



City of Quincy, Massachusetts  
Purchasing Department  
1305 Hancock Street  
Quincy, MA 02169

Phone: 376-106  
Fax: 376-1074

## **ADDENDUM NUMBER 1**

**RE: BID DUE : August 4, 2011 @ 11:30 A.M.**

**BID/RFP TITLE: North Quincy, Sterling Middle School and Goals Building Roof Replacement**

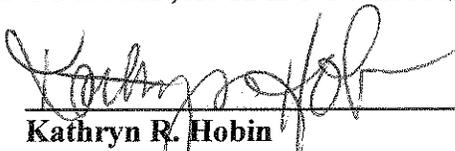
### **PLEASE NOTE :**

#### **Addendum #1**

The following clarifications to the bidding documents are hereby incorporated into the Scope of Work and issued as Addenda 1 and Addenda 2.

Thank you.

**PLEASE SIGN THIS SHEET AND ATTACH IT TO YOUR BID, AS IT IS NOW A PART OF THE BID.**

  
\_\_\_\_\_  
Kathryn R. Hobin  
Purchasing Agent

**Date:** \_\_\_\_\_

**Bidder's Signature:** \_\_\_\_\_

**Addendum Number 1 – August 1, 2011**

The attention of Bidders submitting proposals for the above, mentioned project located in Quincy, Massachusetts, is called to the following information to the Contract Documents. The following additions, clarifications, and/or deletions shall hereby include in their entirety within the scope of the Contract Documents and shall, in turn, form a part of the Proposals submitted for Bid.

**PART 1 - GENERAL**

- 1.1 The following additions, clarifications, and/or deletions shall hereby be included in their entirety within the scope of the Contract Documents and shall, in turn, form a part of the Proposals submitted for Bid.

**PART 2 - SPECIFICATIONS**

- 2.1 Revision of Section 075419—POLYVINYL-CHLORIDE (PVC) ROOFING; paragraph 1.4 Performance Requirements, E. Solar Reflectance Index.
  - A. Revised Section attached.

**Addendum Number 1 – August 1, 2011**

SECTION 075419 - POLYVINYL-CHLORIDE (PVC) ROOFING

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. Adhered minimum 60 mil PVC membrane roofing system.
2. Vapor retarder.
3. Roof insulation, two layers or two inch (2") thick polyisocyanurate.
4. Cover board.
5. Thermal barrier.

B. Related Sections:

1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 Section "Preparation for Re-Roofing" for recover board beneath new membrane roofing.
3. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counter flashings.
4. Division 07 Section "Roof Accessories".
5. Division 07 Section "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
6. Division 22 Section "Storm Drainage Piping Specialties" for roof drains.

1.3 DEFINITIONS

- A. Roofing Terminology: See ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified 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.

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- 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. **Roofing System Design:** Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.
  - 1. Corner Uplift Pressure: 89 lbf/sq. ft.
  - 2. Perimeter Uplift Pressure: 62 lbf/sq. ft.
  - 3. Field-of-Roof Uplift Pressure: 41 lbf/sq. ft.
- D. **FM Approvals Listing:** Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.
  - 1. Fire/Windstorm Classification: Class 1A-90.
  - 2. Hail Resistance: MH.
- E. **Solar Reflectance Index:**
  - 1. **SRI rating is not required.**
  - 2. **All PVC membranes shall be white.**
- F. **Energy Performance:** Provide roofing system that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- G. **Energy Performance:** Provide roofing system with initial solar reflectance not less than 0.80 and emissivity not less than 0.85 when tested according to CRRC-1.

#### 1.5 ACTION SUBMITTALS

- A. **Product Data:** For each type of product indicated.
- B. **Shop Drawings:** For roofing system. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Base flashings and membrane terminations.
  - 2. Tapered insulation, including slopes.
  - 3. Roof plan showing orientation of steel roof deck and orientation of membrane roofing and fastening spacings.
  - 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. **Samples for Verification:** For the following products:

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1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
2. Roof insulation.
3. Cover board.
4. Thermal barrier.
5. Walkway pads or rolls.
6. Metal termination bars.
7. Battens.
8. Six insulation fasteners of each type, length, and finish.
9. Six roof cover fasteners of each type, length, and finish.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  1. Submit evidence of compliance with performance requirements.
- C. 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.
- D. Field quality-control reports.
- E. Warranties: Sample of special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM Approvals approved] for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- C. Source Limitations: Obtain components including roof insulation, fasteners, adhesives, flashing and accessories for membrane roofing system from same manufacturer as membrane roofing.
- D. Exterior Fire-Test Exposure: ASTM E 108, Class A for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

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- E. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Pre-installation Roofing Conference: Conduct conference at Montclair Elementary School, 8 Belmont Street, Quincy, MA.
  - 1. Meet with Owner, Architect, Owner'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 will affect 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.

**1.9 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.

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#### 1.10 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

#### 1.11 WARRANTY

- A. Special Warranty: 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. The total system warranty shall include all roofing materials, related components and accessories including, but not limited to the substrate board, vapor retarder, insulation board, cover board, roofing membrane, membrane flashings, fasteners, adhesives and termination metals. The warranty shall include coverage for windstorms up to 80 miles per hour.
  2. Warranty Period: 20 years from date of Final Acceptance of the roofing system.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PVC MEMBRANE ROOFING

- A. PVC Sheet: ASTM D 4434, Type II, Grade I, glass fiber reinforced.
1. Products: Subject to compliance with requirements, provide the following:
    - a. Sika Sarnafil Inc.; Sarnafil G410.
  2. Thickness: 60 mils (1.5 mm), nominal.
  3. Exposed Face Color: White.
- B. PVC Sheet: ASTM D 4434, Type III, fabric reinforced.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

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- a. Carlisle SynTec, Incorporated.
  - b. Duro-Last Roofing, Inc.
  - c. Johns Manville.
2. Thickness: 60 mils (1.5 mm), nominal.
  3. Exposed Face Color: White.

**2.2 AUXILIARY MEMBRANE ROOFING 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.
  2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
    - a. Plastic Foam Adhesives: 50 g/L.
    - b. Gypsum Board and Panel Adhesives: 50 g/L.
    - c. Multipurpose Construction Adhesives: 70 g/L.
    - d. Single-Ply Roof Membrane Adhesives: 250 g/L.
    - e. Other Adhesives: 250 g/L.
    - f. Single-Ply Roof Membrane Sealants: 450 g/L.
    - g. Nonmembrane Roof Sealants: 300 g/L.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard.
- D. Slip Sheet: Manufacturer's standard, of thickness required for application.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- F. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch (25 mm wide by 1.3 mm) thick, prepunched.
- G. 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 membrane roofing system manufacturer.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

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2.3 SUBSTRATE BOARDS (Thermal Barrier)

- A. Substrate Board: ASTM C 1396/C 1396M, Type X gypsum board, 5/8 inch (16 mm) thick.
- B. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate 1/2 inch (13 mm) thick.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Georgia-Pacific Corporation: Dens Deck.
- C. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to wood roof deck.

2.4 VAPOR RETARDER

- A. Polyethylene Film: ASTM D 4397, 6 mils (0.15 mm) thick, minimum, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
  - 1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
  - 2. Adhesive: Manufacturer's standard lap adhesive, FM Approvals approved for vapor-retarder application.

2.5 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by PVC membrane roofing manufacturer for warranty acceptance, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class I, Grade 3, felt or glass-fiber mat facer on both major surfaces.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate drain sump and crickets to slope 1/2 inch per 12 inches.

2.6 INSULATION ACCESSORIES

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

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- B. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to wood deck, and acceptable to roofing system manufacturer for the specified warranty.
- C. Insulation fasteners for use over wood deck shall be Heavy Duty Roofing Fastener type with a minimum thread diameter of .225 in., Head diameter of .435 in., and a #3 Phillips Truss head style. The fasteners shall be of sufficient length to penetrate the wood decking by 3/4".
- D. Cover Board: ASTM C 1289, high-density, closed-cell polyisocyanurate foam core laminated to coated-glass fiber-mat facer, 1/2 inch (13 mm) thick. Cover board shall acceptable to roofing system manufacturer for the specified warranty
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Carlisle SynTec; SecureShield HD.
    - b. Hunter Panels: H-Shield HD
    - c. Firestone: IsoGard HD

## 2.7 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch (5 mm) thick, and acceptable to membrane roofing system manufacturer.

## PART 3 - EXECUTION

### 3.1 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.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

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- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

#### **3.3 SUBSTRATE BOARD**

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
  - 1. Fasten substrate board (thermal barrier) only as required to prevent movement of board until insulation layers and cover board has been installed and secured to wood deck.

#### **3.4 VAPOR-RETARDER INSTALLATION**

- A. Polyethylene Film: Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively.
  - 1. Continuously seal side and end laps with tape or approved adhesive.

