SECTION 07 53 23

ELASTOMERIC MEMBRANE ROOFING

PART 1 - GENERAL

1.01 SCOPE:

A. Provide all labor, materials, equipment and services required to furnish and install the elastomeric EPDM sheet roofing.

1.02 QUALITY ASSURANCE:

A. Installers:
   1. The roofing and flashing installer shall be currently approved by the manufacturer of the selected elastomeric roofing system.
   2. For actual installation of roofing and flashing, use only competent and skilled roofers completely familiar with the products and the manufacturer's currently recommended methods of installation.
   3. Work associated with single-ply membrane roofing, including (but not limited to) insulation, flashing, and membrane sheet joint sealers, shall be performed by the installer of this Work.
   4. Coordinate with:
      a. Section 07 22 16, Roof Board Insulation
      b. Section 07 62 00, Sheet Metal Flashing.

B. Obtain primary single-ply membrane roofing from a single manufacturer. Provide secondary materials as recommended by manufacturer of primary materials.

C. Pre-roofing conference: Before installing roofing and associated work, meet at mutually agreed location with the installer, roofing manufacturer, installers of related work, and other entities concerned with roofing performance, including governing authorities, Architect and Owner. Record discussions and agreements and furnish copy to each participant. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.

D. Construct the completed roof to comply with requirements of Factory Mutual Loss Prevention Data 1-29 edition for resistance to wind blow-off in correlation with requirements of applicable of applicable building code(s).

1.03 SUBMITTALS:

A. Prior to delivery of materials, submit to the Architect for review the following:
   1. Manufacturer's literature fully describing each product.
   2. A complete description (including, but not limited to, literature and drawings) of all roofing and flashing systems required, listing all components and manufacturers of each.
   3. Shop drawings shall include, but not be limited to:
      a. Outline of roof and roof size.
      b. Number of sheets and their respective sizes.
      c. Seaming locations.
      d. Location and type of all penetrations.
      e. Number of flashing rolls by width.
      f. Details of termination at eaves, vertical surfaces, and roof penetrations.
      g. Insulation thickness and layout.
   4. Submit certification from the roof manufacturer that the roof system (including roof membrane, flashings) will resist code uplift forces of Factory Mutual Bulletin 1-29, that the

roof deck insulation is being provided and installed in an acceptable manner and that the roof system warranty will not be violated.

1.04 PROJECT CONDITIONS:

A. Weather: Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

B. Substrate conditions: Do not begin roofing installation until substrates have been inspected and are determined to be in satisfactory condition.

1.05 GUARANTEE:

A. The roofing system manufacturer shall guarantee to maintain the total roof system in a watertight condition at his own expense for a period of 20 years from the Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 ELASTOMERIC SHEET ROOFING - ADHERED:

A. Product/manufacturer:
1. Universal Design "A" Adhered Roofing System as manufactured by Carlisle Tire and Rubber Company.
2. A comparable system as manufactured by Firestone Rubberguard Roofing Systems.
3. Or an approved equal.

B. Provide an elastomeric roofing system including all incidental and accessory items as drawn and specified which shall include, but not be limited to the following:
1. Membrane: .060 non-reinforced EPDM.
   a. Color: White.
2. Flashing - EPDM 60 MIL
3. Bonding Adhesive
4. Splicing Cement
5. Splice Cleaner
6. Lap Sealant
7. Water Cut-off Mastic
8. Molded Pipe Flashing
9. Nite Seal
10. Pourable Sealer
11. Sure-Seal rubber Fastening Strip and Universal Fasteners
12. Termination bar at roof edges.

C. Epichlorohydrin (eco/co) membrane:
1. Cured, non-reinforced (black), .060" thick ECO/CO compounded Hydrinepichlorohydrin elastomer.
2. Prior to application of ballast, provide in 20' diameter around kitchen exhaust.

2.02 WOOD NAILERS AT ROOF PERIMETER:

A. See Section 06 10 00, "Rough Carpentry".

2.03 INSULATION:

A. See Section 07 22 16, "Roof Board Insulation".

2.04 FOAM TUBING AND FILLER:

A. Cellular foam sponge tubing 50% larger than joint with safing insulation backup filler.

2.05 TRAFFIC PADS:

A. Sure-Seal, 24" x 24" walkway pads, as manufactured by Carlisle Corp. or as manufactured by approved roofing manufacturer.

