

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING**PART 1 GENERAL****1.1 SUMMARY**

- A. This standard provides general guidance concerning the specific performances of the Texas State University for modified bitumen membrane roofing systems.
- B. Texas State University recognizes that projects conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification, it is expected that these guidelines will govern the design and specifications for Texas State University projects.
- C. Roof systems shall be designed in accordance with ASCE 7, the International Building Code, and the International Plumbing Code. See 1.03 Codes-Rules-Laws-Requirements.
- D. Roof edge assemblies and attachment shall be provided in compliance with the most recent edition or version of the SPRI/ANSE ES-1 standard

1.2 RELATED WORK SPECIFIED ELSEWHERE:

- 1. Rough Carpentry
- 2. Roof Tile
- 3. Roof Deck
- 4. Roof Insulation
- 5. Flashing and Sheet Metal.
- 6. Plumbing
- 7. Lightning Protection

1.3 SYSTEM DESCRIPTION

- A. The intent of the specification is for the Contractor to provide a two-ply torch-down modified bitumen roofing system over R-22 roof insulation on an approved substrate, and to furnish a 20 Year No Dollar Limit Total System Manufacturers' Warranty upon completion of the project.
- B. The use of hot asphalt on the campus of Texas State University is prohibited and therefore shall not be a part of the roof assembly.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING**1.4 DESIGN REQUIREMENTS****A. Low slope-roofs:**

1. Where low-slope roofs are present, the roof perimeter shall have a steep sloped mansard Spanish tile system at the perimeter.
2. As one of the means for creating visual unity on the roof of campus buildings, use a cap sheet with colored roof granules, to match Johns Manville cap sheet “Brick Red” color.

B. Roof Drainage:

1. Low slope roofs shall be designed for a slope of $\frac{1}{4}$ ” per foot with crickets to divert rain water to drains and/or scuppers.
2. Roof shall provide slope and drainage to accommodate rainfall in accordance with the Building Code and Plumbing Code, for current codes see 1-03 Codes-Rules-Laws-Requirements. Overflow drains or scuppers to be provided as stipulated in the Building Code.
3. The roofing system is deemed to drain satisfactorily if standing water from any source drains or evaporates from the roof with 48 hours.
4. Primary roof drains shall be sumped in a 48 inch by 48-inch area, but overflow roof drains shall not be sumped.

C. Safe Roof Access

1. Roofs are not intended to be accessible to the public except as may be required by the International Building Code.
2. Provide access for authorized persons to every roof section, either by a roof hatch with contiguous ladder, access door, stairs or exterior mounted ladder.
3. Provide permanent G.I. safety railing around all roof hatch openings. Plastic or composite railings are not acceptable.
4. All roof sections shall have OSHA compliant safety tie-offs wherever roof edges are not protected by parapet walls meeting approved height requirements.

D. Roof Protection

1. Provide roof protection walk pads at the following locations.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

- a. At all roof hatches, penthouse doors, crossover steps, head and foot of roof ladders, and any other roof access points.
 - b. Around all motorized equipment.
 - c. Around the perimeter where window washer equipment may be used.
 - d. Beneath all surface mounted equipment such as satellite antennae.
 - e. At any other known or obvious high mechanical or foot traffic locations.
- E. Other Requirements
1. Roof penetration flashings shall be wood or prefabricated curbs extending 12 inches above the plane of the finished roof with metal covers. Pitch pans are not permitted.

1.5 PERFORMANCE REQUIREMENTS

- A. Factory Mutual: All roofing shall be in accordance with Factory Mutual Class I-75 requirements.
- B. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Buildings and Other Structures.

1.6 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM D41, *Specifications for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing*
 2. ASTM D312, *Specification for Asphalt Used in Roofing*
 3. ASTM D451, *Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products*
 4. ASTM D1079, *Terminology Relating to Roofing, Waterproofing, and Bituminous Materials*
 5. ASTM D1227, *Specification for Emulsified Asphalt Used as a Protective Coating for Roofing*
 6. ASTM D1863, *Specification for Mineral Aggregate Used on Built-up Roofs*

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

7. ASTM D2178, *Specification for Asphalt Glass Felt Used in Roofing and Waterproofing*
 8. ASTM D2822, *Specification for Asphalt Roof Cement*
 9. ASTM D2824, *Specification for Aluminum-Pigmented Asphalt Roof Coating*
 10. ASTM D4601, *Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing*
 11. ASTM D5147, *1991 Test Method for Sampling and Testing Modified Bituminous Sheet Materials*
 12. ASTM E108, *Test Methods for Fire Test of Roof Coverings*
- B. NRCA, National Roofing Contractors Association Roofing Manual, 2006 Edition.
- C. SMACNA Sheet Metal Manual, 1989 Edition.
- D. UL, Underwriters Laboratories

1.7 CONTRACTOR REQUIREMENTS

- A. The roofing contractor shall be experienced in modified bituminous roof application with a minimum of five (5) years experience and who is certified by the roofing system manufacturer as qualified to install manufacturer's roofing materials.
- B. Torch applicators shall have completed a certified training course such as the NRCA Certa Program, and the contractor shall submit the Certificates of Completion for each individual person contemplated for work as a torch applicator on the project. Such certificates shall be provided in the submittal package.
- C. The contractor shall have demonstrated its proficiency by having a satisfactory record of performance in the following areas:
1. On-time completion of previous work of a similar size and scope.
 2. No history of litigation, claims, or lawsuits relating to past or on-going performance that may affect current performance.
 3. Proven safety record demonstrated by company documentation and insurance Experience Modifier.
 4. Record of post-completion warranty service to clients.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

- D. Roofing contractor shall maintain a full-time, non-working, non-changing, English-speaking Supervisor/Foreman on the job site during all phases of modified bituminous sheet roofing work and at any time roofing work is in progress. A copy of the construction documents shall be in the possession of the Supervisor/Foremen and on the roof at all times.

1.8 SUBMITTALS

- A. Submittals shall be provided in accordance with the General Conditions of the Contract. Provide a submittal cover sheet identifying the project by name and number and listing the following columns for review by the design professional with a separate sheet for each roof section.
1. Specification section
 2. Description of brand and product
 3. “Accepted”
 4. “Rejected”
 5. “Resubmit”
 6. “Comments”
- B. Provide a place for the design professional’s signature.
- C. Manufacturer’s Letter of Certification: Provide a letter from the roofing material manufacturer using the exact language on the attached letter and listing all materials comprising any part of the roof assembly and stipulating that such materials are acceptable to the manufacturer and will be covered under the manufacturer’s Twenty (20) Year No Dollar Limit Total Roof System Guarantee.
- D. Product Data for each type of product specified include manufacturer’s technical product data, installation instructions, and recommendations for each type of roofing product required. Include data substantiating that materials comply with specified requirements.
- E. Show evidence that the products and materials are manufactured in the United States. Provide information showing that materials provided conform to all requirements specified herein, are chemically and physically compatible with each other, are suitable for inclusion within the total roof system specified herein and have a successful application record for at least five years of in field service. In such cases where conflicting requirements exist between authoritative industry testing laboratories, trade associations, and the manufacturer's requirements, the most stringent requirements shall govern.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

- F. Provide a sample of each product.
- G. Unexecuted Manufacturer's 20 year warranty, including complete assembly and flashings.
- H. Shop Drawings: Before submitting to the Architect, shop drawings shall be reviewed and signed by the roofing manufacturer indicating acceptance of the roofing details. Submittals and/or shop drawings shall include the following information.
 - 1. Deck type and outline of roof and roof size (square footage).
 - 2. Roof slope and designated direction of slope.
 - 3. Key plan (on multiple roof areas).
 - 4. Location and each type of roof penetration.
 - 5. Each type of flashing detail including perimeter and penetration details.
 - 6. Membrane layout and sizes.
 - 7. Insulation board types, thickness and manufacturer.
 - 8. Layout of insulation showing joints and slopes to drains.
 - 9. Method of installing each type of insulation boards.
 - 10. Fastener manufacturer, brand, length, location and spacing.
 - 11. Method of installing roofing membrane.
 - 12. Warranty type and period.
 - 13. Evidence of Underwriter's approval and uplift capacity.

1.9 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Roofing system manufacturer shall have a minimum of five years experience in manufacturing modified bitumen roofing products in the United States.
- B. **Manufacturer Inspections:** As part of the cost of the roofing assembly the roofing system manufacturer shall provide control inspections by an authorized representative as outlined below:

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

1. Manufacturer shall make at least three inspections, including at the beginning of construction, at 50% roof completion, and at 100% completion. The inspections shall be provided at no additional cost to the owner.
 2. Manufacturer shall notify the owner in advance of such inspections and provide a copy of each inspection report to the owner within seven days of completion of the inspection.
 3. Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
 4. Confirm, after completion of the project and based on manufacturer's observations and tests, that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.
- C. Pre-application Roofing Conference: Following the approval of submittals, and prior to the delivery of any roofing materials, conduct a pre-roofing conference with the following parties present:
1. Owner's representative
 2. Architect's representative
 3. General contractor's representative
 4. Roofing contractor's Project Manager, Superintendent, and both roofing and sheet metal foremen.
 5. Roofing material manufacturer's representative.
 6. Mechanical contractor representative.
 7. Plumbing contractor representative.
 8. Masonry, EIFS, plaster, or fireproofing contractor's representative.
 9. Glazing or skylight representative.
- D. Objectives of the pre-roofing conference shall include:
1. Ensure that the contractor's field supervisors have read and understand the plans and specifications.
 2. Review roofing systems requirements (drawings, specifications, and other contract documents).

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

3. Review the contractor's safety plan for the project.
 4. Review foreseeable methods and procedures related to roofing work including coordination of the work of other trades.
 5. Review required submittals. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 6. Tour representative areas of roofing substrates (decks) inspect and discuss condition of substrate, roof drains, curbs, penetrations, and other preparatory work performed by other trades.
 7. Review required inspection and testing, procedures.
 8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
 9. Review notification procedures for weather or non-working days and requests for time extensions.
 10. Prepare minutes of conference, including decisions and agreements (or disagreements) reached, and furnishes copy of record to each party attending.
- E. Mock-ups.
1. The contractor shall construct a mock-up of each sheet metal flashing or through-wall flashing detail and notify the architect when such mock-up is ready for approval. Sheet metal and flashings installed without prior approval of the mock-up shall be subject to removal if disapproved.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Roof materials shall not be stocked or stored on the roof overnight.
- C. Store roof insulation, rolled goods, lumber, and fasteners in covered storage trailers or enclosed containers. Storing such materials with covered tarpaulins, plastic covers or other temporary coverings is not acceptable. Store all rolled goods on end.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING**1.11 HANDLE AND STORE MATERIALS OR EQUIPMENT ON THE ROOF IN A MANNER TO AVOID SIGNIFICANT OR PERMANENT DEFLECTION OF DECK.PROJECT SITE CONDITIONS**

- A. Weather Condition Limitations: Means and method is the responsibility of the contractor. Time extensions for inclement weather shall be granted, when applicable, within the terms of the General Conditions of the Contract.
- B. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.12 SEQUENCING AND SCHEDULING

- A. Sequence installation of modified bituminous sheet roofing with related units of work specified in other sections to ensure that roof assemblies, including roof accessories, flashing, trim, and joint sealers, are protected against damage from effects of weather, corrosion, and adjacent construction activity.
- B. Sequence roofing work in such a manner as to preclude construction or foot traffic over the completed roof, i.e. commence roofing at the furthest point from the roofing contractor's loading and access points.
- C. The contractor shall protect the roof with plywood from traffic, work, or damage by other trades during construction.
- D. Set up charge points, debris chutes, loading and stocking points, drinking water containers, and all other destination facilities shall be located in such a way as to preclude traffic over the newly installed membrane.

1.13 WARRANTIES

- A. The contractor shall provide three warranties for the project. The warranties shall be as follow:
 - 1. Provide two (2) year roofing contractors warranty on the form provided herein.
 - 2. Provide a Twenty (20) Year Total System No Dollar Limit warranty from the roofing material manufacturer.
 - 3. Provide a Twenty (20) Year finish warranty from the sheet metal manufacturer on the prefinished sheet metal.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

4. All warranties shall carry a concurrent effective date, and that date shall be the Date of Substantial Completion as certified by the Architect/Engineer.

PART 2 PRODUCTS**2.1 GENERAL**

- A. When performance standards are specified, such shall be indicative of a minimum standard required.
- B. Substitutions shall be permitted in accordance with the provisions of the General Conditions of the Contract. Approval of a substitution does not change the original standards for performance nor relieve the contractor from complying with the original specifications.

2.2 APPROVED MATERIALS

- A. All roofing system components shall be manufactured, labeled, or specifically approved in advance in writing by the membrane manufacturer issuing the roofing system warranty.

2.3 ROOFING MATERIALS

- A. Lightweight Insulating Concrete Substrate
 1. Venting base sheet: The following products and manufacturers are acceptable for the venting base sheet to be applied over lightweight insulating concrete substrates.
 - a. Soprema, Inc.
 - b. Siplast
 - c. U.S. Ply, Inc.
 - d. Johns Manville Ventsulation Base
 - e. GAF Stratavent Base Venting Base
 2. Firestone Building Products Co. Base Ply Fasteners: The following manufacturers are acceptable for Lightweight Base Ply Concrete Anchors
 - a. LWC-FM90 Base Ply Fasteners as manufactured by Celotex Corporation
 - b. Zonotite FM-90 Base Ply Fasteners as manufactured by ES Products, Inc.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

- c. Olympic Base Ply Fasteners as manufactured by Olympic Fasteners, Agawam, MA.
- B. All Substrates
1. Approved Roof Membrane Systems: The following manufacturers are acceptable for the Total Roof System assembly.
 - a. Soprema, Inc., Wadsworth, OH.
 - b. Siplast, Inc., Irving, TX
 - c. U.S. Ply, Inc., Fort Worth, TX.
 - d. Johns Manville Corporation, Denver, CO.
 - e. GAF Building Materials Corporation, Wayne, NJ.
- C. Firestone Building Products Company, Indianapolis, IN. Approved cant and tapered insulation materials.
1. Wood Fiber Cants - Products shall be as manufactured by Cant Products Inc., Desoto Cant or approved equal, and shall measure 5" across the face unless shown otherwise on Drawings.
 2. Wood Cants - Wood cants shall be fabricated from 4" x 4" No. 2 YP, Kiln Dried (KD). Components shall be used as braces in nailer details as shown in the Drawings.
- D. Approved Related Bituminous Materials
1. Asphalt Primer - Use for priming metal flanges, concrete, and rough, sandy, or dirty surfaces to receive bitumen. Materials shall comply with ASTM D41.
 2. Granule-surface Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I or II, SBS modified asphalt sheet (reinforced with glass fibers); surfaced with colored granules to have the appearance of terra cotta red tile., suitable for application method specified, and as follows:
 - a. Basis of Design: Siplast, Inc. Paradiene 30 FR TG.
 - b. Granule Color: All roofs shall have the appearance of terra cotta red tile. The roof is to be fairly uniformed in color and with no speckled texture is permitted. Submit cap sheet color sample for approval.
 - c. Weight: 96 lbs. Per 100 sq. ft. minimum.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

3. #30 Plain Felt - #30 asphalt saturated, unperforated felt meeting the requirements for ASTM D-226-87 may be used for temporary waterproofing or sealing during construction.
 4. #15 Plain Felt - #15 asphalt saturated, perforated felt meeting the requirements for ASTM D-226-87 shall be used for temporary waterstops and set in approved compatible adhesive.
- E. Approved Non-bituminous Related Materials
1. Nails - Minimum 1-1/2" hot-dipped galvanized with minimum 3/8" head for nailing sheet metal flanges and concealed cleats.
 2. Capped Nails - 1" hot-dipped galvanized threaded nails with minimum 15/16" head, as made by Simplex Nail Company, for top nailing of membrane plies at nailers and wood blocking.
 3. Lumber and Wood Blocking - All wood blocking and lumber coming into direct contact with roofing materials and fasteners shall be kiln-dried after treatment (KDAT).
 4. Drain Flashing - 4 lb. sheet lead with a minimum sheet size of 30" x 30".
 5. Sealant - Sonneborn Sonolastic NP-150 with VLM technology, one-part polyurethane sealant for sealing pipe collars, lap joints in metal above plane of roof, and at nail on wall flashings.
 6. Walkway Protection - DynaTred as manufactured by Johns Manville, or Tamko Awaplan as manufactured by Awaplan. Other brands may be submitted subject to the approval of the roofing material manufacturer.
 7. Termination or Retainer Bars - Pressure bar - Product No. AL200, as manufactured by JBD Supply of Canton, Ohio, with slotted holes pre-punched 8" O.C., to top anchor membranes to concrete parapet walls. The use of termination bars to secure the base flashing shall not be construed to replace the need for sawcut reglets or through-wall flashings in contiguous walls.
 8. Masonry Anchors - Use #14 Factory Mutual approved fastener, fluorocarbon coated with a minimum .200 diameter shank and .250 diameter thread, as manufactured by Olympic Manufacturing Group Inc., Agawam, MA. Fastener is to be used to fasten approved pressure, termination, or retainer bars.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING**PART 3 EXECUTION****3.1 INSPECTION AND PREPARATION OF DECK**