#### **3.5 INSULATION INSTALLATION**

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation, 8'x8' sumps around all roof drains and tapered crickets between drains, ½" per foot, as indicated on the Drawings.
- D. Install insulation under area of roofing to achieve required thickness. Install two layers of 2.0 inch (2") thick insulation board, with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction. Stagger joints between top and bottom layers of insulation a minimum of 24".
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

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- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
  - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to wood deck .
  - 1. Fasten insulation only as required to prevent movement of board until subsequent insulation layers and cover board have been installed and secured to wood deck.
- H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together and fasten to roof deck.
  - 1. Fasten cover boards according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.
  - 2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

### **3.6 ADHERED MEMBRANE ROOFING INSTALLATION**

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
  - 1. Install sheet according to ASTM D 5036.
- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.
- F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

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1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
  2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
  3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

**3.7 BASE FLASHING INSTALLATION**

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

**3.8 WALKWAY INSTALLATION**

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

**3.9 FIELD QUALITY CONTROL**

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- B. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

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3.10 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of 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.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.11 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS "**Contractor TBD**" of "**TBD**", herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
  - 1. Owner: City of Quincy.
  - 2. Address: 1305 Hancock Street.
  - 3. Building Name/Type: Montclair Elementary School.
  - 4. Address: 8 Belmont Street.
  - 5. Area of Work: Roof Areas 01 and 02.
  - 6. Acceptance Date: TBD.
  - 7. Warranty Period: 20 YEARS/2 YEAR CONTRACTOR.
  - 8. Expiration Date: TBD.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
  - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a. Lightning;
    - b. Peak gust wind speed exceeding 80 mph.
    - c. Fire;

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- d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
  - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
  - f. Vapor condensation on bottom of roofing; and
  - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
  6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
  7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, 2011.

1. Authorized Signature: \_\_\_\_\_.
2. Name: \_\_\_\_\_.
3. Title: \_\_\_\_\_.

Wessling Architects  
Quincy, MA

North Quincy High School, Sterling Middle School  
and Goals Building Roof Replacement  
Quincy, MA

August 1, 2011  
Project # 11123

**Addendum Number 1 – August 1, 2011**

END OF SECTION 075419



City of Quincy, Massachusetts  
Purchasing Department  
1305 Hancock Street  
Quincy, MA 02169

Phone: 376-106  
Fax: 376-1074

## ADDENDUM NUMBER 2

RE: **BID DUE : August 4, 2011 @ 11:30 A.M.**

**BID/RFP TITLE: North Quincy, Sterling Middle School and Goals Building Roof Replacement**

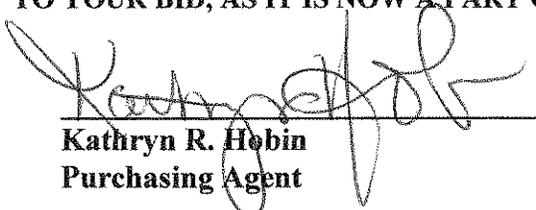
### PLEASE NOTE :

#### **Addendum #2**

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Thank you.

**PLEASE SIGN THIS SHEET AND ATTACH IT TO YOUR BID, AS IT IS NOW A PART OF THE BID.**

  
\_\_\_\_\_  
Kathryn R. Hobin  
Purchasing Agent

Date: \_\_\_\_\_

Bidder's Signature: \_\_\_\_\_

**Addendum Number 2 – August 1, 2011**

The attention of Bidders submitting proposals for the above, mentioned project located in Quincy, Massachusetts, is called to the following information to the Contract Documents. The following additions, clarifications, and/or deletions shall hereby include in their entirety within the scope of the Contract Documents and shall, in turn, form a part of the Proposals submitted for Bid.

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**PART 2 - SPECIFICATIONS**

- A. Insert the following sections into the technical specifications:
1. Section 070150.19...Preparation for Re-Roofing
  2. Section 076200.....Sheet Metal Flashing and Trim
  3. Section 079200..... Joint Sealants
  4. Section 221423.....Storm Drainage Piping Specialties
- B. Revised Sections attached along with revised table of contents.