2.06 EXPANSION JOINT:

A. Product/manufacturer:
   1. Schuller Expand-O-Flash "CF" (curb-to-curb and curb-to-wall) as manufactured by Manville Roofing Systems.
   2. Or an approved equal.

2.07 OTHER MATERIALS:

A. All other materials, not specifically described but required for a proper completion and watertightness of the roof system shall be as selected by the Contractor, but subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 PREPARING SUBSTRATE AND GENERAL REQUIREMENTS:

A. Comply with manufacturers' instructions to prepare substrate to receive single-ply membrane system.
   1. Verify that expansion joints, blocking, drains, sleeves, curbs and other penetrations which pass through surfaces to receive roofing are rigidly installed and clamped into position.

B. Clean substrate of dust, debris and other substances detrimental to single-ply system installation. Remove sharp projections.

C. Install cant strips, flashings, and accessory items as shown and as recommended by the manufacturer.

D. Prime substrate where recommended by the manufacturer of the materials being installed.

E. Prevent compounds from entering and clogging drains and conductors and from spilling or migrating onto surfaces of other work.

F. Provide protection to the roof insulation and to set up area with 3/4" exterior grade plywood. Coordinate with Section 07 22 16.

3.02 APPLICATION OF ROOFING:

A. Apply materials strictly in accordance with the roofing manufacturer's printed specifications. Do no work and install no materials that will in any manner violate or void the guarantee.

B. Start installation only in the presence of manufacturer's technical representative.
   1. Cut out and repair membrane defects at the end of each day's work.

C. When work is stopped at the end of a work day, and when work is stopped because of the

probability of precipitation, seal loose edge of roof membrane in accordance with the roofing manufacturer's printed specifications. Take care to ensure that water does not flow beneath completed sections of roof. When work is resumed, pull the roof membrane free before continuing installation and completely remove any adhesive used.

D. Fully adhered membrane:
   1. Install membrane by unrolling over prepared substrate, lapping adjoining sheets as recommended by manufacturer. Apply adhesive to surfaces to be bonded and roll into place when adhesive has properly cured. Treat seams with special adhesive and apply sealant to exposed sheet edges, tapering application as recommended by manufacturer. Install mechanical fasteners, flashings and counter flashings, and accessories at locations and as recommended by manufacturer.
   2. At crickets overlap at peak a minimum of 6".
   3. At roof edges provide termination bar with screws at 6" o.c.

3.03 SPLICING:

A. Splicing seams with manufacturer's splice adhesive:
   1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
   2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
   3. Prepare each surface of the seam by scrubbing the cleaned areas with seam cleaner using clean cotton rags. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags must be replaced with clean ones as they become dirty. The cleaned membrane shall have a uniform black color when dry. There shall be no streaks present.
      a. Black seam cleaner shall be used with black EPDM membranes.
      b. Clear seam cleaner shall be used with white-on-black EPDM membranes.
      c. Tape primer may be used as a substitute for either the black or white clear seam cleaner.
   4. Seam cleaners, tape primer and splice adhesives shall be thoroughly stirred prior to application. Be sure to scrape the sides and bottom of the cans while stirring.
   5. Apply the splice adhesive to the cleaned surfaces of both sheets. Rutherford County Schools (RCS) recommends the use of a solvent resistant, 3" - 4" wide, short bristle paint brush or a solvent resistant 3" wide, ½" medium nap, paint roller.
   6. Apply the adhesive in a uniformly thick even coat. When using a paintbrush do not use a circular motion. Use long, straight strokes applying sufficient adhesive that will achieve a smooth surface without leaving brush marks. When using a roller do not over roll the adhesive as this will cause an uneven application.
   7. Do not allow the adhesive to puddle or leave globs as these areas will not dry properly and may cause excessive swelling of the membrane which will result in fishmouths in the finished seam.
   8. Adhesive must be applied to both surfaces of the seam at the same time to allow for uniform drying of the adhesive. The adhesive shall fully cover the surface of the splice areas a minimum of 3" wide.
   9. Allow the adhesive to dry until tacky to the touch of a dry finger without stringing or sticking to the finger and does not move when pushed forward or the finger is twisted. Drying time, or Flash Off Time, will vary from day to day depending on the ambient weather conditions. In colder weather, condensation may form on the adhesive that is caused by the solvent flashing off. If this occurs, the application of the splice adhesive shall be discontinued. The surface shall be allowed to dry and a thick coat of adhesive shall be applied over the existing adhesive.

