Specifications

SECTION 07 54 23

THERMOPLASTIC MEMBRANE ROOFING

FLEECE BACK TPO MEMBRANE ADHERED WITH LOW RISE FOAM FB MEMBRANE ADHESIVE

\*\* NOTE TO SPECIFIER \*\* Flex Roofing Systems; thermoplastic membrane roofing.  
 .  
 This section is based on the products of Flex Roofing Systems, which is located at:  
2670 Leiscz's Bridge Road Suite 400   
Leesport, PA 19533  
Toll Free Tel: 800-969-0108   
Tel: 610-916-9500  
Email: [request info (jdoyle@flexmembranes.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Flex%20Roofing%20Systems&coid=32538&rep=&fax=&message=RE:%20Spec%20Question%20(07540fmi):%20%20&mf=)  
Web: [www.flexroofingsystems.com](http://www.flexroofingsystems.com)   
[ [Click Here](http://www.arcat.com/arcatcos/cos32/arc32538.html) ] for additional information.  
   
 Flex Roofing Systems (Flex) is the manufacturer of high quality Thermoplastic Single Ply and Multi Ply Roofing Systems based on DuPont's Elvaloy KEE (ketone ethylene ester). Flex's Roofing Membranes with Elvaloy resin modifiers are performance proven and are specified for commercial, industrial and institutional roofing applications. Flex also manufactures high-quality PVC (polyvinyl chloride) roof membranes and TPO (thermoplastic polyolefin) roof membranes.  
   
 Thermoplastic Single Ply and Multi Ply Roofing Systems Flex Roofing Systems Based On Elvaloy® are the only thermoplastic single ply system types completely compatible with asphalt.   
 Lets you directly cap smooth BUR to minimize tear-off labor and debris disposal cost.   
 Stays flexible and workable indefinitely, even in extreme environments.   
 Repels chemicals, air conditioning coolants, jet fuels, restaurant grease, as well as UV light, airborne bacteria, acid rain and industrial pollutants.   
 Are tough and resistant to tearing by workmen, their tools and equipment.   
 Reflects heat to reduce air conditioning loads.   
 Are easy to clean and are unharmed by the harshest cleaning agents.   
 Are environmentally-friendly, containing no volatile organic compounds (VOC's).   
 Apply either fully adhered or mechanically attached.   
 Are proven in the toughest climates and environments.   
   
 Flex pre-formed flashings, including pipe flanges, inside and outside corners help reduce installation time for penetrations, and corners. Walkways with skid-resistant texture add a convenient access path for workman and help add to roof service life.   
 Flex provides a complete line of environmentally friendly adhesives for use with thermoplastic single ply roofing membranes.   
 Flex supplies all the metal components required for an outstanding installation, including a full range of fasteners, termination bars, coping cap, gravel stops, fascia, retrofit roof drains, Flexclad metal and accessories.   
   
 Warranty: Flex Single Ply and Multi Ply Systems carry standard five, ten, fifteen, twenty or twenty-five year warranties, depending upon the product used, the method of application, the type of application and the climatic environment.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Fleece backed adhered membrane over concrete.
    2. Fleece backed adhered membrane over steel.
    3. Fleece backed adhered membrane over lightweight insulating concrete.
    4. Fleece backed adhered membrane re-roof cover over.
    5. Fleece backed adhered membrane over cementitious wood fiber deck.
    6. Fleece backed adhered membrane over wood.
    7. Fleece backed adhered membrane over gypsum.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06 10 00 - Rough Carpentry.
    2. Section 07 62 00 - Sheet Metal Flashing and Trim.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society of Civil Engineers (ASCE) 7 Minimum Design of Loads for Buildings and Other Structures.
    2. American Society for Testing and Materials (ASTM) C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
    3. American Society for Testing and Materials (ASTM) C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
    4. American Society for Testing and Materials (ASTM) D 41 - Standard Specification for Asphalt Used in Roofing.
    5. American Society for Testing and Materials (ASTM) D 312 - Standard Specification for Asphalt Used in Roofing.
    6. American Society for Testing and Materials (ASTM) D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Material.
    7. American Society for Testing and Materials (ASTM) D 4263 - Standard Test Method for Indicating Moisture in Concrete.
    8. American Society for Testing and Materials (ASTM) D 6878 - Standard Specification for Thermoplastic Polyolefin (TPO) Based Sheet Roofing.
    9. American Society for Testing and Materials (ASTM) D 6506 - Standard Specification for Asphalt Protection Board.
    10. American Society for Testing and Materials (ASTM) E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
    11. American Society for Testing and Materials (ASTM) E 903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
    12. American Society for Testing and Materials (ASTM) E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
    13. Factory Mutual (FM Global) - Approval Guide.
    14. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
    15. National Roofing Contractors Association (NRCA).
    16. Sheet Metal and Air Conditioning Contactors National Association, Inc. (SMACNA) Architectural Sheet.
    17. Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TGFU R9228).
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Shop Drawings:
        1. Show outline and size of the roof, location and type of penetrations, perimeter and penetration flashing detail references to manufacture's standard. Details which do not conform to roofing manufacturer's standards shall be identified with separate approval from roofing manufacturer. Details to be employed on the project shall be approved by roofing manufacturer.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
    2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications:
        1. Membrane manufacturer shall have a minimum of fifteen (15) years experience in the production of thermoplastic scrim-reinforced membrane and related accessories.
     2. Installer Qualifications:
        1. Installer shall have a minimum of five (5) years experience in the application of thermoplastic membrane and shall be certified by the manufacturer of the membrane system.
     3. Product Requirements:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. LEED (USGBC) Certification: The roof system shall comply with LEED requirements for the use of a high albedo roofing material with a Solar Reflectance Index (SRI) of no less than 78 when calculated in accordance with ASTM E 1980. Compliance based on a reflectance rating of at least 0.80 when tested according to ASTM E 903 and an emissivity rating of at least 0.9 when tested in accordance with ASTM E 408 for a minimum of at least 75 percent of the roof surface.
      2. Membrane Qualifications: Membrane shall be factory certified, first run material, seconds will not be permitted. Approvals:

\*\* NOTE TO SPECIFIER \*\* Delete requirements not required.

* + - * 1. State of Florida Building Code Product Approval.
        2. Miami/Dade County Florida NOA.
        3. ICC-ES.
        4. HUD.
        5. Energy Star Partner.
        6. Material and packaging to bear the FM label.

\*\* NOTE TO SPECIFIER \*\* FLEX FB ELVALOY® Roofing Systems, FLEX MF/R ELVALOY® Roofing Systems, FLEX MF/R Roofing Systems comply with the following requirements. Delete requirement below not required for project.

* + - 1. The roofing systems shall meet the Factory Mutual 1-60 requirements.
      2. The roofing systems shall meet the Factory Mutual 1-90 requirements.
      3. The roofing systems shall meet the Factory Mutual 1-105 requirements.
      4. The roofing systems shall meet the Underwriters Laboratories Class A requirements.
    1. Pre-Installation Conference:
       1. Prior to scheduled commencement of the roofing installation and associated work conduct a meeting at the project site with the Installer, Architect, Building Owner, Manufacturer's Representative and any other entities directly involved with the performance of the work.
       2. The installer shall record conference discussions to include decisions, agreements, and open issues and furnish copies of recorded discussions to each attending party. The primary purpose of the meeting is to review foreseeable methods and procedures related to roofing work schedule and quality.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Finish areas designated by Architect.
       2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
       3. Refinish mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging until ready for installation.
     2. Protect stored materials from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Leave product wrapped and protected in original packaging with identification labels, until ready for use on the job.
     3. Store in a clean, dry, well ventilated area protected from weather and other trades. All rolls of membrane shall be stored, lying down, elevated above the roof deck and completely protected from moisture with tarpaulins.
     4. Insulation shall be stored on pallets, fully protected from moisture with tarpaulins. Adhesives shall be safely stored, at temperatures above 45 degrees F (7 degrees C). Flammable materials shall be stored in a cool dry area away from sparks and open flames.
     5. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
  2. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
     2. Weather:
        1. Proceed with the roof installation only when existing and forecasted weather conditions permit.
        2. Ambient Temperatures shall be above 45 degrees F (7 degrees C) when applying hot steep asphalt, water based adhesives or urethane adhesives.
  3. WARRANTY
     1. Manufacturer warrants to the Building Owner, subject to the terms, limitations, and conditions for a period specified, in which the Materials and Workmanship Warranty is effective, the materials installed shall be free from defects in materials supplied and/or defective workmanship provided by the authorized applicator.
        1. The Manufacturer's Technical Service Representative shall inspect the completed roof system, and upon acceptance, the manufacturer shall issue the specified warranty commencing on the Date of Substantial Completion

