Addendum No. 4

Roof Replacement

Peggy Edmiston Administration Building

1075 Mullins Station Road
Memphis, TN 38134

RFP # 14-011-24

Owner
Shelby County Government
Shelby County, Tennessee

December 16, 2013

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ADDENDUM NO. 4

Project: Peggy Edmiston Administration Building Roof Replacement
Location: 1075 Mullins Station Road, Memphis, TN 38134
Owner: Shelby County Government
Architect: John Pruett Architects, 1869 Madison Avenue, Memphis, TN 38104
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Date: December 16, 2013

This Addendum No.4 hereby modifies the Project Manual (dated November 18, 2013) and forms a part of the Contract Documents for the Peggy Edmiston Administration Building Roof Replacement Project RFP #14-011-24 as if bound therein. All Bidders shall acknowledge receipt of Addendum No. 4 on the Bid Form.

Item 1 – Gutters, Downspouts, and Scuppers
Reference: Spec Section 07 71 23 Manufactured Gutters and Downspouts
Gutters, downspouts, and scuppers shall be shop fabricated by UL and ES1 certified manufacturer.

Item 2- Membrane Roofing Systems
Reference: Drawings and Specifications (Includes reference to all details on Sheets A501 and A502.)
Replace Specification Section 07 54 23 Membrane Roofing Systems with the attached revised section.
Revisions include:

a. The base ply (SBS heat-welded modified bitumen membrane moisture barrier) shall be smooth, not granulated.
b. All Fleece backed membrane is removed from the project.
c. All Water based adhesive is removed from the project.
d. At part 1.9.A.2., the Warranty Period shall be 20 years from the date of Substantial Completion.

END OF ADDENDUM NO 4

Attachments:

Revised section 07 54 23 Membrane Roofing Systems

SECTION 07 54 23
MEMBRANE ROOFING SYSTEMS
(Revision 1 – per Addendum 4)

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Fully adhered heat-welded thermoplastic sheet roof membrane system and related accessories.
2. SBS heat-welded granule coated modified bitumen membrane
3. Adhesives, Primers, and Sealants
4. Roof insulation and protection boards

B. Related Sections include the following:
1. Section 04 01 20 “Masonry Tuckpointing” for related masonry repair.
2. Section 06 10 53 "Miscellaneous Carpentry" for wood nailers, cants, curbs, and blocking and roof opening infill construction.
3. Section 07 62 00 “Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.
4. Section 07 71 23 “Manufactured Gutters and Downspouts”
5. Section 01 33 23 “Submittals”

1.3 Not Used

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and failure to weather and ultraviolet light exposure.
B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing, field experience, and conditions of warranty.

1.5 SUBMITTALS

A. Product Data and Shop Drawings: Submit manufacturer's product data for each type of product indicated. At a minimum, submit shop drawings for tapered insulation layout, metal fabrications including gutters, downspouts, scuppers, flashings, curbs, and Unit Skylights.

B. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized,

or licensed by manufacturer to install roofing system.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that installed roofing system complies with requirements specified for product performance.
1. Submit evidence of meeting performance requirements.

D. Qualification Data: For Installer and manufacturer.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

F. Research/Evaluation Reports: For components of roofing system.

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

H. Warranties: Special warranties specified in this Section.

I. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation to be submitted to the Architect prior to issuance of manufacturer's warranty.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: The Prime Contractor will be a qualified roofing company that is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty and can provide evidence of having a minimum of five years successful experience installing single-ply TPO roofing systems and has installed at least one roofing application of similar size and complexity within the past year. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists the foreman for this project who has received training from the manufacturer along with the dates training was received.

B. Manufacturer Qualifications: A qualified manufacturer that has UL approval for roofing system identical to that specified for this Project.

C. Source Limitations: Obtain components for roofing system approved by roofing system manufacturer.

D. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

E. Design Uplift Pressures:
1. The installed roofing system must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated at a minimum in accordance with:
a. ANSI/SPRI WD-1 “Wind Design Standard Practice for Roofing Assemblies”
b. American Society of Civil Engineers (ASCE 7)
c. Applicable sections of the current version of the International Building Code

F. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section of this specifications. Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with Owner, Architect.
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.

G. Final Inspection: Manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system All application errors must be addressed and final punch list completed in addition to the Architect's final punch list items.

1.7 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, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 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.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories roof insulation

fasteners walkway products and other components of roofing system.
2. Warranty Period: 20 years from date of Substantial Completion.
3. Provide certification of manufacturer's warranty reserve.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: All components of the warrantied system shall be provided by a single manufacturer or approved by the primary roofing manufacturer. Subject to compliance with requirements, provide products by one of the following:
1. Fully Adhered heat-welded thermoplastic sheet roof membrane system:
a. GAF Materials Corporation
b. Firestone Building Products Company
c. Carlisle
d. Johns Manville International, Inc.

B. The following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 FULLY ADHERED HEAT-WELDED THERMOPLASTIC SHEET ROOF MEMBRANE MATERIALS

A. Roofing Membrane Sheet Material: 60 -mil thick (ASTM D-6878), white smooth reinforced Thermoplastic Polyolefin (TPO) membrane. Membrane thickness over the reinforcing scrim (top ply thickness) shall be a nominal 15-mil thick or greater. Membrane sheets shall be provided in sheet rolls 12', 10', or 8' wide by 100' long. Minimum SRI shall be 0.835 (ASTM C1549).
B. Roof Membrane Flashing Material: Membrane flashing materials shall be of same type, thickness, and color as the roofing sheet membrane.

2.3 MEMBRANE FLASHING ACCESSORIES MATERIALS

A. Preformed membrane flashing materials to be of same type and color as the roofing membrane.
B. Coated metal flashings to be a minimum of 25-mil thick TPO laminated to 24 GA galvanized steel sheet metal. Coated metal base flashings must be provided with min. 4” wide flanges and formed with 1” cant.
C. Coated Metal Fascias, drip edges, and vertical wall corner edging..
D. Pre-formed vent boots with stainless steel clamping bands.
E. Pre-formed universal corners.
F. Pre-formed expansion joint covers.
G. Pre-formed scupper opening liners.
H. Coated metal sealant box penetration flashing.
I. Termination bars shall be 1” wide and .098” thick extruded aluminum bar pre-punched 6” on center and incorporating a sealant edge to support sealant and provide increased stability.
J. Membrane Walkway pads
K. Sheet Metal Flashings and Trim: Refer to Division 7, Section 07 62 00 “Sheet Metal Flashings and Trim”

section of these specifications.
L. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.4 AUXILIARY ROOFING MEMBRANE MATERIALS – MOISTURE BARRIER

A. ASTM D6164, Type I, Grade G, 0.164 inch thick SBS heat-welded granule coated modified bitumen membrane. Products shall be approved by roofing manufacturer for intended use with installed roofing systems and products.

2.5 ADHESIVES, PRIMERS, AND SEALANTS

A. ADHESIVES
1. Olybond 500: Two component, low rise polyurethane adhesive applied using specifically designed "Pace Cart"dispenser. Substitutions only as approved by Architect for compliance with Article 2.1A of this specification section.
2. not used
3. TPO Membrane Bonding Adhesive: Solvent Based Thermoplastic Polyolefin Membrane Solvent Based Bonding Adhesive as recommended and provided by same manufacturer as roofing membrane manufacturer for this project application.

B. PRIMERS
1. Concrete Deck Primer: Topcoat Matrix 307 Premium Asphalt Primer as manufactured by GAF. ASTM D-41.
2. TPO Primer: Solvent based primer for TPO membrane installations over metal fabrications and trim.

C. SEALANTS
1. One-Part Butyl-Based High Viscosity Sealant: Material as approved by selected TPO system roofing manufacturer for use as water block behind exposed termination bars and between roofing membrane and drain flashing rings.
2. Elastomeric Sealant: Material as approved by selected TPO system roofing manufacturer for use in sealing upper lip of exposed termination bars, metal roof edge flashing joints, and upper edge of penetration clamping rings. Material shall meet ASTM C-920-87, Type S Grade NS, Class 25 testing standards.
3. Two-Part Pourable Sealant: Material as approved by selected TPO system roofing manufacturer for use in filling sealant box roof penetration flashings.
4. TPO Cut Edge Sealant: Material as approved by selected TPO system roofing manufacturer for use in sealing non-factory edge membrane sheet materials.
5. General Building Construction Grade Joint Sealant: Refer to Division 7, Section 07 92 00 "Sealants and Caulking" section of these specifications.

2.6 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards for manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, glass-fiber mat facer on both major surfaces. Insulation shall be provided by same manufacturer issuing roof warranty.

C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches and 1/8” per 12 inches, unless otherwise indicated. (Reference paragraph “B” above for acceptable manufacturers of this product). 1” minimum tapered insulation thickness at roof edges without parapets. 0.5” minimum tapered insulation thickness at roof edge with parapet.

D. Insulation Protection Board: 1/4” thick, fiberglass mat faced, noncombustible high density panel selected from manufacturer's standard sizes.
1. Acceptable Products (substitutions only as approved by archiect for compliance with Article 2.1A of this specification section):
a. Dens Deck Prime as manufactured by Georgia-Pacific. ASTM E136
b. Invinsa Roof Board as manufactured by Johns Manville. ASTM C1289.

E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

F. Tapered insulation design shall be provided by tapered insulation manufacturer for approval by the Architect.

2.8 WALKWAYS

A. Walkway Pads: Walkway pads must be installed at all roof access locations including ladders, hatchways, stairs or doors. Install walkway pads at locations designated on the drawings and at all roof mounted equipment maintenance access points.
B. Walkway Pads must be spaced 6” apart to allow for roof surface drainage.

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 set and braced and that roof drains are securely clamped in place.
2. Verify that blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Proceed with installation only after unsatisfactory conditions have been corrected.
4. Verify deck surfaces are clean, dry and free of snow or ice and meeting roofing system manufacture's criteria for installation of products.

3.2 SBS HEAT-WELD MEMBRANE ROOFING APPLICATION

A. Asphalt Primer: Brush or spray apply ASTM D41 asphalt primer to concrete deck covering the entire surface in even applications at rates of one (1) gallon per square, or at rates per manufacturer recommendations. If first coat is fully absorbed, apply a second coat. Allow first coat to dry before application of second coat.

B. Do not install Heat-Weld membranes without careful review and implementation of all relevant safety and

fire watch requirements including materials/combustible substrates review, LP-Gas equipment storage and handling guidelines, worker safety precautions and training. Refer to manufacturer's General Installation Requirements, Safety considerations and warnings for additional recommendations and safety precautions.

C. The surface of which the membrane is to be installed must be clean, smooth, dry and prepared in accordance with manufacturer's recommendations.

D. Never apply Heat-Weld membranes by any method except welding with a propane torch or other equipment specifically designed for application of SBS modified bitumen.

E. The coiled membrane must be unrolled approximately 10 ft. (3 meters), aligned so that the flow of water is parallel to the ply laps, then the propane torch flame applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be sure that there is complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an “l”, applying about 75% of the heat to the membrane and 25% to the substrate including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.

F. A minimum 1/16” (2mm) asphalt flow-out must be obtained at all seam areas. Dry laps are not acceptable. To ensure the proper bead of bitumen at the seam areas, a manufacturer approved roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or “walking-in the seam” methods are also acceptable. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam area. Wrinkles, fish mouths, and similar defects must be removed and patched. Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

G. All end laps must be staggered a minimum of 18” (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of Heat-Weld membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into,, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.

H. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.

I. SBS membranes must not be applied during adverse weather or without precautionary measures in temperatures below 40º F.

3.3 INSULATION APPLICATION

A. Adhere insulation layers with bands of OlyBond 500 spaced per mnanufacturer's specificaitons. Allow the foam to rise 3/4” to 1”. Consult manufacturer's specifications for application coverage rates as amounts vary based on absorption rates, materials, ambient temperatures and other factors. Install insulation with long joints in

a continuous straight line with end joints staggered by a minimum of 6” between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
B. The tapered insulation application will be tapered polyisocyanurate with flat polyisocyanurate fill boards. Tapered insulation to have a starting thickness of 0.5” at parapet walls and 1.0” at roof edges without parapet walls.
C. Walk in insulation boards after installation to ensure a proper bond.
D. Maximum insulation board size: 4'-0” x 4'-0”
E. Lay tapered boards for a distance of 24 inches back from roof drains for positive drainage.
F. Do not apply more insulation than can be covered with insulation protection board and finished roof membrane in same day.
G. Over the top layer of roof insulation, install the roof insulation protection board in OlyBond 500 adhesive per 3.3A of this section.

3.4 ROOFING MEMBRANE INSTALLATION - GENERAL

A. Coordinate installing roofing system so insulation and other components of the roofing membrane system not meant to be exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation. The roofing installation must be made watertight at the end of each day's activity to prevent water infiltration into the completed roofing system installation. At the edge of the competed roofing system installation, extend the roofing membrane a minimum of 6” beyond the edge. Seal the roofing membrane to the surrounding deck substrate surface with foam sealant. Remove all temporary night seal materials prior to continuing with the roof installation and dispose of properly.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system as the installation progresses.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.5 FULLY ADHERED HEAT-WELDED THERMOPLASTIC SHEET ROOF MEMBRANE INSTALLATION

A. PLACEMENT
1. Place Roof Membrane so that wrinkles and buckles are not formed. Any wrinkles and buckles must be removed from the sheet prior to permanent securement.
2. Full-width rolls shall be installed in the field and perimeter regions of the roof.
3. Overlap roof membrane a minimum of 3” for side laps and for end laps of fully adhered systems that use smooth backed reinforced membrane. Membranes are provided with lap lines along the side laps. Follow roof manufacture's directions.
4. Install membrane so that the laps run across the roof slope lapped toward drainage points.
5. All exposed sheet corners shall be rounded a minimum of 1".
6. All cut edges of reinforced TPO membrane must be sealed with roof membrane manufacturer's cut edge sealant.
7. Overlap roof membrane a minimum of 3" for end laps TPO membranes.

B. COLD BONDING ADHESIVE – SMOOTH REINFORCED MEMBRANE
1. Use appropriate bonding adhesive for substrate surface applied with a solvent-resistant roller, brush or squeegee. When applying over masonry, apply only over dry, sound masonry absent of curing or sealing compounds.

2. Fully adhere membrane sheets at the rate per manufacturer's specifications. Coverage rates will vary depending on substrate. Porous substrates may requires double application of adhesive. Apply bonding adhesive to both the underside of the membrane and the substrate surface. Allow solvents in adhesive to flash off.
3. Prevent seam contamination by keeping the adhesive application a few inches back from the seam area.
4. Adhere approximately one half of the membrane sheet at a time. One half of the sheet's length shall be folded back in turn to allow for adhesive application.
5. For solvent-based adhesives, mate membrane to the substrate coated with adhesive once the bonding adhesive has flashed off and is tacky to the touch.
6. Install with soft bristle broom or roller to ensure complete bonding between adhesive and membrane.

C. Not used

D. FIELD SEAMING
1. Fabricate field seams using a current-generation automatic hot air welding machine and a 10,000 watt voltage controlled generator minimum. Outdated welding equipment and inadequate/fluctuating electrical power are the most common causes of poor seam welds.
2. Equipment Settings- The correct speed and temperature settings for automatic welders are determined by preparing test welds at various settings. The welds are tested by applying pressure to cause the seam to peel apart. A satisfactory weld will fail by exposing the scrim reinforcement called a "film tearing bond." A deficient weld fails by separating between the two layers of the membrane.
3. Adjustments to Equipment Settings - Many factors will affect the settings: thicker membranes, lower air temperatures, and overcast skies will generally require a slower speed than would be required with thinner membranes, higher air temperatures, and sunny skies. The slower speed provides additional heat energy to compensate for heat-draining conditions. The test weld procedure should be conducted at the beginning of every work period (i.e., morning and afternoon) and following a significant change in weather (i.e., air temperature, wind speed, cloud cover.)
4. Membrane laps shall be heat-welded together. All welds shall be continuous, without voids or partial welds. Welds shall be free of burns and scorch marks.
5. Weld width shall be a minimum 1-1/2" in width for automatic machine welding. Weld width shall be a minimum 2" in width for hand welding.
6. All cut edges of reinforced TPO membrane must be sealed with roof membrane manufacturer TPO Cut Edge Sealant.

E. MEMBRANE SURFACE PREPARATION
1. Membrane must be clean of dirt and contaminants, and free from dew, rain, and other sources of moisture. Factory-fresh membrane typically will not require cleaning prior to automatic welding, provided that welding is performed immediately after placement and securement of the membrane.
2. Membrane that has been exposed for over 12 hours or has become contaminated will require additional cleaning methods.
3. Clean membranes with products recommended by roof membrane manufacturer.

3.6 MEMBRANE FLASHING INSTALLATION

A. General
1. Flash all perimeter, curb, and penetration conditions with coated metal, membrane flashing, and flashing accessories as appropriate to the site condition.

2. All coated metal and membrane flashing corners shall be reinforced with preformed corners or unreinforced membrane.
3. Heat weld all flashing membranes, accessories, and coated metal together to achieve a minimum 2" wide (hand welder) weld.
4. All cut edges of reinforced TPO membrane must be sealed with TPO Cut Edge Sealant.
5. When using bonding adhesive, be sure to use adhesive specific to membrane type.
6. Typical minimum flashing height is 8". Consult manufacturer's approval for existing conditions where this dimension is unattainable.

B. Adhered Reinforced Membrane Flashings - Smooth Surface
1. The thickness of the flashing membrane shall be the same as the thickness of the roofing membrane.
2. When using TPO adhesives, use any one of the following substrates: polyisocyanurate insulation (w/o foil facer), high density wood fiber board, gypsum, cured structural concrete absent of curing and sealing compound, untreated oriented strand board (OSB), untreated CDX plywood, Type X gypsum board, and dry, sound masonry absent of curing or sealing compounds.
3. Apply bonding adhesive to both the substrate surface and the underside of the flashing membrane, at the rate of 60 sq. ft. of finished, mated surface area per gallon for solvent-based bonding adhesives. Coverage rates will vary depending on substrate. The solvent adhesive must be allowed to dry until tacky to the touch before flashing membrane application.
4. Apply the adhesive only when the outside temperature is above 40°F. Recommended minimum application temperature is 50°F to allow easier adhesive application.
5. The membrane flashing shall be carefully positioned prior to application to avoid wrinkles and buckles.
6. All laps in smooth-reinforced flashing membrane shall be heat welded in accordance with heat welding guidelines.
7. Porous substrates may require double application of adhesive.
8. All cut edges of TPO reinforced membranes must be sealed with TPO membrane manufacturer's Cut Edge Sealant.

3.7 COATED METAL FLASHING

A. Sheet metal flashing sections used for roof edging and base flashing shall be butted together with a 1/4" gap to allow for expansion and contraction, strip to both sides of the joint, with approximately 1" on either side of the joint left unwelded to allow for expansion and contraction. 2" wide aluminum tape can be installed over the joint as a bond-breaker to prevent welding in this area.
B. Coated metal used for sealant pans and scupper inserts, corners of roof edging and base flashing shall be overlapped or provided with separate metal pieces to create a continuous flange condition, and pop-riveted securely. Heat weld a 6" wide reinforced membrane flashing strip over all seams that will not be sealed during subsequent flashing installation.
C. Coated metal flashings are nailed to treated wood nailers or otherwise mechanically attached to the roof deck, or to the wall or curb substrate, in accordance with construction detail requirements.

3.8 WALKWAY INSTALLATION

A. Walkway Pads: Install traffic walkway pads at locations indicated on drawings. Standard walkway pad dimension shall be 30 x 48 with rounded corners. Space individual pads 6" apart to allow for roof drainage.
B. Install walkway Pad Material between roof accessory contact points and finished roof membrane surfaces where occurs.

C. Heat-weld walkway pads to the roof membrane surface around the entire perimeter of the pad.

3.9 ROOF DRAIN INSERT INSTALLATION

A. Remove the existing insert. Clean inside of existing pipe. Install insert in accordance with manufacturer's instructions for particular roof system.

3.10 ROOF MOUNTED SPLASH PAN INSTALLATION

A. Set rooftop mounted pre-manufactured and finished sheet metal splash pans under downspouts on membrane walkway pad material for finished roof protection.

3.11 FIELD QUALITY CONTROL

A. Inspect completed roof sections on a daily basis. It is the Contractor' responsibility to probe all heat-welded seams and perform an adequate number of seam cuts to ascertain seam consistency.
B. Immediately correct all defects, irregularities, and deficiencies identified during inspections.
C. Remedial work shall be performed with like materials and in a manner consistent with the balance of the roofing installation so as to minimize the number of repair patches.
D. Excessive patchwork will require replacement of the entire affected membrane section, from lap to lap.
E. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
F. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.12 PROTECTING AND CLEANING

A. Protect 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 roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
C. Remove bonding adhesive, bituminous markings and other contaminants from finished surfaces. In areas where finished surfaces are soiled by asphalt or any other source of soiling cause by work of this or other sections, consult manufacturer of surfaces for cleaning advice and conform to those instructions.
D. Cut out and remove any sheet membrane contaminated with solvent-based adhesive, bituminous markings, and other contaminants from finished surface. Repair sheet damage by first cleaning the area with an all-purpose cleaner, then rinse off soapy residue. Reactivate membrane using the appropriate cleaner, wiping with a damp (not saturated) rag. Complete repair by installing a patch of like material to specific system requirements.

END OF SECTION