- A. Inspect the deck to see that all requirements for deck preparation specified elsewhere have been met and that the deck meets the following requirements for application of the roof materials:
1. The deck must be smooth, free of voids and holes, and all damaged areas replaced or repaired.
 2. The deck must be dry, hard and able to withstand the minimum pullout resistance necessary to meet the wind uplift requirements of the Specifications.
 3. The roof substrate shall be inspected by and approved in writing by the roofing material manufacturer providing the warranty prior to commencement of roof application.

3.2 APPLICATION TO VARIOUS SUBSTRATES

- A. Lightweight insulating concrete
1. The lightweight insulating concrete substrate is specified elsewhere.
 2. When the substrate is lightweight insulating concrete, a venting base sheet shall be mechanically fastened to the substrate.
 3. The mechanical fastening pattern shall meet the stipulated wind uplift requirements for the project.
 4. Over the lightweight concrete decks, nail down a Venting Base Sheet with approved fasteners at a frequency and in a pattern certified to meet Factory Mutual 1-90 requirements. In the absence of other fastening patterns specified or approved elsewhere, the fasteners shall be at a maximum distance of 7" O.C. on the side laps and 12" O.C. staggered down the middle of the sheet.
 5. Base ply fasteners shall utilize the 2.7" plates required for FM Class 1-90 or UL-90 wind uplift requirements.
 6. Fastener frequency shall be increased by 50% at the outside perimeter of the building and 100% at all outside building or roof area corners, or in compliance with FM 1-90 requirements, whichever is greater. The perimeter is as defined in ASCE 7.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

7. Failure to install fasteners at the required spacing interval will be considered a serious act of defective workmanship and may cause replacement of the entire roof assembly.
8. Where roof insulation is required to be applied over the base sheet to achieve the desired R-value, all insulation shall be applied using low-rise foam adhesive.
9. Following application of the base sheet, all other plies shall be installed the same is if the substrate is roof insulation.

B. Metal Deck

1. Metal decks shall be covered with rigid roof insulation.
2. The rigid roof insulation is specified elsewhere.
3. When metal decks are the substrate, the bottom layer of roof insulation shall be mechanically fastened, and all subsequent layers installed using low rise foam adhesive.
4. Such roof insulation assembly shall consist of two layers of polyisocyanurate insulation with the joints double-staggered horizontally and vertically. Board sizes shall be no larger than 48"x 48" x 2". Over the polyisocyanurate roof insulation a perlite, or approved cover board shall be applied.
5. Cementitious or gypsum based cover boards are not acceptable.

C. Structural Concrete Deck

1. When the substrate is structural concrete or structural lightweight concrete the deck shall be primed with an asphaltic primer.
2. A vapor barrier consisting of a torch-down base sheet shall be applied over the full area.
3. Rigid roof insulation shall be applied as specified on Section 2.4(A)(4).

3.3 ROOF MEMBRANE INSTALLATION**A. Roof Insulation. Where roof insulation is the substrate, apply roofing plies as follows:**

1. One Ply Torch-Down Base Sheet - Starting at the low point of the roof torch down one ply shingle fashion keeping all lines straight and true. Side and end laps shall conform to the manufacturer's published specifications.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

2. Modified Bitumen FR Rated Cap Sheet - The final ply may be delayed up to five days upon advance written approval of the material manufacturer warranting the roof. Prior to installation of the FR cap sheet, inspect the underlying plies, repair all voids, fishmouths, cuts, or abrasions, and completely clean the roof. Sweep off all loose dirt; where dirt has become imbedded, prime the area prior to commencing application of the FR cap sheet. The FR cap sheet is the second ply in addition to the base ply.
3. Relax Modified Bitumen Cap Sheet - Prior to application of the modified bitumen cap sheet, the material shall be unrolled, and turned upside down to allow for relaxation. The material then may be re-rolled loosely for final application.
4. No Phased Roofing - Unless approved by the roofing material manufacturer issuing the roof warranty, in writing in advance of starting the project, no phased roofing will be permitted. Installing the cap sheet within the five days permitted following application of the base ply will not be considered phasing for purposes of this Specification.
5. Cap Sheet Installation - The cap sheet shall be cut into lengths no longer than ½ the roll length and torched down by a trained applicator. Cap sheet shall be torched down or heat welded. Each piece shall be back-nailed at 3" O.C. at the top. End laps shall be staggered ½ roll so that nowhere is an end lap on one piece contiguous to an end lap on an adjacent roll. End laps shall be a minimum of 9" laps or as otherwise specified by the manufacturer whichever is greater. Side laps shall be securely heat welded without voids or dry laps.
6. End Laps - All end laps shall be lapped a minimum of 6", or as specified by the manufacturer, and all membrane laps shall show a "bleed-out" of between 1/2" and 2". Round corners of roll ends.
7. No Voids or Fishmouths - All plies shall be continuous with no voids, and plies shall be rolled smooth and broomed into place without fishmouths or wrinkles. Fishmouths shall be marked, cutout and a full ply extending 18" on either side of the fishmouth shall be installed prior to installing of the following ply.
8. No Foot Traffic on New Membrane - No workers shall walk on the newly completed membrane for at least thirty minutes after installation to allow for cooling of the asphalt to prevent compression and displacement of asphalt due to point loading or concentration of weight due to a person's foot or equipment.
9. Membrane 2" Above Top of Cant - All roof membrane plies shall extend approximately 2" above the top of the cants at all perimeters and at all roof projections, and bonded securely into place without wrinkles or bridging.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

10. Delayed Flashings - Upon advance written approval of phasing of certain operations, installation of wall flashings and gravel stop strip in may be delayed until completion of the membrane, provided all water entry points at top of cant and walls are sealed to prevent water penetration.
11. Touch-Up Granules - Apply loose touch-up granules to match the granulated surface of the roof membrane at all laps and locations where asphalt bleed-out or spillage shows. Finished product shall be a neat professional and uniform surface.
12. Ridge and Hip Cap Ply - One full width sheet modified bitumen granulated surface sheet is to be run the full length of the ridge and/or hips and carefully mopped in place. All run-out asphalt at the laps and sides are to be covered with granules.
13. Water Cutoffs and Temporary Roofing Daily Water Stops - The Contractor shall provide water stops or temporary roofing daily to prevent moisture from penetrating the integrity of the roofing system and building interior.

B. Wall Flashings

1. Prime Walls - Prime all concrete, block, dusty, or dirty surfaces prior to application of wall flashings.
2. Modified Bitumen Base Flashing - The manufacturers' premium two ply base flashing shall be used in these Specifications. Upon completion of the roof membrane, with all plies extended approximately 2" above the top of the cant, install an additional ply of modified bitumen sheet at least 9" above the plane of the roof, and extending at least 6" out onto the completed roof membrane. Be careful to imbed all flashings particularly at the top and bottom of the cant to avoid bridging. Bridging of wall flashings shall be considered defective workmanship and flashings with voids or bridging shall be removed and replaced. Stagger the laps of the base flashing ply sheet with the cap sheet so that nowhere does the cap sheet end lap fall over the ply sheet end lap.
3. Use Short Flashing Pieces - Cut base flashing modified bitumen flashing materials into pieces no longer than the width of the roll each. Do not attempt to use flashing pieces which cannot be easily handled with one person.
4. Torched Base Flashings - Where an open flame torch is the application method for the flashings, the Contractor shall take full fire precautions as recommended by the NRCA and shall conduct a fire watch for a minimum of two hours following the last use of the open flame torch. All torch application equipment including propane torches and storage containers shall be removed from the roof each day at the end of work.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

5. Nail Flashings at Top - Use Simplex nails to fasten the wall flashing at the top at 6" O.C. when attached to wood nailers, and Olympic #14 screws pre-drilled with metal disks when being fastened into concrete. Seal the top edge of the base flashing.
6. Termination Bars - When flashings are being bonded to concrete or block walls, install termination bars fastened at 8" O.C. at the top of the flashing prior to application of metal counterflashing. Seal the top edge of the base flashing.
7. All base flashings are to be installed and work completed on a daily basis. No condition should exist that will permit moisture entering behind, around, or under the roof or flashing membrane.

C. Roof Drain Flashing:

1. Set 30-inch by 30-inch 4 pound lead flashing sheet in a bed of roofing cement on completed base ply substrate. Wire brush or score the lead flashing prior to applying primer. Prime lead on both sides of the lead; cover lead sheet with one ply of 120-mil SBS stripping, extending a minimum of 12 inches beyond edge of lead flashing onto base plies. Clamp roof membrane and lead flashing into roof drain clamping ring and tighten bolts while adhesive is still damp to ensure setting the flashing in adhesive securely.
2. All existing roof drains shall receive new, stainless steel clamping ring bolts. Re-drill and tap new threads as necessary for the new bolts.
3. Roof drains shall receive a four hour standing water test at the completion of roofing work. Drains shall be close using inflatable plugs and water filled to a level at the top of the sump and permitted to stand for four hours. Check the interior of the building for leaks before removing plugs. Remove all plugs at the end of the day and do not leave drains obstructed over night or under threat of rain..

D. Related Work

1. Plumbing Vents
 - a. Plumbing vents and lightning protection penetrations shall be flashed with 4 pound lead flashing jacks and extend 11" above the plane of the finished roof surface.
2. Through-Wall Scuppers
 - a. Through-Wall Scuppers - All through-wall scupper metal shall be primed with asphalt primer, and stripped in with two plies of modified bitumen flashing premium grade material adhered with an approved flashing mastic.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

All corners, splices, and joints shall be sealed with mastic as required to provide a watertight seal.

- b. Nail Flanges - All flanges shall be securely fastened to wood blocking installed as detailed.

3. Metal Edges

- a. Clean Substrate - After all blocking has been cleaned, deteriorated wood, if any, replaced, and the new modified bitumen roofing system has been installed over the wood edge blocking, install the metal edging.
- b. Prime Metal - Prime the top flange of the metal with asphaltic primer and allow it to dry tacky to the touch.
- c. Strip-In Flashing - Prime the top surface of the metal and roof membrane, and install a 12" wide strip of the modified ply sheet being used followed by an 18" modified bitumen strip-in to the edge using modified bitumen granule surfaced material, installed with hot asphalt with bleed-out at both edges.

3.4 FINAL INSPECTION

- A. Upon completion of roofing installation and associated work, the contractor and representative of the roofing material manufacturer shall accompany representatives of the owner and design professional in conducting a final inspection of the Work.
- B. A final punch list shall be prepared by the design professional and circulated to all parties present. The contractor shall complete all items listed on the final inspection punch list within fourteen (14) days from the date of receipt of the list. The contractor shall notify the owner in writing when all work listed has been completed.
- C. The roof material manufacturer may direct such testing as may be required to confirm that all work has been completed in accordance with the manufacturers published specifications and requirements for issuance of the warranty. Such testing shall be performed at no additional expense to the owner.
- D. Following the final inspection, the material manufacturer will make acceptance in writing and issue the specified warranty.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING**MANUFACTURER'S CERTIFICATION OF MATERIALS
(ROOFING MATERIAL MANUFACTURER'S LETTERHEAD)**

Date

«OWNERREP»
«OWNERTITLE»
«OWNERCOMPANY»
«OWNERADDRESS»
«OWNERCITY» «OWNERZIP»

Subject:

Dear «OWNERREP»,

We are pleased to offer to supply the roofing materials for the roofing project named above. We hereby certify that (Name of Contractor) is an approved roofing contractor/applicator with our firm for the term or type of warranty stipulated below.

The conditions stipulated and representations in this letter are made by us as an inducement to you to use our materials on your roofing job. We propose to furnish roofing materials necessary to provide a watertight roofing assembly on the above project. We hereby represent to you that if our materials are selected for use on your job complying with our standard specifications, upon specific further request, we will issue a twenty (20) year "No dollar Limit" Total System Roof Guarantee on the entire roofing assembly, including the membrane, insulation, and flashings, on the form required in these specifications, so long as the assembly consists of the materials listed below. We approve the following materials for use as components of the roofing assembly we offer to guarantee, and such materials are approved as components of a roof assembly using our materials whether or not we issue a manufacturer's guarantee:

(List specifically by brand name, material number, and ASTM designation)

Bituminous roofing system and components

Roofing membrane

Roofing asphalt

Roof insulation

Secondary moisture protection

Mastics and adhesives

Roof or insulation fasteners

Wood, carpentry, or lumber

Other miscellaneous components, expansion joints, drains, vents, flashings and sheet metal

Special requirements or installation conditions not published in standard specifications

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

In addition, we will provide such inspections as we deem necessary. By means of this letter, we also certify that the contractor listed above has applied for the required warranty and made the necessary payment to cause issuance of the warranty. In the event that anything arises during the course of this transaction, including, but not limited to, failure by the contractor to make full payment for the warranty, or quality assurance issues, which might jeopardize issuance of this warranty, we will notify you, the owner, in writing timely to give you the chance to rectify such problems and cause issuance of the warranty as stipulated above.

Yours very truly,

COMPANY NAME

Signed by

Authorized Representative

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING**CONTRACTOR’S ROOF WARRANTY**

Project Warranty for _____
 Whereas _____ (Contractor),
 Address _____
 Telephone (____) _____ - _____ has performed _____ (Work)
 on the following Project: _____
 _____,
 Address: _____

NOW, THEREFORE, the Contractor hereby Warrants said Work in accordance with the terms hereof, complying with the terms of the Contract with the Owner dated _____, that _____ WARRANTY PERIOD of Two (2) years, STARTING _____, TERMINATING _____.

Such Warranty shall cover without exception all of the work performed and materials either placed and/or supplied by the undersigned under this contract against defective workmanship and/or materials for a period of two (2) years following the date of completion and the Owner's acceptance of the work performed in accordance with the General Conditions of the Specifications, and the contract for this project.

Upon notice by the Owner, the undersigned Contractor will replace faulty workmanship and/or materials furnished or installed by the undersigned contractor which may be evidenced during the guarantee period without cost or charge to the Owner, whether or not such faulty workmanship results in moisture leaks. Faulty workmanship and materials shall include but not be limited to the following:

- Leaks in the roofing system or components installed as part of this job.
- Blisters, slippage or delamination of the membrane or flashings.
- Failure of the attachment, adhesion, or bonding of any component of the roof assembly, whether leaking or not.
- Buckling, cupping, or other dimensional instability of the insulation, if part of the assembly.
- Excessive loss of granules beyond that reasonably expected due to normal wear and tear.

Contractor agrees to inspect the roof with the Owner or Owner's representative within sixty (60) days prior to the expiration of this warranty. If defects as noted above are not corrected by the expiration date of this guarantee, this guarantee shall be extended until such time as all defects present at the time of the inspection noted above have been corrected to the Owner's satisfaction. In case the undersigned Contractor fails to remedy such defects within a reasonable period of time following notice, the Owner may furnish such materials or labor as may be necessary to bring or restore the work to the standards originally specified and the undersigned Contractor agrees to reimburse the Owner fully and promptly for all costs incurred in obtaining such compliance. Correction of defects in workmanship and materials shall not, however, relieve the Owner of responsibility for normal and routine maintenance and cleaning of the roof, and the Contractor shall not be held responsible for routine maintenance.

SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS MEMBRANE ROOFING

IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____,
20____, for the Contractor _____

as its _____ (position).

Name of firm: _____

Address: _____

And has been countersigned in accordance with the terms and conditions, for the General Contractor

_____ as its _____ (position).

Name of firm: _____

Address: _____

Signed: _____

Date: _____

**SECTION 07 52 16 – STYRENE BUTADIENE STYRENE MODIFIED BITUMINOUS
MEMBRANE ROOFING**

END OF SECTION 07 52 16