2. The Roofing System shall receive the manufacturer's standard ten (10) year, fifteen (15) year, twenty (20) year, or twenty-five (25) year guarantee of watertightness.

B. Sheet Metal Warranty: Materials supplied by the roofing manufacturer.

* + - 1. Materials shall be free of defects in material and workmanship for five years after shipment. Defective materials will be repaired or replaced at manufacturer's option. Manufacturer shall not be liable for direct or consequential damages arising from the installation of materials. No other express or implied warranties apply to the products.

\*\* NOTE TO SPECIFIER \*\* FlexCap Coping System only. Delete if not required.

* + - 1. Special Performance Warranty: The FlexCap Coping System in standard sizes, when used as a part of a Flex Roofing System Installation, and installed according to manufacturer instructions, shall not blow off, leak, or cause membrane failure, for an identical period as that warranty for the roof system itself, or we will repair or replace the Coping Cap material.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Decorative Finish Warranty: Pre-finished aluminum and 24 gauge (0.607 mm) galvanized steel, coated with Kynar 500 finish shall receive a limited 30 year warranty.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Spray-applied Kynar 500 finish shall receive a limited 5 year warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Flex Roofing Systems, which is located at: 2670 Leiscz's Bridge Road Suite 400 ; Leesport, PA 19533; Toll Free Tel: 800-969-0108 ; Tel: 610-916-9500; Email: [request info (jdoyle@flexmembranes.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Flex%20Roofing%20Systems&coid=32538&rep=&fax=&message=RE:%20Spec%20Question%20(07540fmi):%20%20&mf=); Web: [www.flexroofingsystems.com](http://www.flexroofingsystems.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.
  1. SYSTEM

\*\* NOTE TO SPECIFIER \*\* Elvlaoy Fleece backed fully adhered. Delete if not required.

* + 1. Flex FB TPO Membrane as manufactured by Flex Roofing Systems.

\*\* NOTE TO SPECIFIER \*\* Delete color not required.

* + - 1. Color: White.
      2. Color: Light Gray.
      3. Color: Tan.

\*\* NOTE TO SPECIFIER \*\* Delete system substrate not required.

* + - 1. Roof System: Provide an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to a protected insulation system adhered to a structural concrete deck.
      2. Roof System: Provide and install an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to a protected insulation system attached to a structural metal deck.
      3. Roof System: Provide and install an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to a protected insulation system adhered to a lightweight concrete deck.
      4. Roof System: Provide and install an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to an existing roof covering.
      5. Roof System: Provide and install an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to a cementitious wood fiber deck.
      6. Roof System: Provide and install an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to a protected insulation system adhered to a structural wood deck.
      7. Roof System: Provide and install an Adhered, Fleece-Back, Thermoplastic, CRRC approved roofing membrane to a gypsum concrete deck.

