PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Base sheet.

B. Cap sheet.

C. Base flashing.

D. Heat welded application.

E. Elastomeric coating.

F. Caulking sealant.

G. Mastic.

H. Parapet membrane flashing.

I. Walk pads.

1.02 MEASUREMENT AND PAYMENT

A. General: Measurement and payment for modified bitumen roofing will be either by the lump-sum method or by the unit-price method as determined by the listing of the bid item for modified bitumen roofing indicated in the Bid Schedule of the Bid Form.

B. Lump Sum: If the Bid Schedule indicates a lump sum for modified bitumen roofing, the lump-sum method of measurement and payment will be in accordance with Section 01 20 00, Price and Payment Procedures, Article 1.02.

C. Unit Price: If the Bid Schedule indicates a unit price for modified bitumen roofing, the unit-price method of measurement and payment will be as follows:

1. Measurement

   a. Modified bitumen roofing, will be measured for payment by the square foot or square yard, as indicated in the Bid Schedule of the Bid Form, acceptably furnished and installed.

   b. Substrate preparation, installation accessories, flashings, protection of non-roofed areas from moisture, and protection of completed surfaces will not be measured separately for payment, but will be considered included with the measurement specified above.
2. Payment: Modified bitumen roofing, will be paid for at the Contract unit price for the computed quantities as determined by the measurement method specified in Article 1.03.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM D41/D41M Standard Specification for Asphalt Primer Used In Roofing, Dampproofing and Waterproofing
2. ASTM D312/D312M Standard Specification for Asphalt Used in Roofing

1.04 REGULATORY REQUIREMENT

A. In addition to the reference standards, the regulatory requirements that govern the work of this Section include the following governing code:


1.05 ROOF SYSTEM DESCRIPTION

A. Modified bitumen roofing membranes, base flashing, insulation, and flashing at metalwork and roof penetrations shall meet or exceed the requirements of a two-ply heat-welded applied modified bitumen roofing system for which an approved single manufacturer can issue a 30-year No Dollar Limit (NDL) material and workmanship guarantee.

1.06 SUBMITTALS

A. General: Refer to Section 01 33 00, Submittal Procedures, and Section 01 33 23, Shop Drawings, Product Data, and Samples, for submittal requirements and procedures.
B. **Product Data:** Submit manufacturer’s specifications for materials and installation of the appropriate roofing system and related flashing, for review. Work shall not proceed until the manufacturer’s specifications have been approved by the Engineer and returned to Contractor.

C. **Samples:** Submit two samples of square eight-inch by eight-inch for base and cap membrane, and base flashing.

D. **Shop Drawings:** Within 20 calendar Days of the effective date of the Notice to Proceed, submit the following for approval:
   
   1. Shop drawings showing setting plan for the insulation including tapered insulation, layout of felts and flashing details.

E. **Copy of valid and updated Certified Roofing Torch Applicator (CERTA) certificate for each worker that will use torch on Jobsite. CERTA training is offered by National Roofing Contractors Association (NRCA).**

### 1.07 QUALITY ASSURANCE

**A. Performance Requirements:**

1. Roofing materials shall be furnished by a manufacturer specializing in the manufacture of roofing materials.

2. Roofing work and related flashings shall be installed by a licensed contractor approved by the manufacturer who furnishes the material. Contractor shall submit a valid “Certificate of Eligibility” from the selected roofing materials manufacturer.

3. Contract Drawings and Specifications for roofing and flashings are diagrammatic and of a general nature only. Therefore, the manufacturer’s specifications and flashing details shall govern as fully as if set forth herein, except as specifically indicated otherwise. Work shall be completed as required to obtain the required warranty and guaranty.

4. The Contractor shall review the Contract Drawings and Specifications with the roofing materials manufacturer and shall obtain manufacturer’s concurrence that the selected roofing, insulation and its installation procedures, and flashing system are proper, compatible, and adequate for this application, and that the conditions and details indicated do not conflict with the recommendations of the manufacturer.

5. The Contractor and roofing materials manufacturer shall determine the probability of thermal and structural movement in the roofing system and shall provide for expansion and contraction in the roofing system as required to provide a serviceable roof without failures.

6. The foreman and the crew shall be trained and follow the safety and application guidelines as outlined in the Certified Roofing Torch Applicator (CERTA) manual.
B. Roofing Manufacturer’s Approval and Inspections:

1. Pre-roofing Conference: Contractor, roofing materials manufacturer’s representative and the Engineer shall meet at the project site well in advance of the time schedules for roofing and other related work, and review requirements for the work and conditions which could possibly interfere with successful performance of the work.

2. Contractor shall arrange for the roofing materials manufacturer to render work-in-progress inspections to make certain that the materials used in the work are in accordance with these specifications, and they are being installed in accordance with this specification and the manufacturer’s installation instructions and recommendations. Roofing materials manufacturer’s inspector shall be present during the initial installation of insulation and placement of plies and intermittently thereafter at the inspector’s discretion to assure the proper installation of roofing. At the completion of the job, promptly conduct final inspection with roofing materials manufacturer’s representative and the Engineer. Manufacturer’s inspector shall submit field reports and manufacturer’s certification to the Engineer.

1.08 GUARANTY

A. Modified bitumen roofing and related flashing installations, including related metalwork, shall be guaranteed against leakage, defective materials, and defective installation of the completed roofing work. Any such defects or leakage occurring during the period of the guaranty shall be promptly and completely corrected, including affected work, at no additional expense to the District. Bulging or wrinkling of modified bitumen roof surfaces will also be interpreted as defects requiring correction.

B. In addition to the guaranty requirements specified in General Conditions Article GC4.9, provide the roofing manufacturer’s thirty (30) year roofing system guaranty. Contractor will ensure that the District receives a proper transfer and assignment of the manufacturer’s thirty (30) year roofing guarantee. The terms of this guarantee shall include provision that it is a “no dollar limit” guarantee, that it covers all the manufacturer’s materials comprising the roof, and that the manufacturer will promptly repair the roof to a watertight condition in the event of (1) normal wear and tear, (2) any deficiencies in the component materials or (3) any deficiencies in the workmanship of the Contractor in the application of the roof.

C. Contractor shall provide a five-year workmanship guarantee against leaks and improper application including but not limited to defects such as: blisters, slippage, wrinkles, areas ponding water, granules loss, and shrinkage even if it hasn’t resulted in leaks.

D. Guaranty shall list the correct building name, address, and contract number.
E. Manufacturer’s Maintenance Agreement: Manufacturer shall inspect the building every four years for the duration of the warranty period. Each inspection shall include a written report on the condition of the roof and areas, and identification of the areas that need repair. A comprehensive report shall be prepared in digital and printed format and describe the condition of the roof. The report shall alert the District to areas that require maintenance. Manufacturer shall make repairs identified in the report and by the District representatives. Repairs shall be included under the warranty and performed at no cost to the District, even if they have not resulted in leaks. Items covered under warranty shall include granule loss, loose flashing, dried out mastic or caulking, blisters, mud cracking, wrinkles, edge metal separation, and damage to the roofing system due to ponding water. Damage to roofing membrane due to natural disasters including but not limited to earthquake and hail damage may be excluded from maintenance agreement.

F. Coating Manufacturer: Coating manufacturer shall issue a seven-year warranty against peeling, flaking, and cracking. The same company supplying and warranting the roofing membrane shall supply and issue the coating warranty.

1.09 OTHER REQUIREMENTS

A. Manufacturer shall submit proof of the following tests and requirements:

1. Fire Testing: Materials shall be tested to a minimum of Class A fire rating in compliance with UL 790 and must bear testing agency’s (Underwriter’s Laboratories, etc.) mark.

2. Wind Uplift: Roofing system shall be classified as Class 90 in compliance with UL 580.

1.10 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Roofing materials shall be delivered to the Jobsite in new, dry, unopened containers clearly showing catalog number, product description, manufacturer’s name and location. Delivered quantities should be sufficient to assure continuous work.

B. Materials shall be kept clean and protected from exposure to excessive heat or cold. Materials shall be stored in an enclosed area where the temperature is above 50 degrees or below 90 degrees Fahrenheit. Materials shall not be set directly on the ground. Labels shall not be removed nor protective covering torn-off until ready for application.

C. Materials shall be protected from exposure to moisture in any form before, during, or after delivery to the site. Delivered materials showing evidence of contact with moisture shall be rejected.

D. Materials shall not be double stacked nor stacked in a manner that could overload the roof structure.
PART 2 – PRODUCTS

2.01 MATERIALS

A. Roofing Membranes:

1. Smooth base membrane shall be premium fiberglass and polyester mat reinforced SBS (Styrene-Butadiene-Styrene) modified bitumen sheets conforming to or exceeding the requirements of ASTM D 6162, Grade S. These sheets shall be an elastomeric, asphaltic-blend product with a minimum thickness of 140 mils and roll weight of not less than 114 pounds per 100 square feet.

2. Cap shall be fire-resistant, premium fiberglass and polyester mat reinforced, white granular surfaced SBS (Styrene-Butadiene-Styrene) modified bitumen cap sheet conforming to or exceeding the requirements of ASTM D 6162, Grade G. Weight shall be at least 116 pounds per 100 square feet.

3. Base flashing shall be an elastomeric SBS modified bitumen sheet surfaced with factory applied white roofing granules. Base flashing shall meet or exceed the product specification of the cap.

B. Associated Materials: Obtain in writing the approval from the roofing materials manufacturer on the use of accessories used in assembly of the roofing system such that they are compatible and do not void the warranty.

1. Cants: Shall be fire-resistant, manufactured of compressed fiberglass or perlite board and/or fabricated of pressure treated Douglas Fir “Construction” or “No. 1” grade.

2. Pitch Pans, Expansion Joints, Metal Flashings: Shall be in compliance with NRCA and SMACNA application standards.

3. Pitch Pan Filler: Shall consist of a two component, cold applied urethane compound as approved by roofing membrane manufacturer.

4. Caulking Sealant: Shall consist of a single component, high performance, elastomeric compound, and conform to ASTM C920, Type S, Grade NS, Class 50.

5. Mastic: Elastomeric mastics, adhesives, and caulking products shall be used. Standard grade adhesive and mastics are not acceptable. Mastics shall conform to ASTM D4586.

C. Coating: Elastomeric high-performance coating approved by the roofing manufacturer for use with the roofing system. Coating shall meet the California Code of Regulations (CCR), Title 24, Part 2, California Building Code, Chapter 15, "Roof Assemblies and Rooftop Structures".

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine roof deck insulation and other surfaces to receive roofing. These surfaces must be clean, smooth, flat, dry, and free from defects or irregularities, which can jeopardize the quality of the work. No roofing work shall be performed on defective areas until suitable corrections have been made.

B. Inspect and approve the installation of roof deck insulation, sheet metalwork, wood nailers, metal framing members, roof specialties and accessories in connection with the roofing work. Refer to Section 07 22 00, Roof and Deck Insulation, for roof deck insulation, refer to Section 07 60 00, Flashing and Sheet Metal, for metal flashing and sheet metalwork, refer to Section 07 70 00, Roof and Wall Specialties and Accessories, for roof specialties and accessories are in.

3.02 INSTALLATION

A. Membrane Application: Installation of roofing membranes shall be in accordance with the materials manufacturer’s specifications, instructions and recommendations for heat-welded two-ply modified bitumen application using only workers skilled and experienced in the installation of the type of work involved. Prior to application, Contractor shall review the specifications and the manufacturer’s technical manual with the manufacturer’s technical representative to make certain that all aspects of membrane application are understood.

B. A competent foreworker shall maintain constant supervision of the work.

C. Install only as much complete roofing system that can be completed in one working shift. No section of roof shall be left exposed and unfinished at the end of each shift.

D. Traffic shall be minimized on a freshly laid roof while material is bonding and hot.

E. At the end of each working day, Contractor shall install temporary water cut-offs where roofing membrane does not abut a wall, wood edge member, or an expansion joint. Water cut-offs shall be removed cleanly when work resume. Roofing materials manufacturer’s instruction shall be followed when installing water cut-offs.

F. Set penetrations in neoprene SBS flashing cement over the SBS base sheet per manufacturer’s specification.

G. Heat fuse a strip of base flashing membrane minimum 10 inch wide to the primed edge metal so that it extends minimum 4 inch beyond edge of the metal.
H. Heat fuse cap sheet over the stripped edge metal.

I. Apply pressure to the surface of fused flashing cap membrane to ensure adhesion and solid fusion.

J. Fill voids between the penetration and flashing collar with sealant.

K. Rolls (both ply and cap) shall not be put down in full-length rolls (33 lineal feet). They shall be cut to the following lengths:

1. Slopes of 1/4 inch to 1 1/2 inch: 17-foot max
2. Slopes of 1 1/2 inch to 2 inch: 11-foot max

L. Material shall be cut to specified lengths then relaxed or heated until the material lies completely flat before installation, with no wrinkles, no buckles, or rigid end strips.

M. Matching granules may be broadcast into the modified bitumen bleed out at seams while hot to enhance the finished appearance of the membrane.

N. End laps shall be staggered a minimum of 18 inches (457 mm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of membrane shall be installed over the end laps. End laps, flashing sheets, and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.

O. Laps shall be parallel or perpendicular to the slope of the roof such that the flow of water is not against the lap.

P. Parapet walls shall be wrapped up and over with the SBS membrane. System shall consist of a smooth membrane and granulated membrane fully adhered to a primed surface. A backer sheet is required with heat welded system. Termination bar shall be covered by metal coping as indicated.

Q. Walk pads shall be manufactured with recycled tire with a minimum thickness of 1/2 inch and approved by the manufacturer of the roofing membrane. Walk pads shall be installed along the access to and around each equipment requiring maintenance. Walk pads shall not obstruct the drainage. Walk pads shall be spaced minimum of two inches and maximum of ten inches apart from each other.

3.03 FIELD QUALITY CONTROL

A. After the completion of roofing and related work, a water ponding test shall be performed for all roof areas, parapets, curbs, penetrations, and accessories by applying a flood coat of water along the high areas so that water at least 1/4-inch deep flows over the areas. Tests shall be performed under the Engineer’s observation.
B. Roof drains shall be temporarily plugged, and at least one inch of water shall be allowed to stand around the roof drain for one hour. Should a leak or low spot that ponds water appear, it shall be repaired, and the roof areas shall be retested until work is watertight.

C. Prior to applying membranes, the Contractor and its foreman shall review the specifications and the manufacturer’s technical manual with the manufacturer’s technical representative to make certain all aspects of membrane application are understood. Application shall proceed in strict accordance with specifications and detailed drawings and instructions in said technical manual. No verbal deviation will be accepted unless authorized on company’s letterhead signed by the company’s “Manager of Technical Services”.

3.04 COATING APPLICATION

A. New granulated cap sheet can be coated no sooner than 21 days of original installation or longer as required by either SBS roofing manufacturer or coating manufacturer. Surface shall be dry and free of any debris.

B. Surface and air temperatures must be a minimum of 60 degrees Farenheit and rising. Application is not allowed if heavy dew or rain is expected within 24 to 48 hours. Apply on a clear, sunny day in morning hours with a 3/4 inch nap exterior paint roller or professional airless sprayer. First, apply one coat over seams and joints. Allow to cure to one hour or until dry, apply two uniform coats over entire surface, avoiding excessive rolling. Two full coats are required. Apply second coat perpendicular to first coat back rolling where necessary. Provide an additional two coats where standing water exists.

3.05 FIRE WATCH

A. Fire watch shall be provided continuously during and for at least two hours following torch application. At least two 2.5-gallon containers of water and two 4A60BC extinguishers shall be available during the fire watch. When work is interrupted, or at the end of a section of roofing, and at end of each day’s work, areas that had been subjected to torch applications shall be surveyed with an infrared sensing device. Hot spots shall be cooled and re-surveyed. If a hot spot persists, the roof shall be cut open and any smoldering shall be extinguished before the Contractor leaves the Jobsite.

END OF SECTION 07 52 16