

SECTION 07 59 00
CUTTING AND PATCHING MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Partial removal of existing roofing system as required for preparation of new construction.
- B. Patch or replace existing roofing where abuts new construction, at flashing and other penetrations occurring through existing roof.
 - 1. Tapered and flat insulation beneath the roofing work of this Section.
- C. Repair existing roofing damaged by the work of this Contract.
- D. Walkway rolls leading from roof access point to each rooftop mechanical unit and at work areas surrounding rooftop units, or as otherwise indicated on the Drawings.
- E. Provide manufacturer's pre-construction and final inspection as required for maintenance of Owner's warranty. These inspections are to be included in the base bid; additional inspections, or work incurred as a result of the final inspection shall be without additional cost to the Owner.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - ROUGH CARPENTRY:
 - 1. Removal and replacement of rotted or damaged existing roof sheathing.
 - 2. Pressure treated blocking, curbing and nailers.
- B. Section 07 72 00 - ROOF ACCESSORIES: New roof curbs and equipment supports.
- C. Division 22 - PLUMBING: Mechanical system and plumbing penetrations through existing roof.
- D. Division 26 - ELECTRICAL; Electrical system penetrations through existing roof.

1.3 REFERENCES

- A. Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01 42 00 - REFERENCES.
 - 1. FM Roof Assembly Classifications and Loss Prevention requirements I-28 and I-29S.
 - 2. UL Fire Resistance Directory.
 - 3. All applicable federal, state and municipal codes, laws and regulations for fire- resistance roof ratings.
- B. The following reference materials are hereby made a part of this Section by reference thereto:
 - 1. NRCA Roofing and Waterproofing Manual, latest printing.

1.4 SUBMITTALS

- A. Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:
 - 1. Literature: Manufacturer's product data sheets, specifications, performance data, physical properties and installation instructions for all proposed items and schedule indicating locations of all roofing accessories.
 - 2. Shop drawings:
 - a. Submit shop drawings showing construction details with specific instructions for attachment and tie-ins.
 - b. Indicate roof walkway locations.
 - 3. Review statement: Written statement, signed by the roofing applicator, stating that the Contract Drawings have been reviewed by an agent of the roofing system manufacturer; accompanied by a pre-installation written statement from the manufacturer that the selected roof system is proper, compatible, and adequate for the application shown.
 - a. The roofing applicator will notify the Architect and Owner in writing if the existing conditions when exposed are in conflict with the Contract Documents for the proper application of the selected roofing system or the warranty requirements.
- B. Submit the following under provisions of Section 01 78 00 - CLOSEOUT SUBMITTALS:
 - 1. Manufacturer's field quality control reports of field inspections, including, revised "as- built" shop drawings and manufacturer's final punch list.
 - 2. Manufacturer's warranties: Include coverage of materials and installation and resultant damage from failure of installation to resist penetration of moisture.

1.5 QUALITY ASSURANCE

- A. The manufacturer's authorized representative shall provide a final inspection at the completion of the project to insure, that the project has been completed in accordance with the manufacturer's warranty requirements. Upon approval and acceptance of the project, an updated manufacturer's warranty certification shall be written, executed and furnished to the Owner.
- B. Submit Manufacturer's field quality control reports of field inspections, including, revised "as-built" shop drawings and manufacturer's final punch list.
- C. All roofing shall be as described in this Section and shall be provided and approved by the existing roof system manufacturer whose warranty is active. Any materials not manufactured or provided by this roofing manufacturer shall have written approval from the roofing manufacturer stating the materials are acceptable and are compatible with the other materials and systems required.
- D. The roof system manufacturer's Technical Specifications shall be considered a part of this specification and should be used as a reference for specific application procedures and recommendations. Where a conflict does exist between the manufacturer's written specifications and those procedures specified in this Section, the more stringent requirements meeting the Manufacturer's minimum requirements for the provided warranty shall apply.

1.6 QUALIFICATIONS

- A. Roofing applicator, with a minimum of 3 years documented experience demonstrating previously successful work of the type specified herein, and shall be trained and certified by roofing manufacturer of the existing roof system.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store all materials in accordance with the manufacturer's recommendations. Protect materials from water and direct sunlight and damage.
- B. Distribute any materials stored on roof levels for immediate use to prevent concentrated loads that would impose excessive strain on deck or structural members. Protect roof stored materials to prevent displacement by the wind and protect from exposure to inclement weather and sun.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not remove existing roofing when weather conditions threaten the integrity of the building contents or intended continued occupancy.
- B. Apply roofing in dry weather; do not install roofing in inclement weather or when precipitation is predicted with greater than 20 percent possibility.
- C. Do not apply roofing membrane to damp or frozen deck surface.
- D. Apply roofing when ambient temperature is above 40 degrees Fahrenheit.

1.9 WARRANTY

- A. Deliver to the Owner upon completion of the work of this Section, a new unconditional warranty on the work of this Section including repairs of existing roof to remain. Warranty shall include the prompt repair of in-place roofing as necessary to prevent penetration of water through it.
 - 1. Warranty shall cover same terms as previous warranty, and include membrane, insulation, adhesives, sealant, fasteners, membrane flashings, and other materials furnished and installed under this Section.
 - 2. Warranty shall cover product quality, performance, and workmanship for a extended period of 20 years from date of Project Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND MATERIALS IN GENERAL

- A. Materials shall be provided by manufacturer of existing roofing system, in full compliance with existing valid roofing warranty. Where an existing roofing warranty has expired and is no longer in effect, manufacturers offering products which may be incorporated in the work are limited to, the following:
 - 1. Firestone Building Products Co., LLC, Indianapolis, IN.

2.2 ROOFING MATERIALS

- A. Roofing membrane: Fabric reinforced TPO sheet complying with ASTM D 6878, internally fabric- or scrim-reinforced, uniform, flexible TPO sheet, with a nominal thickness of 60 mils.
 - 1. Exposed face color: White.
- B. Flashing material: Manufacturer's standard system compatible with flexible sheet membrane.

- C. Bonding adhesive shall be as recommended by manufacturer. Adhesive shall be compatible with all materials to which the elastomeric membrane is to be bonded.
- D. Insulation materials:
 - 1. Acceptable manufacturers: Subject to acceptance of roofing manufacturer and the following specification requirements:
 - a. Pactiv Building Products, Atlanta, GA.
 - b. DiversiFoam Products, Rockford, MN.
 - c. The Dow Chemical Corp., Midland, MI.
 - d. Owens-Corning Roofing Products LLC, Toledo, OH.
 - 2. Extruded polystyrene roofing insulation: Thermal conductivity (K-factor) shall be 0.20 or better. Insulation shall meet or exceed requirements of and ASTM C 578.
 - a. Thickness to provide R-value required by Commonwealth of Virginia State Building Code or as indicated on the Drawings.
 - b. Compressive strength: 25 psi (ASTM D1621).
 - c. Moisture vapor transmission: Less than 1 perm (ASTM E-96).
 - d. Water absorption: Less than 0.1 percent per volume (ASTM C272).
 - e. Provide tapered insulation system as required to meet elevations and slopes shown on drawings or as required by membrane manufacturer, whichever is more stringent. Provide cants and crickets at drains as necessary.
 - 3. Overlayment (recovery) board: 1/2 inch thick complying with ASTM C 1177 and FM 4450, Class I, non-structural glass mat faced, noncombustable, water-resistant treated gypsum core panel.
 - a. Acceptable manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:
 - 1) Georgia-Pacific Building Products, Atlanta, GA, product: "DensDeck Roof Board".
 - 2) United States Gypsum Company, Chicago, IL, product: "Securock Glass- Mat Roof Board".
- E. All accessories, including splicing cement, in-seam sealant, lap sealant, cutoff mastic, night sealer, elastomeric accessories, nailing strips, cant strips, tapered edge strips, and flashing accessories shall be as recommended by roofing manufacturer.
- F. Termination bars: Minimum 1/8 inch thick extruded aluminum, of channel profile with 1/4- inch legs and minimum overall width of 2 inches. Termination bar shall be factory punched to accept fasteners 6 inches on-center. Install with stainless steel screw fasteners.
- G. Screws: Steel fastener with fluorocarbon coating. Minimum thread diameter 0.22 inches and minimum shank diameter of 0.172 inches.
- H. Masonry fasteners: Round head stainless steel screw and neoprene washer with lead expansion anchor, equal to Rawlplug by the Rawlplug Company, Inc., New Rochelle NY. Other manufacturers offering similar products which may be considered equal, include the following:

