

## **SECTION 070150.19 - PREPARATION FOR REROOFING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Partial tear-off of roof areas indicated on Drawings.
  - 2. Temporary roofing.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for use of premises and for phasing requirements.
  - 2. Section 015000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

#### **1.3 ALLOWANCES**

- A. Allowance for removal of existing wet insulation, and replacement with new insulation, is specified under Section 012100 "Allowances."
- B. Allowance for removal of existing deteriorated wood nailers and curbs, and replacement with new wood, is specified under Section 012100 "Allowances."

#### **1.4 UNIT PRICES**

- A. Work of this Section is affected by insulation removal and replacement unit price and roof sheathing removal and replacement unit price.

#### **1.5 DEFINITIONS**

- A. EPS: Molded (expanded) polystyrene.
- B. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.

- C. OSB: Oriented strand board.
- D. Partial Roof Tear-off: Removal of selected components and accessories from existing roofing system.
- E. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.
- F. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.

## **1.6 PREINSTALLATION MEETINGS**

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing 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 tear-off, including, but not limited to, the following:
    - a. Reroofing preparation, including roofing system manufacturer's written instructions.
    - b. Temporary protection requirements for existing roofing system components that are to remain.
    - c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
    - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
    - e. Existing roof deck conditions requiring Architect notification.
    - f. Existing roof deck removal procedures and Owner notifications.
    - g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
    - h. Structural loading limitations of roof deck during reroofing.
    - i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
    - j. HVAC shutdown and sealing of air intakes.
    - k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
    - l. Asbestos removal and discovery of asbestos-containing materials.
    - m. Governing regulations and requirements for insurance and certificates if applicable.
    - n. Existing conditions that may require Architect notification before proceeding.

## **1.7 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Temporary Roofing Submittal: Product data and description of temporary roofing system.
  - 1. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer stating acceptance of the temporary roof and that its inclusion does not adversely affect the new roofing system's resistance to fire and wind or its FM Approvals rating.

## **1.8 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
  - 1. Include certificate that Installer is approved by warrantor of existing roofing system.
  - 2. Include certificate that Installer is licensed to perform asbestos abatement.
- B. Field Test Reports:
  - 1. Fastener pull-out test report.
- C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
  - 1. Submit before Work begins.
- D. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

## **1.9 CLOSEOUT SUBMITTALS**

- A. Certified statement stating that existing roof warranty has not been affected by Work performed under this Section.

## **1.10 QUALITY ASSURANCE**

- A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

B. Regulatory Requirements:

1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

**1.11 FIELD CONDITIONS**

A. Existing Roofing System: EPDM roofing.

B. Owner will occupy portions of building immediately below reroofing area.

1. Conduct reroofing so Owner's operations are not disrupted.
2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.
  - a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.

C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

1. A roof moisture survey of existing roofing system is available for Contractor's reference.
2. The results of an analysis of test cores from existing roofing system are available for Contractor's reference.
3. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.

F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed for rooftop equipment wheel loads and for uniformly distributed loads.

- G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
1. Remove only as much roofing in one day as can be made watertight in the same day.
- H. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
1. Hazardous materials will be removed by Owner before start of the Work.
  2. Existing roof will be left no less watertight than before removal.
  3. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
    - a. Hazardous materials will be removed by Owner under a separate contract.
- I. Hazardous Materials: A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.
  2. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
  3. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

## **1.12 WARRANTY**

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty issued by **existing warranted roof system**.
1. Notify warrantor before proceeding with the Work.
  2. Notify warrantor of existing roofing system on completion of reroofing, and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect.
    - a. Submit documentation at Project closeout.

## **PART 2 - PRODUCTS**

### **2.1 TEMPORARY PROTECTION MATERIALS**

- A. EPS Insulation: ASTM C 578.
- B. Plywood: DOC PS 1, Grade CD, Exposure 1.
- C. OSB: DOC PS 2, Exposure 1.

### **2.2 TEMPORARY ROOFING MATERIALS**

- A. Design and selection of materials for temporary roofing are Contractor's responsibilities.
- B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft..
- C. Base Sheet: ASTM D 4601/D 4601M, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet.
- D. Glass-Fiber Felts: ASTM D 2178/D 2178M, Type IV, asphalt-impregnated, glass-fiber felt.
- E. Asphalt Primer: ASTM D 41/D 41M.
- F. Roofing Asphalt: ASTM D 312/D 312M, Type III or IV.
- G. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approvals' RoofNav.

