DIVISION 7

SECTION 7B ROOFING

7B.01 GENERAL: Comply with all of the Contract Documents.

7B.02 SCOPE OF WORK: Refer to "Division Scope of Work"

7B.03 MATERIALS

A. Cold Applied Roofing System shall be manufactured by Firestone Building Products Company, CertainTeed Commercial Roofing or approved equal as determined by HPD.

B. Roofing System Components:

1. Cant strip shall be installed at all walls and curbs as required by the appropriate design specifications and details using Firestone Multi-Purpose Flashing Cement. Refer to the Design Guide and Details section of Firestone System Application Guide for additional information.

2. Base Sheet - Firestone MB Base M is high-performance asphalt impregnated and coated glass fiber mat reinforced base sheet.

a. Reference Standards:

- Material meets ASTM D 4601-98, Type II, and tested in accordance with ASTM D 146-97

- Classified under UL designation Type G2 Coated Base/Ply for Roofing Systems.

b. Firestone MB Base M shall be used as a base ply in SBS, APP Mofified Bitumen and Built-Up Roofing Systems.

Roll Width:	39.4 in (1.0 m)
Roll Length:	98.7 ft (30.1 m)
Net Coverage:	300 sq. f (27.5 sq.m)
Roll Weight:	75 lb (34.0 kg)

c. Application Method:

- MB base M sheets shall be installed with Firestone approved fasteners.

Note – Use of non-approved by Firestone fasteners will void all warranties, and may cause damage to the membrane.

3. Flashing - Refer to Firestone Details for specific installation requirements of the system flashing.

4. Roof Penetrations - All penetrations which pass through the membrane must be flash in accordance with Firestone Details.

5. Flashing cement - Multi-Purpose MB Flashing Cement is an asphalt-based matrix blended with blended with fibers and selected performance additives. It is specifically designed to provide the adhesion characteristics needed for vertical applications of Firestone APP 160 Cool and SBS Cap products. Meets ASTM D 4586-00, Type I.

6. Membrane Cold Adhesive – Multi-Purpose MB Cold Adhesive is an asphalt matrix blended with fibers and selected performance additives. It is designed to meet the adhesion characteristics necessary for horizontal applications of Firestone APP 160 Cool and SBS Cap roofing membranes. Meets ASTM D 3019-00, Type III and ASTM D 4479-00, Type I.

7. Roofing Membranes;

1.1 - Firestone APP 160 Cool is a durable, smooth surfaced APP modified bitumen membrane consisting of select asphalt, modified with atactic polypropylene, and reinforced with a non-woven 190 g/m² (5.6 oz/yd²) polyester mat, enhanced with continuous glass fiber strands in the machine direction.

a. Reference Standards:

- Material meets ASTM D 6222, Type I Grade S, and tested in accordance with D 5147

- Classified under UL designation. Membrane for Roofing Systems with external Fire Exposure Only.

b. Firestone APP 160 Cool shall be used for low slope roofs both new construction and reroofing applications.

Roll Width:	39.4 in (1.0 m)
Roll Length:	32’-10” (10 m)
Net Coverage:	98 sq. f (9.1 sq. m)
Roll Weight:	87 lb (39.5 kg)

c. Application Method:

- APP 160 Cool is designed for installation at ambient temperatures between 50° F (10° C) and 100° F (43° C).

- APP 160 Cool shall be fully adhered with Firestone Multi-Purpose MB Cold Adhesive.

NOTE: **Torch-down installation of roofing membrane - prohibited.**

1.2 - Firestone SBS Cap is a durable Styrene-Butadiene-Styrene modified bitumen membrane that is reinforced with 190 g/m² (5.6 oz/yd²) non-woven polyester mat enhanced with continuous glass fiber strands in the machine direction. The proprietary compound and top ceramic granules provides resistance to thermal and physical forces over wide range temperatures.

a. Reference Standards:

- Material meets ASTM D 6164, Type I Grade G, and tested in accordance with ASTM D 5147

- Classified under UL designation. Membrane for Roofing Systems with external Fire Exposure Only.

b. Firestone SBS Cap shall be used for low slope roofs both new construction and re-roofing applications.

Roll Width:	39.4 in (1.0 m)
Roll Length:	33'-5" (10.2 m)
Net Coverage:	100 sq. f (9.3 sq. m)
Roll Weight:	97 lb (44.1 kg)

c. Application Method:

- SBS Cap is designed for installation at ambient temperatures between 50° F (10° C) and 100° F (43° C).
- SBS Cap shall be fully adhered with Firestone Multi-Purpose MB Cold Adhesive.

NOTE: **Torch-down installation of roofing membrane - prohibited.**

8. Walkways - walkway pads shall be used for normal, low volume rooftop foot traffic. Walkways shall be constructed from the same material application type as the roof itself. Walkway pads shall be provided by roofing System Manufacturer.

9. Surfacing - Firestone two-coat, water-based reflective coatings; Acrylic Base Coat for Asfalt and AcryliTop ™ PC-100 Top Coat shall be applied over smooth APP or granulated SBS. This two-coat system greatly increases the reflectivity of smooth and granulated asphalt roof systems and reduce the roof surface temperature.

a. Method of Application;

- The membrane surfaces shall be clean, dry and free of foreign materials and contaminants prior to the Acrylic Base Coat for Asphalt Application. The AcryliTp PC-100 topcoat shall be applied in exactly the same manner as the Base Coat. Both coatings may be applied with spray or roller. Allow topcoat to dry to the touch before allowing traffic on the roof. See manufacturer's system specification for details.

10. Installation - Installation of the roof system shall be done in accordance to Manufacturer Specification by the **Manufacturer's Certified Roofing Installer /Applicator.**

7B.04 SAMPLES, SHOP DRAWINGS AND CERTIFICATES

A. Samples and/or copies of material certificates specified herein and sample copy of roofing guarantee shall be submitted to the Architect/Engineer, for approval prior to the delivery of any materials to the work site.

B. Manufacturer's Specification and manufacturer's Certification for licensed and authorized roof installer/applicator shall be submitted for Architect/Engineer review and approval.

C. Submit shop drawings, if applicable, prior to commencement of the work.

7B.05 JOB SITE CAUTION AND WARNINGS

A. Keep all adhesives, sealants and cleaning materials away from all ignition sources (i.e., flames, fire, sparks, etc.). Do not smoke while using these materials.

B. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety instructions for all products used on the project.

C. For safety precautions refer to Manufacturer "Material Safety Data Sheets (MSDS)" and "Application Safety and Equipment policy".

D. Fire safety precautions should be taken during the installation of Roofing System. These precautions only to the prevention of fire ignition or extinguishing of fire during installation.

7B.06 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Approved materials shall be delivered to the site in original containers, dry, undamaged, with seals and labels intact.

B. Storage and Handling:

1. Store roofing materials and accessories, in original containers minimum 6” off the ground, in dry, well-ventilated place, protected from the weather.

2. If materials are stored outside, they must be elevated on a platform and protected with a waterproof cover, which will shed water away from the material.

3. All roofing shall be stored in upright position. Do not double stack unless product is on pallets and packaged as received from the factory.

4. In cold weather store roofing materials in a heated area.

5. Adhesives and primers shall be stored between 60°F (15.5 °C) and 80°F (26.7 °C).

6. All combustible materials shall be stored away from heat and open flame.

7. Do not store modified bitumen membranes at ambient temperatures above 120 °F.

8. Materials improperly stored or which become wet or damaged shall be identified, conspicuously marked as rejected and removed from the job site.

C. Cold weather:

1. When the outside temperature is below 40° F (4.4° C), certain combinations of temperature and humidity may cause condensation on the surface of solvent-based adhesives and primers. If this condition occurs, discontinue roofing application. When the ambient air-conditions no longer cause condensation on adhesive surfaces, re-apply additional adhesive or primer and proceed.

2. The consistency of sealants, adhesives and primers will begin to thicken as the temperature drops and membrane will become stiff. To minimize this, the following is recommended:

   a. Start work with sealants, adhesives, primers and rolls of materials that have been stored in warm storage prior application.

   b. Complete test areas to determine if conditions will cause problems such as condensation with the application of the material.

   c. Stop the operation or change to another warm container when material becomes too thick or stiff to properly apply.

3. Do not use heat guns or open flames to dry adhesives and primers.

D. Follow all OSHA and NRCA provisions for fire protection.

7B.07 - WORKMANSHIP

A. The entire installation shall be provided by a **Manufacturer Certified Installer** in a watertight and workmanlike manner, according to manufacturer's recommendations and best practices of the trade.

B. Certified Installer shall be experienced with installation of specified roofing systems for five years or more.

7B.08 INSTALLATION

A. General:

1. This portion of the section provides instructions for the installation of Roof Systems. Reference to the Manufacturer's Specification for roof installation, is necessary to ensure that the finished roof system is installed in compliance with all requirements and will be covered by Manufacturer's Guarantee.
   Extended guarantees of 15, and 20 years (if required), may require special considerations with regards to fasteners, insulations, flashing, and attachment requirements. Refer to the Manufacturer's Specification for specific requirements.

NOTE: IF A PROPOSED APPLICATION FALLS OUTSIDE OF THIS SPECIFICATION, CONTRACTOR SHALL CONTACT MANUFACTURER'S TECHNICAL SERVICES FOR ADDITIONAL INFORMATION.

2. Roofing system shall be installed in a continuous application.

3. Temporary closures must be used to prevent water from flowing beneath the roofing system during inclement weather.

4. All work shall be performed in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.

B. Roof Substrate Preparation:

1. Examine roof deck to determine that surface is in suitable condition for roofing work. Verify that deck is clean, dry and smooth, free of; depressions, waves, or projections, oil, grease and other materials that may damage membrane and properly sloped to insure drainage.

2. Rough surfaces that could cause damage to the membrane must be repaired.

3. Do not start roof application, until defects have been corrected. Provide deck dryness test in accordance with manufacturer's specification. **Installation of the roof shall be between 50°F and 100°F.**

C. Cant Strip Installation:

1. Install non-combustible cant strips along all parapet walls, stair bulkheads and skylight(s) as required by the Specification and details, using Flashing Cement. Refer to the Manufacturer's Specification for additional information.

D. Base Sheet Installation:

1. Base sheet shall be one layer, mechanically fastened to the plywood substrate.

2. Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching.

3. After allowing relaxing, begin attachment at one end and work towards the other end, keeping the roll tight and wrinkle free.

4. Align subsequent rolls, shingling the laps, maintaining a minimum 3" (76.2 mm) side lap and minimum 6" (152.4 mm) end lap and repeat the application. Stagger all end laps.

5. Mechanical Attachment of Base Sheet:

a. The base sheet must be mechanically attached with cap nails 1" min. (25.4 mm) diameter steel heads, or as Specified by Manufacturer.

E. New Modified Bitumen Roofing:

1. Cold adhesive application of modified Bitumen cap Sheet;

a. Remove the roll wrapping tape and labels from membrane before cap sheet installation.

b. All rolls must be un-rolled and allowed to relax approximately 30 minutes prior to installation.

c. Align cap sheets in their final position, assuring that the minimum side and end laps are maintained. More than one sheet can be positioned in this step. Cut bottom sheet laps at a 45° angle according to Manufacturers Detail.

d. Fold back over roll cores or re-roll the cap sheet in half exposing the substrate.

e. Apply Cold Adhesive to the substrate surface using a 1/4" (6.4 mm) notched neoprene squeegee or airless sprayer at a rate of 1-1/2 gallons per 100 square feet (0.6 to 0.8 L/sq. m).

f. Fold back the cap sheet into the adhesive and broom into place. The adhesive may be left open no more than 20 minutes prior to installing base sheet.

g. Repeat the process for the other half of the base sheet.

h. Areas of adhesive bleed-out require the application of granules, which must be embedded to membrane surface (for SBS Cap only).

i. Completely seal all edges of membrane with roofing trowel making a completely tight seal resulting in thoroughly waterproof installation.

F. Base Flashing and Curbs:

1. All flashing must be completed using roofing Membrane and Flashing Cement, as required by Manufacturer's Specification.

1. Over completed membrane at all vertical surfaces, install base flashing, consisting of one ply of Cap Sheet, set in adhesive to primed concrete blocks or masonry.

2. Base flashing shall extend a minimum of 12" up vertical surfaces and 4" out onto field membrane.

3. Wood surfaces shall receive one ply of Base Sheet extending from top of Cant Strip to top edge of base flushing, prior to application of Cap Sheet.

4. Seal the top of the base flushing, prior to installation of counter-flashing as specified by Manufacturer.

5. Refer to Manufacturers Details for specific requirements of installing flashing made directly to the penetrations or flashing with metal sleeves.

B. Counter-flashing (Cap flashing)

1. At masonry parapet wall, set new aluminum/stainless steel counter flashing twelve (12") inches above roof surface.

2. New aluminum/stainless steel flashing shall be installed to be flat over base flashing, and in no case, shall flashing cover the base flashing, less than four (4") inches.

3. Counter flashing shall be installed with approved anchoring devices and as shown on manufacturer's standard detail.

4. Install accessories such as factory-fabricated corners and use steel drive pins for attachments to the masonry.

C. Flashing (For roof penetration)

1. Install roof flashing for all roof penetrations in strict requirements of the approved Manufacturer.

2. Apply flashing to vent stacks, gooseneck vents and to all pipe protrusions through the roof.

3. Make all installations watertight and allow for expansion.

G. Roof Drains:

1. Install roof drains and drain flashing in strict requirements of the approved Manufacturer.

H. Roof Walkways:

1. Walkways help protect the roof system from damage due to necessary rooftop service traffic.

2. Walkways shall be provided to all access points (electrical fans, ladders, hatches, doorways, etc.) on all roofs, where rooftop service traffic expected to be more than once a month.

3. Identify walkway areas. See Architect roof drawings for walkway passes.

I. Keep rooftop traffic to a minimum, shortly after installation of membrane in order to minimize damage.

7B.09 GUARANTEE

A. The Roofing System Manufacturer, based on system(s) described within this Specification, shall furnish the following guarantee for this project:

1. Roofing Manufacturer guarantee that the roofing system shall remain free from workmanship defects and that the roofing system shall remain free from any manufacturing defects which would affect the watertight integrity of the roof system for a period of 12 years (from the date, when **Final Certificate of Occupancy is issued from Department of Buildings)**.

2. Installing Contractor must be certified by the Roofing Manufacturer for installation of its 12 year NDL* (No Dollar Limit) roof system and all aspects of manufacturer's requirements for NDL guarantees must be complied with.

NOTE: IN CONJUNCTION WITH THE MANUFACTURER'S GUIDELINES FOR ISSUANCE OF NDL GUARANTEE, ROOF SYSTEM MANUFACTURER SHALL PERFORM A PRE-

INSPECTION, IN-PROGRESS INSPECTION AND FINAL INSPECTION OF INSTALLED ROOF.

3. This guarantee with applicable terms must be issued to the Building Owner.

B. Based on guarantee, the approved manufacturer shall repair or replace defective roofing within 72 hours of notification.

END OF SECTION