1. Dur-O-Wal Inc., Dayton, OH.
 2. Hilti Corporation, Tulsa OK.
- I. Retro-fitted roof drains: Polycarbonate co-polymer drain body, clamping ring, strainer dome and seam compression ring. Equal to U-Flow Roof Drain Systems, Inc., Buffalo NY., Product: "PC/PET RetroDrain". Other manufacturers offering similar products which may be considered equal, include the following:
1. W.P. Hickman Company, Asheville, NC.
 2. Johns Manville Roofing Systems, Denver, CO.
- J. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway rolls, approximately 3/16 inch (5 mm) thick, and acceptable to membrane roofing system manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. During the operation of work of this Section, protect the work of other trades against undue soilage and damage by the exercise of reasonable care and precautions. Repair or replace any work so damaged and soiled.
- B. Carefully broom clean substrate immediately prior to patching roofing.
- C. Where surface joints at roof and wall substrates exceed 1/4-inch width, fill flush with surface with pourable sealer before proceeding with the installation.

3.2 EMERGENCY MATERIALS AND PROCEDURES

- A. Maintain continuous temporary protection prior to and during installation of new roofing system. Do not leave unfinished roof areas uncovered over-night or during inclement weather.

3.3 CUTTING AND PATCHING EXISTING ROOFING ASSEMBLY

- A. The existing roof is under valid warranty, Contractor shall obtain warranty information from Owner, notify roofing manufacturer of changes to existing roof and request bid list of applicators who are eligible for the work. All materials must be approved by manufacturer for use on this project.
1. Follow local, state and federal regulations, safety standards and codes. When a conflict exists, the more restrictive document shall govern.
 2. Follow insurance underwriter's requirements acceptable for use with specified products or systems.
- B. Review all special conditions, such as penetrations, projections, tie-ins with existing construction and connections with new construction. Review these conditions with the Roofing Manufacturer, submit the Roofing Manufacturer's recommendations and details to the Architect for approval.
- C. Cut and patch existing roofing to accommodate new roof top equipment and penetrations in roofing. Perform cutting and patching of existing membrane roof as required by new construction in accordance with details and specifications of roofing manufacturer.
- D. Where penetrations are made through membrane roofing system and existing

insulation is disturbed by new construction, install insulation to match existing roof assembly.

3.4 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Clean roofing membrane and heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.5 FLASHING INSTALLATION

- A. Flash all penetrates (pipes, conduits.) passing through membrane. Flash pipe with molded pipe flashings where installation is possible. Where molded pipe flashings cannot be installed, use field fabricated pipe seals. Secure top edge of molded or prefabricated flashing with stainless steel clamping ring.
- B. Flashing for ductwork penetrating roof shall be as detailed and shall consist of metal cover flashing over membrane base flashing, attaching directly to ductwork with screws or flashing of prefabricated curbing. Apply sealant in accordance with manufacturer's instructions.
- C. Unusual Penetrations: Clusters of pipes and unusual shaped penetrations shall be sealed with Pourable Sealer, 2 inches deep minimum, in a pitch pocket type seal.
- D. Molded flashings, prefabricated flashings and membrane base flashings shall be products of the specified manufacturers.
- E. Elastomeric Flashings. Provide elastomeric sheet flashings at elastomeric sheet roofing work, as indicated.
 - 1. Use longest practical lengths and widths of elastomeric sheet flashing material to eliminate or minimize joints. Complete splices between flashings and main-roof sheet before bonding flashings to vertical surfaces. Splices shall be sealed 3 inches beyond fasteners that attach membrane to horizontal nailer in same manner as splices within roofing membrane. Flashings shall be bonded 100 percent to subsurfaces except at coves where movement is anticipated.
 - a. Install flexible tube at coves where movement is anticipated.
 - 2. Apply bonding adhesive to flashing and surface to which it is being bonded. When bonding adhesive has dried to the point where it does not string or stick to a dry finger touch, roll flashing into adhesive. Do not bridge flashing at changes of direction.
 - 3. Nail top of flashing 12 inches on center under sheet metal copings, counter flashing, and other sheet metal work.

3.6 INSTALLATION - RETRO-FITTED DRAINS

- A. Remove any components of the existing drains which prevent the retro-fitted drains from sitting flush with roofing membrane. Ream-out existing roof drain leaders to ensure proper drainage flow.
- B. Verify insulation is sloped around drain to permit water drain off.
- C. Insert and install drains in accordance with manufacturer's instructions.

3.7 CLEANING

- A. Remove elastomeric adhesive markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.
- C. Repair or replace defaced or disfigured finishes caused by the work of this Section.

3.8 PROTECTION

- A. Provide special protection or avoid traffic on completed work. Restore to original condition, or replace, work and roofing materials damaged.

END OF SECTION