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November 17, 2021

ADDENDUM NO. 05
TO
SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
INVITATION TO BID
TMT WAREHOUSE #1 RE-ROOF
JPA CONTRACT NO. C-1631A

The item(s) of this Addendum shall modify and become a part of the contractual documents for this project as of this date.
(Failure to acknowledge this addendum will be grounds for rejection of proposal.)

PHYSICAL CHANGES TO CONTRACT SPECIFICATIONS

Item No. 1
Reference to Base Bid Technical Specifications SECTION 075500 – MODIFIED BITUMINOUS MEMBRANE ROOFING, pages 075500-01 thru 075500-17, **DELETE** in its entirety and **REPLACE** with "**REVISED"** Base Bid Technical Specifications SECTION 075500 – MODIFIED BITUMINOUS MEMBRANE ROOFING, pages 075500-01 thru 075500-17. **(See Attachment No. 1)**

Item No. 2
Reference to Base Bid Technical Specifications SECTION 075500A – MODIFIED BITUMINOUS MEMBRANE ROOFING 40 YEAR ALTERNATE, pages 075500A-1 thru 075500A-14, **DELETE** in its entirety and **REPLACE** with "**REVISED"** Base Bid Technical Specifications SECTION 075500 – MODIFIED BITUMINOUS MEMBRANE ROOFING 40 YEAR ALTERNATE, pages 075500A-1 thru 075500A-14. **(See Attachment No. 2)**

Item No. 3
Reference to BID FORM, pages BF-1 to BF-2, **DELETE** in its entirety and **REPLACE** with "**REVISED"** BID FORM, pages BF-1 to BF-3. **(See Attachment No. 4)**

ATTACHMENTS TO CONTRACT SPECIFICATIONS

Attachment No. 01
"REVISED" Base Bid Technical Specifications SECTION 075500 – MODIFIED BITUMINOUS MEMBRANE ROOFING

Attachment No. 02
"REVISED" Base Bid Technical Specifications SECTION 075500A – MODIFIED BITUMINOUS MEMBRANE ROOFING 40 YEAR ALTERNATE

Attachment No. 03
Indemnification Agreement_0908_Sample (2)

Attachment No. 04
"REVISED" BID FORM, pages BF-1 to BF-3

Acknowledgment of the following addenda is hereby made:

Addendum #5, Dated: _____ Initials _____

Company _____

NOTE: THIS ADDENDUM SHALL BE ACKNOWLEDGED IN YOUR BID SUBMISSION, FAILURE TO ACKNOWLEDGE ADDENDUM WILL BE GROUNDS FOR REJECTION OF BID.

PLEASE VISIT http://www.jaxport.com/procurement/active-solicitations OR CALL THE PROCUREMENT DEPARTMENT AT (904) 357-3017, PRIOR TO THE BID OPENING TO DETERMINE IF ANY ADDENDA HAVE BEEN RELEASED ON THIS CONTRACT.

ATTACHMENT NO. 1

"REVISED"

SECTION 075500 – MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hot Applied 3-Ply Asphalt Roofing (StressPly).

B. Accessories.

C. Edge Treatment and Roof Penetration Flashings.

1.2 RELATED SECTIONS

A. Section 053100 – Steel Decking.

B. Section 061000 - Rough Carpentry.

C. Section 061100- Wood Blocking and Curbing: Wood nailers and cant strips.

D. Section 072100 – Thermal Insulation.

E. Section 076200 - Sheet Metal Flashing and Trim.

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 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

G. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

H. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.

I. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

J. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

K. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet

Materials.

L. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

M. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

N. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

O. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

P. Factory Mutual Research (FM): Roof Assembly Classifications.

Q. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

R. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

S. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

T. Warnock Hersey (WH): Fire Hazard Classifications.

U. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

V. ASCE 7, Minimum Design Loads for Buildings and Other Structures

W. UL - Fire Resistance Directory.

X. FM Approvals - Roof Coverings and/or RoofNav assembly database.

Y. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).

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.