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## SECTION 070150.19 - PREPARATION FOR RE-ROOFING

### 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. (GOALS Building) - Removal of existing gravel surfaced asphalt built-up roof and underlying rigid insulation down to the structural metal deck. (NQHS) - Removal of existing gravel surfaced asphalt built-up roof and underlying rigid insulation, underlying felt plies and base sheet down to the structural wood deck. (R. Sterling Middle) - Removal of existing gravel surfaced coal tar built-up roof and base sheets down to the structural wood deck.
2. Removal of membrane edge, curb and base flashings.
3. Removal of metal edge, curb and base flashings.
4. Removal of roof hatch at (R. Sterling Middle).
5. Removal of abandoned roof top curbs, equipment and penetrations, as shown on the Drawings.
6. Removal of existing roof drain assemblies.

- B. Related Sections:

1. Division 01 Section "Summary" for use of the premises and phasing requirements.
2. Division 01 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.
3. Division 06 Section "Rough Carpentry".
4. Division 07 Section "Polyvinyl Chloride (PVC) Roofing.
5. Division 07 Section "SBS Modified Bituminous Roofing"
6. Division 07 Section "Sheet Metal Flashing and Trim".
7. Division 07 Section "Roof Accessories".
8. Division 22 Section "Storm Drainage Piping Specialties".

#### 1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

#### 1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Existing Membrane Roofing System: Built-up coal-tar roofing membrane, surfacing, base sheet and components and accessories between deck and roofing membrane.
- C. Roof Tear-Off: Removal of existing membrane roofing system from deck.
- D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
- E. Existing to Remain: Existing items of construction that are not indicated to be removed.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer including certificate that Installer is licensed to perform asbestos abatement and is approved by warrantor of existing roofing system].
- B. 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. Submit before Work begins.
- D. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestos-containing material, by a landfill facility licensed to accept hazardous wastes.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Installer of new membrane roofing system, licensed to perform asbestos abatement in the State or jurisdiction where Project is located and approved by warrantor of existing roofing system to work on existing roofing.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Reroofing Conference: Conduct conferences at the GOALS Building located at One Hunt Street, North Quincy High School located at 316 Hancock Street and R. Sterling Middle School located at 444 Granite Street, Quincy, MA.

1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing system tear-off and replacement including, but not limited to, the following:
  - a. Reroofing preparation, including membrane roofing system manufacturer's written instructions.
  - b. Existing roof drains and roof drainage during each stage of reroofing, and roof drain plugging and plug removal requirements.
  - c. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - d. Existing deck removal procedures and Owner notifications.
  - e. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
  - f. Structural loading limitations of deck during reroofing.
  - g. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect reroofing.
  - h. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
  - i. Asbestos removal and discovery of asbestos-containing materials.
  - j. Governing regulations and requirements for insurance and certificates if applicable.
  - k. Existing conditions that may require notification of Architect before proceeding.

#### 1.8 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
  1. Coordinate work activities daily with Owner or Architect so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below the work area.
  2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated before proceeding with work over the impaired deck area.
- B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

1. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's reference. Contractor is responsible for conclusions derived from existing documents.
- E. No member of the roof shall be overstressed due to construction loads and demolition operations. The Owner assumes no responsibility for the actual condition of the structure.
- F. 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.
- G. Hazardous Materials: (GOALS Building only) - The Contractor is hereby notified that the built-up flashings around the upper roof perimeter and the unit curb flashings on the upper roof contain asbestos containing materials (ACM's). The Contractor shall contact the appropriate Massachusetts State Agency and the appropriate Federal Agency concerning all questions and the latest procedures for the safe removal, disposal, or encapsulation of these materials and adhere to all procedures. The Contractor shall provide the Owner these procedures prior to any demolition. The Contractor shall also provide the Owner all information related to the safe disposal of such (i.e. dumping slips, manifestation reports, etc.). If additional asbestos materials, or materials suspected to contain asbestos, are encountered during construction, demolition, or cutting and patching, the Contractor shall immediately cease work in the area of the suspected material, and immediately notify both the Owner and Architect. The Owner or Architect, or their designated representative, will investigate these materials and determine the method for removal, disposal, or encapsulation of these materials.
- H. If the Contractor or Subcontractor disturbs, removes, disposes, or encapsulates these materials without written authorization and instructions from the Owner or Consultant; or disturbs, removes, disposes, or encapsulates these materials in a manner not in accordance with the authorizations and instructions, the Contractor and Subcontractor shall indemnify, defend, and hold harmless the Owner and Consultant against any loss, damage, or liability arising or resulting from such unauthorized improper acts of the Contractor and Subcontractor; and further, the Owner and Consultant shall not be responsible for any such loss, damage, or liability arising or resulting from the Contractor's or Subcontractor's acts.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Provide adequate number and size of dumpsters, refuse containers, trucks, chutes, etc. for proper execution of demolition work. All demolition removal containers shall be properly protected and maintained on a daily basis. Owner must approve locations of dumpsters/refuse containers. Contractor shall submit to the Architect, for approval, proposed methods used to conduct demolition operations and debris control.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- B. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
  - 1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.
- D. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

#### 3.2 ROOF TEAR-OFF

- A. General: Notify Owner and Architect each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing using a power broom or vacuum.
- C. Roof Tear-Off: Remove existing roofing membrane(s) and other membrane roofing system components down to the deck.
  - 1. Remove insulation and substrate boards.
  - 2. Remove fasteners and distribution plates from deck.
  - 3. Remove base sheets and rosin paper.

#### 3.3 DECK PREPARATION

- A. Inspect deck after tear-off of membrane 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. Do not proceed with installation until directed by Architect.

- C. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.
- D. Provide additional deck securement as indicated on Drawings.
- E. Replace deteriorated metal or wood deck as required . Repair and/ or replacement of deck is specified in Sections 053150 "Steel Deck Repair" and Section 061000 "Rough Carpentry."

#### 3.4 EXISTING BASE FLASHINGS

- A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
  - 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.
- C. Inspect parapet sheathing for deterioration and damage. If parapet sheathing has deteriorated, immediately notify Architect.
- D. Plywood parapet sheathing is specified in Section 061000 "Rough Carpentry."

#### 3.5 FASTENER PULL-OUT TESTING

- A. Perform fastener pull-out tests according to SPRI FX-1, and submit test report to Architect before installing new membrane roofing system.
  - 1. Obtain Architect's and roofing membrane manufacturer's approval to proceed with specified fastening pattern. Architect and Roofing membrane manufacturer may furnish revised fastening pattern commensurate with pull-out test results.

#### 3.6 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
  - 1. 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 070150.19

## SECTION 076200 - SHEET METAL FLASHING AND TRIM

### 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. Shop fabricated copper parapet wall panels.
2. Edge metal and accessories.
3. Formed low-slope roof sheet metal fabrications.
4. Parapet scuppers.

- B. Related Requirements:

1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 Section "Polyvinyl Chloride" for materials and installation of sheet metal flashing and trim integral with roofing.
3. Division 07 Section "SBS Modified Bituminous Roofing" for materials and installation of sheet metal flashing and trim integral with roofing.
4. Division 07 Section "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

#### 1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conferences at the GOALS Building, One Hunt Street, North Quincy High School, 316 Hancock Street and R. Sterling Middle School, 444 Granite Street, Quincy, MA.
  1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

## 1.5 ACTION SUBMITTALS

### A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

### B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of special conditions.
10. Include details of connections to adjoining work.
11. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

### C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

### D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested and FM Approvals approved.
- C. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- D. Sample Warranty: For special warranty.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

#### 1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
  - 1. For copings and roof edge flashings that are SPRI ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1. Build mockup of typical roof edge, including fascia, fascia trim and continuous cleat, approximately 24" long, including supporting construction cleats, seams, attachments and accessories.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

## 1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. FM Approvals Listing: Manufacture and install copings and roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-75 & Class 1-90 (Field). Identify materials with name of fabricator and design approved by FM Approvals.
- E. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
  - 1. Design Pressure: GOALS - (Field: 36 psf), (Perimeter: 54 psf), (Corner: 77 psf).
  - 2. Design Pressure: NQHS - (Field: 43 psf), (Perimeter: 65 psf), (Corner: 93 psf).
  - 3. Design Pressure: Sterling - (Field: 41 psf), (Perimeter: 62 psf), (Corner: 89 psf).
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

## 2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Hussey Copper Ltd.
    - b. Revere Copper Products, Inc.
  2. Nonpatinated Exposed Finish: Mill.
- C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
  1. As-Milled Finish: Mill finish.
  2. Alclad Finish: Metallurgically bonded surfacing alloy on both sides, forming aluminum sheet with reflective luster.
  3. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil.
  4. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
  5. Color Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
    - a. Color: As selected by the Owner from full range of industry colors and color densities.
    - b. Color Range: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
  6. Exposed Coil-Coated Finish:
    - a. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

7. Color: As selected by Owner from manufacturer's full range.
  8. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mils.
- D. Polyvinyl Chloride (PVC) – Coated Sheet: a PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Minimum 25 gauge, G90 galvanized metal sheet with a 20-mil unsupported PVC membrane laminated on one side. Standard sheet dimensions are 4 ft x 8 ft or 4 ft x 10 ft. Color to be chosen from manufacturer's standard colors.

### 2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Self-Adhering, High-Temperature Sheet: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.
    - b. Grace Construction Products, a unit of W. R. Grace & Co.-Conn.; Grace Ice and Water Shield HT.
    - c. Henry Company; Blueskin PE200 HT.
    - d. Kirsch Building Products, LLC; Sharkskin Ultra SA.
    - e. Metal-Fab Manufacturing, LLC; MetShield.
    - f. Owens Corning; WeatherLock Specialty Tile & Metal Underlayment.
    - g. Polyguard Products, Inc.; Deck Guard HT.
    - h. Protecto Wrap Company; Protecto Jiffy Seal Ice & Water Guard HT.
    - i. SDP Advanced Polymer Products Inc; Palisade SA-HT.
  2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
  3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.
- C. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

### 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of manufactured item unless otherwise indicated.

- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
  - 2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
  - 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  - 4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
  - 5. Fasteners for Galvanized Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Solder:
  - 1. For Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead] [with maximum lead content of 0.2 percent].
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

## 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry,

metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  2. Obtain field measurements for accurate fit before shop fabrication.
  3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
  2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- I. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- J. Do not use graphite pencils to mark metal surfaces.
- K. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending on to wood nailers for securement. Fabricate from the following materials:

1. Thermoplastic clad metal: 25 gauge, G90 galvanized metal with a 20-mil (1mm) unsupported PVC membrane laminated on one side.
2. Copper: 16 oz./sq. ft..

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop - PVC Roofing System): Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long sections.
1. Joint Style: Butted with ¼" wide expansion space.
  2. Fabricate from the Following Materials:
    - a. Thermoplastic clad metal: 25 gauge, G90 galvanized metal with a 20-mil (1mm) unsupported PVC membrane laminated on one side. Continuous cleats at roof perimeters shall be 22 gauge pre-finished G-90 galvanized steel. Color to be chosen by the Owner from manufacturers standard colors.
- B. Roof Edge Flashing (Gravel Stop – SBS Modified Bituminous Roofing System) : Fabricate in minimum 96-inch long, but not exceeding 12-foot long sections. Furnish with 6-inch wide, joint cover plates. Shop fabricate interior and exterior corners.
1. Joint Style: Butted with expansion space and 6-inch wide, exposed cover plate.
  2. Fabricate from the Following Materials:
    - a. Aluminum: 0.040 inch thick, with 0.050 inch thick continuous cleat. Color to be chosen by the Owner.
- C. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, fasten and seal watertight.
1. Coping Profile: "As shown on the Drawings."
  2. Joint Style: Butted with expansion space and 6-inch- (150-mm-) wide, exposed cover plate.
  3. Fabricate from the Following Materials:
    - a. Aluminum: 0.040 inch with 0.050 inch (1.27 mm) thick continuous cleat. Color to be chosen by the Owner.
- D. Counterflashing: Fabricate from the following materials:
1. Aluminum: 0.032 inch (0.81 mm) thick.
- E. Flashing Receivers: Fabricate from the following materials:

1. Aluminum: 0.032 inch (0.81 mm) thick.
- F. Roof-Penetration Flashing: Fabricate from the following materials:
1. Galvanized Steel: 0.028 inch (0.71 mm) thick.
  2. Thermoplastic clad metal: 25 gauge, G90 galvanized metal with a 20-mil (1mm) unsupported PVC membrane laminated on one side.
- G. Parapet Wall Panels: Fabricate from the following materials:
1. Red Copper: 20 ounce thick.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify compliance with requirements for installation tolerances of substrates.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing installation.
1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches apart, except at perimeter metal where the cleat shall be continuous. Attach each cleat with at least two fasteners. Bend tabs over fasteners. Continuous cleats shall be secured at six inches on center.
  4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
  5. Torch cutting of sheet metal flashing and trim is not permitted.
  6. Do not use graphite pencils to mark metal surfaces.

- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
  2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
  2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.
- H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches ; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-coated steel and aluminum sheet.
  2. Do not pre-tin zinc-tin alloy-coated stainless steel and zinc-tin alloy-coated copper.
  3. Do not use torches for soldering.
  4. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

5. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
  6. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.
- I. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over wood nailers, and under roofing membrane.
1. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.
  2. Loosely lock front edge of scupper with conductor head.

### 3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 6" centers.
- C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- D. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 6" centers.
  2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 16" centers.
- E. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.
- F. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of lead wedges and sealant unless otherwise indicated.

- G. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.
- H. Parapet Wall Panels: Contractor shall be responsible for removal and replacement of existing standing seam copper wall panels from the high parapet located along the front roof perimeter. Panel and coping style, width and dimensions shall match existing. Provide new self-adhering underlayment and rosin paper on substrate prior to installing new copper cladding.
- I. Pitch pockets shall be 16 ounce copper with soldered joints. Pack pitch pocket with grout or acceptable solid fill and top off with pourable sealer. Pourable sealer shall be 2 Part urethane, 2 color product for reliable mixing. Pitch pockets shall be used only where indicated.

#### 3.4 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

#### 3.5 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 079200 – JOINT SEALANTS

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. The work of this Section consists of furnishing and installing all exterior sealant and caulking materials required to complete the roofing application according to the details and specifications.
2. All materials shall be verified by the roofing contractor to be proper for each intended use, and the entire work of this Section shall be done in such a manner that each installation will perform its intended purpose as applicable, in the finished work.

B. Related Sections:

1. Division 07 Section "Polyvinyl Chloride (PVC) Membrane Roof" for installing sheet metal flashings and trim integral with membrane roofing.
2. Division 07 Section "SBS Modified Bituminous Roofing" for materials and installation of sheet metal flashing and trim integral with roofing.
3. Division 07 Section "Sheet Metal Flashing and Trim" for edge metal, roof penetration flashings, flashings, and counterflashings.

1.3 SUBMITTALS

A. Submit the following under provisions of Section 01300:

1. Manufacturer's descriptive literature and data sheets on each type of caulking and sealant material proposed.
2. Manufacturer's descriptive literature and data sheets for primer, foam backer rod, bond breaker tape and other sealant joint accessories
3. Material Safety Data Sheets for all material specified.

1.4 REFERENCES

- A. Except as modified by the requirements of other governing codes, the sealant and its installation shall conform to the provisions and recommendations of the following codes and standards:
1. Federal Specification TT-S-00230C (COM-NBS) Type II Class A .
  2. Federal Specification TT-S-001543A (COM-NBS) Class A.
  3. ASTM C-920-86, Type S, Grade NS, Class 25, Use NT, M, G, A and O.

## 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Sealant installation shall not take place during inclement weather or when the air temperature or wind chill temperature is below 40° F.
- B. Material safety data sheets of all specified products of this section shall be kept on site daily for project duration.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Sealant shall be a low modulus, high performance, one-part moisture curing silicone joint sealant at metal to metal intersections, or approved equal product. Color of sealant shall match color of metal being caulked.
- B. Sealant shall be Dymonic, a one part moisture curing modified urethane sealant at metal to masonry intersections (reglet joint), masonry to masonry joints; or approved equal product. Color of sealant shall match color of new metal counterflashing, or as chosen by the Owner.
- C. Backer rod shall be closed cell polyethylene foam backer rod of proper size to provide 25% compression when installed. Backer rod shall be Ethafoam SB Brand sealant backer rod as manufactured by Dow Chemical or approved equal.
- D. Bond breaker tape shall be one-sided adhesive tape for use in joints with inadequate depth or configuration for use of backer rod. Bond breaker tape shall be 470 Tape as manufactured by 3M Company or approved equal.
- E. All accessories for sealant materials shall be same manufacturer or approved by manufacturer, and shall include the following: primer, solvents, cleaners, and masking materials.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. All caulking and sealant installation must be done by skilled mechanics in accordance with the manufacturer's written instructions so as to produce weathertight and watertight joints.
- B. Do not apply caulking when the ambient air temperature or the temperature of surface to be caulked or sealed is below 50°F or above 100°F. Do not apply caulking or sealant during rain or snow.
- C. Bond Breaker Tape: Install bond breaker tape to the back of the sealant joints neatly, such that sealant will adhere only to sides of the joint when installed.
- D. Mask off the edges of joints to prevent staining unless it can be demonstrated that the quality of workmanship is high enough so that this protection is not needed.
- E. All joints to receive caulking or sealant shall be dry and free of loose particles, oil or grease, or other material that would prevent or interfere with full adhesion of the caulk or sealant.
- F. Existing sealant shall be removed in its' entirety at all joints. Rout out cracks to provide reasonably uniform profiles with depth slightly larger than the width in order to accommodate a sealant joint.

