

DIVISION 07 – THERMAL & MOISTURE PROTECTION  
Section 07 54 23 - Thermoplastic Polyolefin (TPO) Roofing

PART 1 - GENERAL

1.1 WORK INCLUDES

- A. Contractor shall coordinate work with larger project CDB 805-030-020 for roof replacement of the entire facility.
- B. Base Bid: Unless noted otherwise, the General Prime Contractor shall provide all labor and materials for the complete installation of work as specified in this section.
  - 1. Single-ply TPO fully adhered membrane roofing and flashing system as shown and herein specified.
  - 2. Modify edge of existing TPO roof system (CDB 805-030-020) as required to install new insulation and roof system.
  - 3. Install new:
    - a. Vapor retarder (Roof Area 10 only).
    - b. Structural deck and structural framing at openings in metal decks created by the removal of existing capped openings and rooftop equipment not designated to be reinstalled.
    - c. Insulation.
    - d. Coverboard.
    - e. TPO roof membrane.
    - f. Termination bar.
    - g. Counterflashing.
    - h. Coping caps.

1.2 RELATED SECTIONS

- 1. Division 6 Section – Rough Carpentry.
- 2. Division 7 Section – Sheet Metal Flashing & Trim.
- 3. Division 7 Section – Sealants & Caulking.

1.3 DEFINITIONS

- 1. Roofing System Manufacturer: Any of the manufacturers whose systems are specified under "Acceptable Roofing System Manufacturers" in this section hereinafter called "manufacturer."

1.4 QUALITY ASSURANCE

- A. Qualifications:
  - 1. The installing contractor shall be approved or franchised by the roofing system manufacturer.
  - 2. The job foreman shall be trained by the manufacturer in the installation of the specified system.
  - 3. The installing contractor shall comply with the Illinois Roofing Industry Licensing Act.

- B. **Manufacturer's Qualifications:** Manufacturer shall be on CDB's roster of approved roofing system manufacturers. (Note: New roof that is part of this project scope is under 500 SF and as such does not require RSMW. This project shall coordinate with larger project CDB 805-030-020 for roof replacement of the entire facility.)
- C. **Preliminary Roofing Conference:** Before starting roof deck construction, conduct conference at Project site.
1. Meet with CDB, IMSA, Architect, IMSA's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
  7. Review governing regulations and requirements for insurance and certificates if applicable.
  8. Review temporary protection requirements for roofing system during and after installation.
  9. Review roof observation and repair procedures after roofing installation.
- D. **Preinstallation Roofing Conference:** Conduct conference at Project site.
1. Meet with CDB, IMSA, Architect, IMSA's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
  7. Review governing regulations and requirements for insurance and certificates if applicable.
  8. Review temporary protection requirements for roofing system during and after installation.
  9. Review roof observation and repair procedures after roofing installation.

## 1.5 REFERENCES

- A. Cited Standards and specified manufacturers' catalogs, current at the date of bidding documents, unless otherwise specified, are incorporated herein by reference and govern the work. If conflict is discovered between referenced Standards or catalogs and the project specifications, request written clarification from the A/E. Do not proceed with the work until receiving clarification.
- B. Standards:
  - 1. American Society for Testing and Materials (ASTM).
  - 2. Factory Mutual Laboratories (FM).
  - 3. Underwriters Laboratories (UL)
  - 4. Sheet Metal and Air Conditioning Contractors National Assoc. (SMACNA)
  - 5. EPA – Energy Star Roof Products
  - 6. Cool Roof Ratings Council

## 1.6 SUBMITTALS

- A. Make all submittals in accord with the Standard Documents for Construction, Section 01 33 23.
- B. Endorsement of Roofing Firm: Contractor: Within 15 days of receiving the Notice of Award, submit the manufacturer's endorsement of the installing firm.
- C. Shop Drawings:
  - 1. Submit shop drawings to the manufacturer for review and comment.
  - 2. Submit only manufacturer reviewed shop drawings to the A/E.
  - 3. Minimum Scale for Roof Plan:  $1/8" = 1' 0"$ .
  - 4. Minimum Scale for Details:  $1-1/2" = 1' 0"$ .
  - 5. Submit the following:
    - a. Tapered roof insulation plan
    - b. Insulation fastener pattern.
    - c. Base flashings.
    - d. Reglets.
    - e. Membrane terminations.
    - f. Roof projection flashings.
- D. Samples:
  - 1. Roof insulation, 8" x 10, 2 pieces.
  - 2. Insulation fastener and plate, 2 of each.
  - 3. TPO membrane, 4" x 6", 3 pieces.
- E. Product Data:
  - 1. Manufacturer's specifications for roofing system, 2 sets.
  - 2. Roof insulation specifications, 2 sets.

1.7 JOB CONDITIONS

A. Protection:

1. Protect existing roof (from CDB project CDB 805-030-020) and maintain roof system warranty of that existing roof.
2. Protect roof membrane, building surfaces, paving, and landscaping from traffic and roofing equipment.
3. Restore or replace all work or materials damaged by the roofing operation.
4. Remove protection materials upon completion of the work.

B. Sequencing, Scheduling Coordination: In accord with the Standard Documents for Construction, Section 01 31 20.

C. Comply with all regulations imposed by the using agency at the job site.

1.8 WARRANTY

A. General Contractor: Two years in accord with the Standard Documents for Construction, Section 01 78 36.

B. Manufacturer: Provide standard manufacturer's warranty for installed system. Warranty shall match that of larger roof replacement project for the entire facility (CDB 805-030-020).

1. Metal Finish Warranty Length: 20 years.
2. Watertight Warranty Length: 20 Years.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For the entire roofing system provide adhesives, sealants, pre-molded and field fabricated flashings, fasteners, and other related components manufactured or recommended by the selected manufacturer.

2.2 ACCEPTABLE TPO ROOFING SYSTEM MANUFACTURERS

	<u>CODE</u>	<u>BRAND</u>	<u>MANUFACTURER</u>
1.	CAR	Sure-Weld	Carlisle SynTec Systems, Carlisle, PA.
2.	FIR	UltraPly	Firestone Building Products, Indianapolis, IN.
3.	MAN	JM TPO	Johns-Manville, Denver, CO.

2.3 ACCEPTABLE SYSTEMS

- A. Fully Adhered .060 TPO.
1. Carlisle – Sure-Weld
  2. Firestone – UltraPly
  3. Johns Manville – JM TPO

## 2.4 ROOF INSULATION

A. The Contractor shall select a brand acceptable to the roofing manufacturer.

B.	<u>INSULATION TYPE</u>	<u>ASTM</u>	<u>R/INCH</u>
1.	Base Insulation		
a.	Polyisocyanurate	C1289	5.70 (LTTR)
2.	Coverboard (1/4" minimum thickness)		
a.	Invinsa – Johns Manville		
b.	Isogard HD – Firestone		
c.	SecurShield HD – Carlisle		

C. Roof Insulation for Tapered Areas:

1. Polyisocyanurate, Minimum Thickness: 1/2 inch . Slope: 1/8 in./ft. min., (Final roof slope to be 1/4 in./ft. minimum, refer to Section 07 54 23, H, 1 for existing structural slope information).
2. Crickets & Saddles: Polyisocyanurate, Slope: double the slope of the roof field on which the cricket is installed.
3. 1/4" minimum coverboard.
4. LTTR of finished roof system shall achieve a minimum insulating value of R-25.

D. Roof Insulation for Non-Tapered Areas:

1. First Layer: Polyisocyanurate, Minimum thickness: 1.5 inches
2. Second and Subsequent Layers: Polyisocyanurate, Minimum thickness: 1.5 inches (or thickness required to achieve a finish roof system with a LTTR value of R-25)
3. Crickets & Saddles: Polyisocyanurate, Slope: 1/4 in./ft.
4. 1/4" minimum coverboard.
5. LTTR of finished roof system shall achieve a minimum insulating value of R-25.

## 2.5 INSULATION ATTACHMENT

- A. Fasteners manufactured or approved by the roofing system manufacturer, and that have Factory Mutual approval.
- B. Adhesive manufactured or approved by the roofing system manufacturer, and that have Factory Mutual approval.
- C. Mechanically attach the first layer only on roof areas with a steel deck and fully adhere all subsequent layers.

## 2.6 OTHER MATERIALS

- A. Wood Nailers: Wood shall be No. 2 or better construction grade lumber.

- B. Manufacturer's TPO Flashing.
- C. Termination Bar: Required by CDB on all wall terminations. Attach 6" o.c.
  - 1. 040" x 1" aluminum bar under counterflashing or other restricted spaces.
  - 2. 1/8" x 1-1/2" aluminum bar with 45° sealant pocket where space permits.
- D. TPO coated steel sheet: 20mil non-reinforced TPO membrane laminated to 24ga G-90 galvanized sheet.

### PART 3 - EXECUTION

#### 3.1 ENVIRONMENTAL CONDITIONS

- A. Remove existing roofing only in dry weather.
- B. Install roofing only in dry weather.
- C. Comply with manufacturer's climatic restrictions.

#### 3.2 REMOVE EXISTING CONSTRUCTION

- A. Temporary removals:
  - 1. Temporarily remove items in a quantity and manner such that they can be completely reinstalled on the same workday that they are removed
- B. Permanent removals:
  - 1. Remove all existing roof membrane, roof insulation, flashing, and related components down to the roof deck where necessary to install new roof system.

#### 3.3 INSPECTION

- A. Examine all surfaces for inadequate anchorage, foreign material, moisture, unevenness, or other conditions which could prevent the best quality and longevity of roofing, flashing, and accessory components. Notify the A/E of all deficiencies.
- B. Do not proceed with the work until all deficiencies have been corrected to the satisfaction of the A/E and the roofing manufacturer.

#### 3.4 PREPARATION

- A. Ensure that all surfaces are clean and dry before starting and during performance of work.
- B. Verify that all work of other contractors and subcontractors which penetrates the roof deck or requires men and equipment to traverse the roof deck has been completed.

### 3.5 INSTALLATION

- A. Install the roof insulation with end joints staggered at mid-point in each layer. Offset all joints between layers a minimum of six inches.
  - 1. Attach insulation per manufacturer's recommendations.
- B. Install the roofing and flashing system and all accessory items in accord with the manufacturer's printed instructions.
- C. Weld all field seams using the manufacturer's approved welding equipment and in accord with the manufacturer's recommendations.

### 3.6 FIELD QUALITY CONTROL

- A. The A/E will provide onsite observation during installation.
- B. The roofing manufacturer will provide onsite observation and instruction as they deem necessary, but not less than two (2) site visits each week during construction.

### 3.7 ADJUST AND CLEAN

- A. Carefully inspect all completed work and correct all defects.
- B. Remove from the job site and legally dispose of all debris.
- C. Remove all tools, equipment, and construction aids.
- D. Prevent storage of materials and equipment on the completed roof.
- E. Accompany the manufacturer's technical inspector and assist with equipment and workmen if necessary to provide access to the roof. Correct all defects noted during the inspection.

END OF SECTION 07 54 23