C.\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Membrane: The roofing membrane shall meet or exceed the requirements of ASTM D4434 standard for polyvinyl chloride thermoplastic sheet roofing.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Fleece Back TPO 45 Reinforced.
      2. Fleece Back TPO 60 Reinforced.
      3. Fleece Back TPO 80 Reinforced.
  1. INSULATION

\*\* NOTE TO SPECIFIER \*\* Delete insulation not required. Flex Insulation required for system warranty.  
 \*\* NOTE TO SPECIFIER \*\* 1/2 inch (12 mm) thickness is susceptible to breakage during installation. Delete if not required.

* + 1. Extruded Polystyrene Boards: Federal specification HH-I-524C, Type IV minimum thickness 1 inch (25 mm), minimum density 1.6 lb./cf (26 kg/cu m).
    2. Flex ISO II: A closed cell polyisocyanurate foam core laminated to black (non-asphaltic), fiber-reinforced felt facers. Manufactured in accordance with ASTM C 1289, Type II, Class 1.
    3. Polyisocyanurate and Polyurethane Faced Roof Boards: Federal spec. HH-I-1972/ 1&2 Class 1-3, minimum thickness 1 inch (25 mm) nominal.
  1. ACCESSORY MATERIALS

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Adhesives:

\*\* NOTE TO SPECIFIER \*\* Delete adhesive not required.

* + - 1. Flex FB Foam Adhesive: a two component low rise polyurethane adhesive designed to adhere fleece backed roofing membrane to an approved substrate.

a. Flex FB Low Rise Foam Adhesive

b. Olybond 500 Canister Spatter.

c. ICP CR-20 Spatter

d. Millennium PG-1

* + - 1. Flex TPO Bonding Adhesive: Solvent-based Bonding Adhesive: Solvent based adhesive for use with Flex TPO membranes
      2. Flex TPO Low VOC Bonding Adhesive: Solvent base rubberized adhesive for use with Flex TPO membranes.
      3. Flex Insulation Adhesive: two part urethane foam adhesive for adhering insulation or cover boards to approved substrates.

a. Olybond 500, Olybond 500 Spot Shot or Olybond 500 Canister Spatter

b. Millennium PG-1 or One Step.

c. ICP CR-20 or Board Max

* + 1. Fasteners:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Metal Decks: screw type fasteners treated for corrosion resistance with ultimate pull out value of minimum 275 lb. in 22 (0.759 mm) gauge steel deck to be applied in conjunction with Factory Mutual approved pattern:
         1. Flex Screws, Corrosion Resistant # 10 Coating
         2. SFS Intec, Dekfast Fastening System, C-2 type, corrosion resistant only.
         3. OMG Inc., Fasteners, screws long and short, Endurion coated only.
      2. Plywood Decks: screw type fasteners applied in a Factory Mutual approved pattern and method.
         1. Flex Screws, Corrosion Resistant # 10 Coating
         2. SFS Intec Inc., Dekfast Fastening System, C-2 type, corrosion resistant only.
         3. OMG Inc. Fasteners, screws long and short, Endurion coated only.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Solid Wood Decks: screw or nail type fasteners:
         1. Flex Screws, Corrosion Resistant # 10 Coating
         2. SFS Intec, Dekfast Fastening System, C-2 type, corrosion resistant only.
         3. OMG Inc., Fasteners, screws long and short, Endurion coated only.

C. Sealants:

1. Caulking: Silicon, polysulfide or polyurethane caulking, exterior grade for caulking, surface reglets and vent pipe details.

2. Flex Single Ply Sealant

3. Mameco, Vulkem 116, Polyurethane.

1. Sonneborn, NP1.

5. BOSTIK, Chem Caulk

6. For filling pitch pans: Flex Pourable Sealer or as approved by Flex Technical Services Department.

D. Flashing:

* + - 1. Reinforced Membrane: Flex MF/R, same material, color and thickness as roof membrane for all curbs, walls and penetrations.
      2. Non reinforced Membrane: Flex MF: multi angled intersections, sealant pockets and other conditions that would be impractical for reinforced membrane application.

\*\* NOTE TO SPECIFIER \*\* Typically not required for mechanically attached applications. Delete if not required.

E. Wood: Nailers.

1. Number 2 grade lumber minimum salt treated for rot and fire resistance.

* + - * 1. Wolmanized.
        2. Osmose treated.
        3. Pressure treated.

\*\* NOTE TO SPECIFIER \*\* Delete items if not required.

* + 1. Separation Layers:
       1. Georgia Pacific Corporation: Dens Deck, Dens Deck Prime distributed by Flex Roofing System.

2. USG Securock Roof Cover Board distributed by Flex Roofing System.

3. Flex ½” HD Coverboard, High Density Polyisocyanurate Foam with coated Glass Facers

* + 1. Edge Termination:
       1. Size and profile as indicated on drawings.
       2. Profiles and designs engineered for roof perimeter attachment. Components from the membrane manufacturer shall be approved for FM 1-90 rating and ANSI/SPRI ES-1-2003 Wind Design Standard for Edge Systems.

\*\* NOTE TO SPECIFIER \*\* Delete finish not required.

* + - 1. Finish: Natural mill aluminum.
      2. Finish: Pre-Coated Kynar 500 - from the manufacturer's standard color chart.
      3. Finish: Post-Coated Kynar 500 - industry standard two coat colors.
      4. Non-Standard Kynar 500 -colors requiring multiple coatings or protective clear coats.
      5. Finish: Anodized Aluminum - Clear.
      6. Finish: Anodized Aluminum - Bronze.
      7. Finish: Anodized Aluminum - Black.
      8. Flex Clad Metal: for custom fabrication of a hot air weldable edge metal.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

11. FlexLock FLE Roof Edge: decorative FM rated factory fabricated system

* + - * 1. Roof perimeter fascia shall be FlexLock Type FLE as furnished by the membrane manufacturer as part of the complete roof system.
        2. Exterior Fascia shall be 24 gauge (0.607 mm) Kynar 500 coated galvanized steel over continuous aluminum anchor bar.
        3. Exterior Fascia shall be 0.040 inch (1.01 mm) aluminum over continuous aluminum anchor bar.
        4. The fascia and base plate shall be standard twelve-foot (3.65 m) lengths. Provide matching factory fabricated mitered corners and other accessories as may be required

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

12. FlexLock FLT Roof Edge: decorative FM rated factory fabricated system

a. Roof perimeter fascia shall be FlexLock Type FLT as furnished by the membrane manufacturer as part of the complete roof system.

b. Exterior Fascia shall be 24 gauge (0.65 mm) Kynar 500 coated galvanized steel over continuous 0.050” Aluminum formed rail.

c. Exterior Fascia shall be 0.040 inch (1.01 mm) aluminum over continuous 0.050” Aluminum formed rail.

d. The fascia and base plate shall be standard twelve-foot (3.65 m) lengths. Provide matching factory fabricated mitered corners and other accessories as may be required.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

13. FlexLock FLS Roof Edge: decorative FM rated factory fabricated system

a. Roof perimeter fascia shall be FlexLock Type FLS as furnished by the membrane manufacturer as part of the complete roof system.

b. Exterior Fascia shall be 24 gauge (0.607 mm) Kynar 500 coated galvanized steel over continuous 24 gauge (0.65 mm) galvanized steel waterdam.

c. Exterior Fascia shall be 0.040 inch (1.01 mm) aluminum over continuous 24 gauge (0.65 mm) galvanized steel waterdam.

d. Exterior Fascia shall be 0.050 inch (1.27 mm) aluminum over continuous 24 gauge (0.65 mm) galvanized steel waterdam.