### **2.3 INFILL AND REPLACEMENT MATERIALS**

- A. Use infill materials matching existing roofing system materials unless otherwise indicated.
  - 1. Infill materials are specified in Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" unless otherwise indicated.
- B. Steel deck is specified in Section 053100 "Steel Decking."
- C. Wood blocking, curbs, and nailers are specified in Section 061000 "Rough Carpentry." and Section 061053 Miscellaneous Rough Carpentry."
- D. Plywood roof sheathing is specified in Section 061600 "Sheathing."

- E. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

## **2.4 AUXILIARY REROOFING MATERIALS**

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protection of In-Place Conditions:
  - 1. Protect existing roofing system that is not to be reroofed.
  - 2. Loosely lay 1-inch- minimum thick, EPS insulation over existing roofing in areas not to be reroofed.
    - a. Loosely lay 15/32-inch plywood or OSB panels over EPS. Extend EPS past edges of plywood or OSB panels a minimum of 1 inch.
  - 3. Limit traffic and material storage to areas of existing roofing that have been protected.
  - 4. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
  - 5. Comply with requirements of existing roof system manufacturer's warranty requirements.
- B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- C. Shut off rooftop utilities and service piping before beginning the Work.
- D. Test existing roof drains to verify that they are not blocked or restricted.
  - 1. Immediately notify Architect of any blockages or restrictions.
- E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
  - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

- F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
  - 1. Prevent debris from entering or blocking roof drains and conductors.
    - a. Use roof-drain plugs specifically designed for this purpose.
    - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
  - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
    - a. Do not permit water to enter into or under existing roofing system components that are to remain.

### **3.2 ROOF TEAR-OFF**

- A. Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Remove aggregate ballast from roofing. Store aggregate ballast for reuse in manner not to exceed structural loading limitations of roof deck.
- D. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing using a power broom.
- E. Remove pavers and accessories from roofing.
  - 1. Store and protect pavers and accessories for reuse in manner not to exceed structural loading limitations of roof deck.
  - 2. Discard cracked pavers.
- F. Remove ballast, protection mat, and EPS insulation from protected roofing membrane.
  - 1. Discard EPS insulation that is damaged or exceeds 8 lb/cu. ft..
  - 2. Store EPS insulation for reuse and protect it from physical damage.
  - 3. Store ballast for reuse in manner not to exceed structural loading limitations of roof deck.

- G. Partial Roof Tear-off: Where indicated on Drawings, remove existing roofing down to existing cover board existing insulation and immediately check for presence of moisture.
1. Owner will engage a qualified testing agency to perform the following test:
    - a. Coordinate with Owner's testing agency to schedule times for tests and inspections immediately after removal.
  2. Survey exposed substrate that is to remain using infrared color thermography according to ASTM C 1153.
    - a. Prepare survey report of initial scan indicating locations of entrapped moisture, if any, and area calculations of locations of entrapped moisture.
  3. Survey exposed substrate that is to remain using electrical capacitance/impedance testing according to ASTM D 7954/D 7954M.
    - a. Prepare survey report indicating locations of entrapped moisture, if any, and area calculations of locations of entrapped moisture.
  4. Survey exposed substrate that is to remain using nuclear hydrogen detection testing according to SPRI/RCI NT-1.
    - a. Prepare survey report indicating locations of entrapped moisture, if any, and area calculations of locations of entrapped moisture.
  5. Remove wet or damp materials below existing roofing and above deck as directed by Architect.
    - a. Removal is paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
  6. Inspect wood blocking, curbs, and nailers for deterioration and damage.
    - a. If wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
    - b. Removal is paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
  7. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry.
    - a. Remove unadhered bitumen, unadhered felts, and wet felts.
  8. Remove excess asphalt from steel deck that is exposed by removal of wet or damp materials.

- a. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
9. Remove fasteners from deck or cut fasteners off slightly above deck surface.

### **3.3 DECK PREPARATION**

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
  1. Do not proceed with installation until directed by Architect.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
  1. Do not proceed with installation until directed by Architect.
- D. Provide additional deck securement as indicated on Drawings.
- E. Replace steel deck as indicated on Drawings.
- F. Replace steel deck as directed by Architect.
  1. Deck replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
- G. Prepare and paint steel deck surface.
  1. Painting and preparation for painting is specified in Section 099113 "Exterior Painting."
- H. Replace plywood roof sheathing as indicated on Drawings.
- I. Replace plywood roof sheathing as directed by Architect.
  1. Roof sheathing replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

### **3.4 INFILL MATERIALS INSTALLATION**

- A. Immediately after roof tear-off, and inspection and repair, if needed, of deck, fill in tear-off areas to match existing roofing system construction.

1. Installation of infill materials is specified in Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing."
  2. Installation of wood blocking, curbs, and nailers is specified in Section 061000 "Rough Carpentry." and Section 061053 Miscellaneous Rough Carpentry."
- B. Install new roofing patch over roof infill area.
1. If new roofing is installed the same day tear-off is made, roofing patch is not required.

### **3.5 TEMPORARY ROOFING**

- A. Install approved temporary roofing over area to be reroofed.
- B. Install temporary roofing over area to be reroofed.
1. Mechanically fasten base sheet and install a glass-fiber felt, lapping each sheet 19 inches over preceding sheet.
  2. Embed glass-fiber felt in a solid mopping of hot roofing asphalt applied within equiviscous temperature range.
  3. Glaze-coat completed surface with hot roofing asphalt.
- C. Remove temporary roofing before installing new roofing.
- D. Prepare temporary roof to receive new roofing by patching and repairing temporary roofing.
1. Restore temporary roofing to watertight condition.
  2. Obtain approval for temporary roof substrate from roofing manufacturer and Architect before installing new roof.

### **3.6 ROOF RE-COVER PREPARATION**

- A. Remove blisters, ridges, buckles, mechanically attached roofing fastener buttons projecting above roofing, and other substrate irregularities from existing roofing that inhibit new recover boards from conforming to substrate.
1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
  2. Scarify surface of sprayed polyurethane foam as necessary to achieve a sufficiently uniform plane to receive new recover boards.
  3. Broom clean existing substrate.
  4. Coordinate with Owner's inspector to schedule times for tests and inspections.
  5. Verify that existing substrate is dry.

- a. Spot check substrates with an electrical capacitance moisture-detection meter.
6. Remove materials that are wet or damp.
  - a. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
- B. Remove blisters, ridges, buckles, mechanically attached roofing fastener buttons projecting above roofing, and other substrate irregularities from existing roofing that inhibit new roofing from conforming to substrate.
  1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
  2. Shave surface of sprayed polyurethane foam as necessary to achieve a sufficiently uniform plane to receive new roofing.
  3. Broom clean existing substrate.
  4. Coordinate with Owner's inspector to schedule times for tests and inspections.
  5. Verify that existing substrate is dry before proceeding with installation.
    - a. Spot check substrates with an electrical capacitance moisture-detection meter.
  6. Remove materials that are wet and damp.
    - a. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
- C. Remove blisters and areas of roofing not fully adhered.
- D. Remove mechanically attached roofing fastener buttons projecting above roofing and other substrate irregularities that inhibit new recover boards from conforming to substrate.
  1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
  2. Clean substrate of contaminants, such as dirt, debris, oil, and grease, that can affect adhesion of coated foamed roofing.
  3. Power vacuum the existing roof surface.
    - a. If recommended by foam manufacturer, prime dried surface at recommended rate with recommended primer.
  4. Scarify surface of coated polyurethane roofing as necessary to achieve a suitable substrate for new roofing.

5. Provide additional uplift securement for existing roofing system with new screws and plates applied to each roof zone. Verify that surface is dry by pressing litmus paper to surface areas most likely to retain moisture, such as shaded areas and low spots.
  - a. If paper changes color, surface is too wet to apply foam.
6. Build up isolated low spots on existing roofing with sprayed foam specified in Section 075700 "Coated Foamed Roofing" to prevent ponding.

### **3.7 BASE FLASHING REMOVAL**

- A. Remove existing base flashings.
  1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain.
  1. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish as existing.
- C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
  1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- D. Remove existing parapet sheathing and replace with new parapet sheathing to comply with Section 061600 "Sheathing."
  1. If parapet framing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- E. When directed by Architect, replace parapet framing, wood blocking, curbs, and nailers to comply with Section 061000 "Rough Carpentry." and Section 061053 Miscellaneous Rough Carpentry."

### **3.8 FASTENER PULL-OUT TESTING**

- A. Retain independent testing and inspecting agency to conduct fastener pull-out tests according to SPRI FX-1, and submit test report to Architect and roofing manufacturer before installing new roofing system.
  1. Obtain roofing manufacturer's approval to proceed with specified fastening pattern.

- a. Roofing manufacturer may furnish revised fastening pattern commensurate with pull-out test results.

### **3.9 DISPOSAL**

- A. Collect demolished materials and place in containers.
  - 1. Promptly dispose of demolished materials.
  - 2. Do not allow demolished materials to accumulate on-site.
  - 3. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

**END OF SECTION**