A. 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, Method 2 for Components and Cladding.
2) Importance Category:
a) II.
3) Importance Factor of:

a) 1.0
4) Wind Speed: 125 mph
5) Exposure Category:
a) D.
6) Design Roof Height: 30 feet.
7) Minimum Building Width: 450 feet.
8) Roof Pitch: 0.25:12.
9) Roof Area Design Uplift Pressure:
a) Zone 1 - Field of roof 74.3psf
b) Zone 1'- Center of roof 42.7 psf
c) Zone 2 - Eaves, ridges, hips and rakes 98 psf
d) Zone 3 - Corners 133.6 psf

2. Live Load: 20 psf, or not to exceed original building design.
3. Dead Load:
a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

B. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

C. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment shall not be required.

D. Roof system shall have been tested in compliance with the following codes and test requirements:
1. Miami-Dade County:
a. Torch and Mop Membrane Systems Over
1) Steel Decks N.O.A.
a) 16-0711.12
1) PG# 44-45
b. Roofing Underlayments
1) Garland Underlayments N.O.A.
c. Roofing Cements and Coatings
1) Garland Coatings and Mastics N.O.A.
2. Warnock Hersey
a. ITS Directory of Listed Products
1) AC-23

1.5 SUBMITTALS

A. Provide the following to the Owner at the time of bid submittal:
1. Written certification from the roofing system manufacturer corporate officer certifying that the applicator is currently approved for installation of the specified roofing system.
2. Descriptive product data including MSD sheets.
3. Certification of Class A roof system.
4. Sample copy of contractor's workmanship warranty.
5. Sample copy of specified Manufacturer's warranty.
6. Sample copy of Manufacturer's Architectural indemnification Agreement.

B. Product Data: Submit brochures containing material samples, SDS, schedules, charts,

literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

1. Within four (4) weeks of award of contract, submit:

    a. Minimum of two (2) samples of each sheet material and descriptive literature.
    b. Manufacturer’s specifications and other independent test data according to ASTM designation D-5147-91 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material" needed to prove compliance with specified requirements.
    c. All other data and information to satisfy requirements of manufacturer on warranty needs.
    d. A written statement from the roofing materials manufacturers corporate officer approving the installer and stating the intent to guarantee the completed project as specified.
    e. e. Samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
    f. f. Certified copy of ISO 9001 compliance.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane. Indicate size and materials. Show locations and installation procedures. Submit one electronic original prior to the job start and retain approved copies at the site.

D. Materials: Modified Bitumen Manufacturer must also manufacturer all edge metal and standing seam radius panels. Private labeling of material will not be permitted.

E. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7-98 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. Report shall be signed and sealed by a Professional Engineer registered in the State of Florida who has provided roof system attachment analysis for not less than 5 consecutive years.

F. Maintenance Procedures: Upon substantial completion of the project, deliver to Owner three (3) copies of manufacturers printed instructions regarding care and maintenance of the roof.

G. 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.

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

I. 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.

J. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwritters 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.

K. 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 Garland Contractor.

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.

G. Warranty Inspections: shall be provided on years 2, 5, 10, 15, 20 and 25.

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 50 degree F (10 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 Edge-To-Edge NDL System 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 installer, 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 including Garland Metal Components.
   1. Warranty Period:
      a. 30 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. 5 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.
   1. Certainteed
   2. Derbigum

3. Tremco Incorporated

B. Requests for substitutions will be considered in accordance with provisions of Section 012500.

C. Alternate manufactures listed must meet or exceed all aspects of the basis of design.

D. Request for substitutions must be submitted 7 days prior to the bid due date for approval.

E. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
   1. Bidder will not be allowed to change materials after the bid opening date.
   2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
   3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
      d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
      e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
      f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
   4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
   5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.
   6. Material substitution request must be submitted no later than 10 days prior to the bid submittal date for review.

2.2 HOT APPLIED 3-PLY ASPHALT ROOFING - STRESSPLY

A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.
   1. HPR Tri-Base Premium.

B. Base (Ply) Sheet: Two plies bonded to the prepared substrate with Interply Adhesive:
   1. HPR Glasfelt.

C. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with interply Adhesive.
   1. StressPly Plus FR Mineral.

D. Interply Adhesive: (1, 2 and 3)
   1. HPR All-Temp Asphalt.

E. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive except for torch applied:
   1. HPR Tri-Base Premium.

F. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive except for torch applied:
   1. StressPly Plus FR Mineral.

G. Flashing Ply Adhesive:
   1. HPR All-Temp Asphalt.

2.3 ACCESSORlES:

A. Roof Insulation: In accordance with Section 07220.
   1. Insulation shall be in accordance with Miami Dade Notice of Acceptance.
   2. Top Layer Insulation only, ½" DensDeck Prime.

B. Walkway Pads - Commercial Innovations Walkway Pads: As recommended and furnished by the membrane manufacturer set in approved adhesive to control foot traffic on roof top surface and provide a durable system compliant non-slip walkway.

C. Sealant - Green-Lock Structural Adhesive: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
   1. Elongation, ASTM D 412: 300%
   2. Hardness, Shore A, ASTM C 920: 50
   3. Shear Strength, ASTM D 1002: 300 psi

D. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

E. Non-Shrink Grout GarRock: All weather fast setting chemical action concrete material to fill pitch pans.
   1. Flexural Strength, ASTM C 78: (modified) 7 days 1100psi
   2. High Strength, ASTM C 109: (modified) 24 days 8400lbs (3810kg)

F. Pitch Pocket Sealer - Seal-Tite: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.
   1. Durometer, ASTM D 2240: 40-50 Shore
   2. Elongation, ASTM D 412: 250%
   3. Tensile Strength, ASTM D 412: 200 @ 100 mil

G. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Pre-Manufactured Edge Metal Finishes:
   1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill
   2. 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). Provided with the following properties.

1) Pencil Hardness: ASTM D3363, HB-H / NCCA II-2.
2) Bend: ASTM D-4145, O-T / NCCA II-19
3) Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion
4) Gloss (60 deg. angle): ASTM D523, 25+/-5%
5) Reverse Bend: ASTM D2794, no cracking or loss of adhesion
6) Nominal Thickness: ASTM D1005
   a) Primer: 0.2 mils
   b) Topcoat, 0.7 mils min
   c) Clear Coat (optional, only used with 22 ga. steel) 0.3 mils
7) Color: Provide as specified. (Subject to minimum quantities)

B. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

C. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

D. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

E. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

F. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
   1. Tensile Strength, ASTM D 412: 400 psi
   2. Elongation, ASTM D 412: 300%
   3. Density @77 deg. F 8.5 lb/gal typical

G. 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.

H. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
   1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" 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. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
   7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Metal Deck: Metal deck shall be installed as specified in Section
   1. Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
   2. Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
   3. Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
   4. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
   5. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.

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.

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

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION HOT APPLIED ROOF SYSTEM

A. Base/Felt Ply(s): Install base sheet or felt plies in twenty five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.
1. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
2. Install base flashing ply to all perimeter and projection details after membrane application.
3. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
4. Install base flashing ply to all perimeter and projection details.
5. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (11-13kg) per 100 square feet.
1. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
2. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.
3. Install subsequent rolls of modified membrane as above with a minimum of 4 inch (101 mm) side laps and 8 inch (203 mm) end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
4. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
5. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.

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 061140.

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 or Section 07710. 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 surfaces 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 hot material unless otherwise noted in these specifications. 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 sheet of flashing membrane to the substrate.
5. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and 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.

H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap 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.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 076200.
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.

B. Metal Edge:
1. Inspect the nailers to assure proper attachment and configuration.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry. Do not prime for Green-Lock System lightly sand metal to improve bond.
6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.
7. 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. Seal outside edge with rubberized cement.

C. Roof Edge With Gutter:
1. Inspect the nailer to assure proper attachment and configuration. Increase slope at metal edge by additional degree of slope in first board.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install gutter and strapping.
4. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
5. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailer every 3 inches (76 mm) o.c. staggered.
6. Prime metal edge at a rate of 100 square feet per gallon and allow to dry. Do not prime for Green-Lock System lightly sand metal to improve bond.
7. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) onto the field of the roof. Assure ply laps do not coincide with metal laps.
8. 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.

D. 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.

E. Expansion Joint:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Chamfer top of curb. Prime vertical curb at a rate of 100 square feet per gallon and allow to dry.
2. Mechanically attach wood cant to expansion joint nailers. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install compressible insulation in neoprene cradle.
4. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
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. Attach top of membrane to top of 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.
6. Install pre-manufactured expansion joint cover. Fasten sides at 12 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.

F. Curb Detail/Air Handling Station:
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 field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb 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. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

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.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 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.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at a minimum of three times per week, while the job is in progress. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time for a minimum of 5 years by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
   1. HPR Glasfelt: ASTM D 2178 Type IV, Asphalt saturated fiberglass felt.
      a. Meets or Exceeds ASTM D 2178 Type IV Performance Criteria.

B. Thermoplastic/Modified Cap (Ply) Sheet:
   1. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf

2) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N

c. Elongation at Maximum Tensile, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%

2) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%

d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:

1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:

a. Softening Point 225 deg. F - 235 deg. F

b. Flash Point 525 deg. F

c. Penetration @ 77 deg. F 16-20 units

d. Ductility @ 77 deg. F 1.5-2.0 cm

D. Flashing Base Ply:

1. HPR Tri-Base Premium: 60 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite 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 330 lbf/in XD 330 lbf/in

2) 50 mm/min. @ 23 +/- 2 deg. C MD 57.5 kN/m XD 57.5 kN/m

b. Tear Strength, ASTM D5147:

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf XD 550 lbf

2) 50 mm/min. @ 23 +/- 2 deg. C MD 2446 N XD 2446 N

c. Elongation at Maximum Tensile, ASTM D 5147:

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 9%

2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 9%

E. Flashing Ply Adhesive:

1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:

a. Softening Point 225 deg. F - 235 deg. F

b. Flash Point 525 deg. F

c. Penetration @ 77 deg. F 16-20 units

d. Ductility @ 77 deg. F 1.5-2.0 cm

F. Surfacing:

1. Flashing Cap (Ply) Sheet:

a. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G

1) Tensile Strength, ASTM D 5147

a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in

b) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m

2) Tear Strength, ASTM D 5147

a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf

b) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N

3) Elongation at Maximum Tensile, ASTM D 5147

a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%

b) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%

4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

END OF SECTION

"REVISED"

SECTION 075500A - MODIFIED BITUMINOUS MEMBRANE ROOFING 40 YEAR ALTERNATE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hot Applied 2-Ply Asphalt Roofing (OptiMax).

B. Accessories. (2.19)

C. Edge Treatment and Roof Penetration Flashings.

1.2 RELATED SECTIONS

A. Section 053100 - Metal Roof Deck.

B. Section 061000 - Rough Carpentry.

C. Section 072100 – Thermal Insulation Board:

D. Section 076200 - Sheet Metal Flashing and Trim.

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 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

G. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

H. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

I. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

J. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

K. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

L. ASTM D 6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.

M. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

N. Factory Mutual Research (FM): Roof Assembly Classifications.

O. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

P. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

Q. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

R. Warnock Hersey (WH): Fire Hazard Classifications.

S. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

T. ASCE 7, Minimum Design Loads for Buildings and Other Structures

U. UL - Fire Resistance Directory.

V. FM Approvals - Roof Coverings and/or RoofNav assembly database.

W. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).

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. 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, Method 2 for Components and Cladding.
         2) Importance Category:
            a) II.
         3) Importance Factor of:
            a) 1.0
         4) Wind Speed: 125 mph
         5) Exposure Category:
            a) D.
         6) Design Roof Height: 30 feet.
         7) Minimum Building Width: 450 feet.
         8) Roof Pitch: 0.25:12.
         9) Roof Area Design Uplift Pressure:
            a) Zone 1 - Field of roof 74.3psf
            b) Zone 1'- Center of roof 42.7 psf
            c) Zone 2 - Eaves, ridges, hips and rakes 98 psf
            d) Zone 3 - Corners 133.6 psf
   2. Live Load: 20 psf, or not to exceed original building design.
   3. Dead Load:
      a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

D. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

E. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment shall not be required.

F. Roof system shall have been tested in compliance with the following codes and test requirements:
1. Miami-Dade County:
   a. Torch and Mop Membrane Systems Over
      1) Steel Decks N.O.A.
         a) #16-0711.12
            1) PG# 20-21
   b. Roofing Underlayments
      1) Garland Underlayments N.O.A.
   c. Roofing Cements and Coatings
      1) Garland Coatings and Mastics N.O.A.
2. Warnock Hersey
   a. ITS Directory of Listed Products
3. FM Approvals:
   a. RoofNav Website
      1) 234034-388071-0

1.5 SUBMITTALS

A. Provide the following to the Owner at the time of bid submittal:
1. Written certification from the roofing system manufacturer corporate officer certifying that the applicator is currently approved for installation of the specified roofing system.
2. Descriptive product data including MSD sheets.
3. Certification of Class A roof system.
4. Sample copy of contractor's workmanship warranty.
5. Sample copy of specified Manufacturer's warranty.
6. Sample copy of Manufacturer's Architectural indemnification Agreement.

B. Product Data: Submit brochures containing material samples, SDS, schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.
1. Within four (4) weeks of award of contract, submit:

   a. Minimum of two (2) samples of each sheet material and descriptive literature.
   b. Manufacturer's specifications and other independent test data according to ASTM designation D-5147-91 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material" needed to prove compliance with specified requirements.
   c. All other data and information to satisfy requirements of manufacturer on warranty needs.
   d. A written statement from the roofing materials manufacturers corporate officer approving the installer and stating the intent to guarantee the completed project as specified.
   e. Samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.

   f. Certified copy of ISO 9001 compliance.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane. Indicate size and materials. Show locations and installation procedures. Submit one electronic original prior to the job start and retain approved copies at the site.

D. Materials: Modified Bitumen Manufacturer must also manufacturer all edge metal and standing seam radius panels. Private labeling of material will not be permitted.

E. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7-98 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. Report shall be signed and sealed by a Professional Engineer registered in the State of Florida who has provided roof system attachment analysis for not less than 5 consecutive years.

F. Maintenance Procedures: Upon substantial completion of the project, deliver to Owner three (3) copies of manufacturers printed instructions regarding care and maintenance of the roof.

G. 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.

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

I. 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.

J. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwritters 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.

K. 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 Garland Contractor.

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.

G. Warranty Inspections: shall be provided on years 2, 5, 10, 15, 20 and 25.

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 50 degree F (10 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 Edge-To-Edge NDL System 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 installer, 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 including Garland Metal Components.
   1. Warranty Period:
      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. 5 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.
   1. Certainteed
   2. Derbigum
   3. Tremco Incorporated

B. Requests for substitutions will be considered in accordance with provisions of Section 012500.

C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
   1. Bidder will not be allowed to change materials after the bid opening date.
   2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
   3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
      d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
      e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
      f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
   4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
   5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.
   6. Material substitution request must be submitted no later than 10 days prior to the bid submittal date for review.

2.2 HOT APPLIED 2-PLY ASPHALT ROOFING - STRESSPLY, OPTIMAX, OR VERSIPLY

A. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. StressBase 80:

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive.
   1. OptiMax FR Mineral:

C. Interply Adhesive: (1 and 2)
   1. HPR All-Temp Asphalt:

D. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
   1. StressBase 80:

E. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive: except

torch sheet.
1. OptiMax FR Mineral:

F. Flashing Ply Adhesive:
1. HPR All-Temp Asphalt:

2.3 ACCESSORIES:

A. Roof Insulation: In accordance with Section 072100.
1. Insulation shall be in compliance with Miami Dade Notice of Acceptance.

B. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel, Fasteners shall be self-clinching type of penetrating type as recommended by the deck manufacturer. Fasten nails and fasteners flush-driven through flat metal discs not less than 1 inch (25 mm) diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than 1 inch (25 mm) diameter are used.

C. Walkway Pads - Commercial Innovations Walkway Pads: As recommended and furnished by the membrane manufacturer set in approved adhesive to control foot traffic on roof top surface and provide a durable system compliant non-slip walkway.

D. Sealant - Green-Lock Structural Adhesive: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
1. Elongation, ASTM D 412: 300%
2. Hardness, Shore A, ASTM C 920: 50
3. Shear Strength, ASTM D 1002: 300 psi

E. Non-Shrink Grout GarRock: All weather fast setting chemical action concrete material to fill pitch pans.
1. Flexural Strength, ASTM C 78: (modified) 7 days 1100psi
2. High Strength, ASTM C 109: (modified) 24 days 8400lbs (3810kg)

F. Pitch Pocket Sealer - Seal-Tite: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.
1. Durometer, ASTM D 2240: 40-50 Shore
2. Elongation, ASTM D 412: 250%
3. Tensile Strength, ASTM D 412: 200 @ 100 mil

G. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Edge Metal Finishes:
1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill
2. 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). Provided with the following properties.
1) Pencil Hardness: ASTM D3363, HB-H / NCCA II-2.
2) Bend: ASTM D-4145, O-T / NCCA II-19
3) Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion
4) Gloss (60 deg. angle): ASTM D523, 25+/-5%
5) Reverse Bend: ASTM D2794, no cracking or loss of adhesion

6) Nominal Thickness: ASTM D1005
   a) Primer: 0.2 mils
   b) Topcoat, 0.7 mils min
   c) Clear Coat (optional, only used with 22 ga. steel) 0.3 mils
7) Color: Provide as specified. (Subject to minimum quantities)

B. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

C. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

D. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

E. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
1. Tensile Strength, ASTM D 412: 400 psi
2. Elongation, ASTM D 412: 300%
3. Density @77 deg. F 8.5 lb/gal typical

F. Fabricated Flashings: Fabricated flashings and trim are specified in Section 076200.
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.

G. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 077129.
1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" 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. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Metal Deck: Metal deck shall be installed as specified in Section
1. Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
2. Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
3. Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
4. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
5. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.

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.

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

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION HOT APPLIED ROOF SYSTEM

A. Base/Felt Ply(s): Install base sheet or felt plies in twenty five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.
1. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
2. Install base flashing ply to all perimeter and projection details after membrane application.

3. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
4. Install base flashing ply to all perimeter and projection details.
5. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (11-13kg) per 100 square feet.
1. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
2. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.
3. Install subsequent rolls of modified membrane as above with a minimum of 4 inch (101 mm) side laps and 8 inch (203 mm) end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
4. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
5. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.

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 061000.
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 076200 or Section 077200. 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 surfaces 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 hot material unless otherwise noted in these specifications. 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 sheet of flashing membrane to the substrate.
5. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and 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.

H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap 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.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.

B. Metal Edge:
1. Inspect the nailers to assure proper attachment and configuration.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry. Do not prime for Green-Lock System lightly sand metal to improve bond.
6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.
7. 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. Seal outside edge with rubberized cement.

C. Expansion Joint:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Chamfer top of curb. Prime vertical curb at a rate of 100 square feet per gallon and allow to dry.
2. Mechanically attach wood cant to expansion joint nailers. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install compressible insulation in neoprene cradle.
4. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
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. Attach top of membrane to top of 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.

6. Install pre-manufactured expansion joint cover. Fasten sides at 12 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.

D. 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.

E. 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.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 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.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at a minimum of three times per week, while the job is in progress. Provide a final inspection upon completion of the Work.

1. Warranty shall be issued upon manufacturer's acceptance of the installation.
2. Field observations shall be performed by a Sales Representative employed full-time for a minimum of 5 years by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
      2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
      2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
   c. Elongation at Maximum Tensile, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
      2) 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
   d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
1. OptiMax FR Mineral: 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)

C. Interply Adhesive:
1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:
   a. Softening Point 225 deg. F - 235 deg. F
   b. Flash Point 525 deg. F
   c. Penetration @ 77 deg. F 16-20 units
   d. Ductility @ 77 deg. F 1.5-2.0 cm

D. Flashing Base Ply:
1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
      2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf

2) 50 mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N

c. Elongation at Maximum Tensile, ASTM D 5147

1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %

2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 4 % XD 4 %

d. Low Temperature Flexibility, ASTM D 5147

1) Passes -40 deg. F (-40 deg. C)

E. Flashing Ply Adhesive:

1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:

a. Softening Point 225 deg. F - 235 deg. F

b. Flash Point 525 deg. F

c. Penetration @ 77 deg. F 16-20 units

d. Ductility @ 77 deg. F 1.5-2.0 cm

F. Surfacing:

1. Flashing Cap (Ply) Sheet:

a. OptiMax FR Mineral: 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G

1) Tensile Strength, ASTM D 5147

a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in

b) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 39 kN/m

2) Tear Strength, ASTM D 5147

a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf

b) 50 mm/min. @ 23 +/- 2 deg. C MD 1334 N XD 1334 N

3) Elongation at Maximum Tensile, ASTM D 5147

a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%

b) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%

4) Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)

END OF SECTION

DOCUMENT NO. _____

Garland Industries, Inc. Design Professional Liability Indemnity Agreement

Design Professional:_____
License No.:_____ State: _____
Design Professional's Client:_____
Address: _____
City: _____ State: _____ Zip: _____
Building Description:_____
Total Square Feet: _____
Garland System: _____

In addition to Garland's normal project guarantees, as an additional benefit, Garland Industries, Inc. hereby agrees to indemnify the contracting Design Professional for attorney fees, related expenses and judgments incurred through litigation arising out of the application or performance of a Garland roof or roofing system, even if the litigation is groundless, false or fraudulent. Under the terms of this agreement, the contracting Design Professional shall be indemnified for a maximum aggregate sum of $100,000 (depending on the roof size) arising out of the lawsuits filed up to five (5) years after the completion of the installed roof or roofing systems. This professional liability indemnification is subject to the following conditions

1. Installations specifications, describing the detailed manner in which the Garland products and systems are to be applied, must have been previously approved, in writing, by a Regional Manager of The Garland Company, Inc.

2. All products must have been applied in accordance with the properly approved installation specifications and standards.

3. All work must have been performed by a Garland approved contractor, and all obligations for labor and material must have been satisfied.

4. The roof or roofing systems installed must include either a minimum 2-ply BUR underlayment together with a Garland HPR rubber modified membrane, 2-ply modified Garland system including base and cap sheet, or Garland's R-Mer Span system.

5. Any additional terms and conditions required by the Design Professional or Garland with respect to the particular project must have been complied with.

6. The final inspection of the completed project, if deemed necessary by the Design Professional or Garland representative, shall include an infrared survey.

GARLAND INDUSTRIES, INC.

By: _____ Date: _____
David M. Sokol, President

Garland Industries, Inc.
3800 E. 91st Street
Cleveland, OH 44105

BID FORM
JAXPORT PROJECT NO.: T2018-01
JAXPORT CONTRACT NO.: C-1631A
TMT WAREHOUSE #1 RE-ROOF
TALLEYRAND MARINE TERMINAL

BIDDER'S NAME:_____

The undersigned hereby proposes to furnish all materials, equipment, labor, and supervision for the above identified project, in accordance with the specifications and drawings for Contract No. **C-1631A**, at the following price:

Scope of Work: Furnish all labor, materials, equipment and supervision to remove and replace approximately 184,920 total square feet of roof systems at Talleyrand Marine Terminal Warehouse #1, in accordance with contract specifications and drawings.

Bid Submittal Form					
	Item No.	**Description**	**Quantity**	**Unit**	**Total Amount**
GENERAL CONDITIONS - BASE BID					
Section	012900	Insurance and Bonds	1	Lump Sum	$
Section	011000	General Conditions and Mobilization for Base Bid - Special Notices thru Division 01	1	Lump Sum	$
NEW ROOF REPLACEMENT					
Section	050000's	Furnish & install all work related to selected Demolition, Improvements and Renovation of the existing roof structure per Division 050000. Drawings and Specifications.	1	Lump Sum	$
Section	070000's	Furnish & install all work related to Thermal and Moisture Protection. Installation of New Roofing system per Division 07000, Drawings and Specifications. (See SECTION 075500 -- MODIFIED BITUMINOUS MEMBRANE ROOFING, Section 1.11 WARRANTY)	1	Lump Sum	$
Section	070000's	Manufacturer of Material (Bidder must specify Product Manufacturer)			
Section	090000's	Furnish & install all work related to Finishes. Paint metal decking/structures per Division 09000, Drawings and Specifications.	1	Lump Sum	$
UNSPECIFIED WORK (ALLOWANCE) - BASE BID					
Section	**000001**	**Allowance No. 1 - Replace Exhaust Ventilators' motor/components, hood covers and Testing**	**8**	**$ 10,000**	**$ 80,000.00**
TOTAL LUMP SUM BASE BID					
NEW ROOF REPLACEMENT - ALTERNATE No. 1					
Section	070000's	Furnish & install all work related to Thermal and Moisture Protection. Installation of New Roofing system per Division 07000, Drawings and Specifications (See alternate roof specification). Lump Sum to be provided shall be the difference between the base bid and the alternate. (See SECTION 075500A -- MODIFIED BITUMINOUS MEMBRANE ROOFING 40 YEAR ALTERNATE, Section 1.11 WARRANTY). See Note 1 below.	1	Lump Sum	$
Section	070000's	Manufacturer of Material (Bidder must specify Product Manufacturer) for Alternate			
Note 1:	Bidders are encouraged to provide the additional cost for 40 year warranty. The Alternate is not required to submit a bid.				

BID FORM
JAXPORT PROJECT NO.: T2018-01
JAXPORT CONTRACT NO.: C-1631A
TMT WAREHOUSE #1 RE-ROOF
TALLEYRAND MARINE TERMINAL

(Submission of more than one bid form for the same work by an individual, firm, partnership or corporation under the same or different names and/or any alterations, exceptions or comments contained within the bid form shall be grounds for rejection of the bid)

Basis of Award: The Authority reserves the right to award this contract to the bidder whose price is the lowest based on the Lump Sum Base Bid, subject to the availability of appropriated funds.

The Authority reserves the right to award this contract to the lowest, responsive, responsible bidder, and whose bid is fully conforming to the requirements of the bid documents. Nevertheless, JAXPORT reserves the right to waive informalities in any bid, to reject any or all bids, and to accept the bid which in its judgment will be in the best interest of JAXPORT. JAXPORT will be the sole judge of which Bid will be in its best interest and its decision will be final.

JAXPORT reserves the right to award this contract to the bidder offering the lowest price consistent with meeting all specifications, terms, conditions, delivery requirements set forth on this bid. No award will be made until all necessary inquiries have been made into the responsibility of the lowest conforming bidder and JAXPORT is satisfied that the lowest bidder met all the requirements, is qualified and has the necessary organization, capital and resources required to perform the work under the terms and conditions of the contract. JAXPORT reserves the right to accept or reject any or all Bids, in whole or in part.

The required bid guaranty is attached hereto (see "Supplemental Instructions to Bidders") of the contract documents.

Acknowledgment of the following addenda is hereby made (see "Supplemental Instructions to Bidders"):

Addendum No. 1, Dated: _____ Initials: _____

Addendum No. 2, Dated: _____ Initials: _____

Addendum No. 3, Dated: _____ Initials: _____

Addendum No. 4, Dated: _____ Initials: _____

See also "Bid Contents and Format" section of the "Supplemental Instructions to Bidders".

BID FORM

JAXPORT PROJECT NO.: T2018-01
JAXPORT CONTRACT NO.: C-1631A
TMT WAREHOUSE #1 RE-ROOF
TALLEYRAND MARINE TERMINAL

Name of Contractor

AUTHENTICATION (see "Supplemental Instructions to Bidders")

Firm

Business Address | City | State | Zip Code

Mailing Address, if different from above

Authorized Signature | Date Executed

Typed Name | Title

E-Mail Address

Telephone Number | Facsimile Number

Company Federal Tax I.D. No. | Company's Business License No.