* + - * 1. Exterior Fascia shall be 0.063 inch (1.60 mm) aluminum over continuous 24 gauge (0.65 mm) galvanized steel waterdam.
        2. The fascia and base plate shall be standard twelve-foot (3.65 m) lengths. Provide matching factory fabricated mitered corners and other accessories as may be required.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

14. FlexCap Coping - Type FLC: specially designed for anchoring membranes at parapet walls

a\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Exterior Fascia shall be 24 gauge (0.65 mm) Kynar 500 coated galvanized steel formed as indicated with allowance for expansion and contraction.

b. Exterior Fascia shall be 0.063 inch (1.6 mm) aluminum formed as indicated with allowance for expansion and contraction.

c Exterior Fascia shall be 0.050 inch (1.27 mm) aluminum formed as indicated with allowance for expansion and contraction.

d. Exterior Fascia shall be 0.040 inch (1.01 mm) aluminum formed as indicated with allowance for expansion and contraction

H. Detailing Components:

1. Flex Preformed Inside and Outside corners.

2. Flex Preformed Pipe Boots.

3. Flex Split Pipe Boots.

4. Flex Retrofit Drains - Clamping Ring Model.

5. Flex Walkway Pad: Traffic Pads: 34 inches (863 mm) wide by 50 feet (16m) long thermoplastic material provided by the membrane manufacturer.

9. Flex 2 inches (52 mm) Barbed Plate.

10 Flex 2-3/8 inches (60 mm) XHD Barbed Plate.

* + - 1. Flex 2-3/4 inches (70 mm) SXHD Barbed Plate.
      2. Flex Base Sheet Fastener.
      3. Flex Termination Bar.
      4. Flex Standard Screws.
      5. Flex HD Standard Screws.
      6. Flex XHD Standard Screws.
      7. Flex SXHD Standard Screws.

2.4 VAPOR RETARDERS

A. Polyethylene : 10 mil (0.25 mm) thick polyethylene vapor retarder.

B. Flex SA Vapor Barrier: SBS Modified Bitumen vapor barrier 31 mil (0.8mm) thick styrene-butadiene-styrene (SBS) polymer modified bitumen in combination with a high tack self-adhesive specifically designed for use with steel decks. The topside is surfaced with high strength tri-laminate polyethylene film and the underside is surfaced with protective poly-olefin release film that is removed during application.

C. Flex SBS 80 mil base sheet: 80 mil (2.0 mm) SBS polyester reinforced membrane with sanded upper and lower surface for mopping or cold applied adhesives to substrates or insulation boards.

D. Flex NP 180 s/p base sheet: 90 mil (2.2 mm) SBS polyester reinforced membrane with sanded upper surface to receive mopping or cold applied adhesives for insulation or cover boards. Plus a thermofusable lower surface for torch applied installation to approved substrates.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare deck surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

\*\* NOTE TO SPECIFIER \*\* Lightweight insulating concrete and structural concrete decks. Delete if not required.

* + - 1. Deck shall be smooth surfaced. Clean and free of moisture or debris.
      2. Decking shall be G-90 galvanized coated 22 gauge (0.759 mm) or heavier steel panel.
      3. Decking shall be installed to provide positive slope and positive drainage.
      4. Deck panels shall be securely anchored to the supporting members in accordance with the Steel Deck Institutes Design Manual and Factory Mutual Recommendations.
      5. Deck panels shall be installed in a straight line and properly aligned.
      6. Deck shall be clean and free of moisture or debris.

\*\* NOTE TO SPECIFIER \*\* Cementitious wood fiber panel decks. Delete if not required.

* + - 1. Cementitious wood fiber deck panels shall be designed and installed in strict conformance with industry standards, practices and installation requirements.
      2. Joints between adjacent panels greater than 1/4 inch (6 mm) shall be grouted or filled with compatible material as recommended by the panel manufacturer.
      3. Deck surface shall be free of fins, ridges, depressions and other irregularities.
      4. Decking shall be installed to provide positive slope and positive drainage.
      5. Adjacent cementitious wood fiber deck panels shall align vertically to provide a uniform substrate for the roof system. Uneven joints of a 1/8 inch (3 mm) or more shall be grouted with the grout feathered to a slope of 1/8 inch per foot (10mm/m).
      6. Deck shall be smooth surfaced. Clean and free of moisture or debris.

\*\* NOTE TO SPECIFIER \*\* Wood decks. Delete if not required.

* + - 1. Plywood and wood based panel roof decks shall be rated for structural use as roof sheathing.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Plywood shall be a minimum thickness of 15/32 inches (12 mm) or as required by the Building Code.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Wood planks shall be minimum thickness of 1 inch (25 mm) or as required by Building Code.
      1. Boards shall be attached to the intermediate supporting members according to the fastening schedule specified for the required uplift and loads expected for a particular roof system.
      2. Decking shall be installed to provide positive slope and positive drainage.
      3. End joints of wood panels to be staggered. Wood blocking or clips shall be provided at all wood panel joints between supporting members.
      4. Deck surfaces shall be smooth and free of splintered wood, ridges, depressions and other irregularities. Deck shall be clean and free of moisture or debris.

\*\* NOTE TO SPECIFIER \*\* Gypsum concrete deck. Delete if not required.

* + - 1. Poured gypsum concrete decks shall be installed in strict conformance with industry standards, practices and installation requirements.
      2. The density of the cured gypsum concrete shall be no less than 30 lb. per cubic foot (480 kg/cu m) and a compressive strength of 500 lb. per square inch (3.45 MPa).
      3. Finished gypsum concrete deck shall be a minimum thickness of 2 inches (52 mm) not including the formboard.
      4. Decking shall be installed to provide positive slope and positive drainage.
      5. Finished Decking shall be properly cured, dry and ready to receive hot asphalt.
      6. Deck shall be smooth surfaced. Clean and free of moisture or debris.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Existing Roofing Recover:
       1. Blistered or buckled areas shall be cut out and removed.
       2. Areas with wet insulation shall be removed. Replace wet insulation with an insulation board of similar thickness and insulation value.
       3. Damaged areas shall be repaired by installing a minimum of 2 plies of Type IV felts in hot steep asphalt overlapping the existing covering by a minimum of 12 inches (305 mm) prior to installing the roof insulation or coverboard.
  1. INSTALLATION
     1. Install roof system in accordance with manufacturer's instructions.
     2. Wood Nailers:
        1. Locate and install along gravel stops and drip edges and other areas as required by membrane manufacturer.
        2. Anchor nailer to structural deck with manufacturers approved fasteners, spaced appropriately for the specified installation; minimum withdrawal resistance 100 pounds (45 kg) per fastener.

(Optional) Install Vapor Retarder

\*\* NOTE TO SPECIFIER \*\* Typically not required for insulating concrete and recover decks. Delete if not required.

* + 1. Insulation:

\*\* NOTE TO SPECIFIER \*\* Fully adhered fleece backed membrane on gypsum concrete, lightweight insulating concrete, cementitious wood fiber panel and concrete decks. Delete next two provisions if not required.

* + - 1. Insulation shall be set in ¾” min. beads of low rise foam insulation adhesive applied in rows 6” or 12” apart. If applying insulation with cold adhesives follow the adhesive manufactures installation instructions.
      2. Insulation boards to be a maximum size recommended by the manufacturer for adhered applications.

\*\* NOTE TO SPECIFIER \*\* Fully adhered fleece backed membrane on steel decks, Cementitious wood fiber, wood decks. Delete next three provisions if not required.

* + - 1. The first layer of insulation board shall be mechanically attached to the deck with Flex Fasteners and 3 inches (76 mm) insulation plates. Installation of the fastener pattern to be in accordance with the manufacturer's instructions and Factory Mutual Guidelines to meet the wind uplift pressure resistance specified.
      2. Subsequent layers of insulation shall be set in ¾” min. beads of low rise foam insulation adhesive applied in rows 6” or 12” apart. If applying insulation with cold adhesives follow the adhesive manufactures installation instructions.
      3. Insulation boards to be a maximum size recommended by the manufacturer for adhered applications.

\*\* NOTE TO SPECIFIER \*\* General provisions applied to all applications.

* + - 1. Do not install wet, damaged or warped insulation boards.
      2. Install insulation boards with staggered board joints in one direction.
      3. Insulation boards to be installed so that no gaps larger than 1/4 inch (6 mm) are found at the end joints and that the adjoining top surfaces are flat and smooth. All gaps in excess of 1/4 inch (6 mm) shall be filled with like insulation material.
      4. If more than one layer of insulation board is to be installed the joints of the subsequent layers must be staggered. Stagger the joints in the additional layers a minimum of 6 inches (152 mm) from the underlying insulation boards to eliminate vertical gaps.
      5. Do not install any more insulation than will be completely waterproofed each day.
      6. Provide separation layer as required by manufacturer.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Recover Board:
       1. Recover boards shall be set in ¾” min. beads of low rise foam insulation adhesive applied in rows 6” or 12” apart. If applying insulation with cold adhesives follow the adhesive manufactures installation instructions.
       2. Recover boards to be installed so that no gaps larger than 1/4 inch (6 mm) are found at the end joints and that the adjoining top surfaces are flat and smooth.
       3. Stagger the joints in the recover board a minimum of 6 inches (152 mm) from the underlying insulation boards to eliminate vertical gaps.
       4. Do not install any more recover board than will be completely waterproofed each day.

\*\* NOTE TO SPECIFIER \*\* Adhered fleece backed application only. Delete if not required.

* + 1. Membrane Installation:
       1. Adhere membrane to acceptable substrate with Flex FB Low Rise Adhesive applied at the rate specified by the manufacturer.
       2. Position sheets as indicated on approved shop drawings. Measure and chalk lines on the substrate to establish proper alignment of the sheet.
       3. Place the roll on the line and unroll the Flex FB its entire length and allow the membrane to relax. The relaxation time required is dependent on the ambient air temperature.
       4. Fold one end of the Flex FB sheet on top of itself until both ends meet. Apply the bonding material Flex FB Low Rise Adhesive to the prepared roof surface. The sheet can then be pulled and laid into the bonding material using care not to create any wrinkles.
       5. Carefully push and broom into place from fold line to overlap, avoiding wrinkles and air pockets. Roll with a heavy roller (minimum 100 lb. (45 kg)) to insure proper adhesion.
       6. Repeat procedure for other half of sheet.
       7. Lap seams shall be done by lapping the 3 inches (76 mm) selvedge edge over the non-selvedge edge of the previous roll. Do not allow adhesives or other contaminants into the lapped seam. The selvedge edge seam will be completed by the hot air welding method. Seams are to be completed each day during construction.
       8. Roll ends are butted together and capped with a 6 inches (152 mm) wide Flex Trim Strip. The trim strip is centered over the end joint and hot air welded into place.
       9. All seams shall be checked with a needle probe and any voids repaired with the heat gun the same day they are made.
       10. Seams greater than 10 feet (3 m) in length shall be welded with the automatic type welding unit. Hand held welders shall be used only for the remaining seams and detail welding.
    2. Flashing:
       1. Flash penetrations, walls, curbs, expansion joints, drains as shown on details and approved shop drawings with Flex flashing membrane.
       2. Use prefabricated sealant pockets and pre-molded vent / pipe flashing.
       3. Mechanically fasten flashing at terminations according to approved details. Fastening flashing membrane through counter-flashing metal is not acceptable.
       4. Flashing membranes shall be adhered to the approved substrate with Flex Flashing Adhesive. Flashing Membrane is to be installed flat and wrinkle free. Flashings shall be rubbed or rolled onto the substrate for proper adhesion.
  1. INSPECTION
     1. Seam Inspection:
        1. All seams are to be completed by the hot air welding method each day as the installation progresses.
        2. The roofing contractor is to designate a responsible person experienced in hot air welding techniques to inspect the completed installation each day as the installation progresses. The inspection is to include hand probing of all welded seams.
        3. Any defects found during these inspections should be immediately corrected.
     2. Manufacturer's Field Services:
        1. Provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of system installation in accordance with manufacturer's instructions.
        2. Site Visits: Final inspection and acceptance of the installation by the manufacturer’s technical representative is required before a warranty can be issued.
  2. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION