

SECTION 07 14 00
FLUID-APPLIED ROOFING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Fluid-applied roofing system.
- B. Related Sections: SECTION 07 52 16 - SBS Modified Bituminous Membrane Roofing

1.2 REFERENCES

- A. ASTM C836 – High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
- B. ASTM C957 – High Solids Content, Cold-Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface.

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 “Terminology Relating to Roofing and Waterproofing”; glossary of NRCA's "The NRCA Roofing and Waterproofing Manual"; and the Roof Consultants Institute “Glossary of Roofing Terms” for definition of terms related to roofing work in this Section.
- B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, including surface preparation, application, and curing.
- B. Samples: Submit 3-inch by 1-inch samples for approval.
 - 1. Cured fluid-applied waterproofing of manufacturer's standard thickness.
 - 2. Reinforcing fabric and joint cover sheet.

- C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of meeting performance requirements.
- E. Qualification Data: For Installer and manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- G. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Applicator: Use applicator experienced in the application of the fluid-applied waterproofing for a minimum of 2-years on projects of similar size and complexity. Provide a list of completed projects including project name and location, name of engineer, name of coating manufacturer, and approximate quantity of coating applied.
 - 2. Applicator's Supervisor: Employ a supervisor during all phases of the work that had successfully completed manufacturer's contractor training program.
 - 3. Applicator's Personnel: Employ persons trained for the application of fluid-applied waterproofing.
- B. Regulatory Requirements: Comply with environmental regulations.
- C. Moisture Tests: Do not apply primer or coating to concrete surface unless two or more of the following moisture tests confirm appropriate moisture levels for properly prepared substrates:
 - 1. Plastic Sheet Method (ASTM D4263): Pass/Fail.
 - 2. Relative Humidity Test: Less than 75 percent relative humidity at 70 degrees F.
 - 3. Calcium Chloride Test: Less than 5 pounds per 1,000 square feet per 24 hours.
 - 4. Radio Frequency Test: Less than 5 percent moisture.
- D. Source Limitations: Obtain all components from single source roofing manufacturer.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
- F. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Require that all complimentary trades be present at conference. Including, but not limited to; electrical, plumbing, HVAC, and framing contractors.
 7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 8. Review governing regulations and requirements for insurance and certificates if applicable.
 9. Review temporary protection requirements for roofing system during and after installation.
 10. Review roof observation and repair procedures after roofing installation.
- G. Pre-installation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Require all trades listed in Preliminary Roofing Conference to be present.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
2. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - a. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
3. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
4. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
5. Do not deliver material to site more than one month before use.

B. Storage:

1. Store the material in accordance with manufacturer's instructions.
2. Store materials indoor in an area well ventilated and protected from damage.
3. Do not store material near open flame, sparks, or hot surfaces.
4. Store materials on raised platforms and covered by waterproofing covers.
5. Keep material containers closed.

C. Handling: Protect materials during handling and application to prevent damage.

1.8 WARRANTY

- A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 1. Single-Source special warranty includes liquid applied roofing membrane and flashing, roofing membrane accessories, and other single-source components of roofing system marketed by the manufacturer.
 2. Warranty Period: 15 years from date of Substantial Completion.
- B. Installer's Guarantee: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation,

fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Johns Manville Roofing Systems

2.2 FLUID-APPLIED WATERPROOFING

- A. Fluid-Applied Waterproofing: Two-component, high solids, elastomeric asphalt modified urethane designed for spray, squeegee, or roller application. Product: SeamFree Liquid Membrane.
- B. Self-Adhering SBS Base Patching Material: Glass-fiber-reinforced, self-adhering SBS-modified asphalt sheet; smooth surfaced; with a plastic release film on the under-side and selvage. Product: [DynaGrip Base SD/SA](#)
- C. Reinforcing Fabric and Joint Cover Sheet: Stitch bonded polyester designed for compatibility with coating materials. Product: SeamFree Scrim.
- D. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitchbonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. Product: [PermaFlash System](#).

2.3 SURFACING

- A. Provide one of the following as approved by Architect:
 1. Roofing Membrane Cap Sheet, SBS-modified asphalt sheet; granular surfaced; installed in additional layer of two-component, high solids, elastomeric asphalt modified urethane.
 2. Granule Surfaced: Full coat of approved ceramic granules specifically designed for application broadcast in additional layer of two-component, high solids, elastomeric asphalt modified urethane.
 3. Self-Adhered Membrane Cap Sheet: Glass-fiber-reinforced, self-adhering SBS-modified asphalt sheet; granular surfaced; with a plastic release film on the under-side and selvage. Product: [DynaGrip Cap](#)

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect substrate and adjacent areas where fluid-applied waterproofing will be applied. Notify the Engineer of conditions that would adversely affect the application or subsequent utilization of the fluid-applied waterproofing. Do not proceed with application until unsatisfactory conditions are corrected.

3.2 PROTECTION

- A. Protect adjacent work and surrounding areas from contact with fluid-applied waterproofing.

3.3 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply in wet weather or when rain is imminent.
- B. Consult manufacturer for application instructions if the ambient or surface temperature is below 50°F (10°F).
- C. Do not apply over substrates that are frozen or contain frost.

3.4 SURFACE PREPARATION FOR CONCRETE

- A. Prepare surface in accordance with manufacturer's instructions.
- B. Provide clean, dry, and structurally sound concrete surface.
- C. New Concrete:
 - 1. Ensure concrete has a minimum compressive strength of 3,000 psi, is dry, and is free of release agents and curing compounds before application of coating.
- D. Abrasive Blasting:
 - 1. Prepare concrete surface to receive coating by abrasive blasting.
 - 2. Remove dirt, soil, grease, oil, paint, coatings, form release agents, curing compounds, laitance, loose material, unsound concrete, and other foreign materials that would inhibit performance of coating in accordance with ASTM D4258 and by abrasive blasting.
 - 3. Obtain a firm, sound concrete surface in which bug holes are fully opened or repaired.
 - 4. Remove sharp concrete edges and projections.
 - 5. Perform abrasive blasting in accordance with ASTM D4259-88.
 - 6. Receive approval by Engineer of blasting media.
 - 7. Maintain air supply for abrasive blasting free of oil and water in accordance with ASTM D4285.
 - 8. Expose aggregate to obtain a profile of ICRI CSP 4 to 6 in accordance with ICRI 03732.

- E. Repair concrete surface to be free of holes. Fully open bug holes before repair. Repair defects in the concrete surface, such as bug holes, air pockets, and honeycomb by filling and smoothing off with patching material, epoxy patching compound, or grout. Abrasive blast repaired surfaces.
- F. Ensure substrate is clean and dry in accordance with manufacturer's instructions. Remove surface laitance from concrete surface to expose aggregate to obtain a profile of ICRI CSP 4 to 6 in accordance with ICRI 03732.
- G. Repair cracks in concrete surface with material suitable for type and width of crack, compatible with substrate and coating, and approved by the Engineer.

3.5 FLASHING

- A. Install liquid flashing system directly to prepared concrete substrate prior to installation of liquid membrane.
- B. Penetrations, Base Flashings, Low Base Flashing Heights, Unique Conditions: at waterproofing system edges, penetrations and low base heights according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Lay out reinforcement fabric, cut to fit the application. Bridge all vertical to horizontal transitions.
 - 3. Apply fluid-applied flashing directly to prepared substrate. Adhere fabric by pressing into the fluid-applied flashing while still wet.
 - 4. Completely cover fabric with at least 60 mil coat wet film thickness of fluid-applied flashing, and as required by the manufacturer.
 - 5. Extend top coat of fluid-applied flashing system 2 inches beyond edges of reinforcement fabric.
 - 6. Extend Base Flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Roof Drains
 - 1. Flash drain per manufacturer's instructions. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.6 APPLICATION

- A. Install liquid membrane over flashing system before the flashing system has fully cured per manufacturer's instruction.
 - 1. If flashing has cured, abrading the surface is required prior to installation of liquid membrane. Prepare per manufacturer's recommend.
- B. Apply fluid-applied waterproofing in accordance with manufacturer's instructions.

- C. Keep material containers tightly closed until ready for use.
- D. Keep equipment, air supplies, and application surfaces dry.
- E. Mix and apply when fluid-applied waterproofing is above 60 degrees F (15 degrees C).
- F. Do not use adulterants, thinners, or cutback solutions.
- G. Blend and mix 2-component materials in accordance with manufacturer's instructions. Do not hand mix components.
- H. Apply fluid-applied waterproofing directly to a clean and dry surface or to reinforcing fabric.
- I. Apply a 6 to 12-inch wide strip of joint cover sheet over cracks over 1/8-inch wide, non-working joints, and edges. Adhere center joint cover sheet over all joints by applying a tack coat of the fluid-applied waterproofing.
- J. Apply sufficient fluid-applied waterproofing to achieve 90-mils wet film thickness.
- K. Joint Lines:
 - 1. Prepare for joint lines should rain or other conditions require work stoppage or extended delay.
 - 2. Install joint lines clean and straight. Install overlap 6-inches minimum to ensure an impervious joint.
 - 3. Severely abrade with wire brush or sandpaper and apply bonding agent to all areas where the fluid-applied waterproofing has cured beyond its recoat window.
- L. The recoat window is 1-4 hours at 70 degrees F (21 degrees C). The recoat window is affected by air and substrate temperature. Consult manufacturer for assistance in determining recoat window for specific temperatures.
- M. Recoating:
 - 1. Recoat the fluid-applied waterproofing system within the recoat window to obtain maximum interlayer adhesion to build specific thickness.

3.7 CURING

- A. Cure fluid-applied waterproofing in accordance with manufacturer's instructions.
- B. Curing Time:
 - 1. Allow sufficient time for solvents to evaporate from the cured fluid-applied waterproofing before placing into service.
 - 2. Allow minimum solvent release time of 24-hours to 48-hours at 60 degrees F (15 degrees C) for a 90-wet mil coating thickness.
- C. Receive approval of cured coating by Owner's Representative.

3.8 SURFACING

A. Roofing Membrane Cap Sheet:

1. Install modified bituminous roofing membrane cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - a. Install a full application of liquid membrane to use as adhesive for membrane sheet.
 - b. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
2. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - a. Repair tears and voids in laps and lapped seams not completely sealed.
 - b. Apply roofing granules to cover exuded bead at laps while bead is tacky.
3. Install roofing membrane sheets so side and end laps shed water.

B. Granule Surfaced:

1. Install a full application of liquid membrane to use as adhesive for granules while still tacky.
2. Ensure complete coverage of granules over finished liquid membrane.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Self-Adhered Membrane Cap Sheet:

1. Install self-adhered modified bituminous roofing membrane cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - a. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
2. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - a. Repair tears and voids in laps and lapped seams not completely sealed.
3. Install roofing membrane sheets so side and end laps shed water.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency:** Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection:** Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION