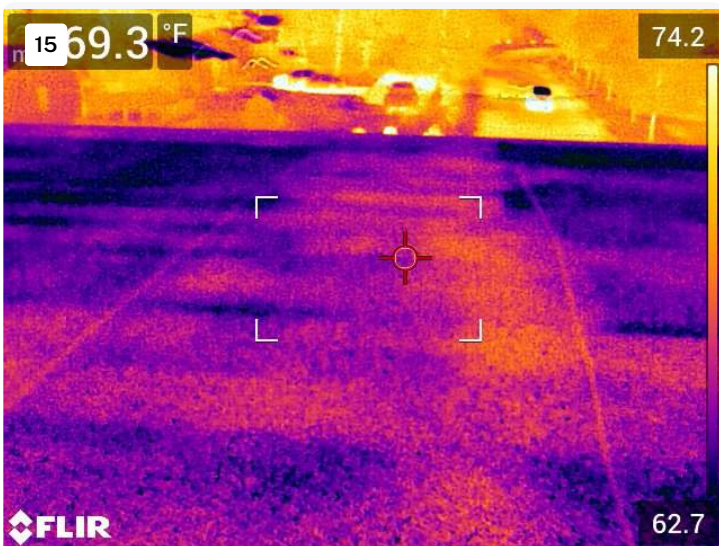
Thermogram identifying anomaly (wet insulation) in the roof assembly.



Thermogram identifying anomaly (wet insulation) in the roof assembly.



Thermogram identifying anomaly (wet insulation) in the roof assembly.



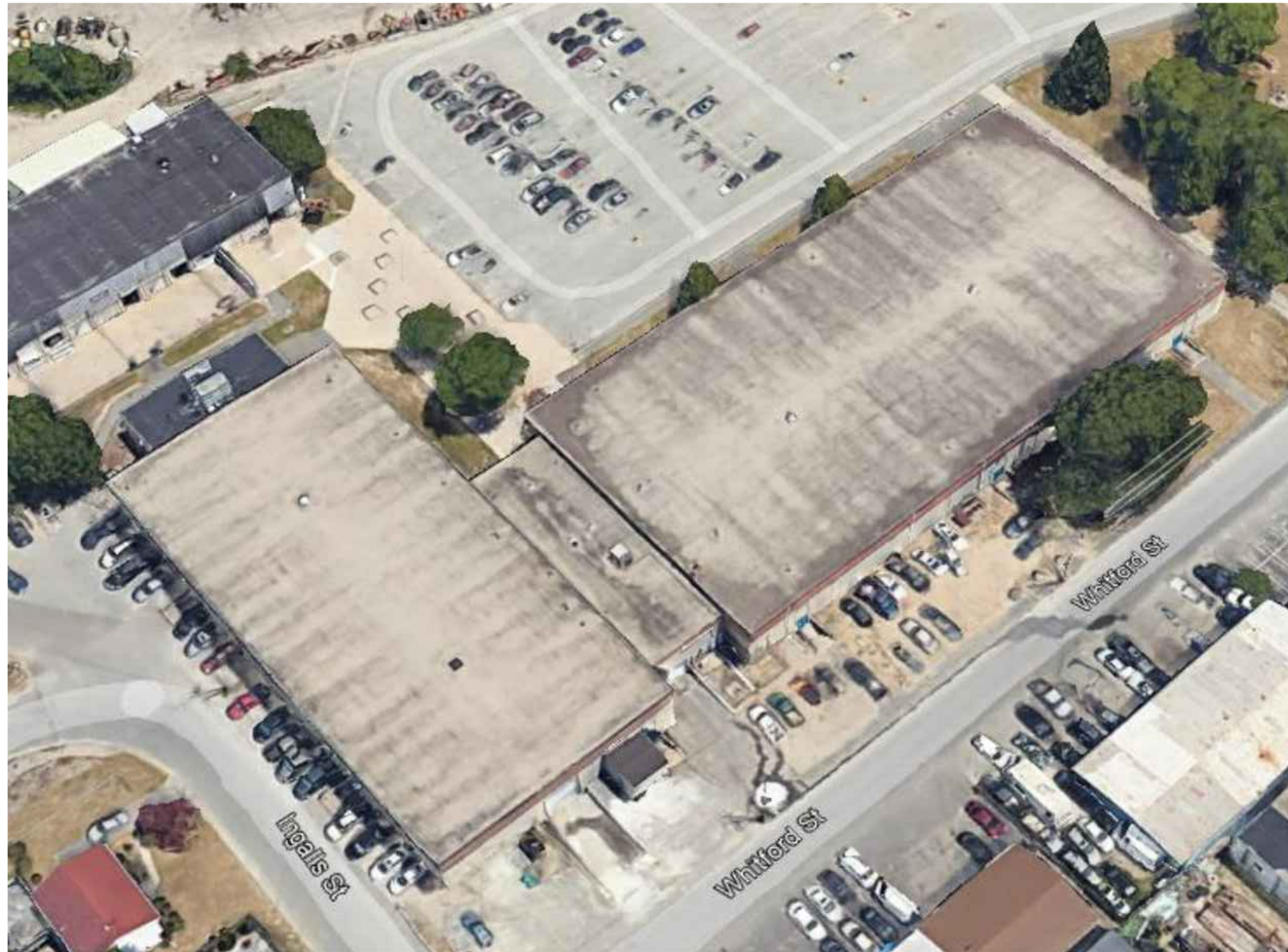
Thermogram identifying anomaly (wet insulation) in the roof assembly.

THAYER ARENA

ICE RINK

975 Sandy Lane, Warwick, RI 02889

PROJECT AERIAL VIEW



DRAWING INDEX

A-001 COVERSHEET
A-101 ROOF PLAN



THAYER ARENA

ICE RINK

975 Sandy Lane
Warwick, RI 02889

SCALE: AS NOTED

DATE: 09/18/2022

PROJ. #:

DRAWN BY:

COVERSHEET

A-001

EXISTING ROOF CORE SAMPLES:

TEST CUT #1:

- TECTUM DECK
- 4 PLY VAPOR BARRIER HOT MOPPED
- 3.3" ISO (DRY)
- 4 PLY BUR HOT MOPPED
- GRAVEL SURFACE BUILT-UP ROOF

TEST CUT #2:

- TECTUM DECK
- 4 PLY VAPOR BARRIER HOT MOPPED
- 3.3" ISO (DRY)
- 4 PLY BUR HOT MOPPED
- GRAVEL SURFACE BUILT-UPROOF

TEST CUT #3:

- STEEL DECK
- 1/2" GYP BOARD HOT MOPPED
- 2 PLY VAPOR BARRIER HOT MOPPED
- 3.3" ISO (DRY)
- 4 PLY BUR HOT MOPPED
- GRAVEL SURFACE BUILT-UPROOF

TEST CUT #4:

- TECTUM DECK
- 3 PLY VAPOR BARRIER HOT MOPPED
- 1" ISO (DRY)
- 4 PLY BUR HOT MOPPED
- GRAVEL SURFACE BUILT-UPROOF

TEST CUT #5:

- TECTUM DECK
- 3 PLY VAPOR BARRIER HOT MOPPED
- 7" ISO (DRY)
- 4 PLY BUR HOT MOPPED
- GRAVEL SURFACE BUILT-UPROOF

TEST CUT #6:

- TECTUM DECK
- 4 PLY VAPOR BARRIER HOT MOPPED
- 3.3" ISO (WET)
- 4 PLY BUR HOT MOPPED
- GRAVEL SURFACE BUILT-UP ROOF









MOISTURE SURVEY RESULTS

ROOF SECTION	APPROX. SIZE (SF)	NUMBER OF WET AREAS	APPROX. WET AREAS (SF)	PERCENTAGE WET
ROOF 'A'	2,077	1	24	1%
ROOF 'B'	22,575	5	978	4%
ROOF 'C'	225	-	-	-
ROOF 'D'	3,850	-	-	-
ROOF 'E'	36,340	5	760	2%
TOTAL	65,067	11	1,762	3%

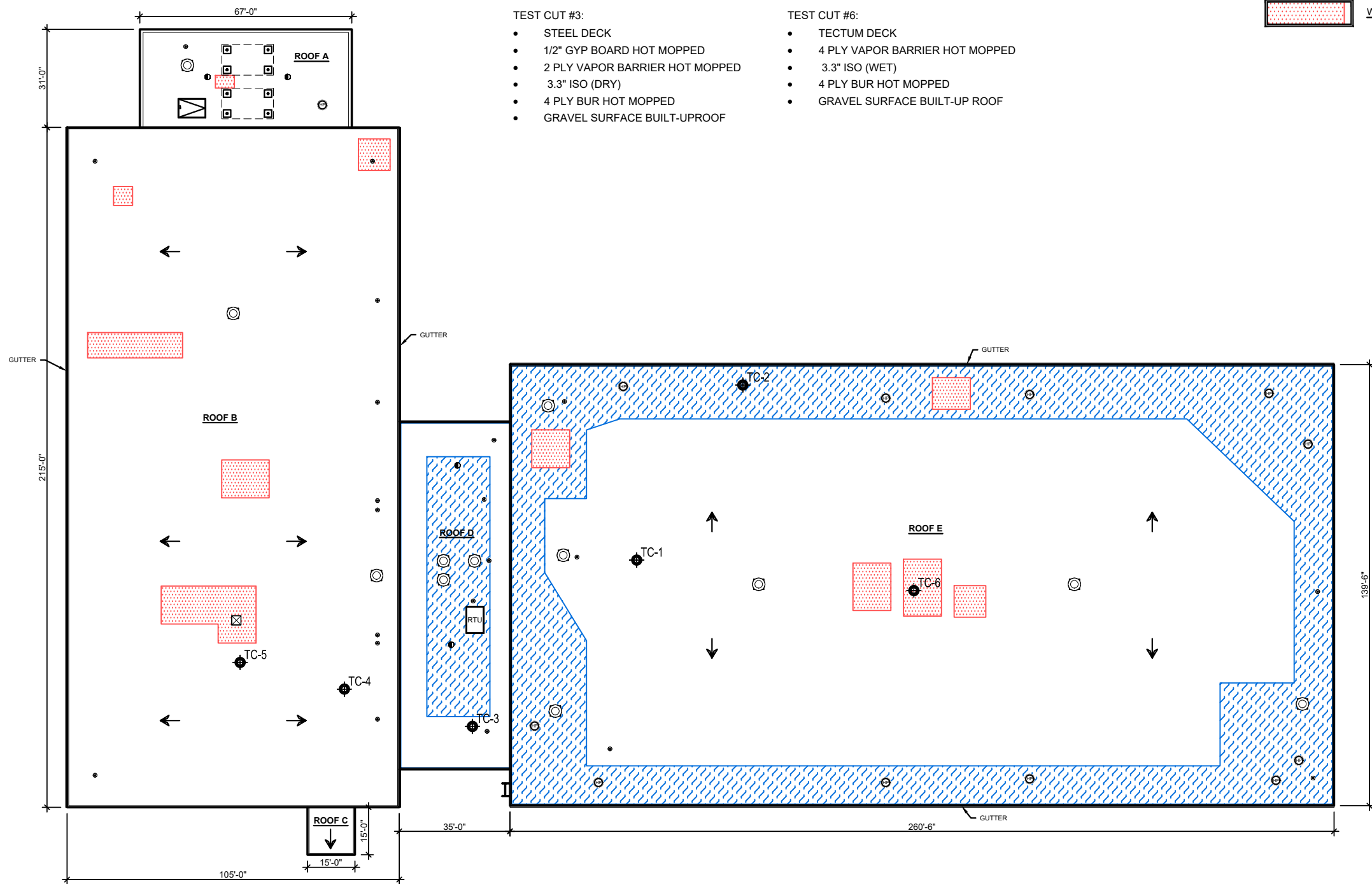
LEGEND

 **WET INSULATION**
 **PONDING LOCATIONS**

SYMBOL LEGEND

-  CAPPED CURB
-  STANDARD CURB
-  ROOF TOP UNIT
-  PLUMBING VENT
-  PITCH POCKET
-  EXHAUST UNIT
-  ROOF DRAIN
-  SCUPPER

NOTE: PENETRATIONS ARE APPROXIMATE IN SIZE AND LOCATION TO BE USED AS REFERENCE POINTS ONLY



THAYER ARENA
ICE RINK
975 Sandy Lane
Warwick, RI 02889

SCALE: AS NOTED
DATE: 08/26/2022
PROJ. #:
DRAWN BY:

ROOF PLAN

THAYER ARENA

ICE RINK

975 Sandy Lane, Warwick, RI 02889

PROJECT AERIAL VIEW



DRAWING INDEX

A-001	COVERSHEET
A-101	ROOF PLAN
A-501	ROOF DETAILS
A-502	ROOF DETAILS

THAYER ARENA

ICE RINK

975 Sandy Lane
Warwick, RI 02889

SCALE: AS NOTED

DATE: 10/10/2022

PROJ. #:

DRAWN BY:

COVERSHEET

A-001

GENERAL NOTES:

- 1.) IT IS THE ROOFING CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH ALL DETAILS INVOLVED IN THE ROOFING CONTRACT.
- 2.) ALL DRAWINGS ARE GRAPHIC REPRESENTATION OF APPROXIMATE LOCATIONS OF EXISTING AND NEW MATERIALS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK.
- 3.) THE ROOFING CONTRACTOR TO PROTECT ALL ADJACENT SURFACES NOT SCHEDULED FOR WORK AND TO REPAIR ANY DAMAGED AREAS AS A RESULT OF CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER.
- 4.) THE ROOFING CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN WATER TIGHTNESS AND PROVIDE PROTECTION AT ANY/ALL OPENINGS IN THE ROOF LEFT AT THE END OF EACH CONSTRUCTION DAY.
- 5.) CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, CONDITIONS AND QUANTITIES.
- 6.) SEE SPECIFICATIONS FOR SCOPE OF WORK.

EXISTING ROOF CORE SAMPLES:

- | | |
|--|--|
| <p>TEST CUT #1:</p> <ul style="list-style-type: none"> • TECTUM DECK • 4 PLY VAPOR BARRIER HOT MOPPED • 3.3" ISO (DRY) • 4 PLY BUR HOT MOPPED • GRAVEL SURFACE BUILT-UP ROOF <p>TEST CUT #2:</p> <ul style="list-style-type: none"> • TECTUM DECK • 4 PLY VAPOR BARRIER HOT MOPPED • 3.3" ISO (DRY) • 4 PLY BUR HOT MOPPED • GRAVEL SURFACE BUILT-UPROOF <p>TEST CUT #3:</p> <ul style="list-style-type: none"> • STEEL DECK • 1/2" GYP BOARD HOT MOPPED • 2 PLY VAPOR BARRIER HOT MOPPED • 3.3" ISO (DRY) • 4 PLY BUR HOT MOPPED • GRAVEL SURFACE BUILT-UPROOF | <p>TEST CUT #4:</p> <ul style="list-style-type: none"> • TECTUM DECK • 3 PLY VAPOR BARRIER HOT MOPPED • 1" ISO (DRY) • 4 PLY BUR HOT MOPPED • GRAVEL SURFACE BUILT-UPROOF <p>TEST CUT #5:</p> <ul style="list-style-type: none"> • TECTUM DECK • 3 PLY VAPOR BARRIER HOT MOPPED • 7" ISO (DRY) • 4 PLY BUR HOT MOPPED • GRAVEL SURFACE BUILT-UPROOF <p>TEST CUT #6:</p> <ul style="list-style-type: none"> • TECTUM DECK • 4 PLY VAPOR BARRIER HOT MOPPED • 3.3" ISO (WET) • 4 PLY BUR HOT MOPPED • GRAVEL SURFACE BUILT-UP ROOF |
|--|--|

MOISTURE SURVEY RESULTS

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TOTAL	65,067	11	1,762	3%

LEGEND

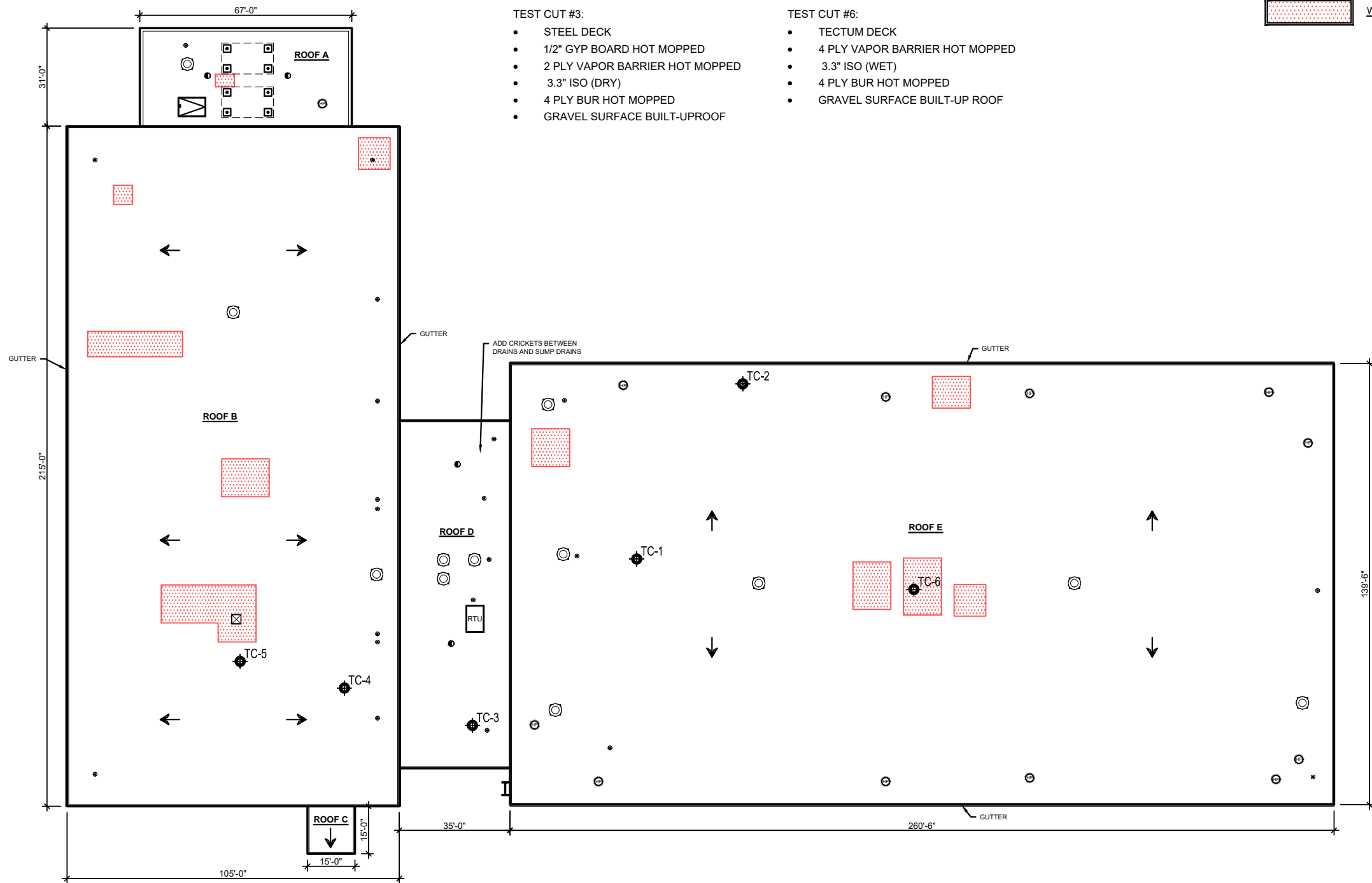


WET INSULATION

SYMBOL LEGEND

- CAPPED CURB
- STANDARD CURB
- ROOF TOP UNIT
- PLUMBING VENT
- PITCH POCKET
- EXHAUST UNIT
- ROOF DRAIN
- SCUPPER

NOTE: PENETRATIONS ARE APPROXIMATE IN SIZE AND LOCATION TO BE USED AS REFERENCE POINTS ONLY



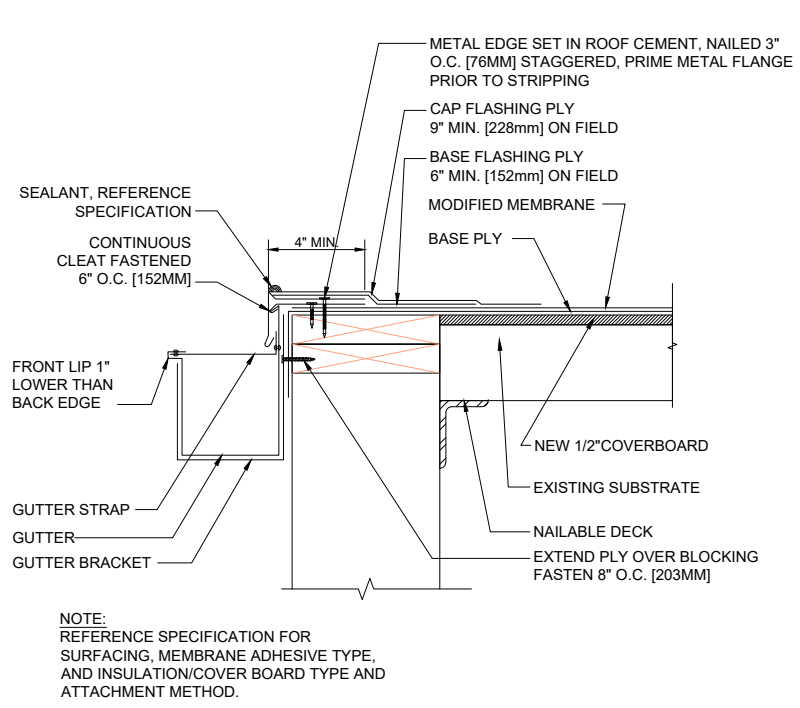
1 ROOF PLAN
A-101 SCALE: N.T.S.

THAYER ARENA
ICE RINK
975 Sandy Lane
Warwick, RI 02889

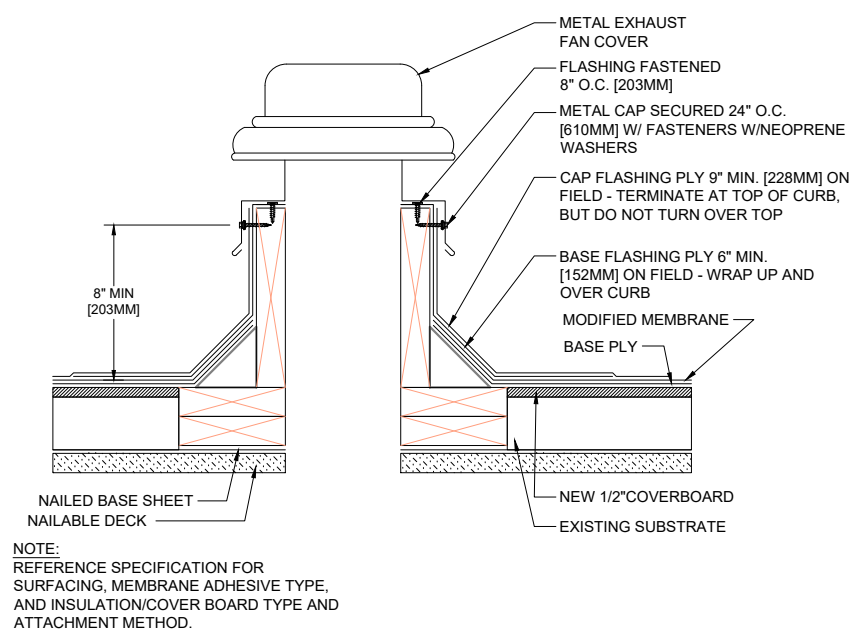
SCALE: AS NOTED
DATE: 10/10/2022
PROJ. #:
DRAWN BY:

ROOF PLAN

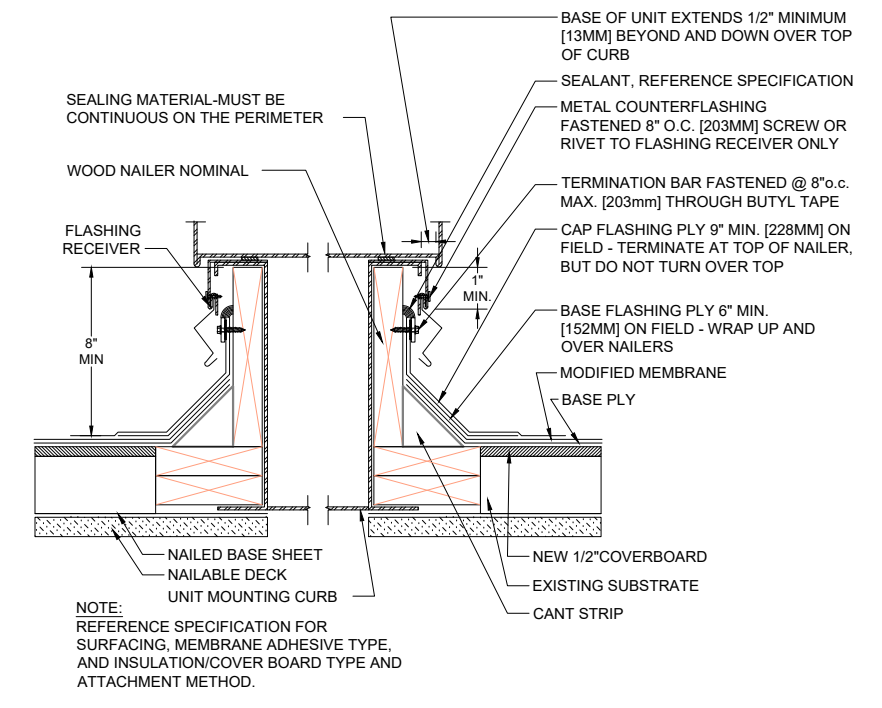
A-101



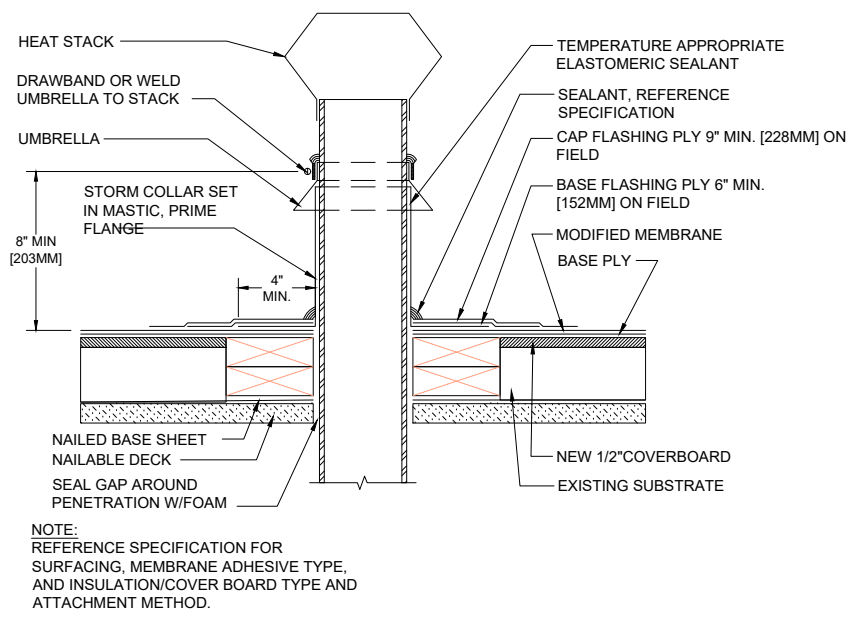
1 METAL EDGE WITH GUTTER DETAIL
A-501 SCALE: N.T.S.



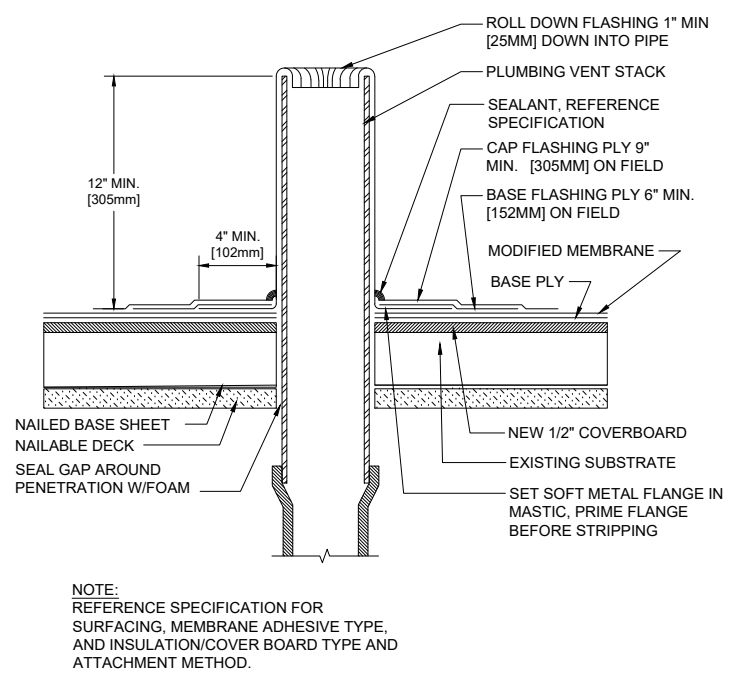
2 EXHAUST FAN DETAIL
A-501 SCALE: N.T.S.



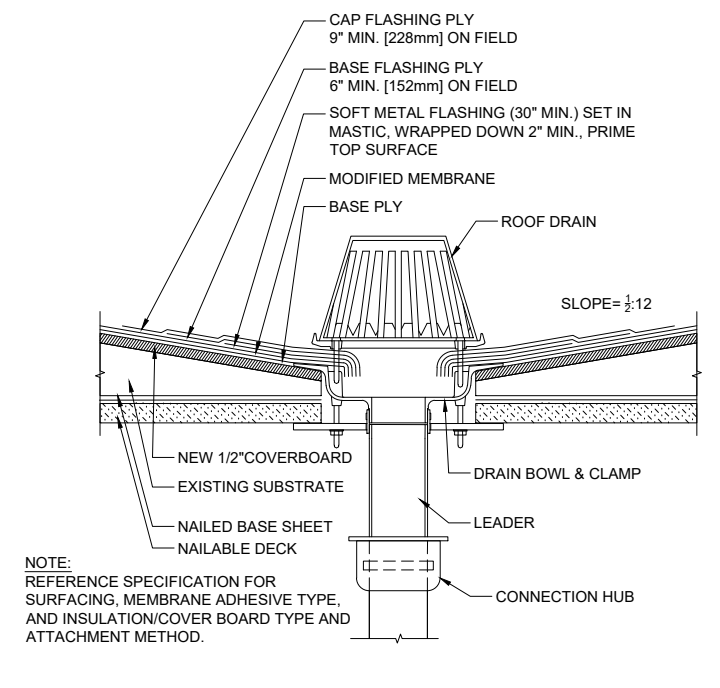
3 CURB AT AIR HANDLING UNIT DETAIL
A-501 SCALE: N.T.S.



4 HEAT STACK DETAIL
A-501 SCALE: N.T.S.



5 PLUMBING STACK DETAIL
A-501 SCALE: N.T.S.

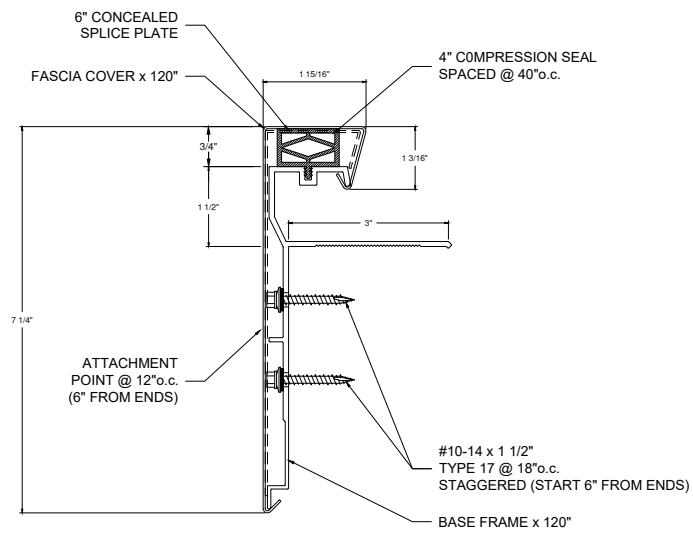


6 ROOF DRAIN DETAIL
A-501 SCALE: N.T.S.

THAYER ARENA
ICE RINK
975 Sandy Lane
Warwick, RI 02889

SCALE: AS NOTED
DATE: 10/10/2022
PROJ. #:
DRAWN BY:

ROOF DETAILS



1 METAL EDGE WITH GUTTER DETAIL
 A-502 SCALE: N.T.S.

**THAYER
 ARENA**

ICE RINK

975 Sandy Lane
 Warwick, RI 02889

SCALE: AS NOTED

DATE: 10/10/2022

PROJ. #:

DRAWN BY:

ROOF DETAILS

A-502