LINESVILLE MAINTENANCE AND GARAGE BUILDING
ROOF REPLACEMENT

1. GENERAL

1.1 Vendor shall provide all plant, labor, supervision, materials, tools, and equipment necessary for furnishing and complete installation of EPDM roof membrane as specified herein.

1.2 The work in this contract shall, in general, consist of, but not be limited to, the following:

A. Preparation of old roof cover, which includes removal of existing ballast, membrane, insulation and installation of membrane with acceptable compatible (manufacturer's recommendation) insulation for the entire roof.

B. Furnish and install all new flashings and counter flashings.

C. Furnish and install adhered membrane roofing system as specified by Carlisle Sure Seal or approved equal; color of membrane shall be white, approximately 6,000 S.F. (bidders shall verify all existing conditions and quantities).

D. All details relating to the installation of the roof system shall be approved by the roofing vendor and/or by the manufacturer and installer, in such a manner that the manufacturer will furnish a 10-year warranty (minimum) for the installation.

E. State prevailing wage rates required (attached).

F. An asbestos bulk sampling was performed by EMC LABS, Inc., and a report is available upon request. No asbestos was found to be present in the existing roof materials sampling.

G. Bidders shall indicate manufacturer and provide catalog cuts for roof system. Information shall be provided with their bid.

2. LOCATION

2.1 The site of the work covered by these specifications is located on lands owned by the Commonwealth of Pennsylvania in Pine Township, Crawford County, Pennsylvania, commonly known as the Linesville State Fish Hatchery.

3. VISIT TO JOB SITE – PREBID (REQUIRED)

3.1 Before submitting a bid, the Vendor shall visit the site to verify all dimensions, quantities, and existing conditions. Arrangements for visits are to be made with the Station Manager, Mr. Rob Brown at (814) 683-4451. Further information concerning the proposed work may be obtained by contacting the Commission's engineer, Mr. Amos Ferguson at (814) 359-5105. Contractor shall bring Site Visit Attendance Sheet to the site visit for authorized signature. Site Visit Attendance Sheet must be attached to bid to be considered valid.

4. VENDOR'S RESPONSIBILITY

4.1 Vendors shall be responsible for the quality and workmanship of all work performed by themselves or their subcontractors and shall, within one year of substantial completion, correct, at no cost to the Commission, any work not covered by the manufacturer's warranty found to be defective or not in accord with the specifications.

4.2 The vendor shall maintain, continuously, protection of his work and all property of owner.

4.3 The Vendor shall coordinate his work with existing work and shall cooperate so as to facilitate, with harmony, a smooth and rapid completion of the project.

4.4 Any costs due to the result of negligence on the part of the Vendor or his employees for correcting defective work or correcting damages to property shall be borne by the Vendor.

4.5 The Vendor shall comply with all current applicable safety regulations of state, local, and federal governments.

4.6 The Vendor shall obtain approval of the Commission's engineer for all materials to be used as a part of this contract prior to using those materials.

4.7 The specifications and existing field conditions must be carefully examined and studied by the Vendor to determine the quantities and types of material required for the complete and entire job. All items of material required in conjunction with the complete project shall be furnished and installed under this section, whether or not such material is specifically called for by the schedule.

4.8 As this is an existing, occupied, and operating building, the Vendor shall guarantee and bear full responsibility for the maintenance of a dry interior of this building once the existing roof membrane is punctured in the progress of this contract.

4.9 The Vendor shall secure and pay for all permits that may be required by the governing authorities for completion of this roofing project.

4.10 The successful bidder shall field verify all roof dimensions and conditions prior to ordering required materials for the completion of the project.

4.11 The Vendor shall be responsible for removal of the old membrane, insulation and ballast from the site and proper disposal of same.

5. QUALITY ASSURANCE

5.1 For purposes of designating type and quality of work, drawings and specifications are based upon Carlisle Sure-Seal Universal Roofing System and Products of Carlisle Tire and Rubber Company. Substitute products will be considered if supporting technical literature, samples, and detail drawings are submitted in order to make a valid comparison of the products involved. Substitute must be equal in quality to brand name. As used in this clause, the term "brand name" includes identification of products by make and model.

5.2 If items called for by this Proposal-Contract have been identified in the Schedule by a "brand name or equal" description, such identification is intended to be descriptive, but not restrictive, and is to indicate the quality and characteristics of products that will be satisfactory. Bids offering "equal" products including products of the brand name manufacturer other than the one described by brand name will be considered for award if such products are clearly identified in the bids and are determined by the Commission to meet fully the salient characteristics requirements referenced in the Bid Proposal.

5.3 Unless the bidder clearly indicates in his bid that he is offering an "equal" product, his bid shall be considered as offering a brand name product referenced in the Bid Proposal.

5.4 A. If the bidder proposes to furnish an "equal" product, the brand name, if any, of the product shall be clearly identified in the bid. The evaluation of bids and the determination as to equality of the product offered shall be the responsibility of the Commission and will be based on information furnished by the bidder or identified in his bid, as well as other information reasonably available to the purchasing activity. CAUTION TO BIDDERS: The purchasing activity is not responsible for locating or securing any information which is not identified in the bid and reasonably available to the purchasing activity. Accordingly, to insure that sufficient information is available, the bidder must furnish as a part of his bid all descriptive material (such as cuts, illustrations, drawings, or other information necessary for the purchasing activity to (i) determine whether the product offered meets the salient characteristics requirement of the proposal-Contract and (ii) establish exactly what the bidder proposes to

furnish and what the Commission would be binding itself to purchase by making an award. The information furnished may include specific references to information previously furnished or to information otherwise available to the purchasing activity.

B. If the bidder proposes to modify a product so as to make it conform to the requirements of the Proposal-Contract, he shall include in his bid a clear description of such proposed modifications to show the proposed modifications.

C. Modifications proposed after bid opening to make a product conform to a brand name product referenced in the Bid Proposal will not be considered.

6. MATERIALS

6.1 All materials used in Carlisle Sure-Seal Universal Roofing System shall be as furnished by Carlisle Syntech Systems, a Division of Carlisle Corporation, Carlisle, Pennsylvania, and as further specified herein, or an approved equal.

6.2 Membrane: Shall be .060 inch thick, maximum 10.0 feet wide, maximum 200 feet long or as determined by job conditions, EPDM (Terpolymer of Ethylene, Propylene, and Diene) compounded elastomer which meets ASTM D3253 and includes the minimum physical properties listed on the following table:

TABLE

SURE-SEAL NON-REINFORCED "WHITE" EPDM

PROPERTY	TEST METHOD	SPECIFICATION
Tolerance on Normal Thickness, %	ASTM D 412	±10
Tensile Strength Min. psi (MPa)	ASTM D 412	1305 (9)
Elongation, Ultimate Min. %	ASTM D 412	350
Tear Resistance Min. Lbf/IN (kN/m)	ASTM D 624 Die C	175 (30.6)
Factory Seam Strength Min.	Modified ASTM D 816	Membrane Rupture
Resistance to Heat Aging*	ASTM D 573	
Properties after 4 weeks @ 240°F		
Tensile strength min. Psi (Mpa)	ASTM D 412	1200 (8.3)
Elongation, ultimate min. %	ASTM D 412	225
Tear resistance min. Lbf/in (kN/m)	ASTM D 624	150 (26.3)

Linear dimensional change max.	ASTM D 1204	±2
Ozone Resistance*		
Condition after exposure to 10 pphm Ozone in air for 168 h @ 104 °F Specimen is at 50% strain	ASTM D 1149	No cracks
Brittleness Temperature Max. Degrees F (degrees C)*	ASTM D 746	-75 (-59)
Resistance to Water Absorption* Change in mass max. after 7d immersion @ 158°F	ASTM D 471	4
Water Vapor Permeability* Max. Perm-mils	ASTM E 96 (Proc B or BW)	2.0
Resistance to Outdoor (ultraviolet) Weathering*		
Properties after 500,000 Langleys EMMAQUA; 50% strain; calendar Finished sheeting		
Tensile Strength min. Psi (Mpa)	ASTM D 412	1200 (8.3)
Elongation min. %	ASTM D 412	225
Sheet Composition*	ASTM D 297	
Weight % of polymer that is EPPDM, min. %		100
Weight % of sheet that is EPDM polymer, min. %		30

