

SECTION 07550

MODIFIED BITUMINOUS MEMBRANE ROOFING

Specifier Note: This section includes system descriptions for cold applied modified bituminous membrane roofing used in new, tear off, and retrofit applications. Please delete all instructions between and including the asterisks. Please select from optional choices between brackets [abc]. Edit this section to eliminate any potentially conflicting requirements.

PART 1 GENERAL

1.1 SECTION INCLUDES

Specifier Note: The Specifier shall provide all additional information describing the scope of work as part of this article. Other applicable items may include tear off, exposure and disposal of existing roofing materials; installation or repair of decking, framing or insulation materials.

- A. Modified bituminous membrane roofing over prepared substrate.

1.2 RELATED SECTIONS

Specifier Note: Delete any of the following subparagraphs that do not apply to the specified project.

- A. Section 06100 - Rough Carpentry: Wood blocking and nails.
- B. Section 07590 - Preparation for Reroofing.
- C. Section 07220 - Roof and Deck Insulation.
- D. Section 07600 - Flashing and Sheet Metal.
- E. Section 07710 – Manufactured Roof Specialties.

1.3 REFERENCES

Specifier Note: List only those reference standards that are included in the text of this section. Verify that References are either the current edition or test specific date. Edit as required to satisfy project conditions.

Specifier Note: Every roof project does not always require FM, UL or WH approval. All Garland roof membranes and systems have been tested and approved by either FM, UL or WH for fire and/or wind when used with the proper substrate and underlying materials. Local or national building codes which also require external ASTM E108 fire tests are often used instead. Please contact a Garland sales representative for the applicable rating requirement and listed roofing system.

- A. American Society of Civil Engineers (ASCE):
 - 1. ASCE 7-[__], Minimum Design Loads for Buildings and Other Structures.
- B. American Society for Testing and Materials (ASTM):

1. ASTM D41-[], Specification 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 as a Protective Coating for Roofing.
 7. ASTM D2178-[], Specification for Asphalt Glass Felt Used as a Protective Coating for Roofing.
 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-[], Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
 12. ASTM D6162-[], Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
 13. ASTM D6163-[], Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
 14. ASTM E108-[], Test Methods for Fire Test of Roof Coverings.
- C. Factory Mutual Research (FM):
1. Roof Assembly Classifications.
- D. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.
- E. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.
- F. Warnock Hersey (WH):
1. Fire Hazard Classifications.

1.4 SYSTEM DESCRIPTION

- A. It is the intent of this specification to install a long-term, quality roof system that meets or exceeds all current NRCA guidelines as stated in the most recent edition of the NRCA Roofing and Waterproofing Manual. Please discuss any concerns with the Architect and Roofing System Manufacturer.

1.5 SUBMITTALS

Specifier Note: Coordinate the section number specified in the following paragraph with the rest of the Project Manual. If Division One-General Requirements is not used on the project delete paragraph "A" in its entirety.

- A. Submit under provisions of Section [01300].
- B. Product Data: Provide manufacturer's technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.
- C. Samples: Submit [two (2)] samples of each product specified.
- D. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membrane.

- E. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class [A] [B] [C] for external fire and meets local or nationally recognized building codes.

Specifier Note: Select the wind uplift rating required for the project and delete the others. Delete wind resistance if not required for the project.

- F. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM [1-90].

Specifier Note: Select the fire rating required for the project and delete the others. Delete wind resistance if not required for the project.

- G. Manufacturer's Certificate: Certify that the roof system furnished meets Factory Mutual Approval Standard 4470.

- H. Manufacturer's Certificate: Certify that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other and are suitable for inclusion within the total roof system specified herein.

- I. Manufacturer's Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001 compliance certificate.

- J. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing indicating compliance with ASTM D5147.

- K. Submit a copy of an unexecuted manufacturer's warranty for review.

Specifier Note: Delete paragraph "L" below if you are specifying a smooth surface or mineral surfaced roof system.

- L. Submit a sample of roofing aggregate for review.

1.6 QUALIFICATIONS

Specifier Note: Specify the minimum number of years of experience for manufacturer and installer as appropriate for project. Delete ISO 9001 certification if not required for project. Delete installer certification if not required for project.

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum [12] years [documented] experience [and] [have ISO 9001 certification].
- B. Installer: Company specializing in modified bituminous roofing installation with a minimum [5] years experience [and] [certified by roofing system manufacturer as qualified to install manufacturer's roofing materials].

Specifier Note: It is the intent of this specification to provide a roof system with an external fire rating. The descriptions given below are general descriptions. The insulation, recovery board, and other components shall be as required by the membrane manufacturer to provide a Class A, B or C fire resistance rating. Delete those fire ratings which are not required on this project.

- C. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work and at any time roofing work is in progress. Maintain proper supervision of workmen. Maintain a copy of the specifications in the possession of the Supervisor/Foremen and on the roof at all times.
- D. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner has the right to hire a qualified contractor and backcharge the original contractor.
- E. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.7 PRE-INSTALLATION CONFERENCE

- A. Pre-Roofing Conference: Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of modified bituminous roofing system installation and associated work.
- B. Require attendance of installer of each component of associated work: Installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing which must precede or follow roofing work (including mechanical work if any), Architect, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, testing agencies and governing authorities.
- C. Objectives of conference to include:
 - 1. Review foreseeable methods and procedures related to roofing work.
 - 2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.
 - 3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
 - 4. Review roofing system requirements (drawings, specifications and other contract documents).
 - 5. Review required submittals both completed and yet to be completed.
 - 6. 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.
 - 7. Review required inspection, testing, certifying and material usage accounting procedures.
 - 8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).
 - 9. Record discussion of conference including decisions and agreements (or disagreements) reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
 - 10. Review notification procedures for weather or non-working days.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

- B. Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).
- C. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- D. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

1.9 MANUFACTURER’S INSPECTIONS

- A. When the project is in progress, the roofing system manufacturer will provide the following:
 - 1. Keep the Architect informed as to the progress and quality of the work as observed.
 - 2. Provide job site inspections a minimum of three days a week.
 - 3. Report to the Architect in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor’s attention.
 - 4. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.10 PROJECT CONDITIONS

Specifier Note: Select one of the following paragraphs and delete the other one.

- A. Weather Condition Limitations: Do not apply roofing membrane during inclement weather or when a 40% chance of precipitation is expected.

***** [OR] *****

- A. 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.
- B. Do not apply roofing insulation or membrane to damp deck surface.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- D. All slopes of greater than 1-1/2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral shank one (1) inch cap nails or screws and plates at a rate of one (1) fastener per ply (including the modified membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and four (4) ft o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 11/2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install four (4) additional fasteners at the upper edge of the modified bitumen sheet when strapping the plies.

1.11 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. Fully complete all modified bituminous membrane roofing field assembly work each day. Phased construction will not be accepted.

1.12 WARRANTY

Specifier Note: Warranties will vary depending upon the type of roof system specified. Warranties are available for up to thirty years. Please contact your local Garland Representative for warranty options and appropriate warranty language.

- A. Upon completion of installation, and acceptance by the Owner and Architect, the manufacturer will supply to the Owner the appropriate warranty.
- B. Installer will submit a minimum of a [two (2)] year warranty to the membrane manufacturer with a copy directly to Owner.
- C. Membrane manufacturer will provide an annual inspection for the life of the warranty.

1.13 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Any material submitted as an equal to the specified material must include a list of three (3) projects where the proposed material has been used in a similar roofing system as that which is specified and is located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least three (3) years old and be available for inspection by the Architect, Owner or Owner's Representative.
- B. Any deficiencies in performance, warranty terms or improper submittal procedure will constitute grounds for immediate rejection of substitution.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. When a particular trade name or performance standard is specified it shall be indicative of a standard required.
- B. Provide products as manufactured by The Garland Company. Submit substitutions under provisions of Section [01600].
- C. Any item or materials submitted as a substitution to the manufacturer specified must comply in all respects as to the quality and performance of the brand name specified. The Architect/Owner shall be the sole judge as to whether or not an item submitted as a substitute is truly equal. Should the Contractor choose to submit a substitute product, he shall assume all monetary or other risk involved, should the Architect/Owner find the substitution unacceptable.

2.2 DESCRIPTION

Specifier Note: This section includes system descriptions for cold applied modified built up roof systems. This section includes ply types, bitumen types and modified types. Consult your local Garland Representative for recommendations on each system component. Please delete all instructions between and including the asterisks.

A. Modified bituminous sheet roofing work including but not limited to:

Specifier Note: Select the ply felt that will be used on this job and delete the other. Select a Garland approved base sheet for standard applications and Polyester-Fiberglass-Polyester base sheet for applications where increased tensile strength is required.

1. Two plies of Garland HPR Glasbase glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of Garland HPR Premium Glasbase glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of Garland HPR TriBase Polyester-Fiberglass-Polyester base sheet double coated with special oxidized asphalt, bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of GMX Glasbase glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of GMX Premium Glasbase glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of GMX Composite Base Sheet Polyester-Fiberglass-Polyester base sheet double coated with special oxidized asphalt, bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of GAF Gafglas #75 Base Sheet glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of Celotex/Certainteed Vaporbar GB #25 glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of Conglas Conbase W-1 IV glass fiber base sheet bonded to the prepared substrate with bitumen.

***** [OR] *****

1. Two plies of Malarkey #515 Standard Fiberglass Base Sheet glass fiber base sheet bonded to the prepared substrate with bitumen.

Specifier Note: Select the interply bitumen that will be used on this job and delete the other. Select the standard cold bitumen for roof slopes up to 1:12. Select the higher slope cold bitumen for roof slopes up to 2:12. Special requirements are necessary for higher slope applications. Please contact your Garland Representative about proper back-nailing and insulation stop requirements.

- 2. The higher slope bitumen will consist of a V.O.C. compliant, non-asbestos containing cold applied adhesive for roof slopes up to 3:12.

Specifier Note: Select the base flashing ply that is best suited for the job and delete the others.

- 3. All flashings will be set in bitumen and will be one ply of SBS base flashing ply covered by an additional layer of modified bitumen membrane.

***** [OR] *****

- 3. All flashings will be set in bitumen and will be one ply of Polyester-Fiberglass-Polyester base sheet double coated with special oxidized asphalt and covered by an additional layer of modified bitumen membrane.

Specifier Note: Select the modified bituminous membrane that is best suited for the job and delete the others. Modified membranes vary depending upon the scrim, the modifier and the application methods. Contact your local Garland Representative for assistance in selecting the proper modified membrane and delete all others.

- 4. Modified Membrane: STRESSPLY "E"; 80 mil SIS, ES and SBS (Styrene-Isoprene-Styrene, Ethylene Styrene and Styrene-Butadiene-Styrene) rubber modified roofing membrane reinforced with a dual fiberglass scrim and polyester mat.

***** [OR] *****

- 4. Modified Membrane: STRESSPLY "E" FR; 80 mil SIS, ES and SBS (Styrene-Isoprene-Styrene, Ethylene Styrene and Styrene-Butadiene-Styrene) rubber modified roofing membrane with fire retardant characteristics and reinforced with a dual fiberglass scrim and polyester mat.

***** [OR] *****

- 4. Modified Membrane: STRESSPLY "E" MINERAL; 135 mil SIS, ES and SBS (Styrene-Isoprene-Styrene, Ethylene Styrene and Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane reinforced with a dual fiberglass scrim and polyester mat.

***** [OR] *****

- 4. Modified Membrane: STRESSPLY "E" FR MINERAL; 135 mil SIS, ES and SBS (Styrene-Isoprene-Styrene, Ethylene Styrene and Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with fire retardant characteristics and reinforced with a dual fiberglass scrim and polyester mat.

***** [OR] *****

4. Modified Membrane: STRESSPLY PLUS -Environmentally Friendly; 80 mil SBS and SEBS (Styrene-Butylene-Styrene and Styrene-Ethylene-Butylene-Styrene) rubber modified roofing membrane incorporating recycled rubber and reinforced with a fiberglass scrim.

***** [OR] *****

4. Modified Membrane: STRESSPLY PLUS FR - Environmentally Friendly; 80 mil SBS and SEBS (Styrene-Butylene-Styrene and Styrene-Ethylene-Butylene-Styrene) rubber modified roofing membrane incorporating recycled rubber, fire retardant characteristics and reinforced with a fiberglass scrim.

***** [OR] *****

4. Modified Membrane: STRESSPLY PLUS MINERAL - Environmentally Friendly; 135 mil SBS and SEBS (Styrene-Butylene-Styrene and Styrene-Ethylene-Butylene-Styrene) mineral surfaced, rubber modified roofing membrane incorporating recycled rubber and reinforced with a fiberglass scrim.

***** [OR] *****

4. Modified Membrane: STRESSPLY PLUS FR MINERAL - Environmentally Friendly; 135 mil SBS and SEBS (Styrene-Butylene-Styrene and Styrene-Ethylene-Butylene-Styrene) mineral surfaced, rubber modified roofing membrane incorporating recycled rubber, fire retardant characteristics and reinforced with a fiberglass scrim.

***** [OR] *****

4. Modified Membrane: STRESSPLY; 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing membrane with dual fiberglass reinforced scrim and superior low temperature capabilities.

***** [OR] *****

4. Modified Membrane: STRESSPLY FR; 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing membrane with fire retardant characteristics, dual fiberglass reinforced scrim and superior low temperature capabilities.

***** [OR] *****

4. Modified Membrane: STRESSPLY MINERAL; 135 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane with dual fiberglass reinforced scrim and superior low temperature capabilities.

***** [OR] *****

4. Modified Membrane: STRESSPLY FR MINERAL; 135 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim and superior low temperature capabilities.

***** [OR] *****

4. Modified Membrane: VERSIPLY MINERAL; 135 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane with dual fiberglass reinforced scrim.

***** [OR] *****

- 4. Modified Membrane: VERSIPLY 80; 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing membrane with dual fiberglass reinforced scrim.

Specifier Note: Select the surfacing that is desired for the job and delete the others. Contact your local Garland Representative for assistance in selecting the proper surfacing material. Additional surfacing is not required for mineral surfaced modified membranes.

- 5. The surfacing will be ASTM D-1863 roofing aggregate consisting of slag, pea gravel or white spar. The aggregate will be set into a cold applied flood coat.

***** [OR] *****

- 5. The surfacing will be ASTM D-2824 aluminum coating.

***** [OR] *****

- 5. The surfacing will be ASTM D-1227 emulsions.

2.3 BITUMINOUS MATERIALS

- A. Asphalt Primer: V.O.C. compliant, ASTM D-41.
- B. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.

Specifier Note: Select the technical data for the interply bitumen type previously chosen in 2.2.A.2. Please contact your local Garland Representative for additional backnailing requirements on higher slope applications.

- C. Cold Applied Membrane Adhesive: V.O.C. compliant ASTM D-3019.

Performance Requirements:

- | | | |
|---------------------------------------|-------------|----------------|
| 1. Non-Volatile Content | ASTM D-4479 | 70% |
| 2. Density | ASTM D-1475 | 7.89 lb./gal. |
| 3. V.O.C. | ASTM D-3960 | 300 gal/l max. |
| 4. Viscosity Stormer
Special Blade | ASTM D-562 | 16-20 sec. |
| 5. Flash Point | ASTM D-93 | 100°F min. |
| 6. Slope | | 1:12 - 3:12 |

- D. Cold Applied Flood Coat Adhesive

Performance Requirements:

- | | | |
|---------------------------------------|-------------|--------------|
| 1. Non-Volatile Content | ASTM D-4479 | 75% |
| 2. Density | ASTM D-1475 | 9.1 lb./gal. |
| 3. V.O.C. | ASTM D-3960 | 285 g/l max. |
| 4. Viscosity Stormer
Special Blade | ASTM D-4449 | 20-25 sec. |
| 5. Flash Point | ASTM D-93 | 100°F |

- E. Brush Grade Flashing Adhesive

Performance Requirements:

- | | | |
|-------------------------|-------------|---------|
| 1. Non-Volatile Content | ASTM D-4479 | 70 min. |
|-------------------------|-------------|---------|

- | | | |
|----------------|-------------|--------------|
| 2. Density | ASTM D-1475 | 8.6 lb./gal. |
| 3. V.O.C. | ASTM D-3960 | 295 g/l max. |
| 4. Flash Point | ASTM D-93 | 100°F |

2.4 SHEET MATERIALS

Specifier Note: Delete all but the previously selected base plies, which were chosen in Section 07550.2.2.A.1

A. Base Plies

1. Fiberglass Base Sheet: Garland Approved

***** [OR] *****

1. Polyester-Fiberglass-Polyester Base Sheet: Garland Approved

B. Base Flashing Ply

Specifier Note: Delete all but the previously selected base-flashing plies, which was chosen in Section 7550.2.2.A.3

1. SBS modified membrane with woven fiberglass scrim reinforcement with the following minimum performance requirements according to ASTM D-5147.

Properties (Finished Membrane):

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 205 lbf/in	CMD 220 lbf/in
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Tear Strength (ASTM D-5147)

2 in/min. @ 73.4 ? 3.6°F	MD 325 lbf	CMD 325 lbf
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Elongation at Maximum Tensile (ASTM D-5147)

2 in/min. @ 73.4 ? 3.6°F	MD 4.0%	CMD 4.0%
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***** [OR] *****

1. Tri-Base Sheet: Double coated Polyester-Fiberglass-Polyester scrim with the following minimum performance requirements according to ASTM D5147.

Properties (Finished Membrane):

Tensile Strength (ASTM D2523)

2 in/min. @ 73.4 ? 3.6°F	MD 135 lbf/in	CMD 120 lbf/in
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Tear Strength (ASTM D-4073)

2 in/min. @ 73.4 ? 3.6°F	MD 220 lbf	CMD 220 lbf
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Elongation at Maximum Tensile (ASTM D-2523)

2 in/min. @ 73.4 ? 3.6°F	MD 4.0%	CMD 4.0%
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C. Modified Flashing Ply

Specifier Note: Select one of the following modified flashing ply materials and its correlating technical data

from Section 07550.2.4.D.1 and delete the others. Contact your local Garland Representative for specific requirements for each flashing ply.

STRESSPLY "E"	STRESSPLY "E" MINERAL
STRESSPLY "E" FR	STRESSPLY "E" FR MINERAL
STRESSPLY PLUS	STRESSPLY PLUS MINERAL
STRESSPLY PLUS FR	STRESSPLY PLUS FR MINERAL
STRESSPLY	STRESSPLY MINERAL
STRESSPLY FR	STRESSPLY FR MINERAL
VERSIPLY 80	VERSIPLY MINERAL

D. Modified Membrane Properties (Finished Membrane):

1. STRESSPLY "E"; ASTM D6162, Type III Grade S

Tensile Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 500 lbf/in	CMD 550 lbf/in
(50 mm/min. @ 23 ? 3°C)	MD 87.5 kN/m	CMD 96.25 kNm
Tear Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 900 lbf	CMD 950 lbf
50 mm/min. @ 23 ? 3°C	MD 4003 N	CMD 4226 N
Elongation at Maximum Tensile (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 6.0%	CMD 6%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY "E" MINERAL; ASTM D6162, Type III Grade G

Tensile Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 500 lbf/in	CMD 500 lbf/in
50 mm/min. @ 23 ? 3°C	MD 87.5 kN/m	CMD 87.5 kNm
Tear Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 900 lbf	CMD 950 lbf
50 mm/min. @ 23 ? 3°C	MD 4003 N	CMD 4226 N
Elongation at Maximum Tensile (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 6.0%	CMD 6.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY "E" FR; ASTM D6162, Type III Grade S

Tensile Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 475 lbf/in	CMD 500 lbf/in
(50 mm/min. @ 23 ? 3°C)	MD 83.2 kN/m	CMD 87.5 kNm

Tear Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 900 lbf	CMD 900 lbf
50 mm/min. @ 23 ? 3°C	MD 4003 N	CMD 4003 N

Elongation at Maximum Tensile (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 6.0%	CMD 6.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY “E” FR MINERAL; ASTM D6162, Type III Grade G

Tensile Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 475 lbf/in	CMD 500 lbf/in
(50 mm/min. @ 23 ? 3°C)	MD 83.2 kN/m	CMD 87.5 kNm

Tear Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 900 lbf	CMD 900 lbf
50 mm/min. @ 23 ? 3°C	MD 4003 N	CMD 4003 N

Elongation at Maximum Tensile (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 6.0%	CMD 6.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY PLUS; ASTM D6163, Type III Grade S

Tensile Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 225 lbf/in	CMD 220 lbf/in
50 mm/min. @ 23 ? 3°C	MD 39.0 kN/m	CMD 38.5 kNm

Tear Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 280 lbf	CMD 250 lbf
50 mm/min. @ 23 ? 3°C	MD 1245 N	CMD 1105 N

Elongation at Maximum Tensile (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 4.7%	CMD 5.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -50°F (-46°C)

***** [OR] *****

1. STRESSPLY PLUS MINERAL; ASTM D6163, Type III Grade G

Tensile Strength (ASTM D5147)		
2 in./min. @ 73.4 ? 3.6°F	MD 220 lbf/in	CMD 210 lbf/in
50 mm/min. @ 23 ? 3°C	MD 38.5 kN/m	CMD 36.8 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 250 lbf	CMD 250 lbf
50 mm/min. @ 23 ? 3°C	MD 1112 N	CMD 1112 N

Elongation at Maximum Tensile (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 4.7%	CMD 5.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY PLUS FR; ASTM D6163, Type III Grade S

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 230 lbf/in	CMD 220 lbf/in
50 mm/min. @ 23 ? 3°C	MD 40.0 kN/m	CMD 38.5 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 250 lbf	CMD 250 lbf
50 mm/min. @ 23 ? 3°C	MD 1112 N	CMD 1112 N

Elongation at Maximum Tensile (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 4.7%	CMD 5.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY PLUS FR MINERAL; ASTM D6163, Type III Grade G

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 225 lbf/in	CMD 215 lbf/in
50 mm/min. @ 23 ? 3°C	MD 39.0 kN/m	CMD 37.5 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 245 lbf	CMD 240 lbf
50 mm/min. @ 23 ? 3°C	MD 1090 N	CMD 1070 N

Elongation at Maximum Tensile (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 4.7%	CMD 5.0%
50 mm/min. @ 23 ? 3°C		

Low Temperature Flexibility (ASTM D5147): Passes -15°F (-26°C)

***** [OR] *****

1. STRESSPLY; ASTM D6163, Type III Grade S

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 225 lbf/in	CMD 220 lbf/in
50 mm/min. @ 23 ? 3°C	MD 39.0 kN/m	CMD 38.5 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F	MD 280 lbf	CMD 250 lbf
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50 mm/min. @ 23 ? 3°C MD 1245 N CMD 1105 N

Elongation at Maximum Tensile (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 4.7% CMD 5.0%

50 mm/min. @ 23 ? 3°C

Low Temperature Flexibility (ASTM D5147): Passes -50°F (-46°C)

***** [OR] *****

1. STRESSPLY MINERAL; ASTM D6163, Type III Grade G

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 220 lbf/in CMD 210 lbf/in

50 mm/min. @ 23 ? 3°C MD 38.5 kN/m CMD 36.8 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 250 lbf CMD 250 lbf

50 mm/min. @ 23 ? 3°C MD 1112 N CMD 1112 N

Elongation at Maximum Tensile (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 4.7% CMD 5.0%

50 mm/min. @ 23 ? 3°C

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY FR; ASTM D6163, Type III Grade S

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 230 lbf/in CMD 220 lbf/in

50 mm/min. @ 23 ? 3°C MD 40.0 kN/m CMD 38.5 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 250 lbf CMD 250 lbf

50 mm/min. @ 23 ? 3°C MD 1112 N CMD 1112 N

Elongation at Maximum Tensile (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 4.7% CMD 5.0%

50 mm/min. @ 23 ? 3°C

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

***** [OR] *****

1. STRESSPLY FR MINERAL; ASTM D6163, Type III Grade G

Tensile Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 225 lbf/in CMD 215 lbf/in

50 mm/min. @ 23 ? 3°C MD 39.0 kN/m CMD 37.5 kNm

Tear Strength (ASTM D5147)

2 in/min. @ 73.4 ? 3.6°F MD 245 lbf CMD 240 lbf

50 mm/min. @ 23 ? 3°C MD 1090 N CMD 1070 N

Elongation at Maximum Tensile (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 4.7% CMD 5.0%
 50 mm/min. @ 23 ? 3°C

Low Temperature Flexibility (ASTM D5147): Passes -15°F (-26°C)

***** [OR] *****

1. VERSIPLY 80; ASTM D6163, Type III Grade S

Tensile Strength (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 205 lbf/in CMD 220 lbf/in
 50 mm/min. @ 23 ? 3°C MD 36.0 kN/m CMD 38.5 kNm

Tear Strength (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 325 lbf CMD 325 lbf
 50 mm/min. @ 23 ? 3°C MD 1445 N CMD 1445 N

Elongation at Maximum Tensile (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 4.0% CMD 4.0%
 50 mm/min. @ 23 ? 3°C

Low Temperature Flexibility (ASTM D5147): Passes -35°F (-37°C)

***** [OR] *****

1. VERSIPLY MINERAL; ASTM D6163, Type III Grade G

Tensile Strength (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 230 lbf/in CMD 220 lbf/in
 50 mm/min. @ 23 ? 3°C MD 40.0 kN/m CMD 39.0 kNm

Tear Strength (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 325 lbf CMD 325 lbf
 50 mm/min. @ 23 ? 3°C MD 1445 N CMD 1445 N

Elongation at Maximum Tensile (ASTM D5147)
 2 in./min. @ 73.4 ? 3.6°F MD 4.5% CMD 4.0%
 50 mm/min. @ 23 ? 3°C

Low Temperature Flexibility (ASTM D5147): Passes -30°F (-34°C)

2.5 SURFACINGS

Specifier Note: Select the surfacing material that is desired for the job and delete the others. Silver-Shield is a fibered aluminum roof coating. Garla-Brite is a non-fibered aluminum paint. Garla-Shield is an emulsion, which will require an additional coat of aluminizer. Contact your local Garland Representative for assistance in selecting the proper material. Additional surfacing materials are not required for mineral surfaced modified membranes.

- A. Fibered Aluminum Roof Coating: Silver-Shield; fibered aluminum roof coating having the following characteristics:
 - 1. Flash Point 100°F (38°C) min.

- 2. Weight/Gallon 8.2 lbs./gal. (1.0 g/cm³)
- 3. Viscosity (75°F) 100 - 125 K.U.

***** [OR] *****

- A. Non-Fibered Aluminum Paint: Garla-Brite; non-fibered aluminum paint having the following characteristics:
 - 1. Flash Point 103°F (39°C) min.
 - 2. Weight/Gallon 7.9 lbs./gal. (1.0 g/cm³)
- B. Emulsion: Garla-Shield; emulsion having the following characteristics:
 - 1. Weight/Gallon 8.6 lbs./gal. (1.0 g/cm³)
 - 2. Viscosity (75°F) 120 - 150 K.U.

Specifier Note: Select Slag, Pea Gravel or White Spar to achieve the desired aesthetic effect.

- C. Aggregate: To conform to ASTM D1863.
 - 1. Slag
 - 2. Pea Gravel
 - 3. White Spar
- D. Loose Roofing Granules: ASTM D451; as recommended by the membrane manufacturer. Match color of granulated membrane sheet. Match size of granules on the membrane.

2.6 RELATED MATERIALS

Specifier Note: Select the related materials that are necessary for the job and delete the others. Contact your local Garland Representative for assistance.

- A. Roof Insulation: In accordance with Section 07220.
- B. Roof Insulation Fasteners: In accordance with Section 07220.
- C. Base Sheet: ASTM D4601, Type II; as recommended and furnished by the membrane manufacturer.
- D. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the deck material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.
- E. Metal Discs: Flat discs or caps of zinc-coated sheet metal not lighter than 28 gauge and not less than one (1) inch in diameter. Form discs to prevent dishing. Bell or cup shaped caps are not acceptable.
- F. Walkway Pads: As recommended and furnished by the membrane manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

Specifier Note: Review and edit the following paragraphs as appropriate to the substrate type and project conditions.

- A. Verify that deck surfaces and project conditions are ready to receive work of this section.
- B. Verify that deck is supported and secured to structural members.
- C. Verify that deck is clean and smooth, free of depressions, projections or ripples, and is properly sloped to [drains] [valleys,] [or] [eaves].
- D. Verify that adjacent roof members do not vary more than [one quarter (1/4)] inch in height.
- E. Verify that deck surfaces are dry [and free of snow or ice]. [Verify that metal deck flutes are clean and dry.]
- F. Confirm that moisture content does not exceed [twelve (12)] percent by moisture meter tests.
- G. Verify that openings, curbs, pipes, conduit, sleeves, ducts and other items which penetrate the roof are set solidly and that [wood cant strips] [wood nailing strips] [and reglets] are set in place.

Specifier Note: Use the following paragraph if a moisture absorptive deck requires testing to measure moisture content.

3.2 PREPARATION – WOOD DECK

- A. Verify that wood decking is flat and has tight joints.
- B. Seal plywood joints with tape.
- C. Fill knot holes with latex filler.

***** [OR] *****

3.2 PREPARATION – CONCRETE DECK

- A. Fill honeycombing and imperfections in deck surface with latex filler.

***** [OR] *****

3.2 PREPARATION – METAL DECK

- A. [Install preformed sound absorbing insulation strips in acoustic deck flutes in accordance with manufacturer's instructions.]

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
- B. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

- C. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the modified bituminous roofing system.
- D. Coordinate installation of roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation with two (2) plies of #15 organic roofing felt set in roofing cement and with joints and edges sealed with roofing cement. Remove cut-offs immediately before resuming work.
- E. Cold applied membrane adhesive coverage rates for interply application two (2) to two and a half (2 ½) gallons per one hundred (100) square feet (plus or minus twenty five (25) percent on total job average basis.)
- F. All insulation joints must be taped along with deck penetrations to prevent bitumen from penetrating substrate joints, entering building or damaging roofing system components or adjacent building construction by applying a tape barrier.
- G. Apply roofing materials as specified by manufacturer's instructions.
 - 1. Keep roofing materials dry before and during application.
 - 2. Do not permit phased construction.
 - 3. Complete application of roofing plies, modified sheet and flashing in a continuous operation.
 - 4. Begin and apply only as much roofing in one day as can be completed that same day.
- H. Cut-Offs (Waterstops): At end of each day's roofing installation, protect exposed edge of incomplete work, including ply sheets and insulation. Provide temporary covering of two (2) plies of #15 organic roofing felt set in roofing cement with joints and edges sealed.

Specifier Note: Use Paragraph "T" for mineral surfaced roof systems only. Delete this paragraph if you are not specifying a mineral surfaced roof system.

- I. Broadcast minerals into the bleed out of bitumen to achieve uniform color throughout.

3.4 VAPOR RETARDER INSTALLATION

Specifier Note: Vapor retarder can be detrimental when it is not needed. This specification is for a two-ply asphalt and felt vapor retarder. Several other materials can be used to accomplish the same result. Please follow the manufacturer's recommendations on installation of these products. Contact your local Garland Representative with any questions.

- A. Fiberglass Plies: Install [two (2)] fiberglass ply sheets in 25 lbs. per square of bitumen shingled uniformly to achieve two plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof.
- B. Lap ply sheet ends eight (8) inches. Stagger end laps 12 inches minimum.
- C. Extend plies two (2) inches beyond top edges of cants at wall and roof projections and equipment bases.
- D. Install base flashing ply to all perimeter and projection details.

3.5 BASE PLY INSTALLATION

Specifier Note: Please delete all but the previously selected base plies which was selected in 07550.2.2.A.1

- A. Fiberglass Plies: Install (2) two fiberglass base sheets in two (2) to two and one half (2-1/2) gallons per ply per square of bitumen shingled uniformly to achieve two plies throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing. Prior to installation, cut sheets into 18' lengths and allow to relax.

***** [OR] *****

- A. Tri-Base Plies: Install (2) Fiberglass/Polyester/Fiberglass base sheets in two (2) to two and one half (2-1/2) gallons per square of cold applied membrane adhesive, shingled uniformly to achieve two plies throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
- B. Lap ply sheet ends eight inches. Stagger end laps twelve inches minimum.
- C. Extend plies two inches beyond top edges of cants at wall and projection bases.
- D. Install base flashing ply to all perimeter and projection details.
- E. Allow the two plies of base sheet to cure at least thirty minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

3.6 MODIFIED MEMBRANE APPLICATION

- A. Solidly bonded to the base layers with specified cold adhesive at the rate of two (2) to two and one half (2-1/2) gallons per 100 square feet.
- B. The roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
- C. Subsequent rolls of modified shall be installed across the roof as above with a minimum of four (4) side laps and eight (8) end laps. The end laps shall be staggered. The modified membrane shall be laid in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
- D. For best results, allow the cold adhesive to set for five (5) to ten (10) minutes before installing the top layer of modified membrane.
- E. Extend membrane two (2) beyond top edge of all cants in full moppings of the cold adhesive as shown on the drawings.

3.7 FLASHING MEMBRANE INSTALLATION

- A. Seal all curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

Specifier Note: Verify that drawings contain applicable details. Otherwise delete the text in brackets indicated in the following paragraph.

- B. Prepare all walls, penetrations, expansion joints [and where shown on the drawings] to be flashed with asphalt primer at the rate of one hundred (100) square feet per gallon. Allow primer to dry tack free.
- C. Use the modified membrane as the flashing membrane. Adhere to the underlying base flashing ply with specified asphalt unless otherwise noted in these specifications. Nail off at a minimum of eight (8) inches o.c. from the finished roof at all vertical surfaces.
- D. Solidly adhere the entire sheet of flashing membrane to the substrate.
- E. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and fiberglass mesh.

Specifier Note: Delete the text within brackets in the following two paragraphs if no other applicable roofing sections are included in the Project Manual.

- F. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work [as specified in other sections].
- G. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work [as specified in other sections].

Specifier Note: Include only the following paragraphs; which coordinate with details existing on the roof that you are specifying. Please delete the paragraphs that do not apply to your roof. The detail number correlates to a detail drawing that should accompany this specification. Delete the drawing number in brackets in the final edit of the specification. Contact your local Garland Representative with any questions regarding unusual or custom details.

3.8 FLASHING MEMBRANE INSTALLATION

- H. Metal Edge [Detail No. MBC-10]:
 - 1. Inspect the nailer to assure proper attachment and configuration.
 - 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at eight (8) inches o.c.
 - 3. Install continuous cleat and fasten at six (6) inches o.c.
 - 4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailer every three (3) inches o.c. staggered.
 - 5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
 - 6. Strip in flange with base flashing ply covering entire flange in bitumen with six (6) inches on to the field of roof. Assure ply laps do not coincide with metal laps.
 - 7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof.
- I. Raised Metal Edge [Detail No. MBC-11]:
 - 1. Inspect the nailer to assure proper attachment and configuration.
 - 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at eight (8) inches o.c.
 - 3. Install continuous cleat and fasten at six (6) inches o.c.
 - 4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailer every three (3) inches o.c. staggered.

5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
 6. Strip in flange with base flashing ply covering entire flange in bitumen with six (6) inches on to the field of roof. Assure ply laps do not coincide with metal laps.
 7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof.
- J. Raised Metal Edge Cap [Detail No. MBC-12]:
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at eight (8) inches o.c.
 3. Install continuous cleat and fasten at six (6) inches o.c.
 4. Strip in cant dam with base flashing ply covering entire vertical area in bitumen with six (6) inches on to the field of the roof. Assure ply laps do not coincide with metal laps.
 5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof.
 6. Install new metal edge hooked to continuous cleat and set in bed of roof cement.
 7. Attach metal edge with approved fasteners and neoprene washers at eight (8) o.c.
- K. Roof Edge With Gutter [Detail No. MBC-13]:
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at eight (8) inches o.c.
 3. Install gutter and strapping.
 4. Install continuous cleat and fasten at six (6) inches o.c.
 5. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailer every three (3) inches o.c. staggered.
 6. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
 7. Strip in flange with base flashing ply covering entire flange in bitumen with six (6) inches onto the field of the roof. Assure ply laps do not coincide with metal laps.
 8. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof.
- L. Scupper Through Roof Edge [Detail No. MBC-14]:
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at eight (8) inches o.c.
 3. Install a scupper box in a 1/4inch bed of mastic. Assure all box seams are soldered and have a minimum four (4) inch flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
 4. Fasten flange of scupper box to nailer every three (3) inches o.c. staggered.
 5. Strip in edge with base flashing ply covering entire area in bitumen with six (6) inches on to the field of the roof.
 6. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams.
- M. Scupper Through Wall [Detail No. MBC-15]:
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over nailer, into scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
 3. Install a scupper box in a 1/4 inch bed of mastic. Assure all box seams are soldered and have a minimum four (4) inch flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
 4. Fasten flange of scupper box every three (3) inches o.c. staggered.
 5. Strip in flange of scupper box with base flashing ply covering entire area with six (6) inch overlap on to the field of the roof and wall flashing.

6. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams.
- N. Scupper Through Wall (Overflow) [Detail No. MBC-16]:
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over nailer up the overflow, into the scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
 3. Install scupper box in a ¼ inch bed of mastic. Assure all box seams are soldered and have a minimum four (4) inch flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
 4. Fasten flange of scupper box every three (3) inches o.c. staggered.
 5. Strip in flange scupper box with base flashing ply covering entire area with six (6) inch overlap on to the field of the roof and wall flashing.
 6. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams.
- O. Coping Cap [Detail No. MBC-20]:
1. Minimum flashing height is eight (8) inches. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Attach tapered board to top of wall.
 4. Install base flashing ply covering entire wall and wrapped over top of wall and down face with six (6) inches on to field of roof and set in cold asphalt. Nail membrane at eight (8) inches o.c.
 5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and allow to cure and aluminize.
 6. Install continuous cleat and fasten at six (6) inches o.c. to outside wall.
 7. Install new metal coping cap hooked to continuous cleat.
 8. Fasten inside cap 24 inches o.c. with approved fasteners and neoprene washers.
- P. Coping Cap [Generic Premanufactured]:
1. Minimum flashing height is eight (8) inches. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering entire wall and wrapped over top of wall and down face with six (6) inches on to field of the roof and set in cold asphalt. Nail membrane at eight (8) inches o.c.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and allow to cure and aluminize.
 5. Install coping cap per manufacturer's recommendations.
- Q. Surface Mounted Counterflashing/Coping Cap [Detail No. MBC-21]:
1. Minimum flashing height is eight (8) inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering wall set in bitumen with six (6) inches on to field of roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and allow to cure and aluminize.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall.
 6. Secure counterflashing set on butyl tape above flashing. Fasten eight (8) inches o.c. and caulk top of counterflashing.

7. Attach tapered board to top of wall (minimum slope 1/4 -12).
 8. Cover tapered board and all exposed wood with base flashing ply. Fasten inside and out at eight (8) inches o.c.
 9. Install continuous cleat and fasten at six (6) inches o.c. to outside wall.
 10. Install new metal coping cap hooked to continuous cleat.
 11. Fasten inside of cap 24inch o.c. with approved fasteners and neoprene washers.
- R. Surface Mounted Counterflashing [Detail No. MBC-22]:
1. Minimum flashing height is eight (8) inches. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering wall set in bitumen with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall.
 6. Secure counterflashing set on butyl tape above flashing at eight (8) inches o.c. and caulk top of counterflashing.
- S. Reglet Mounted Counterflashing [Detail No. MBC-23]:
1. Minimum flashing height is eight (8) inches. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering wall set in bitumen with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall.
 6. Cut reglet in masonry one joint above flashing.
 7. Secure reglet counterflashing with expansion fasteners and caulk reglet opening.
- T. Through Wall Counterflashing [Detail No. MBC-24]:
1. Minimum flashing height is eight (8) inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry
 2. Set cant in bitumen. Run all plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering wall with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall at eight (8) inches o.c.
- U. Base Flashing For Non-Supported Deck [Detail No. MBC-25]:
1. Inspect the nailer to assure proper attachment and configuration. The wood cant strip should be mechanically attached to the vertical and horizontal wood nailers.
 2. Install compressible insulation in neoprene cradle between wall and vertical wood nailer.
 3. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 4. Install base flashing ply covering entire wall and wrapped to top of wood nailer with six (6) inches on to field of the roof. Nail membrane at eight (8) inches o.c.
 5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 6. Attach counterflashing through wall flashing at a spacing of 24 inches o.c.

- V. Manufactured Wall Panel W/Modified Roof/Flashing (Slip Flashing) [Detail No. MBC-26]:
1. Minimum flashing height is eight (8) inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering wall with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Install manufacturer's standard hat channel into the top of the modified membrane to act as a termination bar.
 6. Install hat channels at 24 inches o.c. vertically spaced up the wall.
 7. Install the uppermost hat channel at the bottom edge of the coping cap. Insert rigid insulation between the hat channels. Place manufacturer's standard seam tape on top of all hat channels.
 8. Fasten the first manufactured wall panel vertically plumb and fasten every six (6) inches o.c.
 9. Install adjoining panels by engaging the opposing interlocking seam and fastening as described above.
 10. Complete inside and outside corners by installing pre-fabricated corners or job site braking a full width panel to accommodate the corner, so that the sides engage the lock of the panels to the corner areas.
 11. Trim excess seam tape and seam raw edges with manufacturer's recommended sealant.
 12. Fasten slip flashing to existing coping cap with a waterproof rivet every 24 inches o.c. to act as a counterflashing over the manufactured wall panel.

- W. Manufactured Wall Panel W/Modified Bitumen Roof/Flashing [Detail No. MBC-27]:
1. Minimum flashing height is eight (8) inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering wall with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Install manufacturer's standard hat channel into the top of the modified membrane to act as a termination bar.
 6. Install hat channels at 24 inches o.c. vertically spaced up the wall.
 7. Install the uppermost hat channel at the bottom edge of the coping cap. Insert rigid insulation between the hat channels. Apply manufacturer's standard seam tape on top of all hat channels.
 8. Fasten the first manufactured wall panel vertically plumb and fasten every six (6) inches o.c.
 9. Install adjoining panels by engaging the opposing interlocking seam and fastening as described above.
 10. Complete inside and outside corners by installing pre-fabricated corners or job site braking a full width panel to accommodate the corner so that the sides engage the lock of the panels to the corner areas.
 11. Trim excess seam tape and seam raw edges with manufacturer's recommended sealant.

- X. Expansion Joint [Detail No. MBC-30]:
1. Minimum curb height is eight (8) inches. Chamfer top of curb. Prime vertical curb at a rate of 100 square feet per gallon and allow to dry.
 2. Mechanically attach wood cant to expansion joint nailers. Run all field plies over cant a minimum of two (2) inches.
 3. Install compressible insulation in neoprene cradle.
 4. Install base flashing ply covering curb set in bitumen with six (6) inches on to field of the roof.
 5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Attach top of membrane to top of curb and nail at eight (8) inches o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.

6. Install pre-manufactured expansion joint cover. Fasten sides at 12 inches o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
- Y. Area Divider [Detail No. MBC-31]:
1. Minimum curb height is eight (8) inches. Prime vertical curb at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering curb set in bitumen with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Attach top of membrane to top of curb and nail at eight (8) inches o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Install pre-manufactured cover. Fasten sides at 24 inches o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
- Z. Equipment Support [Detail No. MBC-32]:
1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering curb set in bitumen with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Attach top of membrane to top of curb and nail at eight (8) inches o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Install pre-manufactured cover. Fasten sides at 24 inches o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
 6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.
- AA. Curb Detail/Air Handling Station [Detail No. MBC-33]:
1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering curb set in bitumen with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 5. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
 6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.
- BB. Skylight [Detail No. MBC-34]:
1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering curb set in bitumen with six (6) inches on to field of the roof.
 4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Attach top of membrane to top of wood nailer and apply a three-course application of mastic and mesh. Allow to cure and aluminize.
 5. Install pre-manufactured lens and fasten flashing sides at eight (8) inches o.c. with fasteners and neoprene washers.
- CC. Skylight With Protection Screen [Detail No. MBC-34b]:
1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
 2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
 3. Install base flashing ply covering curb set in bitumen with six (6) inches on to field of the roof.

4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, nine (9) inches on to the field of the roof. Attach top of membrane to top of wood nailer and apply a three-course application of mastic and mesh. Allow to cure and aluminize.
5. Install pre-manufactured lens and fasten flashing sides at eight (8) inches o.c. with fasteners and neoprene washers.
6. Install OSHA compliant, compression mounted skylight protection screen per membranes manufacturers written instructions.

DD. Pre-manufactured Curb For Equipment Support [Detail No. MBC-35]:

1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Run all field plies over cant of the pre-manufactured equipment support a minimum of two (2) inches.
3. Install base flashing ply covering pre-manufactured curb with six (6) inches on to field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install pre-manufactured cover. Fasten sides at 24 inches o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

EE. Exhaust Fan [Detail No. MBC-36]:

1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all plies over cant a minimum of two (2) inches.
3. Install base flashing ply covering curb with six (6) inches on to field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.

FF. Passive Vent/Air Intake [Detail No. MBC-37]:

1. Minimum curb height is eight (8) inches. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all plies over cant a minimum of two (2) inches.
3. Install base flashing ply covering curb with six (6) inches on to the field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install passive vent/air intake over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendations.

GG. Roof Drain [Detail No. MBC-40]:

1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches from center of drain.
3. Run roof system plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30 inch square minimum) in 1/4inch bed of mastic. Run lead/copper into drain a minimum of two (2) inches. Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
5. Install base flashing ply (40 inch square minimum) in bitumen.
6. Install modified membrane (48 inch square minimum) in bitumen.

7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

HH. Roof Drain Alternate [Detail No. MBC-41]:

1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches from center of drain.
3. Install two (2) base flashing plies (40 inch square minimum) in bitumen.
4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of two (2) inches. Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
5. Run roof system plies over drain. Cut out plies inside drain bowl.
6. Install modified membrane (48 inch square minimum) in bitumen.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

II. Plumbing Stack [Detail No. MBC-50]:

1. Minimum stack height is 12 inches.
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of one (1) inch down inside of stack.

JJ. Heat Stack [Detail No. MBC-51]:

1. Minimum stack height is 12 inches.
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install modified membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Install new collar over cape. Weld collar or install stainless steel draw band.

KK. Pitch Pocket [Detail No. MBC-52]:

1. Run all plies up to the penetration.
2. Place the pitch pocket over the penetration and prime all flanges.
3. Strip in flange of pitch pocket with one (1) ply of base flashing ply. Extend six (6) inches onto field of roof.
4. Install second layer of modified membrane extending nine (9) inches onto field of the roof.
5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
6. Caulk joint between roof system and pitch pocket with roof cement.

LL. Pitch Pocket Umbrella [Detail No. MBC-53]:

1. Run all plies up to the penetration.
2. Place the pitch pocket over the penetration and prime all flanges.
3. Strip in flange of pitch pocket with one (1) ply of base flashing ply. Extend six (6) inches onto field of roof.
4. Install second layer of modified membrane extending nine (9) inches onto field of the roof.
5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
6. Caulk joint between roof system and pitch pocket with roof cement.
7. Place a watershedding type bonnet over the top of the pitch pocket and clamp the top with a drawband collar. Caulk the upper edge of the band with an elastomeric sealant.

3.8 APPLICATION OF SURFACING

Specifier Note: Delete one of the following subparagraphs to agree with the selected surfacing which was chosen in Section 07550.2.5.A.

- A. Prior to installation of surface, obtain approval from manufacturer as to work completed. On average, at least 30 days are required prior to final surfacing.

- B. Aggregate Surfacing
 - 1. Apply surfacing materials in the quantities specified (four (4) gal. per square). Uniformly embed aggregate in a flood coat of cold adhesive at a rate of five hundred (400) lbs. per square for aggregate or four hundred (300) lbs. per square for slag after felt flashings, tests, repairs and corrective actions have been completed and approved.

***** [OR] *****

- 1. Aggregate shall be dry and placed in a manner required to form a compact, embedded overlay. To aid in proper embedment, lightly roll aggregate provided that there is no damage to the roofing membrane.

Specifier Note: Delete one of the following subparagraphs to agree with the selected coating and/or emulsions which were chosen in Section 07550.2.5.A.

- B. Aluminum Coating:
 - 1. Allow all cold applied mastics and coating to properly dry and cure before installing the aluminum coating.
 - 2. Brush apply glass fibered asphalt emulsion at a rate of five (5) gallons per 100 square feet. Paint all exposed membrane with manufacturer's aluminum coating installed at a rate of one (1) gallon per square per coat. This shall be a one-coat application with the finished stroke in one direction.
 - 3. Paint all exposed membrane with manufacturer's non-fibrated aluminum paint installed at a rate of one-half (1/2) gallon per square per coat. This shall be a two-coat application with the finished stroke in one direction.

***** [OR] *****

- 3. Paint all exposed roofing with manufacturer's fibrated aluminum coating installed at a rate of two and one half (2-1/2) gallons per square. This shall be a one-coat application with the finished stroke in one direction.

- C. Mineral Surfaced Membrane System: While bleed out from the side and end laps are still cold, hand broadcast minerals into asphalt bleed out for a monolithic appearance. Aluminize any areas of improper adherence of minerals and rebroadcast minerals while coating is still wet.

3.9 FIELD QUALITY CONTROL

Specifier Note: The following paragraphs specify requirements for inspection and testing, if required by either the manufacturer or owner. Delete if not required for project.

- A. Perform field inspection and [and testing] as required [under provisions of Section 01410].

- B. Correct defects or irregularities discovered during field inspection.
- C. Require attendance of roofing [and insulation] materials manufacturers' representatives at site during installation of the roofing system.

3.10 CLEANING

- A. Remove bitumen adhesive drippings from all walls, windows, floors, ladders and finished surfaces.
- B. In areas where finished surfaces are soiled by asphalt or any other sources of soiling caused by work of this section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.
- C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.11 FINAL INSPECTION

Specifier Note: Modify the following paragraph to only include those parties involved in the project.

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative and other representatives directly concerned with performance of roofing system.
- B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

Specifier Note: Delete "[Roofing]" from the following paragraphs if a general contractor is utilized on the project.

- C. The roofing system manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the [Roofing] Contractor at a negotiated price.
- D. If core cuts verify the presence of damp or wet materials, the [Roofing] Contractor shall be required to replace the damaged areas at his own expense.
- E. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

Specifier Note: Delete the applicable parties from the following paragraph as appropriate to the project.

- F. Notify the [Contractor] [Architect] [Owner] upon completion of corrections.
- G. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

END OF SECTION