10. Roll the top sheet onto the bottom sheet being careful not to stretch or wrinkle the membrane. Apply hand pressure brushing from the inside of the sheet outward to the edge removing air and fishmouths.
11. Using a 2" wide steel roller, apply positive pressure rolling from the inside of the seam working out over the edge of the sheet perpendicular to the direction of the seam. The entire seam shall be rolled in this manner. A J. R. Seamer Power Roller may be used in place of the 2" steel roller.
12. All “T-joint” laps in the field membrane shall be reinforced with a 6" piece of uncured EPDM membrane (uncured flashing tape may also be used) centered over the intersection of the edges of the seams. All “T-joint” patches shall be caulked with lap sealant.
13. Field seams and flashings shall be allowed to set for several hours prior to the application of lap sealant. At the latest, lap sealant shall be applied to all seam edges at the end of the workday and before any moisture has a chance to form on the membrane.
14. Just prior to applying the lap sealant, the seam and flashing edges shall be cleaned with a clean rag or cloth using the seam cleaner to remove any dirt or talc that may remain along the seam edge. Assure that all edges of the splice have been covered with a continuous bead of lap sealant. It is not necessary to trowel (screed) the caulk. The lap sealant shall be applied at a maximum rate of 20 lf per tube.

B. Splicing seams with In-Seam Tapes
1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Tape Primer using clean cotton rags or Scotch-Brite® pads. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags and Scotch-Brite® pads must be replaced with clean ones as they become dirty. The primed membrane should have a uniform black color when dry. There should be no streaks present. The Tape Primer shall be thoroughly stirred prior to use.

4. Roll the top sheet back over the bottom sheet and mark the bottom sheet to allow for proper placement of the In-Seam Tape. Mark the bottom sheet along the edge of the top sheet, but ½" away from the sheet, as a guide for the installation of the In-Seam Tape. Do not use a chalk line or any type of marker that will prevent the seam tape from sticking.
5. Fold the top sheet back. Approximately 1/8" to 3/8" of In-Seam Tape should be exposed along the completed seam. Unroll 2 or 3 feet of the In-Seam Tape leaving the release liner in place. Align the In-Seam Tape so that the edge of the release liner is touching the guideline. Do not install the tape over the line. Leaving the release paper in place, install the In-Seam Tape along the marks on the bottom sheet. Roll the tape with a 2" steel roller along the entire length of the seam. The roller must run perpendicular to the tape with overlapping strokes.
6. Wait a minimum of 2 hours prior to application of the Lap Sealant. The Lap Sealant is only required at intersections with factory seams, where two pieces of tape overlap within the seam and on patches installed over “T-joints”. A bead of Lap Sealant should be applied along the overlap for 6" in each direction from the center point of the overlap.

C. Regardless of the method used to splice the seams, all seams must be thoroughly inspected for fishmouths, bubbles, blisters and wrinkles and repaired as necessary.
1. If fishmouths or wrinkles occur through the seam, they must be cut out and patched with cured membrane (cured cover tape may be used).
2. Patch with cured EPDM membrane or Cured Cover Tape (do not use uncured flashing or

flashing tape) that is at least 3 inches larger in all directions than the area that has been cut out. Round the corners of the patch.

3. Center the patch over the area to be repaired. Follow the splicing procedures for the appropriate material used.

D. Seams and Splicing of seams:
   1. Wrinkles that transmit through the seams shall be cut out and patched using cured sheet.
   2. All seams shall be thoroughly inspected for fishmouths, bubbles, blisters and wrinkles and repaired.
   3. If fishmouths or wrinkles occur through the seam, they shall be cut out and patched with cured membrane (cured cover tape shall be used).
   4. Patch with cured EPDM membrane or cured cover tape (do not use uncured flashing or flashing tape) that is at least 3" larger in all directions than the areas that has been cut out. Round the corners of the patch.
   5. Center the patch over the area to be repaired. Follow splicing instructions procedures for the appropriate material used.

E. RMS (Reinforced Membrane Strip) attachment strip
   1. The RMS is a 6" wide reinforced strip of EPDM membrane that may be installed at the base of walls and curbs. manufacturer's 2.4-inch seam plates are used to attach the RMS either horizontally or vertically with appropriate fasteners. Refer to manufacturer's Details for appropriate placement of the RMS, plates and fasteners. The RMS is installed prior to the placement of the field sheet.
   2. Follow the standard procedures for cleaning and splicing the RMS and field sheet. Only the Black Seam Cleaner and Black Splice Adhesive may be used to seam the RMS to the field sheet. Bonding Adhesive and Single Seal Adhesive are not permitted for use with the RMS attachment strips. Lap sealant is not required. The RMS is also available as a pre-taped product. Use Tape Primer to prepare the membrane surface when using

      the pre-taped RMS.
   3. Spacing of the fasteners shall not exceed 12 inches on center. Adjoining RMS strips shall be spaced a maximum of 1 inch apart. It is not required to overlap the RMS.
   4. For vertical attachment, the RMS membrane must extend a minimum of 3 inches onto the horizontal surface (roof substrate). Refer to the manufacturer's Detail. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.
   5. For horizontal attachment, the membrane must be placed a maximum of ½ inch from the base of the angle change extending out onto the horizontal surface (roof substrate). The 2.4-inch seam plates must be placed a minimum of ½ inch to a maximum of 1 inch from the exterior edge of the strip. Refer to the manufacturer's Detail. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.

F. Drip Apron and Gravel Stop
   1. For drip aprons and gravel stops, the metal flange shall extend a minimum of 3 inches onto the wood nailer. The wood nailer must be wider than the metal flange. Approved screw fasteners shall be installed a maximum of 6 inches on center and ½" to 3/4" from the inside edge of the metal flange. Ring shank nails spaced a maximum 4" on center may also be used.
   2. All drip aprons and gravel stops shall primed with Tape Primer and stripped with Cured Cover Tape. Cleaning the metal with a solvent such as toluene or xylene to remove oil film may be required prior to installing and priming with the Tape Primer.
   3. The edge of the Cured Cover Tape overlapping the metal flange shall be caulked with Lap Sealant. For those areas where water flows over the drip apron, both sides of the Cured Cover Tape must be caulked.

3.03 FLASHING:

A. Coordinate with the requirements of Section 07 62 00.

B. Use the longest pieces of material which are practical. All flashings and terminations shall be installed in accordance with the membrane manufacturer approved details and instructions.

C. When using a continuation of deck membrane as flashing, bond the membrane to the surface to be flashed without folding the membrane in the corners and prior to installing the fastening strip in the angle change.
   1. Turn membrane up the walls except at the high wall at the gymnasium and auditorium.

D. Terminate edges in accordance with the manufacturer's instructions.

E. Flash roof penetrations in accordance with manufacturer's instructions. Make flashing directly to the perimeter wall, gravel stop or penetration passing through the membrane system.

F. Membrane junctions at expansion joint intersections shall be flashed using 3 layers of elastoform flashing with each layer 3" larger than the previous layer in all directions. At intersections with walls or parapets construction expansion joint using sponge tubing and expansion joint filler.

3.04 PROTECTION:

A. During the work: Provide shoe protection for walking around on the roof during the application. Shoes shall be clean, mud-free, not causing scratching or damage of any kind.

B. After completing roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner, describing nature and extent of deterioration or damage.

C. Repair or replace deteriorated or defective work found at the time of final inspection to a condition free of damage and deterioration at the time of Substantial Completion and according to the requirements of the specified warranty.

D. Water cut-offs:
   1. Provide where and when a danger exists that water caused by precipitation may get under the new roofing membrane.
   2. Construct by extending the membrane beyond the insulation and securely setting the end of the membrane in 6" of plastic roofing cement.
   3. All temporary water cut-offs shall be removed prior to proceeding with the next work period, by cutting off that portion of the membrane that has been in contact with the plastic roofing cement and disposing of it.

3.05 CLEAN UP:

A. Clean up entire roof surface. Promptly remove foreign matter, debris, equipment, and surplus materials from job site.

- END OF SECTION -