*Not a quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

6.3 Insulation. Roof insulation shall be compatible with membrane (manufacturer's recommendation) with R value of 30 minimum.

6.4 Fasteners

A. Structural concrete, rated 3000 psi or greater:

1. Sure-Seal Concrete Fasteners are recommended.

2. An alternate fastener or method of fastening may be used provided it is approved by the roofing manufacturer so as to be covered by the warranty clause of this contract.
3. Pull out resistance of 800 pounds must be provided by all fasteners. Due to the wide variations which are found among decks commonly referred to as "structural concrete," only the onsite trial of drill bits and acceptable fasteners can determine considerations which must be the basis of project cost calculations.

B. Wood planks or minimum 15/32 inch thick plywood:

1. Sure-Seal HP Fasteners are recommended. All fasteners must penetrate the deck a minimum of one (1) inch to a maximum of 1-1/2 inches. Fasteners shall not penetrate wood deck; the bottom of wooden deck is the ceiling of the interior space of the building.

2. An alternate fastener must be recommended by the respective manufacturer AND must be accepted by Carlisle for use on each specific project PRIOR to bid and installation. Pull out resistance of 360 pounds minimum must be provided.

C. Cementitious wood fiber of gypsum decking:

1. Sure-Seal light weight deck fasteners are recommended.

2. The Sure-Seal HP Speedlock Toggle Bolt is an acceptable alternate with a minimum pull out of 500 pounds per fastener.

3. All alternate fasteners must be accepted by Carlisle for use on each specific project PRIOR to bid and installation. Minimum pull out of 225 pounds per fastener for cementitious wood fiber or 300 pounds per fastener for gypsum.

D. Steel Deck 22 Gauge or Heavier:

1. Sure Seal HP Fasteners are recommended.

2. An Alternate fastener must be recommended by the respective manufacture and accepted for use on this specific project prior to bid and installation of the fastener.

3. Due to the fluted design of most steel docks, a specific effort is required to ensure ¾" deck penetration by ever fastener. Pre bid investigation of deck alignment; physical conditions and rib depth are strongly recommended. Pull out resistance of 360 pounds minimum must be provided for fasteners.

4. Decks heavier than 22 gauge may require drilling.

E. Steel Deck, Lighter than 22 Gauge

1. Sure-Seal HP Toggle bolts are recommended,

2. Alternate toggle bolts must be accepted by Carlise prior to project bid and installation.

3. A pre bid investigation of deck alignment; physical conditions and rib depth is strongly recommended. Pull out strength and resistance of 500 pounds minimum per fastener.

NOTE: When the fastener is expected to be exposed to a high humidity and/or a corrosive environment, Carlisle should be consulted regarding the use of special fasteners. A test installation with the proposed membrane underlayments and fastener is strongly recommended.

6.5 Insulation Attachment

A. Sure-Seal Polyisocyanurate insulation, which is 2 inches thick or greater (used as the uppermost layer) may be fastened at a rate of one Carlisle fastener and plate every four square feet.

B. Insulations by others (when promoted by the respective manufacturer and accepted by Carlisle) shall be mechanically fastened to the roof deck with one insulation fastener and plate for every two square feet of insulation unless otherwise approved in writing by the insulation manufacturer.

C. When mechanical attachment of the insulation is not feasible, or desired, an alternative insulation attachment method may be specified. The alternative attachment method incorporates the use of a solid mopping of hot asphalt and a recommended series of grid nailers which subdivide the entire roof area into small sections of 2,400 square feet maximum.

D. See Note Section 6.4-D.1.

6.6 Other Carlisle Materials: For specific information related to the following Carlisle materials refer to the respective Technical Data Bulletin.

A. Flashing: EPDM Elastoform Flashing, furnished by the membrane manufacturer for this system. (Not acceptable for tie-in to an existing build-roof – Neoprene Elastoform Flashing is required.)

B. Bond Adhesive: 90-8-30A Bonding Adhesive, furnished by the membrane manufacturer for this system.

C. Splicing Cement: Brite-ply Splicing Cement, furnished by the membrane manufacturer for this system.

D. Lap Sealant: Shall be trowel or gun consistency, furnished by the membrane manufacturer for this system.

E. Water Cut-Off Mastic: Furnished by the membrane manufacturer for this system.

F. Molded Pipe Flashing: Furnished by the membrane manufacturer for this system.

G. Nite Seal and Lay Falt Tubing: Furnished by the membrane manufacturer for this system.

H. Pourable Sealer: Furnished by the membrane manufacturer for this system.

I. Rubber Fastening Strip #3: Furnished by the membrane manufacturer for this system.

J. Walkway Pads and Splicing Cement: Furnished by the membrane manufacturer for this system. Walkways shall not be placed on roof slopes greater than two inches per one horizontal foot.

K. Roof Drain: Furnished by the membrane manufacturer for this system.

7. DELIVERY AND STORAGE

7.1 Materials shall be delivered in their original, unopened containers, clearly labeled with manufacturer's name, brand name and such identifying numbers as are appropriate. All materials other than membrane shall be stored between 60 degrees and 80 degrees F. Should they be exposed to lower temperatures, restore to room temperature prior to use. Do not use materials damaged in handling or storage. All cardboard containers should be stored in a DRY area.

7.2 Insulation and other roofing materials stored on the job site which are subject to damage because of weather conditions shall be stored in weatherproof enclosure until such time as these materials are incorporated into the work.

7.3 The floor of the enclosure shall be a minimum of 6" above the ground level. Vendor shall submit a sketch of the enclosure to the Commission's engineer for approval and will be responsible for day-to-day maintenance to keep it weathertight.

7.4 Failure of the Vendor to comply with the storage requirements specified herein will be sufficient cause for rejection of all unsuitable stored materials by the Commission.

8. CAUTIONS

8.1 Do not use oil base or plastic roof cement in conjunction with roofing system materials.

8.2 Waste products (petroleum, grease, oil and solvents)—vegetable or mineral oil and animal fat—direct contact with steam venting) should not be allowed to come in contact with the roofing system.

8.3 Cements and bonding adhesive contain petroleum distillates and are extremely flammable; avoid breathing vapors; do not use near fire or flame.

8.4 Installation of the roofing system is not restricted because of cold temperatures. Follow precautions as stated by the manufacturer for cold weather installation.

8.5 Splicing and bonding surface must be dry.

9. PREPARATION OF SUNSTRATE

9.1 The Vendor shall be responsible to remove water on existing roof prior to installing new insulation and membrane roofing system.

9.2 The Vendor shall be responsible for providing proper substrate to receive the roofing system. All deteriorated or defective decking, nailers, etc., shall be brought to the attention of the Commission's engineer for verification of quantities involved. The Vendor shall not proceed until the defects in the substrate have been corrected or until so directed by the Commission's engineer.

9.3 The Vendor shall be responsible for removal and proper disposal of the existing ballast, roof membrane and insulation.

10. VAPOR BARRIER

10.1 Additional vapor barrier may be required in accordance with manufacturer's recommendation.

11. MEMBRANE APPLICATION

11.1 Position roofing membrane without stretching over the approved substrate. Allow the membrane to relax for approximately one-half hour before fastening or splicing.

11.2 Adjoining sheets: Apply adjoining sheets in the same manner as specified in Clause 13 Splicing, lapping the edges a minimum of three inches. This minimum 3" splice area should not have bonding adhesive applied to the splice surface.

12. MEMBRANE SPLICING

12.1 Membrane splices must be a minimum of three inches wide. Field splices at roof drains must be located outside the drain sump.

12.2 A slip sheet or other means of protection shall be used to avoid surface discoloration along the splice area and beneath Splicing Cement and Bonding Adhesive containers.

12.3 Bond adjoining membrane sheets in place and remove dirt and excess dust from mating surfaces of overlapping membrane sheets by wiping with Sure Seal Splice Wipes or a clean rag. To remove accumulated dirt, footprints, etc., scrub the membrane sheets with warm water and a low-sudsing soap; rinse with clean water.

12.4 Clean the dry splice area of membrane sheets by scrubbing the Sure-Seal HP Splice Wipes or clean natural fiber rags saturated with Sure-Seal/Brite-Ply, Splice Cleaner as per the manufacturer's recommendations.

12.5 Application of any splice cleaners must be dispensed from an OSHA approved safety can.

12.6 Check the membrane surfaces to verify adequate cleaning procedures have been maintained. Hold the top membrane sheet back as the cleaning and scrubbing process continues along the length of splice so that both mating surfaces may be cleaned at approximately the same time.

12.7 Follow the manufacturer's recommendations for preparation of appropriate splicing cement to both mating surfaces with three inch wide ½ inch medium nap roller. Apply cement smoothly, continuously and relatively evenly to achieve a heavy coat. The Vendor shall follow all manufacturer's recommendations for application of cement according to temperature related instructions.

12.8 Roll the top membrane sheet to the mating surface. Take care not to stretch or wrinkle the membrane sheet to avoid a fishmouth in the field space. For corrective measures, refer to manufacturer's recommendations.

12.9 Lap sealant must be applied according to all the manufacturer's recommendations. Application of lap sealant must be completed by the end of the day. Lap sealant may be applied immediately upon completion of uncured to cured or uncured to uncured splices. Delayed lap sealant application (not within the same day) will requires scrubbing of accumulated dirt and dust, as previously

described, along the splice edge, rinsing with clean water and cleaning with splice cleaner.

13. ADDITIONAL MEMBRANE SECUREMENT

Securement must be provided at the perimeter of each roof level, roof section, expansion joint, curb flashing, interior wall, and at any inside angle change where slope or combined slopes exceed two inches in one horizontal foot, and at other penetrations in accordance with the manufacturer's details and securement options as listed below:

13.1 Securement may be achieved as follows:

A. Reinforced Universal Securement Strip – Loose lay the six-inch wide reinforced strip along parapet walls and fasten with Seam Fastening Plates and the appropriate fastener to the roof deck or vertically into the parapet wall. All fasteners must be installed so the tops of the fasteners are flush with the top of the Seam Fastening Plate. Spacing of the Seam Fastening Plates shall be a maximum of 12 inches on center. If adjustment of fasteners becomes necessary to avoid obstructions below the roof deck, the manufacturer must be contacted for specific requirements.

1. For horizontal attachment, the reinforced strip must be positioned a minimum of 1/8 inch to a maximum of 6 inches away from the angle change.

2. For vertical attachment, the reinforced strip must be attached to the vertical wall and must extend a minimum of three inches onto the horizontal substrate/insulation.

13.2 Adjoining sections of the reinforced strip need not be overlapped; however, gaps between adjoining sections must not exceed one inch.

13.3 Follow standard cleaning procedures outlined previously to clean the securement strip and deck membrane.

13.4 To splice the deck membrane to the reinforced strip, follow standard splicing procedures as outlined in Section 12, Membrane Splicing, excluding the use of In-Seam Sealant and Lap Sealant. The vertical field splices at the base of a wall or curb must be overlaid with six inch wide Sure-Seal Pressure Sensitive Flashing or uncured Elastoform Flashing centered over the field splice.

13.5 Seam Fastening Plates. Where the use of reinforced universal securement strip is not feasible, Sure-Seal Seam Fastening Plates (two inch diameter metal plates) may be used in lieu of the securement strip.

13.6 Seam Fastening Plates may be installed horizontally into the structural deck or vertically into walls or curbs.

13.7 Securement of EPDM membrane with the Seam Fastening Plates must be a maximum of 12 inches on center starting 6 inches to 9 inches maximum from inside and outside corners.

13.8 If horizontal wood nailers are provided, secure the Seam Fastening Plates to the wood nailer with the specified fastener. Roofing nails are not acceptable for securement.

13.9 After mechanically fastening the Seam Fastening Plates, flash in accordance with the appropriate manufacturer's recommendation.

14. FLASHING – GENERAL CONSIDERATIONS

14.1 All existing loose flashing must be removed prior to the application of new Sure-Seal/Brite Ply flashing. New flashing must extend above all existing intact flashing but must not conceal weep holes or cover existing throughwall counterflashing.

14.2 Install surface mounted reglets and compression bar terminations directly to the wall surface.

14.3 In-Seal Sealant is required on all vertical splices between adjoining sections of cured membrane flashing.

14.4 All vertical field splices at the base of a wall or curb must be overlaid with six-inch wide Sure Seal Pressure Sensitive Flashing or uncured Elastoform Flashing centered over the field splice.

14.5 Uncured Elastoform Flashing must be limited to the overlayment of vertical seams (as required at angle changes) or to flash inside/outside corners, vent pipes, scuppers and other unusually shaped penetrations where the use of cured EPDM membrane or Pressure-Sensitive Flashing is not practical.

NOTE: Even when working in elevated temperatures, in most cases a heat gun will be required to elevate the temperature of uncured Elastoform Flashing to a higher than warm tool temperature (which is between 105 and 110 degrees Fahrenheit) to permit proper forming of the uncured flashing.

The Brite-Ply Flashing stretches easier crosswise than it does lengthwise. When forming outside corners, it must be positioned so that the longer points of the diamond shaped embossment in the poly backing and the Elastoform are pointing to the outside corner. The same procedure must be followed for the vertical wrapping of a field fabricated pipe seal.

14.6 Use of Reinforced Universal Securement Strip

A. Splice the EPDM deck membrane to the securement strip before bonding the membrane to the vertical surface. Follow standard splicing procedures excluding the use of In-Seam Sealant and Lap Sealant.

14.7 Continuation of Deck Membranes as Flashing in Conjunction with Seam Fastening Plates

A. Bond the continuous deck membrane up to the designated termination. Secure the deck membrane at the angle change with Seam Fastening Plates spaced a maximum of 12 inches on center. Flash the Seam Fastening Plates with a nine-inch wide piece of cured .060 inch thick "seamless" EPDM membrane centered over the plates with a bead of In-Seam Sealant completely surrounding each plate.

B. As an alternate to the use of nine-inch wide cured EPDM membrane flashing, six-inch wide Sure-Seal Pressure Sensitive Flashing may be used to overlay the Seam Fastening Plates. The Pressure-Sensitive Flashing must extend a minimum of 1-1/2 inches on either side of the plates.

14.8 Use of a Separate Piece of Cured EPDM Membrane. Commonly use in conjunction with Seam Fastening Plates. Although not prohibited, it is not practical for use when the Reinforced Universal Securement Strip method of securement is utilized.
The flashing height must be calculated so that the cured membrane flashing includes a minimum three-inch splice beyond the Seam Fastening Plates.

A. Secure the deck membrane at the angle change with Seam Fastening Plates spaced a maximum of 12 inches on center.

B. Flash the membrane securement with a separate piece of cured EPDM membrane to be used as flashing. Complete the splice between the flashing and the deck membrane AND crease the flashing into the angle change before bonding it to the vertical surface.

C. Follow standard membrane splicing procedures including the use of In-Seam Sealant and Lap Sealant.

14.9 Metal Edge Terminations

A. The width of the perimeter wood nailer to which the metal edge is to be secured must extend beyond the width of the metal edge deck flange.

B. The metal edge must be secured to the wood nailer as specified by the manufacturer.

C. All perimeter wood nailers must be totally concealed by extending the deck membrane or the securement strip to completely cover the nailers.

D. To remove finishing oil residue, scrub metal edge deck flange with warm water and a low-sudsing soap; rinse with clean water.

E. Prior to flashing, scrub the metal edge deck flange and the membrane with Splice Cleaner to remove field contaminants.

F. Due to the wide variety of flashing options, the appropriate manufacturer's detail should be used for clarification.

G. Metal flashing shall be applied in accordance with the manufacturer's recommendations. Flashing shall be of a thickness adequate to provide strength and to withstand wind action.

15. WOOD NAILERS AND TAPERED EDGE STRIPS, CRICKETS OR SADDLES

15.1 A horizontal wood nailer is used to provide an effective substrate for some installation details and for other roof accessories. In addition, it is used to provide solid protection for the edge of the membrane underlayment. Minimum thickness of the nailer must be such that the top of the nailer is flush with the top of the membrane underlayment.

15.2 Wood nailers are required for the securement of metal edging, metal scuppers, and certain curbs, pourable sealer pockets, pipes, etc., as shown on the applicable detail. Parapet walls and curbs do not require the utilization of wood nailers.

NOTE: The width of the wood nailer must be specified to exceed the width of the metal flange of edging, scuppers, etc.

15.3 When wood nailers are used, it is recommended that only lumber which has been pressure treated with salt preservatives be specified.

Lumber treated with any of the wood preservatives such as, but not necessarily limited to, the list below will adversely affect the EPDM membrane when in direct contact area, therefore, unacceptable:

A. Creosote
B. Pentachlorophenol
C. Copper Nephthenate
D. Copper 8-quinolinolate

15.4 Methods used to fasten the nailer vary with building conditions; however, it is essential that secure attachment of durable stock be accomplished. Factory Mutual Loss Prevention data Bulleting I-49 contains options for the spacing and sizing of fasteners based on the project wind zone.

15.5 Tapered edge strips, crickets or saddles are recommended where periodic ponding of water may occur.

15.6 Tapered edge strips, crickets or saddles may be composed of wood fiberboard, perlite, polystyrene or other suitable insulation.

15.7 It is preferred that the slope of the taper not exceed two inches to one horizontal foot to avoid additional membrane securement required at angle changes which exceed such a slope. If a greater slope is necessary, securement of the membrane at the base of the tapered edge strip will be required utilizing either Reinforced Universal Securement Strip beneath the EPD membrane of Seam Fastening Plates.

15.8 Tapered edge strips, crickets or saddles should be positioned beneath the specified insulation/underlayment so the membrane can be adhered directly to the acceptable insulation/underlayment. If tapered edge strips, crickets or saddles are specified above the insulation, they must be constructed of or overlaid with an acceptable insulation/underlayment.

16. EXPANSION JOINTS

16.1 The EPDM deck membrane must be secured on both sides of the expansion joint with reinforced universal securement strap. Refer to the manufacturer's Expansion Joint Details for proper securement procedures.

16.2 Membrane junctions at expansion joint intersections, expansion joint repairs, and intersections between expansion joints to wall or edging, must be flashed using three layers of uncured Elastoform Flashing with each layer three inches larger than the previous layer in all directions.

17. ROOF DRAINS/SCUPPERS

17.1 Provide a smooth transition from the roof surface to the drain clamping ring. Prepare the substrate around each roof drain to avoid membrane bridging (minimum ½ inch) at the sump area and possible distortion at the drain clamping ring.

NOTE: When reinforced membrane has been specified and the slope of the drain sump is greater than 3 inches in 12 inches, a separate piece of cured, non-reinforced membrane must be extended into the drain sump according to the manufacturer's recommendations.

The mating surfaces between the clamping ring and drain basin must be clean and have a smooth finish.

Field splices at roof drains must be located at least six inches outside the drain sump.

Cut the membrane so it extends approximately ½ inch beyond the attachment points of the drain clamping ring.

CAUTION: Under no circumstances should the hole in the membrane restrict water flow or be smaller than the drain tube.

The seal between the membrane and the drain base must be provided by Water Cut-Off Mastic under compression as shown in the manufacturer's details.

ALL BOLTS AND/OR CLAMPS MUST BE IN PLACE TO PROVIDE COMPRESSION ON THE WATER CUT-OFF MASTIC.

Only drain strainers which have been approved by the manufacturer and owner in accordance with all applicable codes may be used.

18. VENT PIPES

18.1 Pipes, Round Supports, Etc.

A. Flash pipes with molded pipe flashings where their installation is possible.

B. Sure-Seal/Brite-Ply Pressure Sensitive Pipe Flashings may also be used. When the deck flange of the Pressure Sensitive Pipe Seal intersects with a field or factory splice, the pipe seal must be installed in conjunction with In-Seam Sealant or a surface splice which is larger than the flange of the pipe seal. Refer to the manufacturer's requirements.

C. Molded pipe flashings or Pressure Sensitive Pipe Seals cannot be cut and patched; deck flanges cannot be overlapped or installed over angle changes.

D. Where Molded Pipe Flashings or Pressure Sensitive Pipe Seals cannot be installed, apply Field Fabricated Pipe Seals using uncured Elastoform Flashing. Refer to the manufacturer's requirements.

18.2 Flexible Penetrations (Braided Cables, Conduit, Wires, Etc.)

A. A watertight seal depends upon a stable installation detail. When a flexible penetration is encountered, it must be enclosed in a stable "goose neck" set in Water Cut-Off Mastic and secured to the deck or to wood nailers built up to the level of the membrane underlayment. Apply a field fabricated pipe seal using uncured Elastoform Flashing to flash the goose neck.

18.3 Hot Pipes

A. Hot pipes or other similar penetrations which exceed 180 degrees Fahrenheit, must be installed utilizing an insulated metal collar and rain hood and flashed with a field fabricated pipe seal using uncured Elastoform Flashing in accordance with the manufacturer's recommendations.

18.4 Pipe Clusters

A. Pipe clusters, which prohibit the installation of field fabricated pipe seals, must incorporate a poured sealer pocket (refer to Pourable Sealer Pockets below for installation criteria).

18.5 Vertical Terminations

A. Install termination at the top of the membrane flashing at the height specified.

B. Do not cover existing through wall flashing or weep holes with new membrane.

C. In areas where metal counterflashing is used as the vertical termination, the counterflashing must be sealed with a rubber grade caulking to prevent moisture migration behind the new wall flashing.

D. Proper membrane termination must be provided to ensure the watertight integrity of the membrane roofing system. For proper membrane termination at any compression type termination detail, existing flashing must be removed to provide for termination directly to the substrate.

18.6 Pourable Sealer Pockets

A. For unusually shaped penetrations or when penetrations (pipes are too close together for the installation of field fabricated pipe seals) use a pourable sealer pocket. The pourable sealer must be a minimum of two inches deep and provide a minimum one-inch clearance between all pipes and the sides of the pourable sealer pocket. Install Sure-Seal Pressure Sensitive Pourable Sealer Pockets or shop fabricated pourable sealer pockets in accordance with the applicable Pourable Sealer Pocket Details.

19. SHEET METAL

19.1 Metal work securement shall be sufficient that all fastening of metal will provide the metal work from either pulling free or buckling, which could eventually cause roofing problems.

19.2 All metal work shall be sealed and watertight to prevent leakage into the building.

19.3 Refer to Section 14.9-G.

SITE VISIT ATTENDANCE SHEET

Contractor's Name_____

_____ _____

Date of Visit Authorized Agent Signature

NOTE: Site Visit Attendance Sheet must be returned with bid in order for bid to be considered.