### 3.2 INSTALLATION

- A. Backer rod shall be installed at all reglet joints and elsewhere as indicated on the Drawings. Install backer rod carefully with approximately 30% compression avoiding tearing, twisting, or stretching. Splices shall be butted tightly. Install backer rod to provide a depth-to-width ratio for the sealant joint of 1:2.
- B. Bond Breaker Tape: Install bond breaker tape to the back of the sealant joints neatly, such that sealant will adhere only to sides of the joint when installed.
- C. Force sealant tightly into the joint, forcing out all air pockets and filling the void completely. Nozzle size shall be of the proper size to the particular joint.
- D. Sealant shall be dry-tooled immediately after application to provide a smooth, uniform surface of the recommended profile.

### 3.3 CLEAN-UP

- A. All surfaces stained, soiled or discolored during caulking or sealing shall be cleaned or restored.
- B. Smears and excess caulking and sealant shall be removed with a cleaning agent as recommended by the sealant manufacturer.

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Quincy, MA  
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END OF SECTION 079200

## SECTION 221423 - STORM DRAINAGE PIPING SPECIALTIES

### 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. Removal of existing copper drain insert sleeves and roof drain assemblies and installation of new specified roof drain assemblies to match existing pipe diameters.
- 2. Miscellaneous storm drainage piping specialties.

- B. Related Requirements:

- 1. Division 07 Section "Preparation for Re-Roofing" for removal of existing inserts and drain assemblies.
- 2. Division 07 Section "Polyvinyle Chloride (PVC) Roofing" for flashing at drain intersections.
- 3. Division 07 Section "SBS Modified Bituminous Roofing" for flashing at drain intersections.
- 4. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings.
- 5. Division 07 Section "Joint Sealants "for joint fillers, and joint preparation.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.4 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

## PART 2 - PRODUCTS

### 2.1 METAL ROOF DRAINS

- A. Cast-Iron, Large-Sump, General-Purpose Roof Drains. Roof drains to be sized to match existing vertical leader diameters.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Josam Company.
    - b. Marathon Roofing Products.
    - c. Smith, Jay R. Mfg. Co.
    - d. Zurn Plumbing Products Group; Specification Drainage Operation.
  2. Standard: ASME A112.6.4, for general-purpose roof drains.
  3. Body Material: Cast iron.
  4. Dimension of Body: Nominal 14-inch (357-mm) diameter.
  5. Combination Flashing Ring and Gravel Stop: Required.
  6. Flow-Control Weirs: Not required.
  7. Outlet: Bottom.
  8. Extension Collars: As Required.
  9. Underdeck Clamp: Required.
  10. Expansion Joint: As Required.
  11. Sump Receiver Plate: As Required.
  12. Dome Material: Cast iron.
  13. Perforated Gravel Guard: Not required.
  14. Vandal-Proof Dome: Required.

### 2.2 MISCELLANEOUS MATERIALS

- A. Pipe Joint: To be caulked with lead and oakum with cast iron leaders only.
- B. Drain Piping: Service weight of same diameter as presently exists.
- C. Insulation: Dual temperature black fiberglass pipe insulation a minimum of one inch (1") thick sealed with vapor barrier system or approved equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install roof drains according to roof membrane manufacturer's written installation instructions ensuring flange is flush with the roof membrane and all compression seal connections are proper to create a positive watertight connection with the existing drain leader pipe.

1. All roof drain elevations shall be checked to ascertain whether or not positive drainage exists. Any drains found to be too high shall be lowered to ensure that ponding does not exist.
2. If existing drain supports are inadequate for the lowered drains, new drain supports shall be furnished and installed along with all other labor and material required for watertight connections.
3. Flash in flange up to and around vertical drain bosses per roof membrane manufacturer's flashing requirements.
4. Install clamping ring over raised bosses and tighten clamping ring against membrane flashing until secure.
5. Install strainer dome onto clamping ring and lock in place.

### 3.2 CONNECTIONS

- A. (If applicable) Lines shall be connected and run in a workmanlike, manner, straight and in accordance existing lines. All connections shall conform to the current Massachusetts State Plumbing Code requirements. Piping shall pitch a minimum of one-quarter of an inch per foot (1/4" per 12") inside the building.

### 3.3 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.
- C. Snake clear all existing drains for a distance of 100 feet from the drain opening after all roof drain assemblies are properly installed and flashed

END OF SECTION 221423