

THE CITY OF POUGHKEEPSIE
NEW YORK

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WPCP Solids Handling Building Roof Replacement

RFB-COP-04-16-04R

ADDENDUM No. 2

To: All Bidders

This addendum contains the following answers to pre-bid questions:

1. Will cold-applied adhesives be allowed in the re-bid?

Contractor, in lieu of the specified hot-applied BUR 202 Adhesive, may utilize cold-applied Multi-Ply Adhesive for the specified roof cover. Insulation adhesive shall be OlyBond 500 or accepted equal. Vapor barrier adhesive shall be a quick-curing, urethane adhesive, namely, Multi-Ply Adhesive SF. All other requirements/components as specified remain unchanged.

2. Technical specification section 2.1 A.11 calls for a non-penetrating railing system as Alternate #1. The bid form has no space to provide this alternate price. How are we to show the cost this alternate?

The railing system is not intended to be a part of the scope as an alternate or otherwise. Please disregard 2.1 A.11. A revised specification is attached with this section removed and supersedes the previous specification.

Please acknowledge receipt of this addendum by including this receipt with your bid package!

Receipt of Addendum# 2

Signed: _____

Company Name: _____

Dated: _____

PART I - GENERAL

1.01 RELATED DOCUMENTS

- A. The attached are components of this section:
 - 1. General Conditions.
 - 2. Drawing A-1

1.02 SCOPE OF WORK

- A. Furnish and install specified roofing and related components for The City of Poughkeepsie Water Pollution Control Plant, located at 173 Kittredge Place, Poughkeepsie, NY. Work to be performed on the Solids Handling Building.
- B. Removal of all existing roof system(s), including the original multi-ply roof cover, EPDM one-ply roof membrane, ballast, insulation, base flashings and termination details down to existing concrete deck and/or substrate.
- C. **Work includes:**
 - 1. Installation of the following:
 - a. Prime existing concrete deck as specified.
 - b. Adhere new, trilaminate reinforced base sheet in specified hot-applied elastomeric adhesive directly to primed concrete deck to serve as a temporary roof cover/vapor barrier.
 - c. Adhere tapered polyisocyanure insulation w/ hot-applied elastomeric adhesive. Min. thickness: 1.5". Avg. slope: 1/8":12". Avg. "R" - 20.
 - d. Adhere single layer of 1.0" MonoBoard Plus in specified hot-applied adhesive over newly installed tapered insulation system.
 - e. Adhere specified, modified bituminous roof cover as specified. System shall be a two (2) ply base, with a succeeding modified cap sheet, adhered in specified solvent-free adhesive (cap sheet only).
 - f. Specified elastomeric flashings, termination details, specified plywood substrate at perimeter parapet walls and accessories.
 - g. Re-work of existing drain(s). See unit pricing for replacement on bid form.
 - h. Installation of specified free-floating coping cap.
 - i. Apply specified primer and 2-coat silicone coating system as specified.
 - j. Submit alternate cost for specified perimeter railing system.

Note: All base flashing have tested positive for asbestos, and shall be removed as per Code Rule 56 requirements, and New York State Law. All applied for variances shall be submitted for review prior to commencement of project.

1.03 QUALITY CONTROL

- A. Contractor shall:
 - 1. Be experienced in built-up roofing.
5 years minimum.
 - 2. Be acceptable by the City of Poughkeepsie Engineer and Water Pollution Control Plant and its' representatives.
 - 3. Be Approved by the Roofing Materials Manufacturer.(RMM)

- B. The selected roofing material manufacturer (RMM) shall:
 - 1. Be approved by the City Engineer.
 - 2. Have an established, documented program, for providing periodic job-site inspection during the construction of roofing work. Inspections to be a minimum of three (3) day's per week, as provided by an employee of the manufacturer, to ensure warranty compliance. Field Reports documenting work at hand shall be forwarded to the CITY ENGINEER in a timely fashion.

- C. Project meetings:
 - 1. **Mandatory Pre-Bid Conference:**
 - a. Attendance:
 - 1) CITY ENGINEER Representative
 - 2) Contractor(s)
 - b. Agenda:
 - 1) Review of contract documents.
 - 2) Answer any questions.
 - 3) Walkover inspection.
 - 2. Pre-construction conference:
 - a. Will be scheduled by CITY ENGINEER and representatives.
 - b. Attendance:
 - 1) Contractor's Representative.
 - 2) RMM's Representative
 - 3) CITY ENGINEER/ Representative
 - c. Agenda:
 - 1) Submittal of insurance certificates prior to project commencement.
 - 2) Submittal of executed bonds prior to project commencement.
 - 3) Tax exemption certificate.
 - 4) Submittal of list of subcontractors, material submittal, and

- progress schedule.
 - 5) Designation of responsible personnel.
 - 6) Walkover inspection.
 - 3. Progress meetings:
 - a. Will be scheduled by CITY ENGINEER as required.
 - b. Attendance:
 - 1) CITY ENGINEER
 - 2) Contractor's Representative.
 - 3) RMM's Representative
 - c. Minimum agenda:
 - 1) Review of work progress.
 - 2) Field observations, problems, and decisions.
 - 3) Effect of proposed changes on progress schedule.
 - 4) Other business relating to work.
 - 4. Final inspection:
 - a. Will be scheduled by CITY ENGINEER upon job completion.
 - b. Attendance:
 - 1) CITY ENGINEER
 - 2) Contractor.
 - 3) RMM's Representative
 - 4) Subcontractors, as appropriate.
 - c. Minimum agenda:
 - 1) Walkover inspection.
 - 2) Identification of problems which may impede Project Closeout
- D. Random sampling:
 - 1. Roofing material:
 - a. **During course of work, the CITY ENGINEER or his representative, may secure samples according to ASTM D140-88 of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.**
 - b. Should test results prove that a material is not functionally equal to specified material:
 - 1) **Contractor shall pay for all testing.**
 - 2) **Roofing installed and found not to comply with the specifications shall be removed and replaced at no charge to CITY of POUGHKEEPSIE.**

E. Regulatory requirements:

1. UL 790.
Class A Fire Rating
2. FM 1-90, Class 1A, 4470

F. Plans and specifications:

1. Contractor must notify CITY ENGINEER of any omissions, contradictions or conflicts seven (7) days before bid date. The CITY ENGINEER will provide necessary corrections or additions to plans and specifications by addendum. If contractor does not so notify CITY ENGINEER of any such condition, it will be assumed that the contractor has included the necessary items in the bid to complete this specification.
2. It is the intent that this be a completed project as far as the contract documents set forth. It is not the intent that different phases of work on this project be delegated to various trades and subcontractors by the contract documents. **Contractor must make own contracts with various subcontractors, setting forth the work these subcontractors will be held responsible for. Contractor alone will be held responsible to CITY ENGINEER for the completion of this project.**
3. It is the contractor's responsibility during the course of the work, to bring to the attention of the owner's representative any defective membrane, insulation or deck discovered where not previously identified.

1.04 REFERENCES

- A. SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Vienna, VA.
- B. UL - Underwriters Laboratories, Northbrook, IL.
- C. ASTM - American Society for Testing and Materials, Philadelphia, PA.

1.05 SUBMITTALS

- A. **Submission of the items listed below is required by The City of Poughkeepsie prior to project award.**

1. **Product compatibility:**
 - a. Written verification from RMM that major roofing components, including (but not limited to) coatings, cold process adhesives; roofing ply sheets; reinforcement fabric felts and mats; mastics; hot asphalt, modified asphalt, and sealants are all compatible with each other.
2. **Product data:**
 - a. Product data sheets with all appropriate ASTM numbers demonstrating compliance with specification, coupled with overall roof system compliance requirements shall be reviewed by The City.
 - b. Material safety data sheets.
 - c. Samples of coatings, adhesives, and roofing ply sheets.
 - d. Samples of each material specified, properly labeled.
 - e. Shop drawings or samples of metal flashings, showing exact profile, lengths, joints termination and methods of attachment.
 - f. Sample of each fastener type.
 - g. **Independent 3rd party, test results of all material/system specified demonstrating compliance with specifications.**

1.06 DELIVERY, STORAGE AND HANDLING

- A. Delivery of materials:
 1. Deliver materials to job-site in new, dry, unopened, and well-marked containers showing product, manufacturer's name and date of manufacture.
 2. Deliver materials in sufficient quantity to allow continuity of work.
 3. Coordinate delivery with CITY ENGINEER.
- B. Do not order project materials or start work before receiving CITY ENGINEER's written approval.
- C. Storage of materials:
 1. Store roll goods on ends only. Discard rolls which have been flattened, creased, or otherwise damaged. Place materials on pallets. Do not stack pallets.
 2. Stack insulation on pallets.
 3. Store materials marked "keep from freezing" in areas where temperatures will remain above 40F.
 4. Store metal roof deck on pallets with one end elevated to provide drainage.

5. For insulation, remove plastic packaging shrouds. For felt rolls, slit the top of the plastic shrink wrap only. Cover top and sides of all stored materials with tarpaulin (not polyethylene). Secure tarpaulin.
6. Rooftop storage: Disperse material to avoid concentrated loading.
7. No materials may be stored in open or in contact with ground or roof surface.
8. Should Contractor be required to quickly cover material temporarily, such as during an unanticipated rain shower, all materials shall be stored on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom.
9. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

D. Material handling:

1. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

1.07 SITE CONDITIONS

A. Field measurements and material quantities:

1. Applicator shall have **SOLE** responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

B. Existing conditions:

1. Building space directly under roof area covered by this specification will be utilized by on-going operations. Do not interrupt The City of Poughkeepsie operations unless prior *written request* from the contractor and approval is received.
2. **Access to roof shall be from exterior only.**
3. Rooftop units and other equipment shall be moved as required to install roofing materials complete and in accordance with plans and specifications. When units and equipment are to be moved, they shall be carefully disconnected and removed to a protected area so as not to damage any part

or component thereof, and shall be reconnected in such a way that they are restored to a prior work operating condition. Appropriate measures shall be taken to prevent dust, vapors, gases or odors from entering the building during roof removal, replacement or repair.

4. All dis-connection and re-connection shall be performed by a mechanical an/or electrical company licensed to perform such work unless directed otherwise by the City Engineer. Copy of License to be submitted to CITY ENGINEER, prior to commencement of work.

C. Safety requirements:

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, local and Owner fire and safety requirements.
3. Advise ENGINEER if work is expected to be hazardous to staff, employees, and/or operators.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
5. Maintain fire extinguisher within easy access whenever power tools, and torches are being used.

D. Waste Disposal:

1. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.

E. Environmental requirements:

1. Do not work in rain, snow, or in presence of water.
2. Do not work in temperatures below 35F.
3. Do not install materials marked "keep from freezing" when daily temperatures are scheduled to fall below 35F.
4. Do not perform masonry work below 35F.
5. Remove any work exposed to freezing.

F. Security requirements:

1. Comply with Plant manager/ CITY ENGINEER specific security requirements.
2. Provide CITY ENGINEER with current list of accredited persons.

G. Temporary sanitary facilities:

1. Furnish, install, and maintain temporary sanitary facilities for employee use during project. Remove on project completion.
2. Place portable toilets in conformance with applicable laws, codes, and regulations.

1.08 SUBSTITUTIONS and "OR EQUALS"

- A. When a particular make or trade name is specified, it shall be indicative of a required level of performance. These specifications incorporate clearly defined ASTM test methods for evaluating the performance levels of materials and systems. The Contractor shall submit, for review by The City of Poughkeepsie, Bureau of Engineering, any materials which the Contractor believes to meet-or-exceed the performance standards required in these specifications. *The Contractor is cautioned to carefully investigate and submit for only those products which meet-or-exceed the performance requirements defined in this specification.*

Any correspondence in this regard shall incorporate the following:

1. Written application with explanation of why product, or material, should be considered. Submit seven (7) days prior to bid date to allow for review by CITY ENGINEER.
 2. Accredited, **independent, testing laboratory** certificate comparing substitute's physical/performance values when tested in accordance with the ASTM test methods as specified.
 3. Material Safety and Data Sheets.
 4. 3 job references located within a 50 mile radius of Poughkeepsie where warranted, hot-applied, built-up roof system, has been utilized.
- B. **The City of Poughkeepsie Engineer retains sole authority to reject or accept any material.** Only materials approved in writing by CITY ENGINEER shall be incorporated for use within this project.

1.09 QUALITY ASSURANCE GUARANTEE

- A. Guarantee
 - 1. Upon completing the project, the contractor shall provide a 3 year contractor's and 20 year, no dollar limit, Manufacturer's Warranty to CITY ENGINEER.

- B. Warranty and Service Agreement
 - 1. A single manufacturer shall provide the specified guarantee and as outlined below. The manufacturer's warranty must include labor and material coverage against leakage on all components including those manufactured by others. Included is the following:
 - a. Insulation materials, fasteners and adhesives.
 - b. All new and temporary roof membrane components/adhesives.
 - c. All metal edge components including continuous cleats.
 - d. All tapered edge and cant strips
 - e. All surface mastics, coatings, stripping plies etc.
 - f. All drains and lead flashings.
 - g. Any roof leaks or other conditions caused by substrate movement of any component other than the deck shall not be excluded.
 - h. Any leaks associated with metal edge joints and/or flange movement.
 - i. Damages caused by wind speeds up to 74 miles per hour.
 - j. Permanent tie-ins and/or control joints separating old and new roofing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with all required levels of performance as clearly defined in these specifications utilizing ASTM test methods. Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. **Modified Bituminous Roofing:**
Basis of Design: **Viridian Systems, 300 Southwest Ave., Tallmadge, Ohio 44278**
 2. **Vapor Barrier Membrane**
Basis of Design: Multi-Ply Glass CL (polyester/fiberglass/polyester) by Viridian Systems Inc., 300 Southwest Ave., Tallmadge, OH 44278 - 330.634.0454.
 3. **SEBS/SBS Mineral-Surfaced Cap Sheet**
Basis of Design: Pika-Ply MS-4 by Viridian Systems Inc., 300 Southwest Ave., Tallmadge, OH 44278 - 330.634.0454.
 4. **Polyisocyanurate Crickets:** (installed over base layers insulation)
 - a. Atlas Roofing Corporation - AC Foam II
 - b. Slope Requirement: 1/4":12"
 - c. Size: 1/4" : 12" x 16'
 5. **Trilaminate Reinforced Ply-Sheet (2-ply in Roof Cover)**
Basis of Design: Multi-Ply Glass CL (polyester/fiberglass/polyester) by Viridian Systems Inc., 300 Southwest Ave., Tallmadge, OH 44278 - 330.634.0454.
 6. **Tapered Polyisocyanurate Board Insulation:**
 - a. FS HH-I-1972/2(1), Class 1, isocyanurate. 20 PSI.
 - b. Black, glass fiber reinforced, organic, non-asphaltic facer
 - c. Required Taper: 1/8" : 12"
 - d. Minimum thickness: 1.5"
 - e. Required "R" Value: Average "R" of 20
 - f. Manufacturer: ATLAS or approved equal.

7. **Recovery Board Insulation:** (top layer of insulation)
 - a. MonoBoard Plus
 - b. Thickness: 4' x 4' x 1.0"
 - c. Manufacturer: Roxul.

8. **Insulation/Recovery Board/Vapor Barrier/2-Ply Base/Adhesive:**
Basis of Design: BUR 202 by Viridian Systems Inc., 300 Southwest Ave., Tallmadge, OH 44278 – 330.634.0454.

- 8a. **Cap Sheet Adhesive:**
 Multi-Ply Adhesive SF by Viridian Systems Inc., 300 Southwest Ave., Tallmadge, OH 44278 – 330.634.0454

9. **Reflective Coating System for Cap Sheet:**
Basis of Design: PolySil 2200 by Coating and Foam Solutions, Hudson Falls, NY – 518.441.8801. Finished Color; DARK GRAY

10. **Primer/Stain Blocker for Cap Sheet**
Basis of Design: Prime Tek #11 by Coating and Foam Solutions, Hudson Falls, NY – 518.441.8801.

2.2 INSULATION, INTERPLY, VAPOR BARRIER ADHESIVE:

- A. BUR Plus 202 by Viridian Systems, Inc. or approved equal, meeting the following performance properties:

a Property	b Typical Value	c Test Method
Asbestos Content	None	EPA 600/M4-82-020
Penetration	20 units	ASTM D 92
Tensile Strength	60 psi	ASTM D 412
Elongation	1,000%	ASTM D 412
Density	1.0 or greater	ASTM D 412
Solids	100%	ASTM D 412
Cold Temperature bend	30F	ASTM D 3111
Fire Resistance	Pass	ASTM E 108/UL 790

2.3 PLY SHEET(S) IN ROOF SYSTEM

- A. Multi-Ply Glass CL Trilaminare Ply Sheet by Viridian Systems, meeting the following performance properties:

Test	Typical Value	Test Method
Thickness, mils	65 (nominal)	ASTM D 751
Breaking Strength	165 lbf/in. MD 155 lbf/in. XMD	ATM D 146
Elongation	6.3% MD 4.1% XMD	ASTM D 4601
Pliability (1/2" Radius)	Pass	ASTM D 146
Mass of Desaturated Felt	4.0/100 ft ²	ASTM D 5147
Asbestos Content	0%	EPA 600/R-93/116
Asphalt, Minimum	33 lb/100 ft ²	ASTM D 4601
Moisture	0%	ASTM D 5147
Fire Resistance	Pass, Class A	UL 790 / ASTM E 108

2.4 SBS/SEBS MINERAL-SURFACED MODIFIED BITUMINOUS CAP SHEET

- A. Pika-Ply MS-4 by Viridian Systems, Inc., meeting the following performance properties:

Test	Typical Value	Test Method
Thickness, mils (mm)	180 (4.5)	ASTM D 6164
Peak Load, 73.4 ± 3.6°F (23 ± 2°C), lbf/in (kN/m)	114 (19.9) MD 85 (14.8) XMD	ASTM D 6164
Elongation at Max Load, 73.4 (23 ± 2°C), %	47 MD 47 XMD	ASTM D 6164
Maximum Load, 0 ± 3.6°F lbf/in. (kN/m)	135 (23.8) MD 115 (20.1) XMD	ASTM D 6164
Elongation at Max. Load @ 0F (-18 ± 2°C), %	52 MD 56 XMD	ASTM D 6164
Tear Strength at 73.4 ± 3.6°F (23 ± 2°C), lbf/in (kN/m)	134 (596) MD 122 (543) XMD	ASTM D 6164
Low Temperature Flexibility, °F	32 (0)	ASTM D 6222
Dimensional Stability, max., %	<0.5	ASTM D 6222
Compound Stability, min., °F (°C)	230 (110)	ASTM D 6222
Granule Adhesive, g, max.	<2.0	ASTM D 6222

2.5 MULTI-PLY, ROOF ASSEMBLY:

- A. Minimum overall performance properties of specified overall roof system assembly meeting the following overall system performance properties:

Property	Typical Value	Test Method
Maximum Load @ 0F	513.7 lbf/in. MD 517.9lbf/in. XMD	ASTM D 2523
Elongation @ Max. Load @ 0F	6.7 % MD 8.3% XMD	ASTM D 2523
Maximum Load @ 77F	319.6 lbf/MD 337.8 lbf/XMD	ASTM D 2523 ASTM D 2523
Elongation @ Max. Load @ 77F	5.6% MD 5.6% XMD	ASTM D 2523
Thickness	Minimum 300 mils	
Elongation @ Break 77F	4.9% MD 4.9% XMD	ASTM D 2523

2.6 SBS/SEBS CAP SHEET ADHESIVE:

- A. Multi-Ply Adhesive SF (solvent-free) by Viridian Systems, Inc., meeting the following performance properties:

Test	Typical Value	Test Method
Solids by Weight	>98 %	ASTM D 4479
Weight per Gallon	9.5 - 10	ASTM D 4479
Flash Point	105°F	ASTM D 93
Viscosity @ 77°F	14,000 - 30,000 cps	ASTM D 2196
Fire Resistance	Pass, Class A	UL 790 / ASTM E 108

2.7 AUXILIARY MEMBRANE MATERIALS

- A. General: Furnish auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
- B. Asphalt Mastic - HK ARM by Viridian, or approved equal.
- C. Reinforcing Membrane - HK Glass Mesh from Viridian, or approved equal.

- D. Sealant - Reglet Caulk by Viridian Systems or approved equal
- E. Walkway Pads - Walktred by Viridian Systems, or approved equal.
- F. Drain Flashing Sheet - 4 lb Sheet lead min size 30" x 30" .
- G. Termination Bar: Snap on Reglet by Viridian Systems, or approved equal.
- H. Tapered edge strip: perlite ASTM 728
- I. Flashing Membrane(s); SS-3P TG Base (heat-fused)/MS-4 TG Mineral-Surfaced Finished Membrane (heat-fused)

2.8 PITCH PANS/PLUMBING VENTS/STACKS

- A. Copper: 16OZ. ASTM B101, Type 1.
 - B. Solder: ASTM B 32, Alloy Grade 60A.
 - C. Flux: Muriatic acid killed with zinc (zinc chloride). Avoid excessive fluxing. Wash off acid thoroughly after soldering.
 - D. Pitch Pan Mastic: Two part urethane by the system Manufacturer. Type: Duo-Lastic by Viridian Systems
 - E. All seams shall be soldered.
 - F. All work shall be in accordance with Architectural Sheet Metal Manual, Third Edition, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA).
- A. Formed Metal Cap: .050 Aluminum
 - B. Rails and Cleats: 24 Galvanized Steel
 - C. Color:
 - 1.Formed Metal Cap: Kynar finished matching new gravel stop fascia assembly.
 - D. Fabricated to the size and dimensions as indicated on the drawings, and verified in the field.

- E. Accessories: Factory fabricated end caps, miters and splice plates.
- F. Work shall be in accordance with Architectural Sheet Metal Manual, Third edition, as issued by sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA).

2.9 FREE-FLOATING COPING/FASCIA SYSTEM

- A. Type: Storm Defender by Roofing Innovations, LLC, with galvanized cant dam, concealed spring clip, .050 Aluminum, Kynar coated. Fascia finish and watertightness of all perimeter gravel stop fascia assemblies to be included in the roof system watertightness warranty as supplied by the roof system manufacturer, for the project. Color to be selected from manufacturer's standard color samples. Contractor to submit color samples to Consultant for selection and approval.

PART III - EXECUTION

3.01 EXAMINATION

- A. Verify conditions as satisfactory to receive work.
- B. Do not begin roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.
- C. Verify that work of other trades penetrating roof deck or requiring men and equipment to traverse roof deck has been approved by CITY ENGINEER, manufacturer, and roofing contractor.
- D. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roofing system.

3.02 GENERAL WORKMANSHIP

- A. All work performed by Contractor shall conform to this specification.
- B. The presence and activity of the manufacturer's representative, architect's representative, and/or Owner's representative shall in no way relieve Contractor of contract responsibilities or duties.
- C. Substrate: Free of foreign particles prior to laying roof membrane.
- D. Provide additional fastening of mechanically attached base sheets in roof perimeter and corner areas.
- E. Phased application: Not permitted. All plies shall be completed each day.
- F. Traffic and equipment: Kept off completed plies until adhesive has set.
- G. Wrapper and packaging materials: Not to be included in roofing system.

- H. Entrapped aggregate: Not permitted within new membrane. Its discovery is sufficient cause for rejection.
- I. Ply shall never touch ply, even at roof edges, laps, tapered edge strips, and cants.
- J. Fit plies into roof drain rims; install lead flashing and finishing plies; secure clamping collars; install domes.
- K. Extend roofing membrane to top edge of cant at wall and projection bases.
- L. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.
- M. Asphalt heating:
 - 1. Use low burner flames during initial melt-downs, circulate asphalt after initial melt-down.
 - 2. Maximum asphalt temperature: 25F below the flash point. Avoid prolonged heating of asphalt at high temperatures. Reduce the asphalt temperature to below 500F if asphalt is not being used for periods of 4 hours or more.
 - 2. Kettle: Free of contaminants.
 - 3. Application rates: Bitumen quantities for waterstop/tie-offs, flashings, miscellaneous detail applications, and minimum kettle capacity are not included in application rates. To account for these factors, add approximately 25 percent additional bitumen on a total-job average basis.
- N. Cold weather/high wind bitumen mopping techniques.
 - 1. When ambient temperatures are below 45F, or when wind speeds exceed 15 mph, use the following techniques:
 - a. Use insulated bitumen handling and storage equipment.
 - b. Do not apply the bitumen more than 5 feet ahead of the roofing roll.
 - c. Immediately set and broom the roll in the bitumen.
 - d. Return materials to heated storage if they become stiff or unworkable.

3.03 PREPARATION

- A. Surface preparation:
 - 1. Remove: Existing roofing, insulation, flashings and termination details to

- existing concrete roof deck.
 - 2. Sweep clean roof deck and prime with specified primer.
- B. Protection:
- 1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.
 - 2. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
 - 3. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each work day or before arrival of inclement weather.
 - 5. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
 - 6. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
 - 7. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Spilled or scattered debris shall be cleaned-up immediately. Remove material to be disposed from roof as it accumulates.
 - 8. At end of each working day, seal removal areas with water stops along edges to prevent water entry.
 - 9. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

3.04 VAPOR BARRIER INSTALLATION

- A. Prime existing concrete deck with HK Rapid Dry Primer at a rate of 150 s.f. per gallon per square. Allow to dry.
- B. Adhere one (1) ply of specified coated base sheet in specified hot-applied asphalt at a rate of 25lbs. per square. Lap all side laps a minimum of 4" and all end laps a minimum of 6".

3.05 THERMAL INSULATION ATTACHMENT

- A. Adhere specified tapered insulation over newly installed vapor barrier with specified hot-asphalt. Adhere specified 1" Monoboard Plus recovery board over newly installed tapered insulation system.
- B. Adhere layer(s) with a uniform and continuous application of asphalt at a rate of 30 lbs. per 100 sq. ft. 20 percent.
- C. Immediately after placement, walk insulation boards into hot bitumen to achieve solid bond.
- D. Promptly spread any bitumen pools that may accumulate on insulation surface to achieve smooth surface for roofing installation.

3.06 ROOF SYSTEM APPLICATION

- A. Install specified 2-ply base to roof and all wall, curb, and projection bases in a uniform and continuous mopping of modified hot-melt adhesive, applied within its Equiviscous Temperature (EVT) range.
- B. Two ply base laps: 18 inches.
- C. Apply adhesive no more than 10 feet (3 meter) ahead of each roll being embedded.
- D. Roofing ply shall never touch roofing ply, even at roof edges, laps, tapered edge strips, and cants. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.
- E. Use mop technique to ensure selvage receives hottest bitumen.
- F. Ensure complete and continuous seal and contact between bitumen and base/ply sheets, including ends, edges, and laps without wrinkles, fish mouths, or blisters. Broom width: 34 inches minimum. Avoid walking on membrane until adhesive has set.
- G. Adhere specified cap sheet in the cold-applied solvent-free adhesive at a rate of 2.0 gallons per square. Broom-in to ensure positive adhesion.

- H. Interply mopping rate for everything except cap sheet: 25 lbs. per 100 sq. ft. average, tolerance 20 percent.

3.07 FLASHINGS

A. General flashing requirements:

*All metal flashing components and installations shall follow all SMACNA design requirements.

- 1. **Elastomeric Flashing:**
 - a. Heat-Fuse Elastomeric Flashing completely to flashing surface, and roofing with specified flashing adhesive
 - b. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 4 inches.
 - c. Flashing sheeting width: Sufficient to extend at least 4 inches beyond toe of cant onto new roof.
 - d. Strip-in vertical laps with 6" strip of mesh, and Flashing Adhesive. Strip-in base w/ ply sheet + adhesive.
 - e. Fasten top edge of flashing w/ termination below existing counterflashing.

- B. At wood curb flashings: (Minimum Height: 8" - Contractors Responsibility)
 - 1. Remove mechanical equipment from curb.
 - 2. Install new roofing to top edge of cant. Nail 8 inches o.c. with spiral or annular nails, with a 1 inch cap.
 - 3. Install elastomeric base flashing described in general flashing requirements section.
 - 4. Secure top edge of sheeting to substrate with spiral or annular shank nails, with a 1 inch cap, 8 inches o.c.
 - a. Fabricate and install .040, surface mounted, counterflashing.
 - 5. Reinstall mechanical equipment onto curb. Refasten.

- C. At plumbing vents:
 - 1. Wedge plumbing vent tight against deck.
 - 2. Apply 1/16 inch uniformly thick layer of asphalt mastic to surface receiving metal flange.

 - 3. Fabricate and install plumbing vent flashing from lead. Flange: 4 inches wide

- minimum; extend completely around periphery of vent flashing. Set flange into mastic. Neatly dress flange with wood block.
4. Prime metal flange with asphalt primer.
 - a. Pipe outside diameter greater than 2 inches: Bend lead inside pipe 1 inch minimum with pliers or rubber/plastic mallet; replace cracked lead.
 - b. Pipe outside diameter 2 inches or less: Cut lead at vent top; fabricate and install integral lead cap.
 5. Install two (2) ply stripping described in general flashing requirements section.
- D. At pitch pockets:
1. Fabricate pitch pans. Sides: 4 inches high, hemmed to outside at top edge. Flange: 4 inches wide, completely around periphery. Clearance between projection and pitch pan: 2 inches. Set flange in mastic.
 2. Pack gap between roof-penetrating element and deck with compressible insulation. Seal with reinforcing membrane embedded between alternate courses of asphalt mastic.
 3. Nail flange to wood blocking 3 inches o.c., staggered.
 4. Prime metal flange, projection, and pitch pan interior with asphalt primer.
 5. Install two (2) ply stripping described in general flashing requirements section.
 6. Fill pitch pan with asphalt mastic. Double fill if necessary.
 7. **Fabricate and install umbrella with drawband over pitch pan. Tighten drawband.**
 8. Wipe clean top of umbrella and projection with metal cleaner. Prime surface with metal primer.
 9. Caulk stack/sheet metal interface. Provide watershed. Tool neatly.
- E. At roof drains:
1. Install tapered edge strip around drain to create approximate 48 x 48 inch sump. Miter corners. Seal toe of tapered edge to drain rim with reinforcing membrane embedded between alternate courses of asphalt mastic.
 2. Install roofing system into sump and onto drain rim.
 3. Plug drain to prevent water entry until service connection is completed.
 4. Prime the bottom side of the lead flashing.
 5. Apply 1/16 inch uniformly thick layer of asphalt mastic to surface receiving lead flashing.
 6. Set single piece lead flashing in mastic centered over drain; extend lead 6 inches beyond drain rim. Neatly dress lead with wood block.
 7. Clamp flashing collar to drain in bed of mastic.
 8. Neatly cut lead/felts within drain at rim. Lead to extend 1 inch (25 mm) into bowl.

9. Prime lead with asphalt primer.
10. Install two (2) ply stripping described in general flashing requirements section. Stripping shall not extend under clamping ring.

D. At perimeter parapet wall:

1. Install $\frac{3}{4}$ " CDX plywood to existing parapet wall(s). Anchor with a minimum of 11 masonry anchors per board. Note: remove existing counterflashing prior to installing plywood substrate.
2. Install specified insulation and butt-up to newly installed plywood. Install specified wood-fiber cant.
3. Install pressure treated wood-nailer on top of parapet wall. Secure to parapet wall 16" o.c. staggered with masonry anchors.
4. Run all plies up the cant. Seal top edge of plies with asphalt cement.
5. Adhere specified flashing from the field of the roof, over the wood-fiber cant, up the newly installed plywood and over the newly installed wood-nailer.
6. Install specified Storm Defender Coping as outlined in the detail drawings.

3.08 SURFACING APPLICATION

1. Apply specified 2-component primer/stain blocker (Prime Tek #11) at a rate of 1.25 gallons per square. Allow to dry.
2. Apply base coat of PolySil 2200 (light gray) at a rate of 1.25 gallons per 100 ft². Allow to dry.
3. Apply final coat of PolySil 2200 (dark gray) at a rate of 1.25 gallons per square.

3.09 ADJUSTING AND CLEANING

A. Repair of deficiencies:

1. Installations of details noted as deficient during final inspection must be repaired and corrected by applicator, and made ready for re-inspection, within five (5) working days.

B. Clean-up:

1. Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of debris.