



## Addendum No. 3

FCO Contract F4009  
12/20/2023

**RE:** FCO Contract F4009  
**PROJECT:** ITB-07299 – Roof Replacement – D4/6 Materials and Research Office  
**OPENING:** Thursday, December 28, 2023, at 10:30 (EST)

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Notice is hereby given regarding the above-referenced ITB:

**1. Exhibit 1 – Invitation to Bid**

Exhibit 1 - Invitation to Bid was revised on 12/20/2023. Please refer to Addendum No. 3 - Exhibit 1 - Invitation to Bid. All bid documents must be physical/hard copy and submitted in a sealed envelope. The Bid Bond must be an **original**, it cannot be a copy.

**2. Exhibit A – Technical Special Provisions:**

The Technical Special Provisions were revised on 12/20/2023. Please refer to Addendum No. 3 - Exhibit A - Technical Special Provisions. A redline version (that shows the changes) and a clean version has been provided.

(Exhibit 1)  
**State of Florida**  
**DEPARTMENT OF TRANSPORTATION**  
**INVITATION TO BID**

Sealed bids will be received and publicly opened and read aloud by the Florida Department of Transportation (hereinafter referred to as Owner) at the following date, location, and local time: **Florida Department of Transportation – District Four, 3400 West Commercial Boulevard, Fort Lauderdale, FL 33309**; on **Thursday, December 28, 2023, at 10:30 am (EST)** and publicly opened and read aloud on **Thursday, December 28, 2023 at 10:30 am (EST)**.

**FINANCIAL PROJECT NO.:** 450053-9-52-01 **CONTRACT NO.:** F4009

**PROJECT NAME:** Roof Replacement – D4/6 Materials and Research Office

**PROJECT LOCATION:** 14200 West SR84, Davie, FL 33325

**PROJECT DESCRIPTION:** Work includes the removal of the existing roof, furnishing and installing new roof and finish with Thermoplastic Polyolefin (TPO) covering approximately 40,000 square ft. for DOT D4/6 Materials and Research Office, FDOT Building 4388.

**PRE-BID MEETING:**   Mandatory.

A mandatory pre-bid meeting will be held at the following location, date, and local time: **14200 West SR84, Davie, FL 33325, Thursday, December 14, 2023, at 10:30 am (EST)**

Appropriate Personal Protective Equipment (PPE) must be worn. Owner representatives will be present to discuss plans, specifications, and conditions of the project. The Owner’s Project Manager is Sasha Khan and may be reached at 954-677-7015 or sasah.khan@dot.state.fl.us. *NOTE: Any contractor who fails to attend a mandatory pre-bid meeting will not be eligible to bid on the project.*

**MINORITY BUSINESS ENTERPRISES (MBE) UTILIZATION:** The Owner encourages the recruitment and utilization of certified and non-certified minority businesses. The Owner, its contractors, suppliers, and consultants should take all necessary and reasonable steps to ensure that minority businesses have an opportunity to compete for and perform contract work for the Owner in a nondiscriminatory environment.

**QUESTIONS:** All questions must be submitted to D4.designbuild@dot.state.fl.us by (or before) **Wednesday, December 20, 2023**.

**BID PROPOSAL:** Bids must be delivered to Florida Department of Transportation – District Four, 3400 West Commercial Boulevard, Fort Lauderdale, FL 33309, by (or before) **Friday, December 28, 2023, at 10:30 am (EST)**. Bids must be submitted in full accordance with the requirements of the Drawings, Specifications, Bidding Conditions, and Contractual Conditions, which may be examined and obtained from the Invitation to Bid email sent by Dylan Kennedy (dylan.kennedy@dot.state.fl.us), and published in the Vendor Information Portal on Thursday, November 30, 2023.

**INSURANCE:** The awarded Bidder is responsible for maintaining the insurance coverage specified in the Non-Technical Specifications for the duration of this project.

**DOCUMENTS TO BE SUBMITTED WITH BID:**

- Exhibit 2 – Bid Proposal
- Exhibit 10 – List of Subcontractors
- Exhibit 13 – Bid Bond
- Exhibit 15 – Contractor’s Experience Questionnaire and Financial Statement (“CEQ and FS”)
- Experience Form
- Documentation supporting compliance with License Requirements

**DOCUMENTS FOR COMPLETION PRIOR TO AWARD:**

- Exhibit 11 – Performance Bond
- Exhibit 12 – Labor and Materials Payment Bond
- Certificate of Insurance

(Exhibit 1)  
**INVITATION TO BID**

**TIME OF COMPLETION:** The work to be performed under this contract shall be substantially completed within **90** calendar days after the date of this Notice to Proceed, and shall be finally completed within **30** calendar days after the date of substantial completion. Please refer to the Non-Technical Specifications, Section A-22 for more information.

**PREQUALIFICATION:** Each bidder shall submit a current license issued by the State of Florida (specify type license required for the work) and, if a Florida Corporation, a copy of the Corporate Charter as prequalification of their eligibility with the bid document to the Department of Transportation, Procurement Services Office: **Florida Department of Transportation – District Four, 3400 West Commercial Boulevard, Fort Lauderdale, FL 33309.**

The bid will be rejected if a copy of the Contractor’s License is not included either with the bid or provided to the Owner prior to the Letting. After the bid opening, the lowest responsive bidder shall qualify in accordance with this contract document.

**BID BOND:** If the bid amount exceeds \$100,000, the bidder must provide with the bid, a Bid Guaranty of five percent (5%) of the actual total bid in the form of a certified check, cashier’s check, treasurer’s check, bank draft of any national or state bank, or a surety Bid Bond made payable to the Department of Transportation. A Bid Guaranty in an amount less than five percent (5%) of the actual bid will invalidate the bid. Bid Bonds shall conform to the Departments Bid/Proposal Bond Form furnished with the proposal package.

**PERFORMANCE BOND and LABOR AND MATERIALS PAYMENT BOND:** If the contract award amount exceeds \$100,000, both a Performance Bond and a Labor and Material Payment Bond of 100% each of the contract sum are required at the time of award.

**BID POSTING / CONTRACT AWARD:** The Bid Tabulation and Notice of Award Recommendation will be posted at the following location, date, and local time: <https://www.fdot.gov/contracts/district-offices/d4/lettings/fco-contracts/fixcdcapitaloutlay.shtm> on January 23<sup>rd</sup> or 25<sup>th</sup>, 2024, at 10:30 am (EST).

In the event the Bid Tabulation and Notice of Award Recommendation cannot be posted in this manner, all bidders will be notified by certified United States Mail, return receipt requested, express or fax delivery, receipt requested. If no protest is filed the Owner will award the contract to the qualified, responsive low bidder. The Owner reserves the right to reject any or all bids.

**BID SOLICITATION/AWARD/NON-AWARD PROTEST RIGHTS:** Any person adversely affected by this Bid Solicitation shall file a notice of protest within 72 hours of receipt of the bid documents in accordance with Section 120.57(3), Florida Statutes and Rule Chapter 28-110, Florida Administrative Code. Any person adversely affected by the intended decision of the Owner to award a contract or to reject all bids shall file a notice of protest within 72 hours after the posting of the Summary of Bids (bid tabulation). If notice of intended decision is given by certified mail, express or fax delivery, the adversely affected person must file the notice of protest within 72 hours after receipt of the notice of intent.

A formal written protest must be filed within 10 days after filing the notice of protest. The formal written protest shall state with particularity the facts and law upon which the protest is based. All protests must be submitted in accordance with Section 120.569 and 120.57, Florida Statutes. The required notice of protest and formal protest must each be timely filed with the Clerk of Agency Proceedings, Office of General Counsel, 605 Suwannee Street, Room 550, MS-58, Tallahassee, Florida, 32399-0450. Failure to file a protest within the time prescribed in Section 120.57(3), Florida Statutes, shall constitute a waiver of proceedings under Chapter 120, Florida Statutes.

**DISCRIMINATION CLAUSE:** An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity, per Section 287.134(3)(a), Florida Statutes.

**PUBLIC ENTITY CRIME INFORMATION STATEMENT:** A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for Category Two for a period of 36 months for the date of being placed on the convicted vendor list.

STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION  
District 4 Contract Office  
3400 West Commercial Boulevard  
Fort Lauderdale, FL 33309

**TECHNICAL SPECIAL PROVISIONS  
For  
FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROOF REPLACEMENT  
D4/6 MATERIALS AND RESEARCH OFFICE  
(14200 WEST SR84, DAVIE, FL 33325)**

**Financial Project Number:  
450053-9-52-01**

**Addendum No. 3, Revised 12/20/2023  
(Redline Version)**

**SECTION 00 01 10  
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**THE FOLLOWING SPECIFICATION SECTIONS ARE ADDED AS A TECHNICAL SPECIAL PROVISION AND SHALL GOVERN "LUMP SUM" CONSTRUCTION WORK**

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**SECTION 01 10 00**  
**GENERAL INFORMATION FOR ALL SECTIONS**

**PART 1 DESCRIPTION**

**1.1 SUMMARY**

- A. Work under this Technical Special Provision (TSP) includes the removal of the existing roof, furnishing and installing new roof and finish with Thermoplastic Polyolefin (TPO) covering approximately 20,000 square ft. for DOT D4/6 Materials and Research Office, (FDOT Building Number 4388) located at 14200 West State Road 84 Davie, FL 33325. Scope does not include the adjoining garage. All work shall be performed in accordance with the corresponding specifications of the Manufacture.

**PART 2 QUALITY CONTROL**

**2.1 SUMMARY**

- A. Quality Control Plan: Contractor shall provide bi-yearly inspections and advise if maintenance is needed to ensure manufacture warranty for the full 20-year life cycle. The inspection shall be performed without additional cost to the Owner. The Contractor shall provide a quote for the recommended maintenance which if performed would be at the Owner's expense.
- B. Source limitation: Obtain all products or systems for each Section from a single source manufacturer for each product required. Multiple sources for the same product or system is not permitted.
- C. Weather limitations: Proceed with installation only when the existing and forecasted weather conditions permit assembly or installation as required by the manufacturer of the specified product, system, or equipment.
- D. Environmental limitations: Do not install products, systems, or equipment on the interior environment until ambient temperature and humidity conditions are maintained at levels indicated in reference standards and manufacture's written instructions.
- E. Remove and replace applications that do not comply with the manufacturer's written requirements.
- F. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
- G. Where required, provide compliance with the 2020 Florida Building Code.

**2.2 TESTING AGENCY QUALIFICATIONS**

- A. For testing agency providing classification markings, an inspection agency acceptable to the authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

**2.3 PERSONNEL QUALIFICATIONS**

- A. Roofing supervisor will have a minimum of 5 years of documented/verifiable experience on similar projects or larger.
- B. Provide references along with contact information for job history check.
- C. Where required by the product, system, or equipment Manufacturer, installers and supervisors shall be trained and approved by the manufacturer.
- D. Provide the qualifications of all of the above personnel

**2.4 SHOP DRAWINGS**

- A. Provide shop drawings of the proposed work for this Technical Special Provision. Shop Drawings shall include but not be limited to those items listed herein.

## **PART 3 MANUFACTURER'S WARRANTIES**

### **3.1 SUMMARY**

- A. Secure all warranties provided by the manufacturer for the specific equipment or material included in this TSP. Ensure that all warranties are fully transferable from the Contractor to the Department within the project limits. Transfer warranties upon final acceptance. Document all warranties and warranty transfers and provide a copy to the Project Manager. Terms and Conditions: Ensure that the terms and conditions of warranties are documented by the manufacturer for equipment and material submittals on construction projects. Include terms for a specified service performance with provisions for repair parts and labor or for replacement. When a warranty is available, ensure that it accompanies the manufacturer's billing invoice. Ensure warranties require the manufacturer to furnish replacements for any part or equipment found to be defective during the manufacturer's warranty period at no cost to the Department within the project limits.

**END OF SECTION**

**SECTION 07 01 50.19  
PREPARATION FOR RE-ROOFING**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. ~~Partial-Complete~~ removal of existing roofing system in preparation for a new roof membrane system.

1.2 RELATED REQUIREMENTS

- A. Section 07 54 23 - Thermoplastic-Polyolefin Roofing (TPO)

1.3 REFERENCE STANDARDS

- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with affected mechanical and electrical work associated with roof penetrations.
- B. Preinstallation Meeting: Convene one week before starting work of this section. Coordinate meeting time with FDOT Project Manager.
- C. Schedule work to coincide with commencement of installation of new roofing system.

1.5 FIELD CONDITIONS

- A. Maintain continuous temporary protection prior to and during installation of new roofing system.
- B. Documents were prepared based on casual field observations and information provided by FDOT. It is incumbent upon the bidder to observe the existing conditions in and around the site and draw his own conclusions and report any concerns in writing to the FDOT Project Manager.
- C. Existing Mechanical Equipment shall stay operational to the greatest extent possible. Coordinate temporary shutdown during buildings non-operational hours in advance with FDOT Project Manager.
- D. Coordinate with FDOT Project Manager as to the removal and disposition of debris storage on site; delivery and storage of new material on site; and the coming and going of personnel and vehicles.
- E. Coordinate with FDOT Project Manager as to any security requirements in and around the building and the site.
- F. Existing satellite dish and related concrete masonry units and metal framing shall be removed and stored on site as directed by FDOT Project Manager.

**PART 2 PRODUCTS**

2.1 MATERIALS

- A. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.
- B. ~~Recover~~ Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, moisture and fire-resistant board with factory applied acrylic primer coating.
  - 1. Board Size: 4 feet by 8 feet.
  - 2. Board Thickness: 1/2 inch.
  - 3. Board Edges: Square.



## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that existing roof surface is clear and ready for work of this section.
- B. Inspection of the existing condition of the corrugated roof deck shall be performed by the bidder to confirm the roof is ready for reeovering re-roofing.

### **3.2 PREPARATION**

- A. Sweep roof surface clean of loose matter.
- B. Remove loose refuse and dispose off site.

### **3.3 MATERIAL REMOVAL**

- A. Remove only existing roofing materials that can be replaced with new materials the same day.
- B. Remove metal counter flashings.
- C. Remove existing roof membrane vents.
- D. Prepare existing substrates as required by roofing manufacturer to receive new roof system.
- E. Remove and replace roof mounted condensing units to properly flash curbs with roofing membrane. Temporarily detach ductwork, wiring and condensate lines as required and reattach to make units fully functional and operational. All HVAC work shall be accomplished by a licensed mechanical contractor.
- F. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.
- G. Cut and lay flat any membrane blisters.
- H. Remove damaged insulation and fasteners, cant strips and blocking as required.

### **3.4 PROTECTION**

- A. Provide temporary protective sheeting over uncovered deck surfaces.
- B. Turn sheeting up back of parapet to bottom of cornice, retain sheeting in position with weights.
- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.
- E. ~~Install recovery board over existing membrane.~~

**END OF SECTION**

**SECTION 07 54 23**  
**THERMOPLASTIC-POLYOLEFIN ROOFING (TPO)**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Project Name: State Of Florida Department of Transportation - D4/6 MATERIALS AND RESEARCH OFFICE ROOF REPLACEMENT.
- B. Thermoplastic membrane roofing system, including all components specified.
- C. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in a manner complying with all applicable federal, state, and local regulations.
- D. Commencement of work by Contractor shall constitute acknowledgement by Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 01 50.19 - Preparation for Re-Roofing

**1.3 DEFINITIONS**

- A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.

**1.4 REFERENCE STANDARDS**

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- C. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
- D. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
- E. ASTM D1079 - Standard Terminology Relating to Roofing and Waterproofing.
- F. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C.
- I. FM DS 1-28 - Wind Design.
- J. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System.
- K. ISO 9000 - ISO Standards Compendium: ISO 9000 - Quality management.

**1.5 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
  - 1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.

2. Coordinate meeting time with FDOT Project Manager in advance of meeting.

## 1.6 SUBMITTALS

### A. Product Data:

1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include at least the following:
  - a. Technical data sheet for roof membrane.
  - b. Technical data sheets for splice tape and adhesives.
  - c. Technical data sheet for batten strips and fasteners.
  - d. Technical data sheet for each cover board type.
  - e. Technical data sheet for each type of metal edging.
2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable; include data itemizing the components of the classified or approved system.
3. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.

### B. Samples: Submit samples of at least the following:

1. Sample of roof membrane.
2. Sample of termination bar and counter flashing.
3. Sample of walkway pads.
4. Sample of each insulation type.

### C. Shop Drawings: Provide:

1. The roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof scuppers, terminations, expansion joints, penetrations, and interior drains.
2. Provide project-specific layout and dimensions for each cover board.

### D. Specimen 20-year Warranty: Submit prior to starting work.

### E. Florida Product Approval: Provide NOA documents showing State of Florida Product Approval.

### F. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.

### G. Pre-Installation Notice: Copy to show that manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the manufacturer.

### H. A Warranty Agreement authorized and approved by the manufacturer and bidder prior to the final acceptance for final payment. Executed Warranty.

- I. Proof of compliance with the Technical Special Provisions, Section 01 10 00, Subsection 2.3 – Personnel Qualifications.
- J. Proof of compliance with the Technical Special Provisions, Section 07 54 23, Subsection 1.7 – Quality Assurance.

#### 1.7 QUALITY ASSURANCE

A. Installer Qualifications: Roofing installer shall have the following:

- 1. Current approval, license, or authorization as applicator by the manufacturer.
- 2. Fully staffed office within 100 miles of the job site.
- 3. At least five years' experience in installing specified system.
- 4. Capability to provide payment and performance bond to building owner as required.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.
- C. Keep combustible materials away from ignition sources.

#### 1.9 WARRANTY

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.
- B. Warranty: Warranty covering membrane, roof insulation, and other indicated components of the system, for the term indicated.
  - 1. Limit of Liability: 20 Year. No dollar limitation.
  - 2. Scope of Coverage: Repair leaks in the roofing system caused by:
    - a. Ordinary wear and tear of the elements.
    - b. Manufacturing defect in manufacturer's brand materials.
    - c. Defective workmanship used to install these materials.
    - d. Damage due to winds up to 72 mph.
  - 3. Not Covered:
    - a. Damage due to winds in excess of 72 mph.
    - b. Damage due hurricanes or tornadoes.
    - c. Hail.
    - d. Intentional damage.
    - e. Unintentional damage due to normal rooftop inspections, maintenance, or service.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis Of Design Manufacturer - Roofing System: Firestone Building Products LLC, Carmel, IN, UltraPly TPO ~~over Recover Deck~~ or approved equal.
  - 1. Roofing systems manufactured by others are acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the manufacturer meets the following qualifications:
    - a. Specializing in manufacturing the roofing system to be provided.
    - b. Minimum ten years of experience manufacturing the roofing system to be provided.
    - c. Roofing systems manufactured by the companies listed below are acceptable provided they are completely equivalent in materials and warranty conditions:
      - 1) Carlisle "Sureweld Single Ply TPO ~~over Recover Deck~~".
      - 2) GAF "Everguard Single Ply Roofing ~~over Recover Deck~~".
      - 3) Or Owner approved equal.
- B. Manufacturer of Cover Boards: As specified in Section 2.2; B.
- C. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.
  - 1. Metal roof edging products by other manufacturers are not acceptable.
  - 2. Field- or shop-fabricated metal roof edgings are not acceptable.

### 2.2 ROOFING SYSTEM DESCRIPTION

- A. Roofing System: Thermoplastic polyolefin (TPO) single-ply membrane.
  - 1. Membrane Attachment: Fully adhered.
  - 2. Warranty: Full system warranty; Equal to Firestone UltraPly TPO ~~over Recover Deck~~; 20-year Red Shield Limited Warranty covering membrane, ~~recovery cover~~ board, and membrane accessories.
  - 3. Slope: If Deck is sloped but not enough; provide additional slope of 1/8 inch per foot by means of tapered insulation.
  - 4. Comply with applicable local building code requirements.
  - 5. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
  - 6. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28, and FM DS 1-29, and meeting minimum requirements of FM 1-90 wind uplift rating.
- B. Roofing System Components: Listed in order from the top of the roof down:
  - 1. Membrane: .080" UltraPly TPO (BOD).
  - 2. Cover Board: Equal to DensDeck Prime, Gypsum Based Board, factory primed facer, 1/2" thick.
    - a. Steel Deck - Mechanically fasten through existing roof to deck.
    - b. Concrete Deck - Mechanically fasten through existing roof to deck.
  - 3. Insulation: Tapered: Slope as indicated on roof plan to form crickets and slopes to roof drain; place tapered layer on bottom.

## 2.3 MEMBRANE MATERIALS

- A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878/D6878M, with polyester weft inserted reinforcement and the following additional characteristics:
  - 1. Sheet Width: Provide the widest available sheets to minimize field seaming.
  - 2. Solar Reflectance: 0.79, minimum, when tested in accordance with ASTM C1549.
  - 3. Color: White.
- B. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches wide.
- C. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
  - 1. Thickness: 0.060 inch plus/minus 10 percent.
  - 2. Tensile Strength: 1550 psi, minimum, when tested in accordance with ASTM D638 after heat aging.
  - 3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
  - 4. Tearing Strength: 12 lb., minimum, when tested in accordance with ASTM D1004 after heat aging.
  - 5. Color: White.
  - 6. Acceptable Product: UltraPly TPO Flashing by Firestone or Approved Equal.
- D. Tape Flashing: 5-1/2 inch nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch nominal; TPO QuickSeam Flashing by Firestone or Approved Equal.
- E. Bonding Adhesive: Neoprene and SBR rubber blend, formulated for compatibility with the membrane other substrate materials, including masonry, wood, and insulation.
- F. Facings: Equal to UltraPly Bonding Adhesive by Firestone or Approved Equal.
- G. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Firestone or Approved Equal.
- H. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
- I. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches wide by 0.10 inch thick; Firestone Termination Bar by Firestone or Approved Equal.
- J. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; UltraPly TPO Cut Edge Sealant required by manufacturer or Approved Equal.
- K. General Purpose Sealant: EPDM-based, one-part, white general-purpose sealant; UltraPly TPO General Purpose Sealant required by manufacturer; or Approved Equal.
- L. Coated Metal Flashing and Edgings: Galvanized steel with roofing manufacturer's bonded TPO coating; UltraPly TPO Coated Metal by Firestone or Approved Equal.
- M. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; UltraPly TPO Small and Large Pipe Flashing required by manufacturer.

- N. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch by 30 inches by 40 feet long with patterned traffic bearing surface; manufacturer's standard TPO Walkway Pads.

## 2.4 TAPERED INSULATION FOR CRICKETS AND COVER BOARDS

- A. Polyisocyanurate Board Insulation (Tapered Insulation for Crickets): Closed cell polyisocyanurate foam, complying with ASTM C1289 Type II Class 1, with the following additional characteristics:
  - 1. Size: 48 inches by 48 inches, nominal; to be attached using adhesive.
  - 2. Compressive Strength: 20 psi when tested in accordance with ASTM C1289.
  - 3. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
  - 4. Recycled Content: 19 percent post-consumer and 15 percent pre-consumer (post-industrial), average.
  - 5. Acceptable Product: ISO 300 by Firestone or approved equal.
- B. Gypsum-Based Cover Board (Cover Board) (Concrete Deck / Steel Deck): Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and with the following additional characteristics:
  - 1. Size: 48 inches by 96 inches, nominal.
    - a. Exception: Board to be attached using adhesive or asphalt may be no larger than 48 inches by 48 inches, nominal.
  - 2. Thickness: Equal to 1/2-inch DensDeck Prime.
  - 3. Surface Water Absorption: 2.5 g, maximum, when tested in accordance with ASTM C473.
  - 4. Spanning Capability: Recommended by manufacturer for following minimum flute spans:
    - a. 1/2-inch Thickness: 5 inches, minimum.
  - 5. Surface Burning Characteristics: Flame spread index of 0 (zero), smoke developed index of 0 (zero), when tested in accordance with ASTM E84.
  - 6. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
  - 7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
  - 8. Mold Growth Resistance: Zero growth, when tested in accordance with ASTM D3273 for a minimum of 4 weeks.
  - 9. Acceptable Product: Georgia-Pacific DensDeck Prime Roof Guard or Approved Equal.
- C. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

## 2.5 METAL ACCESSORIES

### A. Metal Termination Bar

- 1. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.

2. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
3. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14-inch-long legs on corner pieces.
4. Scuppers: Welded watertight.
5. Accessories: Provide .032 Aluminum Counter Flashing as shown on the drawings.

## **PART 3 INSTALLATION**

### **3.1 GENERAL**

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

### **3.2 EXAMINATION**

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.



- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptance of project conditions and requirements.

### 3.3 PREPARATION

- A. At penetrations, remove all existing flashings, including lead, asphalt, mastic, etc.
- B. At walls, curbs, and other vertical and sloped surfaces, remove loose and unsecured flashings; remove mineral surfaced and coated flashings; remove excessive asphalt to provide a smooth, sound surface for new flashings.
  - 1. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
  - 2. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease, and other materials that may damage the membrane.
  - 3. Fill all surface voids in the immediate substrate that are greater than 1/4 inch wide with fill material acceptable insulation to membrane manufacturer.
  - 4. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

### 3.4 TAPERED INSULATION AND COVER BOARD INSTALLATION

- A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- B. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch. Fill gaps greater than 1/4 inch with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch.
- C. Deck: Install 1 layer product equal to DensDeck Prime, mechanically fastened through all layers utilizing screws and plates in a quantity and attachment pattern as recommended by the selected membrane manufacturer. Increase fastening in perimeters and corners to meet elevated pressures. Coordinate and verify with Wind Pressure Diagram Sheet information.

### 3.5 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams, bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Install membrane adhered to the substrate, with edge securement as specified.
- E. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.
- F. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.

1. Exceptions: Round pipe penetrations less than 18 inches in diameter and square penetrations less than 4 inches square.
2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

### 3.6 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
  1. Follow roofing manufacturer's instructions.
  2. Remove protective plastic surface film immediately before installation.
  3. Install water block sealant under the membrane anchorage leg.
  4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
  5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
  6. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- C. Existing Scuppers: Remove scupper and install new scupper.
- D. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer.
- E. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches high above membrane surface.
  1. Use the longest practical flashing pieces.
  2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
  3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
  4. Provide termination directly to the vertical substrate as shown on roof drawings.
- F. Roof Drains and Vents:
  1. Existing Drains and Vents: Remove all existing flashings, drain leads, roofing materials and cement from the drain; remove clamping ring.
  2. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed manufacturer's recommendations.
  3. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch of membrane to extend inside clamping ring past drain bolts.
  4. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
  5. Apply sealant on top of drain bowl where clamping ring seats below the membrane.

6. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.
- G. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
  1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
  2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches deep, with at least 1 inch clearance from penetration, sloped to shed water.
  3. Structural Steel Tubing: If corner radii are greater than 1/4 inch and longest side of tube does not exceed 12 inches, flash as for pipes; otherwise, provide a standard curb with flashing.
  4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

### 3.7 FINISHING AND WALKWAY INSTALLATION

- A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
- B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch and maximum of 3.0 inches from each other to allow for drainage.
  1. If installation of walkway pads over field fabricated splices or within 6 inches of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches on either side.
  2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

### 3.8 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e., not a salesperson).
- B. Perform all corrections necessary for issuance of warranty.

### 3.9 CLEANING

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

### 3.10 PROTECTION

- A. Where construction traffic must continue over finished roof membrane, provide durable protection, and replace or repair damaged roofing to original condition.

**END OF SECTION**

**TECHNICAL SPECIAL PROVISIONS  
For  
FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROOF REPLACEMENT  
D4/6 MATERIALS AND RESEARCH OFFICE  
(14200 WEST SR84, DAVIE, FL 33325)**

**Financial Project Number:  
450053-9-52-01**

**Addendum No. 3, Revised 12/20/2023  
(Clean Version)**

**SECTION 00 01 10  
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**THE FOLLOWING SPECIFICATION SECTIONS ARE ADDED AS A TECHNICAL SPECIAL PROVISION AND SHALL GOVERN "LUMP SUM" CONSTRUCTION WORK**

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**SECTION 01 10 00**  
**GENERAL INFORMATION FOR ALL SECTIONS**

**PART 1 DESCRIPTION**

**1.1 SUMMARY**

- A. Work under this Technical Special Provision (TSP) includes the removal of the existing roof, furnishing and installing new roof and finish with Thermoplastic Polyolefin (TPO) covering approximately 20,000 square ft. for DOT D4/6 Materials and Research Office, (FDOT Building Number 4388) located at 14200 West State Road 84 Davie, FL 33325. Scope does not include the adjoining garage. All work shall be performed in accordance with the corresponding specifications of the Manufacture.

**PART 2 QUALITY CONTROL**

**2.1 SUMMARY**

- A. Quality Control Plan: Contractor shall provide bi-yearly inspections and advise if maintenance is needed to ensure manufacture warranty for the full 20-year life cycle. The inspection shall be performed without additional cost to the Owner. The Contractor shall provide a quote for the recommended maintenance which if performed would be at the Owner's expense.
- B. Source limitation: Obtain all products or systems for each Section from a single source manufacturer for each product required. Multiple sources for the same product or system is not permitted.
- C. Weather limitations: Proceed with installation only when the existing and forecasted weather conditions permit assembly or installation as required by the manufacturer of the specified product, system, or equipment.
- D. Environmental limitations: Do not install products, systems, or equipment on the interior environment until ambient temperature and humidity conditions are maintained at levels indicated in reference standards and manufacture's written instructions.
- E. Remove and replace applications that do not comply with the manufacturer's written requirements.
- F. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
- G. Where required, provide compliance with the 2020 Florida Building Code.

**2.2 TESTING AGENCY QUALIFICATIONS**

- A. For testing agency providing classification markings, an inspection agency acceptable to the authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

**2.3 PERSONNEL QUALIFICATIONS**

- A. Roofing supervisor will have a minimum of 5 years of documented/verifiable experience on similar projects or larger.
- B. Provide references along with contact information for job history check.
- C. Where required by the product, system, or equipment Manufacturer, installers and supervisors shall be trained and approved by the manufacturer.
- D. Provide the qualifications of all of the above personnel

**2.4 SHOP DRAWINGS**

- A. Provide shop drawings of the proposed work for this Technical Special Provision. Shop Drawings shall include but not be limited to those items listed herein.

## **PART 3 MANUFACTURER'S WARRANTIES**

### **3.1 SUMMARY**

- A. Secure all warranties provided by the manufacturer for the specific equipment or material included in this TSP. Ensure that all warranties are fully transferable from the Contractor to the Department within the project limits. Transfer warranties upon final acceptance. Document all warranties and warranty transfers and provide a copy to the Project Manager. Terms and Conditions: Ensure that the terms and conditions of warranties are documented by the manufacturer for equipment and material submittals on construction projects. Include terms for a specified service performance with provisions for repair parts and labor or for replacement. When a warranty is available, ensure that it accompanies the manufacturer's billing invoice. Ensure warranties require the manufacturer to furnish replacements for any part or equipment found to be defective during the manufacturer's warranty period at no cost to the Department within the project limits.

**END OF SECTION**

**SECTION 07 01 50.19**  
**PREPARATION FOR RE-ROOFING**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Complete removal of existing roofing system in preparation for a new roof membrane system.

1.2 RELATED REQUIREMENTS

- A. Section 07 54 23 - Thermoplastic-Polyolefin Roofing (TPO)

1.3 REFERENCE STANDARDS

- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with affected mechanical and electrical work associated with roof penetrations.
- B. Preinstallation Meeting: Convene one week before starting work of this section. Coordinate meeting time with FDOT Project Manager.
- C. Schedule work to coincide with commencement of installation of new roofing system.

1.5 FIELD CONDITIONS

- A. Maintain continuous temporary protection prior to and during installation of new roofing system.
- B. Documents were prepared based on casual field observations and information provided by FDOT. It is incumbent upon the bidder to observe the existing conditions in and around the site and draw his own conclusions and report any concerns in writing to the FDOT Project Manager.
- C. Existing Mechanical Equipment shall stay operational to the greatest extent possible. Coordinate temporary shutdown during buildings non-operational hours in advance with FDOT Project Manager.
- D. Coordinate with FDOT Project Manager as to the removal and disposition of debris storage on site; delivery and storage of new material on site; and the coming and going of personnel and vehicles.
- E. Coordinate with FDOT Project Manager as to any security requirements in and around the building and the site.
- F. Existing satellite dish and related concrete masonry units and metal framing shall be removed and stored on site as directed by FDOT Project Manager.

**PART 2 PRODUCTS**

2.1 MATERIALS

- A. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.
- B. Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, moisture and fire-resistant board with factory applied acrylic primer coating.
  - 1. Board Size: 4 feet by 8 feet.
  - 2. Board Thickness: 1/2 inch.
  - 3. Board Edges: Square.



## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that existing roof surface is clear and ready for work of this section.
- B. Inspection of the existing condition of the corrugated roof deck shall be performed by the bidder to confirm the roof is ready for re-roofing.

### **3.2 PREPARATION**

- A. Sweep roof surface clean of loose matter.
- B. Remove loose refuse and dispose off site.

### **3.3 MATERIAL REMOVAL**

- A. Remove only existing roofing materials that can be replaced with new materials the same day.
- B. Remove metal counter flashings.
- C. Remove existing roof membrane vents.
- D. Prepare existing substrates as required by roofing manufacturer to receive new roof system.
- E. Remove and replace roof mounted condensing units to properly flash curbs with roofing membrane. Temporarily detach ductwork, wiring and condensate lines as required and reattach to make units fully functional and operational. All HVAC work shall be accomplished by a licensed mechanical contractor.
- F. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.
- G. Cut and lay flat any membrane blisters.
- H. Remove damaged insulation and fasteners, cant strips and blocking as required.

### **3.4 PROTECTION**

- A. Provide temporary protective sheeting over uncovered deck surfaces.
- B. Turn sheeting up back of parapet to bottom of cornice, retain sheeting in position with weights.
- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.

**END OF SECTION**

**SECTION 07 54 23**  
**THERMOPLASTIC-POLYOLEFIN ROOFING (TPO)**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Project Name: State Of Florida Department of Transportation - D4/6 MATERIALS AND RESEARCH OFFICE ROOF REPLACEMENT.
- B. Thermoplastic membrane roofing system, including all components specified.
- C. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in a manner complying with all applicable federal, state, and local regulations.
- D. Commencement of work by Contractor shall constitute acknowledgement by Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 01 50.19 - Preparation for Re-Roofing

**1.3 DEFINITIONS**

- A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.

**1.4 REFERENCE STANDARDS**

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- C. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
- D. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
- E. ASTM D1079 - Standard Terminology Relating to Roofing and Waterproofing.
- F. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C.
- I. FM DS 1-28 - Wind Design.
- J. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System.
- K. ISO 9000 - ISO Standards Compendium: ISO 9000 - Quality management.

**1.5 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
  - 1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.

2. Coordinate meeting time with FDOT Project Manager in advance of meeting.

## 1.6 SUBMITTALS

### A. Product Data:

1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include at least the following:
  - a. Technical data sheet for roof membrane.
  - b. Technical data sheets for splice tape and adhesives.
  - c. Technical data sheet for batten strips and fasteners.
  - d. Technical data sheet for each cover board type.
  - e. Technical data sheet for each type of metal edging.
2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable; include data itemizing the components of the classified or approved system.
3. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.

### B. Samples: Submit samples of at least the following:

1. Sample of roof membrane.
2. Sample of termination bar and counter flashing.
3. Sample of walkway pads.
4. Sample of each insulation type.

### C. Shop Drawings: Provide:

1. The roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof scuppers, terminations, expansion joints, penetrations, and interior drains.
2. Provide project-specific layout and dimensions for each cover board.

### D. Specimen 20-year Warranty: Submit prior to starting work.

### E. Florida Product Approval: Provide NOA documents showing State of Florida Product Approval.

### F. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.

### G. Pre-Installation Notice: Copy to show that manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the manufacturer.

### H. A Warranty Agreement authorized and approved by the manufacturer and bidder prior to the final acceptance for final payment. Executed Warranty.

- I. Proof of compliance with the Technical Special Provisions, Section 01 10 00, Subsection 2.3 – Personnel Qualifications.
- J. Proof of compliance with the Technical Special Provisions, Section 07 54 23, Subsection 1.7 – Quality Assurance.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Roofing installer shall have the following:
  - 1. Current approval, license, or authorization as applicator by the manufacturer.
  - 2. Fully staffed office within 100 miles of the job site.
  - 3. At least five years' experience in installing specified system.
  - 4. Capability to provide payment and performance bond to building owner as required.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.
- C. Keep combustible materials away from ignition sources.

#### 1.9 WARRANTY

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.
- B. Warranty: Warranty covering membrane, roof insulation, and other indicated components of the system, for the term indicated.
  - 1. Limit of Liability: 20 Year. No dollar limitation.
  - 2. Scope of Coverage: Repair leaks in the roofing system caused by:
    - a. Ordinary wear and tear of the elements.
    - b. Manufacturing defect in manufacturer's brand materials.
    - c. Defective workmanship used to install these materials.
    - d. Damage due to winds up to 72 mph.
  - 3. Not Covered:
    - a. Damage due to winds in excess of 72 mph.
    - b. Damage due hurricanes or tornadoes.
    - c. Hail.
    - d. Intentional damage.
    - e. Unintentional damage due to normal rooftop inspections, maintenance, or service.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Basis Of Design Manufacturer - Roofing System: Firestone Building Products LLC, Carmel, IN, UltraPly TPO or approved equal.
  - 1. Roofing systems manufactured by others are acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the manufacturer meets the following qualifications:
    - a. Specializing in manufacturing the roofing system to be provided.
    - b. Minimum ten years of experience manufacturing the roofing system to be provided.
    - c. Roofing systems manufactured by the companies listed below are acceptable provided they are completely equivalent in materials and warranty conditions:
      - 1) Carlisle "Sureweld Single Ply TPO".
      - 2) GAF "Everguard Single Ply Roofing".
      - 3) Or Owner approved equal.
- B. Manufacturer of Cover Boards: As specified in Section 2.2; B.
- C. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.
  - 1. Metal roof edging products by other manufacturers are not acceptable.
  - 2. Field- or shop-fabricated metal roof edgings are not acceptable.

### **2.2 ROOFING SYSTEM DESCRIPTION**

- A. Roofing System: Thermoplastic polyolefin (TPO) single-ply membrane.
  - 1. Membrane Attachment: Fully adhered.
  - 2. Warranty: Full system warranty; Equal to Firestone UltraPly TPO; 20-year Red Shield Limited Warranty covering membrane, cover board, and membrane accessories.
  - 3. Slope: If Deck is sloped but not enough; provide additional slope of 1/8 inch per foot by means of tapered insulation.
  - 4. Comply with applicable local building code requirements.
  - 5. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
  - 6. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28, and FM DS 1-29, and meeting minimum requirements of FM 1-90 wind uplift rating.
- B. Roofing System Components: Listed in order from the top of the roof down:
  - 1. Membrane: .080" UltraPly TPO (BOD).
  - 2. Cover Board: Equal to DensDeck Prime, Gypsum Based Board, factory primed facer, 1/2" thick.
    - a. Steel Deck - Mechanically fasten through existing roof to deck.
    - b. Concrete Deck - Mechanically fasten through existing roof to deck.
  - 3. Insulation: Tapered: Slope as indicated on roof plan to form crickets and slopes to roof drain; place tapered layer on bottom.

## 2.3 MEMBRANE MATERIALS

- A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878/D6878M, with polyester weft inserted reinforcement and the following additional characteristics:
  - 1. Sheet Width: Provide the widest available sheets to minimize field seaming.
  - 2. Solar Reflectance: 0.79, minimum, when tested in accordance with ASTM C1549.
  - 3. Color: White.
- B. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches wide.
- C. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
  - 1. Thickness: 0.060 inch plus/minus 10 percent.
  - 2. Tensile Strength: 1550 psi, minimum, when tested in accordance with ASTM D638 after heat aging.
  - 3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
  - 4. Tearing Strength: 12 lb., minimum, when tested in accordance with ASTM D1004 after heat aging.
  - 5. Color: White.
  - 6. Acceptable Product: UltraPly TPO Flashing by Firestone or Approved Equal.
- D. Tape Flashing: 5-1/2 inch nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch nominal; TPO QuickSeam Flashing by Firestone or Approved Equal.
- E. Bonding Adhesive: Neoprene and SBR rubber blend, formulated for compatibility with the membrane other substrate materials, including masonry, wood, and insulation.
- F. Facings: Equal to UltraPly Bonding Adhesive by Firestone or Approved Equal.
- G. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Firestone or Approved Equal.
- H. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
- I. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches wide by 0.10 inch thick; Firestone Termination Bar by Firestone or Approved Equal.
- J. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; UltraPly TPO Cut Edge Sealant required by manufacturer or Approved Equal.
- K. General Purpose Sealant: EPDM-based, one-part, white general-purpose sealant; UltraPly TPO General Purpose Sealant required by manufacturer; or Approved Equal.
- L. Coated Metal Flashing and Edgings: Galvanized steel with roofing manufacturer's bonded TPO coating; UltraPly TPO Coated Metal by Firestone or Approved Equal.
- M. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; UltraPly TPO Small and Large Pipe Flashing required by manufacturer.

- N. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch by 30 inches by 40 feet long with patterned traffic bearing surface; manufacturer's standard TPO Walkway Pads.

## 2.4 TAPERED INSULATION FOR CRICKETS AND COVER BOARDS

- A. Polyisocyanurate Board Insulation (Tapered Insulation for Crickets): Closed cell polyisocyanurate foam, complying with ASTM C1289 Type II Class 1, with the following additional characteristics:
  - 1. Size: 48 inches by 48 inches, nominal; to be attached using adhesive.
  - 2. Compressive Strength: 20 psi when tested in accordance with ASTM C1289.
  - 3. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
  - 4. Recycled Content: 19 percent post-consumer and 15 percent pre-consumer (post-industrial), average.
  - 5. Acceptable Product: ISO 300 by Firestone or approved equal.
- B. Gypsum-Based Cover Board (Cover Board) (Concrete Deck / Steel Deck): Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and with the following additional characteristics:
  - 1. Size: 48 inches by 96 inches, nominal.
    - a. Exception: Board to be attached using adhesive or asphalt may be no larger than 48 inches by 48 inches, nominal.
  - 2. Thickness: Equal to 1/2-inch DensDeck Prime.
  - 3. Surface Water Absorption: 2.5 g, maximum, when tested in accordance with ASTM C473.
  - 4. Spanning Capability: Recommended by manufacturer for following minimum flute spans:
    - a. 1/2-inch Thickness: 5 inches, minimum.
  - 5. Surface Burning Characteristics: Flame spread index of 0 (zero), smoke developed index of 0 (zero), when tested in accordance with ASTM E84.
  - 6. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
  - 7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
  - 8. Mold Growth Resistance: Zero growth, when tested in accordance with ASTM D3273 for a minimum of 4 weeks.
  - 9. Acceptable Product: Georgia-Pacific DensDeck Prime Roof Guard or Approved Equal.
- C. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

## 2.5 METAL ACCESSORIES

### A. Metal Termination Bar

- 1. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.

2. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
3. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14-inch-long legs on corner pieces.
4. Scuppers: Welded watertight.
5. Accessories: Provide .032 Aluminum Counter Flashing as shown on the drawings.

## **PART 3 INSTALLATION**

### **3.1 GENERAL**

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

### **3.2 EXAMINATION**

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.



- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptance of project conditions and requirements.

### 3.3 PREPARATION

- A. At penetrations, remove all existing flashings, including lead, asphalt, mastic, etc.
- B. At walls, curbs, and other vertical and sloped surfaces, remove loose and unsecured flashings; remove mineral surfaced and coated flashings; remove excessive asphalt to provide a smooth, sound surface for new flashings.
  - 1. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
  - 2. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease, and other materials that may damage the membrane.
  - 3. Fill all surface voids in the immediate substrate that are greater than 1/4 inch wide with fill material acceptable insulation to membrane manufacturer.
  - 4. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

### 3.4 TAPERED INSULATION AND COVER BOARD INSTALLATION

- A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- B. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch. Fill gaps greater than 1/4 inch with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch.
- C. Deck: Install 1 layer product equal to DensDeck Prime, mechanically fastened through all layers utilizing screws and plates in a quantity and attachment pattern as recommended by the selected membrane manufacturer. Increase fastening in perimeters and corners to meet elevated pressures. Coordinate and verify with Wind Pressure Diagram Sheet information.

### 3.5 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams, bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Install membrane adhered to the substrate, with edge securement as specified.
- E. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.
- F. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.

1. Exceptions: Round pipe penetrations less than 18 inches in diameter and square penetrations less than 4 inches square.
2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

### 3.6 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
  1. Follow roofing manufacturer's instructions.
  2. Remove protective plastic surface film immediately before installation.
  3. Install water block sealant under the membrane anchorage leg.
  4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
  5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
  6. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- C. Existing Scuppers: Remove scupper and install new scupper.
- D. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer.
- E. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches high above membrane surface.
  1. Use the longest practical flashing pieces.
  2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
  3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
  4. Provide termination directly to the vertical substrate as shown on roof drawings.
- F. Roof Drains and Vents:
  1. Existing Drains and Vents: Remove all existing flashings, drain leads, roofing materials and cement from the drain; remove clamping ring.
  2. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed manufacturer's recommendations.
  3. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch of membrane to extend inside clamping ring past drain bolts.
  4. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
  5. Apply sealant on top of drain bowl where clamping ring seats below the membrane.

6. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.
- G. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
  1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
  2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches deep, with at least 1 inch clearance from penetration, sloped to shed water.
  3. Structural Steel Tubing: If corner radii are greater than 1/4 inch and longest side of tube does not exceed 12 inches, flash as for pipes; otherwise, provide a standard curb with flashing.
  4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

### 3.7 FINISHING AND WALKWAY INSTALLATION

- A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
- B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch and maximum of 3.0 inches from each other to allow for drainage.
  1. If installation of walkway pads over field fabricated splices or within 6 inches of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches on either side.
  2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

### 3.8 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e., not a salesperson).
- B. Perform all corrections necessary for issuance of warranty.

### 3.9 CLEANING

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

### 3.10 PROTECTION

- A. Where construction traffic must continue over finished roof membrane, provide durable protection, and replace or repair damaged roofing to original condition.

**END OF SECTION**