

The attention of bidders submitting proposals for the subject project noted above is called to the following Addendum to the Contract Forms and Specifications.

The items set forth herein, whether of omission, addition, substitution or clarification are to be included in and form a part of the proposal submitted.

**THE NUMBER OF THIS ADDENDUM MUST BE ENTERED IN THE SPACE PROVIDED ON THE
BID PROPOSAL FORM.**

This Addendum consists of the following information:

Part 1	Division #0 & 1, Bidding and Contract Requirements	NOT USED
Part 2	Technical Changes, Architectural, Structural and Civil	
Part 3	Technical Changes, Mechanical, Electrical and Plumbing	NOT USED
Part 4	Drawing Changes, Architectural and Civil	
Part 5	Drawing Changes, Structural	NOT USED
Part 6	Drawing Changes, Mechanical, Electrical and Plumbing	
Part 7	Clarifications	
Part 8	New Issues – List of attached Documents	

Part 2 Technical Changes, Architectural, Structural and Civil

1. **00 20 00 Instructions to Bidders** – Item 11 - REMOVE reference to Project Labor Agreement
2. **06 00 00 Millwork Schedule** – ADD note “Cubby finish: Stained Red Oak veneer & hardwood edges”
3. **ADD Section 06 10 00 Carpentry**
4. **ADD Section 07 53 23 EPDM Roofing**
5. **ADD Section 07 62 00 Sheet Metal Flashings & Specialties**
6. **ADD Section 07 72 00 Roof Accessories**
7. **09 31 00 Ceramic Tiling**
 - a) 2.8 C. - ADD “Floor transitions from porcelain tile to other materials shall have Schluter transitions unless otherwise scheduled. Stainless steel products from the Schiene or Reno line are acceptable.”
 - b) 2.8 C. 1. – ADD “Exterior tile corners specified as Schluter Jolly may be used unless field conditions require corners and the like. In this case, the entire system shall change to the Schluter Quadec line in anodized aluminum which offers these accessories.”
8. **09 65 00 Resilient Flooring and Accessories**
 - a) 2.3 A. – CHANGE “(VT1 through VT7)” to “(VT).” The abbreviation “VT” is used to designate solid vinyl floor as specified. The intended design is to use a field of a uniform color in each of these spaces. Include (4) potential field colors that shall be selected by Architect from the manufacturer’s full range. Field colors shall be assigned to the rooms by the architect during submittal review.

Part 4 Drawing Changes, Architectural and Civil

1. **A101/1**
 - a) ADD note to Multi-Purpose Room 122 east wall “Remove existing wall tile. Prep wall for installation of scheduled wall tile”

2. A401

- a) CHANGE all counter heights noted as 2'-2" in Classroom LL06, LL2A, and LL31 to be 2'-4".

3. A440/Detail 1

- a) ADD note "Proved (2) SS top-mounted double hooks along with (2) SS side-mounted double hoots at each cubby."

Part 6 Drawing Changes, Mechanical, Electrical and Plumbing

1. E101

- a) ADD note "All duplex receptacles shall be Tamper resistance wall-mounted receptacles similar to Hubbell# 5362WTR"

Part 7 Clarifications

- 1. Canopy roof shall consist of fully adhered 60 mil thick EPDM, over tapered isocyanurate insulation and a Dens Deck cover Board. (Canopy addition is Alternate No.3)
- 2. 013101 RFI Submittal Form states the correct email address (rcarper@kgdarchitects.com) in which to send RFI's. Do not use the clickable link embedded within the .pdf file. RFIs will not be received at the email address associated with the link (ewilson@kgdarchitects.com).
- 3. A502 – No flooring work on the steps from the stage.
- 4. Owner has agreed to allow contractor use of the elevator for material hoisting provided existing elevator condition is maintained.

Part 8 New Issues – List of attached Documents

- 1. 06 10 00 Carpentry (dated 1/8/2021)
- 2. 07 53 23 EPDM Roofing (dated 1/8/2021)
- 3. 07 62 00 Sheet Metal Flashings & Specialties (dated 1/8/2021)
- 4. 07 72 00 Roof Accessories (dated 1/8/2021)

End of Addendum

SECTION 061000

CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 SUMMARY

- A. All plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules and notes, as specified, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Roof related wood nailers, blocking, shims, and plywood.
 - 2. Light gauge metal framing.
 - 3. Re-secure existing roof related blocking; remove and separate multiple layers of blocking, and secure each layer individually.
- B. Related Requirements
 - 1. EPDM Roofing - Section 075323
 - 2. Sheet Metal Flashing & Specialties - Section 076200
 - 3. Roof Accessories - Section 077200

1.3 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.
 - b. The Installer shall have a full time supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.
 - 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within a fifty mile radius of this project, which may be observed by representatives of the Owner:

- a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name - contact person - phone number and address and the Architect's name - contact person and phone number.
 - b. Submit the reference list upon request.
- B. Material Quality: Obtain each type of material from a single source to ensure consistent quality, color, pattern, and texture.
- C. Pre-Construction Conference: Attend the pre-construction meeting and discuss how and when carpentry work will be performed and coordinated with other work, and how the building will be kept watertight as work occurs.

1.4 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:
 - 1. A pre-work site and building inspection report with photos, to document conditions before work starts on site.
 - 2. Manufacturer's technical literature for all materials.
 - 3. Test reports and certifications substantiating compliance with specification requirements if requested.
 - 4. 2 foot long on-site samples which show the size, shape, configuration and method of fastening for all wood blocking assemblies, and which show how the blocking assemblies will relate to and fit on adjoining work.
- B. Simultaneously provide all technical submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
 - 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 - 2. Provide electronic submittals using an on-line service if an account is established for this project, or on USB drives if an on-line account is not established.
 - 3. Provide submittals in pdf format, organized in folders by Section.
 - 4. Do not include SDS sheets when making technical submittals.
 - 5. Do not provide sales brochures as a technical submittal.
 - 6. Provide an 8-1/2 by 11 inch data sheet for each product, to identify the product and manufacturer's names.

- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections - collated by section, in three ring binders. Provide two binders.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials dry at all times. Cover with tarps and protect against exposure to weather and contact with damp or wet surfaces.
- B. Do not overload the structure when storing material on the roof.
- C. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.6 GUARANTEE

- A. Provide a written Contractor's Guarantee which guaranties that all work will remain free of material and workmanship defects and in a watertight condition for a five year period beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: leakage, delamination, lifting, loosening, splitting, cracking, joint separation and movement.
 - 2. The Contractor shall make the repairs and modifications necessary to enable the work to perform as guaranteed at his own expense:
 - 3. Guarantee coverage shall include removing and replacing items installed as part of the original work, if removal is needed to make repairs.
- B. Provide one Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- C. The Guarantee shall take effect no more than 30 days before the satisfactory completion of all punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. WOOD, including shims, nailers, blocking, furring and similar members, in the sizes indicated, worked into the shapes shown, and as follows:

1. Lumber: Douglas Fir dimension lumber, free of large knots and other imperfections.
 2. Plywood: Exterior grade APA rated Type CDX underlayment plywood.
 3. Beveled Siding: Utility grade cedar, redwood, or synthetic siding, 1/2 inch by 6 inches and 3/4 inch by 10 inches wide, tapered to 1/8 inch thick.
- B. METAL, including light gauge metal channel and stud sections factory formed of minimum 24 gauge cold rolled galvanized steel.

2.2 FASTENERS

- A. Hot dipped galvanized steel, stainless steel, or steel covered with a proprietary rust inhibiting coating.
- B. Use screws wherever possible, minimum size diameter #12.
1. Do not use dry wall screws to secure wood blocking assemblies. Remove and replace carpentry components installed with drywall screws.
- C. If nails are used they shall be annular ring shank type.
1. Do not use smooth shank or un-coated steel nails. Remove and replace carpentry components installed with un-coated steel nails.

PART 3 - EXECUTION

3.1 INSTALLATION – GENERAL

- A. Coordinate carpentry work with all other work, including the installation of the vapor barrier, roof insulation, EPDM roofing, flashings, and other similar items.
- B. Shim and set carpentry work plumb and true, except provide slope at the top surfaces of horizontal members as indicated.
- C. Stagger joints in built up assemblies at least 2 feet to obtain maximum strength. Provide the shapes needed and adjust wood blocking to suit the existing conditions and achieve full bearing and secure attachment. Discard defective material, and pieces which are too small, and fabricate the work with a minimum of joints and an optimum joint arrangement.
- D. Securely attach carpentry work to resist a force of 275 pounds per lineal foot in any direction. Countersink all fasteners flush unless otherwise shown.
- E. Space fasteners to achieve adequate holding power, and generally 12 inches apart. :
1. Space fasteners in wood blocking 8 inches apart.
 2. Space fasteners in concrete or metal substrate 12 inches apart.
 - a. Use 1/4 inch diameter Spike or Drive fasteners in concrete. Pre-drill the holes.

- b. Use #12 screws in metal.
- 3. Install two rows of fasteners on blocking wider than 5 inches.
- F. Fit carpentry work neatly scribed and cut to fit within 1/8 inch of adjoining materials. Position furring, nailers, blocking, shims and similar supports for the proper attachment of subsequent work.

3.2 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any existing leaks or damage, prior to performing any work on site.
- B. Pay to restore all leaks or damage that isn't described in the report or repaired to the Owner's satisfaction.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage that results from the construction work or inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather - which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site presents a neat, orderly and workmanlike appearance. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.
- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

END OF SECTION

SECTION 075323

EPDM ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 SUMMARY

- A. All plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules, and keynotes, as specified, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Inspect the underside of the roof deck before starting work, and periodically each day as work occurs, to determine if there are conduits, pipes, ceiling hangers or fixtures next to the deck or fastened to the deck that could be affected as the work occurs.
 - a. Perform the work so any conduits, pipes, ceiling hangers or fixtures are not disturbed.
 - b. Replace and reset any conduits, pipes, ceiling hangers or fixtures that are affected by the work.
 - 2. Remove and dispose of existing gravel surfacing, roofing, insulation, underlayment, wood blocking, and flashing.
 - a. Clean all residual material from the surface of the decks, and from within the flutes of the steel decks.
 - b. The work may include removing asbestos containing roofing materials. Refer to the asbestos abatement specification for additional information and asbestos removal requirements.
 - 3. Install a new fully adhered unreinforced 60 mil thick EPDM roofing system, including a vapor barrier on the concrete deck areas, and insulation, a cover board, flashing, stripping and related accessories.
 - 4. Provide miscellaneous mechanical, electrical, hoisting and other work needed, and remove, adjust, modify, reset and reconnect all roof-mounted and roof-penetrating equipment.
 - 5. Install new flashings at the roof drains, and all roof-mounted and roof-penetrating equipment.

6. Disconnect and remove abandoned mechanical equipment and curbs, and infill the roof deck.
7. Cover new and existing rooftop ductwork with isocyanurate insulation and fully adhered unreinforced EPDM. Configure the insulation so the top surfaces slope for drainage. Install acrylic color coating on the EPDM duct wrap.
8. Refasten loose sections of the metal roof decks as Base Bid work.
9. Repair deterioration less than 1/2 inch deep in the surface of the existing concrete decks as Base Bid work.
10. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

B. Related Requirements

1. Carpentry - Section 061000
2. Sheet Metal Flashing & Specialties - Section 076200
3. Roof Accessories - Section 077200

1.3 CODE APPROVAL REQUIREMENTS

A. Install roofing and insulation system components to meet the following minimum requirements:

1. New York State Uniform Fire Prevention and Building Code, which includes by reference the New York State Energy Conservation Code.
2. Underwriters Laboratories Inc. Class A External Fire Rating for roof assemblies tested in accordance with ASTM E 108 or UL 790.
3. Underwriters Laboratories Inc. Standard 1256 for roof assemblies with foam insulation.
4. Minimum wind uplift pressure calculated using ASCE 7 and a safety factor of 2:
 - a. Field Zone - 60 psf
 - b. Perimeter Zones - 100 psf
 - c. Corner Zone – 150 psf

B. Provide written certification from the roof material Manufacturer, before beginning work, to confirm the roofing system meets these requirements.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:

1. A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.

- a. The Installer shall directly employ the personnel performing the work of this section.
 - b. The Installer shall have a full time supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 1. Submit the supervisor's resume upon request.
 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design within a fifty mile radius of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name - contact person - phone number and address and the Architect's name - contact person and phone number.
 - b. Submit the reference list upon request.
 3. The Installer shall be acceptable to or licensed by the Manufacturer of the primary roofing materials, and provide written certification from the Manufacturer to confirm this prior to award if requested.
- B. Material Quality: Obtain each type of material from a single source to ensure consistent quality, color, pattern, and texture.

1.5 PRE-CONSTRUCTION CONFERENCE

- A. Meet at the project site between one and two weeks prior to starting work, with the Architect, Owner and other representatives concerned about the work, to discuss the following:
1. How the building will be kept watertight as old roofing is removed and the work progresses.
 2. How the installation of new roofing will be coordinated with the installation of the vapor barrier, insulation, cover board, flashings and other items to provide a watertight assembly.
 3. Generally accepted industry practice and the Manufacturer's instructions for handling and installing his products.
 4. The condition of the substrate (deck), curbs, penetrations and other preparatory work needed.
 5. Incomplete submittals; note that progress payments will be not processed until all submittals are received and approved.

6. The construction schedule, weather forecast, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.
7. A schedule for Manufacturer and Owner inspections.

1.6 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:
 1. A pre-work site and building inspection report with photos to document conditions before work starts.
 2. Written certification from the Manufacturer which states that the Installer is acceptable or licensed to install the specified roofing; if not previously provided.
 3. Manufacturer's technical literature for all materials.
 4. Samples of the Contractor's Guarantee and Manufacturer's warranty forms.
 5. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
- B. Simultaneously provide all technical submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 2. Provide electronic submittals using an on-line service if an account is established for this project, or on USB drives if an on-line account is not established.
 3. Provide the submittals in pdf format, organized in folders by Section.
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections - collated by section, in three ring binders. Provide two binders.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.7 JOB CONDITIONS (CAUTIONS & WARNINGS)

- A. Do not use oil or solvent based roof cement with EPDM roofing. Do not allow waste products, (petroleum grease or oil, solvents, vegetable or mineral oil, animal fat) or direct steam venting to come in contact with any roofing, insulation or flashing product. Do not expose EPDM roofing and accessories to a temperature in excess of 175 degrees Fahrenheit.
- B. Splice cleaner, primer, cements and bonding adhesives are flammable. Do not breathe vapors or use near fire or flame or in a confined or unventilated area. Dispense only from a UL listed safety can or the Manufacturer's original container.

- C. Remove empty adhesive, cleaner and solvent containers and contaminated rags from the roof and legally dispose of them daily.
- D. Do not apply primer, cleaners or adhesives next to ventilation system louvers or windows. Temporarily cover the louvers and windows with 6 mil fire retardant polyethylene and prevent odors from entering the building. Remove temporary covers at the end of each days work.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to the site in the Manufacturer's original and unopened packaging, with intact and legible labels which identify the products and Manufacturers,
- B. Cover all stored materials, except rolls of EPDM and sealed cans of adhesives, with watertight tarpaulins installed immediately upon delivery.
- C. Immediately remove insulation which gets wet from the job site.
- D. Store and install all material within the Manufacturer's recommended temperature range.
- E. Do not overload the structure when storing materials on the roof.
- F. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.9 GUARANTEE AND WARRANTY

- A. Provide a written Manufacturer's Full System Warranty which warrants that the roof assembly, including the vapor barrier, insulation, cover board, EPDM roofing and flashings, will remain in a watertight condition for a twenty year period beginning upon Final Completion.
 - 1. Guarantee coverage shall remain in effect for gust wind speeds up to 72 miles per hour, measured at ground level at the site.
 - 2. Guarantee coverage shall have no dollar value limit.
- B. Provide a written Contractor's Guarantee which guaranties that all work will remain free of material and workmanship defects and in a watertight condition for a five year period beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: leakage, adhesive separation, delamination, lifting, loosening, splitting, cracking, joint separation, movement and undue expansion or shrinkage.
 - 2. The Contractor shall make the repairs and modifications necessary to enable the work to perform as guaranteed at his own expense:

3. Guarantee coverage shall include removing and replacing materials installed as part of the original work, if removal is needed to affect guaranteed repairs.
 4. Guarantee coverage shall remain in effect for gust wind speeds up to 72 miles per hour, measured at ground level at the site.
 5. Guarantee coverage shall have no dollar value limit.
- C. Provide one Contractor's Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- D. The Manufacturer's Warranty and Contractors Guarantee shall take effect no more than 30 days before the completion of all punch list work.
- E. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.
- F. Guarantee and Warranty coverage may be cancelled, for the affected portion of the roof, if the work is damaged by winds in excess of 72 mph, by hail, lightning, insects or animals, by failure of the structural substrate, by exposure to harmful chemicals, by other trades on the roof, or by vandalism, or if the Owner fails to maintain the roof in accordance with, or makes roof alterations contrary to, the Manufacturer's printed recommendations.
1. Guarantee and Warranty coverage shall be reinstated, for the remainder of the original period; if the Owner restores the roof to the condition it was in prior to the damage occurring.

1.10 SUBSTITUTIONS

- A. The following factors will be considered when evaluating a possible alternative to the roofing system specified:
1. The wording and intent of the warranty to be issued.
 2. The financial status, numbers of years in business, and stability of the entity that will issue the warranty.
 3. A reference list of at least five completed similar projects of comparable size, with a successful functional history of at least five years, within an approximate fifty mile radius of the Project.
 4. Technical aspects of the system, especially relating to durability, serviceability and performance.
 5. The Manufacturer's ability and history providing technical support, on-site inspections and in progress assistance.

6. The availability and experience of local authorized applicators to install and maintain the proposed alternate system.
7. The Manufacturer's willingness and history responding to warranty claims previously made by the Owner, Architect or Consultant's involved in this project.

PART 2 - PRODUCTS

2.1 GENERAL

- A. EPDM roof system components are specified as products of Firestone Building Products Company to establish a standard of quality. Equal products and systems from Carlisle SynTec or Johns Manville will be accepted.
- B. Primary products required for this project include:
 1. Vapor barrier
 2. Insulation
 3. Cover board
 4. EPDM roofing
 5. Primers and adhesives
 6. Sealants
 7. EPDM flashing
 8. Fasteners
 9. Acrylic coating

2.2 EPDM

1. Unreinforced 60 mils thick, fire retardant, EPDM (Ethylene Propylene Diene Monomer) sheet membrane conforming to the following minimum physical properties.

PROPERTY	TEST METHOD	SPECIFICATION
Color	—	Gray/Black
Tensile Strength	ASTM D-412	1305 psi min.
Elongation	ASTM D-412	300% min
Tear Strength	ASTM D-624	150 lb/in min
Ozone Resistance	ASTM D-1149	No cracks, 7 days/100 pphm/100°F/50% strain
Heat Aging	ASTM D-573	1200 psi min@ 200% elongation/4 wks/240°F
Brittleness Temperature	ASTM D-746	-49°F
Water Vapor Permanence	ASTM E-96	2.0 perm max
Thickness	ASTM D-412	60 mils plus/minus 6 mils
Fire Retardant		UL Class A

2.3 RELATED MATERIALS

- A. Cleaners, adhesives, sealants, caulking and fasteners furnished by the EPDM system Manufacturer, that comply with low VOC regulations in effect at the time of application.

1. Stripping: 90 mil thick 5 inch and 9 inch wide self adhering flashing, consisting of 45 mils of semi-cured EPDM factory laminated to 45 mils of cured seaming tape.
 2. Bonding Adhesive: High strength contact adhesive.
 3. Splice Adhesive: High strength synthetic polymer based contact cement formulated specifically to splice EPDM sheets.
 4. Lap Sealant: EPDM rubber based gun grade sealant.
 5. Water Block Seal: One component low viscosity butyl rubber sealant.
 6. Pre-Molded Pipe Flashing: Pressure sensitive prefabricated flashings with pre-applied adhesive.
 7. Pourable Sealer: Two component, solvent free polyurethane based sealant.
 8. Reinforced Perimeter Fastening Strips: .030 inch thick reinforced cured EPDM.
 9. Seam Tape Primer: Synthetic rubber polymer based primer designed to clean and prime seam tape splice areas prior to installing the tape.
 10. Seam Splice Tape: Nominal 30 mil thick cured polymer self adhesive tape with release paper carrier, 6 inches wide.
 11. Plates and Bars: Galvanized and corrosion resistant specialty products.
 12. Fasteners: #14 Fluorocarbon polymer coated heavy duty screws.
- B. Primer & Vapor Barrier:
1. Primer: Thin, cut back asphalt meeting ASTM D41.
 2. Vapor Barrier: Fire resistant torch grade SBS modified granular surfaced polyester and glass scrim reinforced cap sheet meeting ASTM D 6163 Type I, Grade G, furnished by the same manufacturer as the EPDM.
- C. Gypsum Cover Board: 1/4 inch thick fire resistant gypsum board decking with inorganic glass mat facers and a water resistant core, formulated in 48 x 48 inch square edge boards, UL Class A, meeting ASTM C-1177, manufactured under the trade name Dens-Deck Prime.
- D. Insulation: Flat and tapered rigid cellular polyisocyanurate boards with fibrous felt/fiberglass mat facers, minimum compressive strength 20 psi, meeting ASTM C1289-01, Type II, Class1, Grade 2, as manufactured by Firestone under the trade name of "ISO 95+ Isocyanurate Insulation". Minimum thickness as shown on the roof plan.
1. Tapered insulation sloping 1/8 inch per foot.
 2. Crickets sloping 1/4 inch per foot.

- E. Tapered edge strips – high density isocyanurate or wood fiberboard strips installed at the drain sumps, and insulation transition points.
- F. Insulation adhesive: Two component low rise polyurethane foam adhesive, installed with a mixing extruding Pace Cart dispenser, or with a pleural heated foam rig, Firestone I.S.O. Adhesive.
 - 1. Use insulation adhesive suitable for application at the intended application temperatures.
 - 2. Do not use twin cartridge “caulking gun” adhesive except on very small isolated sections of roof.
- G. Acrylic Color Coating: Latex based acrylic coating containing 67% solids by weight, resistant to heat, cold water, ozone, ultraviolet rays, and intended for installation on weathered EPDM. Custom color tint as selected by the Architect.
- H. Concrete Grout: Fast setting Portland cement based polymer modified repair mortar as manufactured by The Quikrete Companies, under the trade name Quick-Setting Cement, or equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install the new roofing system in a watertight, workmanlike manner, meeting the guarantee requirements specified herein; in accordance with the drawings and in conformance with the Manufacturer's requirements, except as enhanced by the drawings and specifications.
- B. Perform work next to roof mounted mechanical equipment, so the work coincides with equipment shutdown periods and does not affect building occupants. Temporarily cover and protect equipment openings, and windows next to the work area, with 6 mil fire retardant polyethylene, so dirt, dust and odors do not enter the equipment or building. Remove covers as soon as the work is complete and at the end of each workday.
- C. Clean substrate surfaces of all laitance, dirt, oil, grease or other foreign matter.
- D. Remove debris daily and as it is generated. Do not stock-pile debris on the roof. Do not leave any debris on the roof or in the adjoining bulkheads at the end of the day. Do not overload the roof structure when moving debris.
- E. Install roof system components on dry surfaces only. Do not install any components when the weather and outside temperatures are not suitable in accordance with the Manufacturer's recommendations.
- F. Complete all work including the equipment flashings, in sequence as quickly as possible so the smallest area possible is under construction at any one time. Complete the entire area of work begun each day, the same day, and make all exposed edges watertight at the end of each day's work.

- G. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

3.2 SUBSTRATE INSPECTION

- A. Remove existing gravel, fabric scrim, EPDM roofing, insulation, flashings, and underlayment material, and then carefully check the existing deck. To be an acceptable surface for the new roofing system, it is to be well secured to the underlying structure and not rotted or otherwise deteriorated.
- B. Immediately notify the Architect and Owner by telephone and in writing if defects in the substrate are discovered.
- C. Maintain the building watertight in the interim, but do not install new roof system components until defects have been corrected.

3.3 DECK REPAIR

- A. Steel deck repairs:
 - 1. Remove damaged and deteriorated decking across the entire width of individual sections by a length equal to a minimum of two joist bays.
 - 2. Install new deck to match the thickness, gauge and cross section of the existing deck. New steel deck shall be galvanized and match the existing deck.
 - 3. Fasten new decking to each joist with #10 screws spaced 6 inches on center.
 - 4. Stitch side seams of steel deck with #10 screws spaced 24 inches apart.
- B. Concrete deck repairs:
 - 1. Perform repairs to the surface of concrete deck areas, 1/2 inch or less in depth, with quick setting non-shrink grout under the Base Bid.
 - 2. Deterioration greater than 1/2 inch deep shall be brought to the Architects attention for his review and direction.

3.4 VAPOR BARRIER CONCRETE DECKS

- A. Install asphalt primer and allow it to dry.
- B. Starting at the low point, torch apply and fully adhere modified bitumen vapor barrier sheets to the primed substrate. Lap the sheets at least 4 inches at the ply overlaps and at least 6 inches at the end laps.
- C. Carefully install the vapor barrier sheets to achieve only the minimum required bleed out.

- D. Extend the vapor barrier up vertical surfaces at the roof perimeter, and up and around all penetrations and curbs, and seal the vapor barrier to provide continuity of the air / vapor envelope.
- E. Note the vapor barrier can be installed prior to the finished roof and act as a temporary roof while the existing equipment is removed and new equipment is installed.
 - 1. Damaged areas of the vapor barrier must be replaced prior to installing the finished roof assembly.

3.5 INSULATION AND COVER BOARD

- A. Install tapered insulation neatly cut at all miters and transitions. Do not lace corner boards.
- B. Install insulation with joints offset between rows and layers a minimum of 12 inches. Cut insulation to fit neatly at penetrations and joints. Fill any gap which is greater than 1/4 inch.
- C. Fasten all layers of insulation only to the top flute of steel decks, with screws and discs which penetrate through the deck a minimum of 3/4 inch and a maximum of 1-1/2 inches.
 - 1. Install 32 fasteners per 4 by 8 foot insulation board.
 - 2. Carefully choose the length and position of each screw to ensure the screws do not damage conduits mounted on the underside of the deck.
- D. install all layers of insulation over the vapor barrier on concrete deck areas using low rise polyurethane foam adhesive applied in accordance with the Manufacturer's recommendations and to achieve the specified minimum uplift resistance. .
 - 1. Install 1/2 inch diameter adhesive beads 12 inches on center in the field of the roof.
 - 2. Install 1/2 inch diameter adhesive beads 6 inches on center in 8 foot wide perimeter zones.
 - 3. Install 1/2 inch diameter adhesive beads 4 inches on center in 8 foot square corner zones.
 - 4. Place 5 gallon pails half full of gravel or concrete on the insulation boards to hold them firmly in position for at least 15 minutes while the low rise foam adhesive sets. Position the pails no more than 24 inches apart in all directions.
- E. Install gypsum cover board over the insulation using low rise polyurethane foam adhesive applied in accordance with the Manufacturer's recommendations and to achieve the specified minimum uplift resistance.
 - 1. Install 1/2 inch diameter adhesive beads 12 inches on center in the field of the roof.
 - 2. Install 1/2 inch diameter beads spaced 6 inches on center in 8 foot wide perimeter zones.
 - 3. Install 1/2 inch diameter adhesive beads 4 inches on center in 8 foot square corner zones.

4. Place 5 gallon pails half full of gravel or concrete on the gypsum cover boards to hold them firmly in position for at least 15 minutes while the low rise foam adhesive sets. Position the pails no more than 24 inches apart in all directions.

- F. Remove and replace any insulation or cover boards that are installed without using pails of concrete or gravel ballast.

3.6 EPDM

- A. Place EPDM roofing on the substrate without stretching it, and allow it to relax approximately one hour – before starting to adhere it to the substrate and form the seams.
- B. Place adjoining sheets in the same manner lapping the edges to shed water.
- C. Fully adhere EPDM to the substrate with bonding adhesive.
 1. Open each can of adhesive and stir it with an electric paddle mixer for at least 5 minutes before applying the adhesive. Re-stir adhesive that isn't used within two hours of initial mixing.
 2. Do not punch holes in cans of adhesive and use them in a "Better Spreader" without first opening the cans to mix them.
 3. Replace used roller covers each day; discard covers after each days use.
 4. Allow bonding adhesive to dry to the touch before joining the EPDM to the substrate.
 5. Roll the EPDM onto the dried bonding adhesive and immediately rub it vigorously with a soft bristle broom to ensure complete adhesion.
- D. EPDM installed over improperly applied adhesive or with adhesive that wasn't stirred, and roofing installed with blisters, ridges, mole runs and similar deficiencies shall be removed and replaced at the Contractor's expense. Removal shall include the insulation and cover board assembly.

3.7 SPLICING

- A. Form EPDM roof splices with 6 inch wide field applied seam tape, or with 3 inch wide factory applied seam tape.
 1. Fold the top sheet back and clean mating surfaces using clean rags with splice wash.
 2. Scrub a smooth coat of QuickPrime onto mating surfaces, with long strokes, and to obtain complete coverage, using approximately 1 gallon per 225 square feet. Do not allow the QuickPrime to glop, streak or puddle; allow it to dry to the touch before installing the seam tape.

3. Position the seam tape so 1/8 inch minimum and 1/2 inch maximum will be exposed at the seam edge when the seam is complete.
 - a. Install 5 inch uncured EPDM stripping over any seam where the tape is exposed less than 1/8 inch or more than 1/2 inch.
 4. Roll and allow the top sheet to fall freely into place without stretching or wrinkling it.
 5. Pull splice tape release paper from within the seam and neatly mate the seam using hand pressure to rub the membrane together.
 6. Immediately roll the splice with a 2 inch wide roller, using positive pressure, toward the outer edge of splice.
- B. Install uncured EPDM target patches with rounded corners, over all T-Seam intersections.

3.8 PERIMETER FASTENING

- A. Secure the EPDM at the perimeter of each roof level, and at eaves, penetrations, expansion joints and slope changes greater than 1 inch in 12 inches. Utilize surface applied discs or adhere the EPDM to continuous reinforced EPDM fastening strips. Secure the discs and EPDM fastening strips 12 inches on center.

3.9 FLASHINGS

- A. Utilized cured EPDM for all flashings; utilize self-curing EPDM at corners and angle changes only where required by the Manufacturer.
1. Form flashing splices, and the splice between the flashing and main roof sheet with 6 inch seam tape.
 2. Adhere the flashing to vertical surfaces with bonding adhesive.
 3. Fasten the top edge of all flashings, positioning the fasteners 12 inches on center, to be covered by a cap flashing.
- B. Install premolded pipe flashings wherever possible. Where premolded pipe flashings cannot be installed, use field wrapped flashings. Install sealant pockets as a last resort.
- C. Remove existing pipe flashings and Kennedy type couplings and extend the vent pipes to finish a minimum of 18 inches above the roof surface.
1. Extend the pipes using the same type of pipe material as the original vent pipe.
 2. Use threaded or no-hub couplings, positioned within the insulation layer to extend the pipes.

3.10 DUCT WRAP WATERPROOFING:

- A. Cover roof top ductwork with isocyanurate insulation and fully adhered 60 mil thick EPDM roofing.
 - 1. Install EPDM cover strips and target patches to seal all duct air leaks before covering them.
 - 2. Install flat 3 inch thick insulation on the sides and bottom of the ducts.
 - 3. Install tapered insulation sloping 1/4 inch per foot, minimum-starting thickness 3 inches on top of the ducts.
 - 4. Secure the isocyanurate insulation with screws and plates, install one fastener per 2 square feet.
 - 5. Cover the insulation with fully adhered 60 mil thick EPDM.
 - 6. Install two roller applied coats of acrylic color coating on the EPDM duct cover.

3.11 MISCELLANEOUS

- A. Provide any miscellaneous roofing, flashing, caulking, and metal work needed to leave the work complete and entirely watertight, neatly and carefully executed in a thorough and workmanlike manner.
- B. Use mechanics skilled and licensed in the trades to perform mechanical and electrical work. Provide new material, couplings, transition pieces, blocking, fasteners and the like needed to complete the work.

3.12 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leakage or damage, prior to performing any work.
- B. Pay to restore all leaks or damage that isn't described in the report or repaired to the Owner's satisfaction.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather - which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site presents a neat, orderly and

workmanlike appearance. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.

- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

3.13 ROOF INSPECTIONS BY MANUFACTURER

- A. Arrange for the roofing Manufacturer, or his authorized representative, to make a minimum of three inspections in accordance with the following schedule and submit a written report of each inspection to the Architect.
 - 1. First inspection during the first two days of new roof installation.
 - 2. Second inspection when all roofing and flashings are installed.
 - 3. Final inspection at the completion of all work.
- B. Provide 48 hours advance written notice to the Architect, so he may have a representative attend the inspections.
- C. Submit the inspection reports within one week following each inspection.
 - 1. Payment requisitions will not be reviewed nor approved until the inspection reports are received.

END OF SECTION

SECTION 076200

SHEET METAL FLASHINGS & SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 SUMMARY

- A. All plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules and keynotes, as specified, and as required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Sheet metal work that is compatible with the roofing systems specified, including cap flashings, hook strips, fascia, drip edges, gutters, leaders, and miscellaneous flashings.
- B. Related Requirements
 - 1. Carpentry - Section 061000
 - 2. EPDM Roofing - Section 075323
 - 3. Roof Accessories - Section 077200

1.3 CODE APPROVAL REQUIREMENTS

- A. Fabricate and install roof perimeter flashings that comply with the NY State Uniform Fire Prevention and Building Code and with ANSI/SPRI ES-1 "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems" requirements.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.
 - b. The Installer shall have a full time supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.

2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within a fifty mile radius of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name - contact person - phone number and address and the Architect's name - contact person and phone number.
 - b. Submit the reference list upon request.
- B. Material Quality:
 1. Obtain each product from a single Manufacturer which has manufactured the same product in the United States of America for not less than 5 continuous years.
 2. Obtain copper and pre-finished sheet metal items from the same mill run to maintain consistent color hue and surface finish.
- C. Pre-Construction Conference: Meet at the project site between one and two weeks prior to starting work, with the Architect, Owner and other representatives concerned about the work, to discuss the following:
 1. How the building will be kept watertight as work progresses.
 2. How sheet metal work will be coordinated with the installation of the vapor barrier, insulation, cover board, roofing, flashings, roof accessories and other items to provide a watertight installation.
 3. Generally accepted industry practice and the Manufacturer's instructions for handling and installing his products.
 4. The condition of the substrate, curbs, penetrations and other preparatory work needed.
 5. Incomplete submittals; note that progress payments will not be processed until all submittals are received and approved.
 6. The construction schedule, weather forecast, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.
 7. A schedule for Manufacturer and Owner inspections.

1.5 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:

1. A pre-work site and building inspection report with photos to document conditions before work starts.
 2. Manufacturer's technical literature for all materials.
 3. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
 4. Shop drawings, or 2 foot long samples, for each sheet metal item, to show how it relates and fits on adjoining masonry and wood blocking assemblies, and with the roof, stripping, and flashings.
 5. 6 inch square pieces of each type of sheet metal to show surface finish, texture and color.
 6. A sample of the Contractor's guarantee form.
- B. Simultaneously provide all technical submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
1. Submittals shall be prepared and made by the firm that will perform the actual work.
 2. Provide electronic submittals using an on-line service if an account is established for this project, or on USB drives if an on-line account is not established.
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections - collated by section, in three ring binders. Provide two binders.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.6 JOB MOCK-UPS

- A. After the submittals are approved, prepare in actual job locations, mock-ups of cap flashings, hook strips, drip edges, gutters, leaders, and all other items of sheet metal and related work, for inspection and approval by the Architect.
- B. Construct each mock-up of two full lengths of metal, fastened, connected and stripped-in to the related roofing system, to show the following:
1. Type, gauge, color, cross-sectional dimensions and shape, and joint and mitering techniques.
 2. Related masonry work, wood blocking, and the attachment techniques and fasteners for all wood and metal components.

3. Other sheet metal related materials and their installation techniques to fully define the detailing of each mock-up.
- C. Mock-ups shall be constructed to establish the minimum standard of materials and workmanship, and to assure that completed work which matches the mock-ups will be fully functional and serve the purpose for it has been designed.
- D. Approved mock-ups may be left in place and incorporated into the permanent installation. Rejected mock-ups shall be removed and replaced until an acceptable mock-up is approved.
- E. Do not purchase or fabricate sheet metal items until mock-up installation, inspection and approval are completed and approval is documented in writing.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to the site in the Manufacturer's original and unopened packaging, with intact and legible labels which identify the products and Manufacturers,
- B. Cover all stored materials with watertight tarpaulins installed immediately upon delivery.
- C. Do not overload the structure when storing materials on the roof.
- D. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.8 GUARANTEE

- A. Provide a written Contractor's Guarantee which guarantees that all work will remain free of material and workmanship defects and in a watertight condition for a five year period beginning upon Final Completion:
 1. Defects include but are not limited to the following: peeling paint, leakage, adhesive separation, delamination, lifting, loosening, splitting, cracking, and undue expansion.
 2. The Contractor shall make the repairs and modifications necessary to enable the work to perform as warranted at his own expense.
 3. Guarantee coverage shall include removing and replacing materials installed as part of the original work, if removal is needed to affect guaranteed repairs.
 4. Guarantee coverage shall have no dollar limit.
- B. Provide one Contractor's Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.

- C. The Guarantee coverage shall take affect no more than 30 days before the completion of all punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Copper sheet: ASTM B370, 99.0 % pure copper, thickness 16 ounces per square foot. Use copper for all metal items not otherwise indicated
- B. Zinc-Tin coated copper: copper sheet, coated on both sides, with a smooth uniform coating of zinc and tin, base metal weight 16 ounces per square foot, cold rolled temper, available as FreedomGray Copper by Revere.
- C. Solder:
 - 1. 50-50 tin and lead for plain copper, supplied in one pound bars with the alloy mixture stamped into the bar by the Manufacturer.
 - 2. Lead free / or pure tin solder for zinc-tin coated copper, Number 497 by Johnson Manufacturing.
- D. Flux:
 - 1. Water-Soluble Liquid Flux, Kester #3345 for iron soldering of brass and copper.
 - 2. Tin-bearing flux such as "Flux-N-Solder E127 with pure tin" by Johnson Manufacturing.
- E. Aluminum fascias, hook strips, gravel stops and miscellaneous trim: #3105-H14 alloy aluminum, minimum thickness .040 inches unless otherwise indicated, factory finished with a Fluoropolymer Kynar 500 finish, color as selected by the Architect, from the full range of custom and standard colors.
- F. Fasteners: fabricated of stainless steel, or material that matches the sheet metal being fastened.
- G. Underlayment: one ply of high temperature ice & water shield and one ply of 5 pound rosin paper.
- H. Exterior mounted gutters: 6 inch wide, .032 inch thick aluminum, factory finished with a baked acrylic enamel, ogee style gutters supported with concealed aluminum fascia brackets spaced 12 inches on center fastened with 1-1/2 inch long stainless steel screws.
- I. Exterior mounted leaders and straps: .027 inch thick rectangular corrugated aluminum leaders factory finished with baked acrylic enamel. Fasten each leader with 1/16 inch thick by 1 inch wide straps spaced 7 feet on center.

- J. Sealant: High performance, solvent free, formulated and moisture curing silyl-terminated polyether sealant, ASTM C-920, Type S, Grade NS, Class 25, NovaLink construction sealant by ChemLink, color as selected.

PART 3 - EXECUTION

3.1 GENERAL

- A. Accurately reproduce the details and design shown, and form profiles, bends and intersections, sharp, true and even. Fabricate sheet metal in the shop whenever possible, and form joints, laps, splices and connections to shed water and condensation in the direction of flow.
- B. Provide any miscellaneous flashing and sheet metal work not shown on the drawings but otherwise needed to leave the project complete and entirely watertight, neatly and carefully executed in a thorough and workmanlike manner.

3.2 INSPECTION

- A. Examine surfaces to receive work of this section and report any defects to the Owner. Commencement of work will be construed as complete acceptance of surfaces.

3.3 INSTALLATION

- A. Fabricate and install copper work in accordance with the current edition of "Copper and Common Sense" as published by the Revere Copper and Brass Company, unless otherwise indicated.
 - 1. Form all joints, except loose locked sealant filled expansion joints, to overlap 2 inches.
 - 2. Secure the joints with rivets spaced 1 inch on center positioned about 1/2 inch from the top edge of the joint, then sweat solder the joint.
 - 3. Use solder only to fill and seal the joint, not for mechanical strength. Form soldered joints continuous, strong and free from defects, with well heated soldering irons. Do not use open flame torches for soldering.
 - 4. Clean soldered joints daily, immediately after soldering, by washing them with soap and water applied with a soft bristle brush, then rinsing with clear water.
- B. Securely fasten and anchor all work, and make provisions for thermal expansion. Submit details of expansion joints for approval. Install fasteners through one edge of metal only, use a hook strip on the other edge.
- C. Use stainless steel pin Zamac type nail-in fasteners, or stainless steel screws and washers with neoprene inserts where fasteners will be exposed.

3.4 CAP FLASHINGS

- A. Install new aluminum cap flashings on the change in elevation walls and equipment curbs.
 - 1. Form the cap flashing to extend at least 2 inches under the equipment and 4 inches behind the wall panels, 4 inches over the base flashing, and finish with a 1/2 inch hem on the bottom edge.
 - 2. Install a 1/2 inch thick by 2 inch wide continuous foam gasket between the cap flashing and mechanical equipment. Do not set the equipment in sealant.
 - 3. Secure the equipment to the curb with stainless steel screws spaced 12 inches on center.

3.5 DRIP EDGES

- A. Fabricate drip edges to extend 1-1/2 inches past the roof edge, and turn down to ensure water cannot track back and run down the fascia. Secure the drip edge with roofing nails along the top edge, spaced 4 inches apart along the raw metal edge. Form joints in the drip edge with 6 inch wide concealed under plates which duplicate the profile of the drip edge. Set the underplates in a full bed of sealant.

3.6 HOOK STRIPS

- A. Form continuous hook strips with locks that engage the superimposed trim piece a minimum of 3/4 inch, and to cover the entire underside edge of the wood blocking and neatly extend to the building wall.
- B. Fasten hook strips along their bottom edge, just above the 45 degree bend, with nails spaced 4 inches on center into underlying wood blocking; Zamac type nail-in type fasteners spaced 8 inches on center into masonry surfaces, or screws spaced 8 inches on-center into sheet metal surfaces.

3.7 FASCIA

- A. Fabricate new fascia to engage the hook strip 3/4 inch minimum and extend to the top of the wood fascia blocking. Secure the fascia with a continuous hook strip along the bottom edge and roofing nails along the top edge spaced 8 inches apart, positioned to be covered by the roof edge trim. Form joints in the fascia with 6 inch wide concealed under plates which duplicate the profile of the fascia. Set the underplates in a full bed of sealant.

3.8 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leakage or damage, prior to performing any work.
- B. Pay to restore all leaks or damage that isn't described in the report or repaired to the Owner's satisfaction.

- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather - which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site presents a neat, orderly and workmanlike appearance. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.
- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

END OF SECTION

SECTION 077200

ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 SUMMARY

- A. All plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules and keynotes, as specified, and as required by conditions and authorities having jurisdiction, including, but not limited to, the following:

1. Roof accessories that are compatible with the roofing systems specified, including:
 - a. Drains, drain pipes and couplings.
 - b. Pipe insulation and fitting covers.
 - c. Aluminum smoke vent hatches.
 - d. Galvanized steel roof access ladders.
 - e. Roof walkway pads and concrete pavers.
2. Prepare, prime and paint all roof top equipment, equipment support dunnage, bulkhead doors and frames (inside and outside), vent pipes and other miscellaneous rooftop items indicated.

- B. Related Requirements

1. Carpentry - Section 061000
2. EPDM Roofing - Section 075323
3. Sheet Metal Flashing & Specialties - Section 076200

1.3 CODE APPROVAL REQUIREMENTS

- A. Fabricate and install roof accessories that comply with the NY State Uniform Fire Prevention and Building Code.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:

1. A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.

- b. The Installer shall have a full time supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.
 - 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within a fifty mile radius of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name - contact person - phone number and address and the Architect's name - contact person and phone number, and the Contractor's Supervisor's name.
 - b. Submit the reference list upon request.
- B. Material Quality: Obtain each product from a single Manufacturer which has manufactured the same product in the United States of America for not less than 5 continuous years.
- C. Pre-Construction Conference: Meet at the project site between one and two weeks prior to starting work, with the Architect, Owner and other representatives concerned about the work, to discuss the following:
 - 1. How the building will be kept watertight as work progresses.
 - 2. How roof accessory work will be coordinated with the installation of the vapor barrier, insulation, cover board, roofing, flashings, and other items to provide a watertight installation.
 - 3. Generally accepted industry practice and the Manufacturer's instructions for handling and installing his products.
 - 4. The condition of the substrate, curbs, penetrations and other preparatory work needed.
 - 5. Incomplete submittals; note that progress payments will not be processed until all submittals are received and approved.
 - 6. The construction schedule, forecast weather, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.
 - 7. A schedule for Manufacturer and Architect inspections.

1.5 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work:

1. A pre-work site and building inspection report with photos to document conditions before work starts.
 2. Manufacturer's installation instructions and technical data sheets for each item. Material sample submittals are not needed unless requested to show color and texture.
 3. Samples of the Contractor's and Manufacturer's guarantee/warranty forms.
 4. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
- B. Simultaneously provide all technical submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
1. Submittals shall be prepared and made by the firm that will perform the actual work.
 2. Provide electronic submittals using an on-line service if an account is established for this project, or on USB drives if an on-line account is not established.
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections - collated by section, in three ring binders. Provide two binders.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to the site in the Manufacturer's original and unopened packaging, with intact and legible labels which identify the products and Manufacturers,
- B. Cover all stored materials with watertight tarpaulins installed immediately upon delivery.
- C. Do not overload the structure when storing materials on the roof.
- D. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.7 GUARANTEE

- A. Provide a written Contractor's Guarantee which guarantees that all work will remain free of material and workmanship defects and in a watertight condition for a five year period beginning upon Final Completion:
 1. Defects include but are not limited to the following: peeling paint, leakage, adhesive separation, delamination, lifting, loosening, splitting, cracking, movement and undue expansion.

2. The Contractor shall make the repairs and modifications necessary to enable the work to perform as warranted at his own expense.
 3. Guarantee coverage shall include removing and replacing materials installed as part of the original work, if removal is needed to affect repairs.
 4. Guarantee coverage shall have no dollar limit.
- B. Provide one Contractor's Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- C. Guarantee coverage shall take affect no more than 30 days before the satisfactory completion of all punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.
- E. Provide a Manufacturer's written warranty, which warrants the skylights will remain watertight for a minimum 5 year term beginning upon final completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide Manufacturer's standard units, modified as necessary to comply with the specified requirements. Fabricate each unit in a shop to the greatest extent possible, using the following components:
1. Aluminum Sheet: ASTM B 209 alloy 3003, tempered for forming and performance; mill finish, except as otherwise noted.
 2. Extruded Aluminum: Standard extrusions alloy 6063-T52; 0.078 inch minimum thicknesses for primary framing and curb member legs, 0.062 inch thickness for secondary framing and covers; mill finish, except as otherwise indicated.
 3. Insulation: Rigid fiber glass boards where encapsulated inside metal skirts, rigid isocyanurate where covered with roof flashings on the exterior of curbs.
 4. Wood Nailers: Dimension grade Douglas Fir, not less than 1-1/2 inches thick.
 5. Fasteners: Nonmagnetic stainless steel or hot dipped galvanized steel, to match the finish of the material being fastened.
 6. Gaskets: Tubular neoprene or polyvinyl chloride, or block sponge neoprene.
 7. Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

2.2 DRAINS, DRAIN PIPES, AND COUPLINGS

- A. Conventional cast iron bottom and side outlet roof drains, installed with drain receivers, under deck clamps, cast iron strainers, cast iron clamping rings and factory installed stainless steel gravel screens Series 1011 as manufactured by Jay R. Smith Manufacturing Company.

- B. Match the drain outlet size and style to the building drain line, except if the drain line is a copper pipe, then furnish the drain body with a threaded outlet and use a male adapter to connect the drain body to the drain line.
- C. Drain pipe: cast iron pipe with no hub fittings, minimum 3 inch diameter, and larger to match the existing building drain lines.
- D. No-hub couplings: heavy duty rubber neoprene sleeve couplings with full length Type 304 stainless steel shields and at least 4 worm drive clamps, conforming to ASTM A564.

2.3 PIPE INSULATION AND FITTING COVERS

- A. Insulation: minimum 1 inch thick pre-molded 3.5 lb. heavy density fiberglass pipe insulation with UL rated non-combustible service jackets.
- B. .030 inch thick factory fabricated white PVC "Smoke Safe" fitting and drain bowl covers as manufactured by the Speedline Corporation, with a maximum Flame Spread Value of 25 and a maximum Smoke Developed Value of 50 in accordance with ASTM E8450.

2.4 ALUMINUM SMOKE VENT HATCH

- A. UL listed single leaf hatch constructed with welded double wall 11 gauge mill finish aluminum cover that incorporate insulation, and 24 inch high aluminum curb complete with counter flashing, neoprene draft seal, 3-1/2 inch deck flange, interior and exterior handles and tamper resistant hinges contained within the hatch, as manufactured by The Bilco Company.
 - 1. Furnish unit with 24 inch high curb with built in louvers on 3 sides.
 - 2. Furnish unit with manual, fusible link and electric releases that can be reset without having to replace any parts.
 - a. Match the electric release voltage to the voltage of the local smoke detector and alarm system.
- B. Furnish the hatch with 4 inch by 4 inch 6 gauge galvanized steel welded wire safety screen supported on 1-1/2 by 1-1/2 by 1/4 inch thick steel perimeter angle support frames.
- C. Furnish the hatch to fit the deck opening.

2.5 GALVANIZED STEEL ROOF ACCESS LADDERS

- A. Fabricate ladders from 1-1/4 inch inside diameter steel pipe rails, spaced 22 inches apart, and 3/4 inch solid steel rebar rungs spaced 12 inches on center. Fit the rungs into drilled holes in the centerline of the rails, weld and grind the welds smooth. Extend

the ladder rails and form goose-neck returns to finish 42 inches above the roof surface.

1. Hot dip galvanize coat the ladder and mounting brackets after fabrication. Install with Type 316 stainless steel hardware.

2.6 ROOF WALKWAY PADS AND CONCRETE PAVERS

- A. 2 inches thick, 24 inches by 24 inches precast concrete pavers, natural buff color and finish, minimum 7500 psi compressive strength as manufactured by Hanover Architectural Products.
- B. 30 inches by 30 inches hard rubber black walkway pads manufactured by Firestone.

2.7 PAINT AND PRIMER

- A. Alkyd base rust inhibiting exterior primer and high gloss finish paint for ferrous metal surfaces as manufactured by Benjamin Moore or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Field measure existing openings. Comply with manufacturer's instructions and recommendations. Coordinate with the installation of the roof deck and other substrates, vapor barriers, roof insulation, roofing and flashing to ensure that each element of the work performs and fits properly, and that combined elements are waterproof and weathertight. Anchor accessories securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.

3.2 DRAINS, DRAIN PIPES AND COUPLINGS

- A. Remove and replace the existing drains where roof removal and replacement work is indicated:
 1. Remove the existing drains and flashings; use care not to break or disturb the drain pipes within the building.
 2. Modify the existing drain lines to properly connect to the new drain assemblies.
 3. Enlarge the hole in the deck and reinforce the deck to accommodate the new drain, and install the drain recessed below the roof surface to achieve maximum drainage.
 4. Support the drain with a stamped sump drain receiver, secure it with an under deck clamp and patch the deck around the new drain.

5. Connect the new drain to the existing drain line to conform to all applicable codes, and insulate the underside of the drain body and drain line.
- B. Connect the fittings and sections of cast iron pipe using heavy duty no-hub couplings; solvent weld PVC fittings and pipe, and use threaded connections to join steel fittings and pipe.
- C. Install new drain pipes to slope 1/4 inch per foot, and support each section of pipe with a hanger, supported on a structural member or strut, on each side of every coupling. Do not rely on the couplings to support any weight. Do not hang the drain pipes from the roof deck.

3.3 PIPE INSULATION AND FITTING COVERS

- A. Install insulation where missing on all horizontal drain piping, and on new vertical pipes installed to connect the new drains to the existing lines.
- B. Install insulation on the undersides of the new drains.
- C. Install white PVC fitting and drain bowl covers, and wrap the joints between fitting covers and pipe insulation jackets with 3 inch wide white PVC tape.

3.4 SMOKE VENT HATCH

- A. Remove the existing gooseneck ventilator and related flashings. Modify electrical conduits, sprinkler and heating system pipes which protrude above the level of the new curb.
- B. Support the new smoke hatch on solid wood blocking that matches the height of the new roof surface.
- C. Connect the smoke hatch to a local smoke detector and the existing smoke alarm system. Test the smoke hatch to the satisfaction of the Architect and Owner.
- D. Install new safety screen to fit inside the curb opening. Wire brush, prime and install two finish coats of paint prior to installation. Fasten the screen with 5/16 inch diameter lag bolts / expansion bolts / epoxy set bolts spaced 12 inches on center around the entire perimeter of the screens.

3.5 GALVANIZED STEEL ROOF ACCESS LADDERS

- A. Install ladders at exterior locations shown. Support and secure each ladder at the top and bottom and at intermediate points spaced a maximum of 5 feet on center. Use bolted steel brackets. Space the ladders to provide 7 inches of toe clearance. Extend the rails 42 inches and goose-neck form them to provide additional support at the top of the ladder.

3.6 ROOF WALKWAY PADS AND CONCRETE PAVERS

- A. Install concrete pavers at new ladders and duct supports, and spaced 5 feet on center for conduit and equipment pipe supports.

- 1. Install pavers over a piece of hard rubber walkway pad.

- B. Install hard rubber walkway pads to provide a path 2-1/2 feet wide where shown, and at all roof access points, i.e., doors, ladders, under concrete pavers used for conduit and pipe supports, and around all HVAC equipment.

- 1. **Adhere each pad with five self adhesive strips - do not install the pads using three strips of tape as supplied by the manufacturer.**

3.7 PAINTING

- A. Scrape and wire brush roof top equipment, equipment support dunnage, access doors and frames (both sides), and vent pipes to remove loose and peeling paint and surface rust.
- B. Install one coat of primer and two finish coats of paint using a brush or roller. Wait 24 hours for each coat of paint to dry before applying the next coat.

3.8 MISCELLANEOUS

- A. Provide and install any sealants needed, where shown or required.
- B. Perform mechanical and electrical work using skilled and licensed tradesmen.
- C. Provide new material, couplings, transition pieces, blocking, fasteners and the similar accessories needed to complete the work.

3.9 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any existing leakage or damage, prior to performing any work on site.
- B. Pay to restore all leaks or damage that isn't described in the report or repaired to the Owner's satisfaction.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage; from construction activities or inclement weather.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather - which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site presents a neat, orderly and

workmanlike appearance. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.

- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

3.10 TESTING

- A. Test the new smoke hatch with the Architect or Owner present, to demonstrate it is functional, particularly with regard to security, alarm signal operation, and venting. If faults are evidenced, make the needed corrections and repeat the test until no faults occur.

END OF SECTION