

**Howard Community College**

ITB: East & West Garage Repairs and Preventative Maintenance

Bid Number: 22-005

ITB Opening Date: April 21, 2022

**ADDENDUM No. 3**

*Q1. Per Div. 01 General Requirements-Summary of Work Item 1.03.E.3. The miscellaneous work shall also include cleaning and repairs to the existing drainage system in work areas of parking structure, as required. If this is pertaining to their Existing condition - Are they presently leaking? Are they clogged? Need Snaked?*

Summary of Work Item 1.03.E.3. is intended to ensure that the drainage is not clogged with construction debris and is functional after completion of all repair works. Contractor will be responsible for any cleaning and repairs to drains in the area of work if damage is caused by their respective work. Drainage system is currently operating as designed without known deficiencies.

*Q2. There is no specification nor warranty time frame for the roof replacement on the one East garage stair way roof to be replaced. Ref. Drawing 3G-5 and Detail 2 on Drawing R-4.*

Technical Specification Section 07 53 23 is attached and applies to the roof replacement for the East Garage East Stair (ref. Drawing EG-5 and Detail 2/R-4). An updated Table of Contents is also attached.

Issued on April 7, 2022

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END OF SECTION

**SECTION 07 53 23**

**EPDM ROOFING SYSTEM**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. The extent of work included in this Section is shown on the Drawings and is specified as follows:

1.02 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand required uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- C. Wind Uplift Performance:
1. Provide assembly, including insulation and components, meeting wind uplift resistance for field, perimeter and corners in accordance with the Building Code.
  2. Roofing System Design:
    - a. Tested by a qualified testing agency to uplift pressures required by the Building Code and ASCE/SEI 7.
    - b. Edge securement shall be tested by a qualified testing agency for resistance in accordance with ANSI/SPRI ES-1.
- D. Fire Resistance: UL Class A.

1.03 SUBMITTALS

- A. Manufacturer's Data: Submit specifications, installation instructions and general recommendations from the roofing materials manufacturer, for each type of roofing product required. Include manufacturer's data substantiating that the materials comply with specified requirements.
- B. Shop Drawings: Submit shop drawings showing roof configuration including, but not limited to, orientation of membrane roofing, sheet layout, details at perimeter and special conditions.
- C. Quality Control Submittals
1. Qualification Data: For qualified Installer, manufacturer and testing agency.
  2. Manufacturer Certificate: Signed by roofing manufacturer certifying that membrane roofing system complies with requirements specified in "Performance Requirements" Article.
  3. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

4. Design Calculations: Provide analysis data and calculations sealed by a professional engineer, registered in the State where the work is performed, showing compliance with all design loads and performance requirements.
  5. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
  6. Field quality-control reports.
- D. Cold Weather Procedure: Where it is intended to install the roofing system during cold weather, submit to the Engineer for approval a written program outlining installation procedures for cold weather projects. The procedures shall be submitted no later than three weeks before roofing installation and shall be discussed therein. **No roofing installation will be allowed without this submittal reviewed & approved by the Engineer.**
- E. Maintenance Data: For membrane roofing system to include in maintenance manuals.
- F. Warranties: Sample of special warranties.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.
- B. Installer: A firm with not less than three (3) years of successful experience in installation of roofing systems similar to those required for this project and which is acceptable to or licensed by manufacturer of primary roofing materials.
- C. Source Limitations: Obtain components for membrane roofing system from the same manufacturer as membrane roofing.
- D. Fire Performance Characteristics:
  1. Fire Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.06 PROJECT CONDITIONS

- A. Weather: Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.

1.07 WARRANTY

- A. Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Warranty includes membrane roofing, base flashings, roofing accessories, roof edges, and other components of membrane roofing system.
  - 2. Warranty Period: 20 years from date of Substantial Completion.

**PART 2 - PRODUCTS**

2.01 ROOFING MEMBRANE

- A. Roofing membrane shall be 60 mil thick, specially compounded unreinforced EPDM (Ethylene Propylene Diene Monomer) sheet elastomer complying with ASTM D4637, Type I and ANSI/RMA IPR1.
  - 1. Exposed Face Color: Black
- B. Manufacturers offering products that comply with the requirements of this Section include the following:
  - 1. Carlisle SynTec Systems; "Sure-Seal" Non-Reinforced EPDM Membrane
  - 2. Firestone Building Products; "RubberGard" Non-Reinforced EPDM Membrane
  - 3. GenFlex Roofing Systems; "AFR" Non-Reinforced EPDM Membrane
  - 4. Versico Incorporated; "Versigard Black" Non-Reinforced EPDM Membrane

2.02 AUXILIARY MEMBRANE MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Flashing Material: Manufacturer's standard system utilizing 60-mil-thick EPDM, partially cured or cured, according to application and compatible with flexible sheet membrane.
- C. Membrane Adhesive: Manufacturer's standard material for particular substrate and project conditions, formulated to withstand required uplift force.
- D. Sheet Seaming System: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch-wide minimum, butyl splice tape with release film for sealing lapped joints.
- E. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.

- F. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- G. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- H. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.
- I. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.
- J. Miscellaneous Accessories: Provide cant strips, tapered edge strips, sealers, preformed flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, adhesive tapes, flashing cements, termination reglets, and other accessories acceptable to manufacturer.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
  - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that minimum concrete curing period recommended by roofing system manufacturer has passed.
  - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
  - 5. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Commencing Work indicates the Contractor's acceptance of the surfaces; if any defective Work is covered and roofing must be removed to correct defects, both removal and replacement shall be performed at the Contractor's expense.

#### **3.02 INSTALLATION, GENERAL**

- A. Roofing insulation and single ply membrane roofing shall be applied in accordance with the accepted roofing manufacturer's specifications and as approved by the Architect.
- B. Deck surfaces shall be clean and dry before applying roofing. Remove any sharp projections.
- C. Check slopes, openings, and flashing reglets with other trades before execution of their Work to assure proper conditions for roofing. Provide base flashings to supplement the specified roofing.
- D. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other work.

3.03 EPDM MEMBRANE INSTALLATION

A. General:

1. Start installation only in presence of manufacturer's technical representative if required as a condition for issuing warranty.
2. The installation requirements of this Section reference the National Roofing Contractors Association's "Roofing and Waterproofing Manual" hereafter referred to as the "NRCA manual".

B. Do not allow the membrane to come in contact with surfaces contaminated with asphalt, coal tar, oil, grease, or other substances which are not compatible with EPDM roofing membrane.

C. Where practicable, install the membrane so the sheets run perpendicular to the long dimension of the insulation boards.

D. Where practicable, commence installation at the low point of the roof and work towards the high point. Lap the sheets so the flow of water is not against the edges of the sheet.

E. Membrane Placement:

1. Roll sheet out on deck; inspect for defects as material is being rolled out and remove any defective areas.
  - a. Repair areas of welded seams where samples have been taken or marginal welds, bond voids, or skips occurs.
  - b. Repair fishmouths and wrinkles by cutting to lay flat and installing patch over cut area extending four inches beyond cut.
2. Allow for sufficient relaxing of the membrane material before proceeding.
3. Position the membrane so it is free of buckles and wrinkles.
4. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer.
5. Lap edges and ends of sheets 3-inches or more as recommended by the manufacturer. Stagger end laps.
6. Adhesively splice laps. Apply pressure as required. Seam strength of laps as required by ASTM D4637.
7. Check seams to ensure continuous adhesion and correct defects.
8. Finish edges of laps with a continuous beveled bead of sealant to sheet edges to provide smooth transition.
9. Finish seams as the membrane is being installed.
10. Anchor perimeter to deck or wall as specified below.

F. Membrane Perimeter Anchorage:

1. Install batten strip or steel stress plate with fasteners at the perimeter of each roof level, curb flashing, expansion joints and similar penetrations as indicated in accordance with membrane manufacturer's instructions on top of roof membrane to deck or wall.
2. Mechanical Fastening:
  - a. Set top of mechanical fastener set flush with top surface of the nailing strip or stress plate. Space mechanical fasteners a maximum of 12-inches on center starting 1-inch from the end of the nailing strip.

- b. When strips are cut, round the corners and eliminate any sharp corners.
  - c. Set fasteners in lap sealant and cover fastener head with fastener sealer including batten strip or stress plate.
  - d. Stop fastening strip where the use of the nailing strip interferes with the flow of the surface water, separate by a 6- inch space, then start again.
  - e. After mechanically fastening, cover and seal with a 9-inch wide strip of flashing sheet. Use splice adhesive on all laps and finish edge with sealant as specified.
  - f. At roof edge metal, turn the membrane down over the front edge of the blocking or the nailer to below blocking. Secure the membrane to the vertical portion of the nailer; with fasteners spaced not over 6-inches on centers.
  - g. At parapet walls intersecting building walls and curbs, secure the membrane to the structural deck with fasteners 6-inches on center or as shown in NRCA manual.
- G. Adhered System:
- 1. Apply bonding adhesive in quantities required by roof membrane manufacturer.
  - 2. Fold sheet back on itself after rolling out and coat the bottom side of the membrane and the top of the deck with adhesive. Do not coat the lap joint area.
  - 3. After adhesive has set according to adhesive manufacturer's application instruction, roll the membrane into the adhesive in manner that minimizes voids and wrinkles.
  - 4. Repeat for other half of sheet. Cut voids and wrinkles to lay flat and clean for repair patch over cut area.
- H. Install flashings as the membrane is being installed. If the flashing cannot be completely installed in one day, complete the installation until the flashing is in a watertight condition and provide temporary covers or seals.
- I. Flashing Roof Drains:
- 1. Install roof drain flashing as recommended by the membrane manufacturer, generally as follows:
    - a. Coordinate to set the metal drain flashing in asphalt roof cement, holding cement back from the edge of the metal flange.
    - b. Do not allow the roof cement to come in contact with the EPDM roof membrane.
    - c. Adhere the EPDM roof membrane to the metal flashing with the membrane manufacturer's recommended bonding adhesive.
  - 2. Turn down the metal drain flashing and EPDM roof membrane into the drain body and install clamping ring and strainer.
- J. Installing EPDM Base Flashing and Pipe Flashing:
- 1. Install EPDM flashing membranes to pipes, walls or curbs to a height not less than 8-inches above roof surfaces and 4-inches on roof membranes. Install as follows in accordance with the NRCA manual:
    - a. Adhere flashing to pipe, wall or curb with bonding adhesive.
    - b. Form inside and outside corners of EPDM flashing membrane in accordance with NRCA manual. Form pipe flashing in accordance with NRCA manual (use pipe boot).



- c. Lap ends not less than 4-inches.
  - d. Adhesively splice flashing membranes together and flashing membranes to roof membranes. Finish exposed edges with sealant as specified. Install flashing membranes in accordance with NRCA manual.
2. Anchor top of flashing to walls or curbs with fasteners spaced not over 6-inches on center. Use surface mounted fastening strip with sealant on ducts. Use pipe clamps on pipes or other round penetrations.
  3. Apply sealant to top edge of flashing.

#### 3.04 FIELD QUALITY CONTROL

- A. Follow waterproofing membrane manufacturer guidelines for inspection of substrate conditions; surface preparation; and application of the membrane, flashings, protection, and drainage components; and furnishing reports.
- B. Flood Testing: Flood test each roof area for leaks, according to recommendations in ASTM D5957, after completing and protecting waterproofing but before overlaying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
  1. Flood to an average depth of 2-1/2 inches with a minimum depth of 1 inch and not exceeding a depth of 4 inches. Maintain 2 inches of clearance from top of sheet flashings.
  2. Flood each area for 24 hours.
  3. After flood testing, repair leaks, repeat flood tests, and make further repairs until waterproofing installation is watertight.

#### 3.05 REPAIRS

- A. Repairs to membrane and flashings:
  1. Remove sections of EPDM sheet roofing or flashing that is creased wrinkled or fishmouthed.
  2. Cover removed areas, cuts and damaged areas with a patch extending 4-inches beyond damaged, cut, or removed area. Adhesively splice to roof membrane or flashing. Finish edge of lap with sealant as specified.

#### 3.06 PROTECTION OF ROOFING

- A. Upon completion of the roofing work and associated work, protect the roofing for the remainder of the construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

**END OF SECTION**