SECTION 07 56 00

COLD LIQUID APPLIED MEMBRANE ROOFING
IN EXISTING ROOF RECOVERY
(Specification for a fully-reinforced, IMPERMITEK IR-26 roofing membrane with optional surfacing)

NOTE: This guide specification is provided as a guideline and must be modified, as required, by the Designer of Record for each project. This specification is prepared in general accordance with CSI format to be included under Division 7 – Thermal and Moisture Protection. Additional information is provided. [delete this paragraph]

Optional information is presented in "blue" font below. Choose appropriate options, delete as necessary. [delete this paragraph]

1. GENERAL

1.1. SUMMARY

A. The new roofing and waterproofing system shall consist of a cold liquid applied reinforced waterproofing membrane, flashings and finish layers as specified.

B. Work shall include, but is not limited to, the following:
1. Preparation of existing roof membrane to remain and all flashing substrates.
2. Optional SBS-modified bitumen base-ply, self-adhered.
3. New liquid applied, reinforced flashings.
4. New liquid applied, reinforced waterproofing membrane.
5. Optional liquid applied aesthetic smooth, textured, and/or slip resistant pigmented surfacing.
6. All related materials and labor required to complete specified waterproofing necessary to receive specified manufacturer's warranty.

1.2. RELATED SECTIONS

A. Division 010000 - General Requirements
B. Division 011000 - Summary of Work
C. Division 072713 - Modified Bituminous Sheet Vapor Retarders
D. Division 076200 - Sheet Metal Flashing and Trim

1.3. DEFINITIONS

A. ASTM D 1079- Standard Terminology Relating to Roofing and Waterproofing.

B. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

1.4. REFERENCES

A. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.

B. AMERICAN STANDARD OF TESTING METHODS (ASTM):

1. ASTM C 836 - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
2. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
3. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
4. ASTM D 312- Standard Specification for Asphalt Used in Roofing.
5. ASTM D 1863 – Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
6. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
7. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
8. ASTM D 3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered.
9. ASTM D 3746 - Standard Test Method for Impact Resistance of Bituminous Roofing System.
10. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
11. ASTM D 4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
12. ASTM D 5147 - Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.
13. ASTM D 5849 - Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement)
14. ASTM D 6162 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
15. ASTM D 6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
16. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

17. ASTM D 6298 - Standard Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface.
18. ASTM D 7379 - Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive.
19. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
20. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):
1. ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge System Used with Low Slope Roofing System.
2. ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
3. ANSI/SPRI IA-1, Standard Field Test Procedure for Determining the Mechanical Uplift Resistance of Insulation Adhesives over Various Substrates.
4. ANSI/FM 4474- American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.

D. CANADIAN GENERAL STANDARDS BOARD (CGSB):
1. CGSB 37-GP 56M- Standard for: Modified Bituminous, Prefabricated, and Reinforced for Roofing.

E. COOL ROOF RATING COUNCIL (CRRC)

F. EPA ENERGY STAR

G. FACTORY MUTUAL (FM):
1. FM 4450 - Approval Standard - Class I Insulated Steel Roof Decks.
2. FM 4470 - Approval Standard - Class I Roof Covers.

H. INTERNATIONAL CODES COUNCIL (ICC):
1. 2015 International Building Code (IBC).

I. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA).
1. UL 790 Standard Test Methods for Fire Tests of Roof Coverings.
2. UL 1256 – Fire Test of Roof Deck Constructions.

1.5. ACTION SUBMITTALS

A. Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.

B. Safety Data Sheets: Submit manufacturer’s Safety Data Sheets (SDS) for each component.

C. Sample warranty from the manufacturer and contractor.

D. Provide roof plan and representative detail drawings.

1.6. INFORMATIONAL SUBMITTALS

A. Submit a letter from the roofing manufacturer indicating the contractor is an authorized applicator.

1.7. CLOSEOUT SUBMITTALS

A. Warranty: Provide manufacturer's and contractor's warranties upon project completion.

1.8. QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS:
   1. Manufacturer shall have 20 years of manufacturing experience.
   2. Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.
   3. Manufacturer shall provide site visit reports in a timely manner.

B. CONTRACTOR QUALIFICATIONS:
   1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
   2. Applicators shall have completed projects of similar scope using same or similar materials specified.
   3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roofing from beginning through satisfactory project completion.
   4. Applicators shall be skilled in the application methods for all materials.
   5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
   6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.

C. SUBSTRATE EVALUATION:
   1. Contractor shall evaluate substrate moisture content and adhesion of waterproofing materials to substrate throughout the work and record with daily inspection reports or other form of reporting acceptable to the owner or his designated representative and waterproofing manufacturer.
      a. Moisture content: Evaluate substrate moisture content to determine acceptability for application of the specified liquid applied waterproofing materials. Moisture testing shall be performed by means suitable to the project application, or by testing substrate relative humidity (RH) in accordance with ASTM F 2170 when needed, required, or if substrate moisture content is in question.

      b. Adhesion: Evaluate soundness and surface preparation of concrete and/or masonry substrates. Prepare representative areas using specified methods complete with applied primer and waterproofing membrane. Test for minimum acceptable tensile

bond strength values as required in accordance with ASTM D 4541. Evaluate all areas where concrete appears to differ in appearance or consistency, if multiple areas are involved in the scope of work, evaluate each area with a minimum of (3) tests for every 5,000 ft^2 or as required by project conditions.

1.9. DELIVERY, STORAGE AND HANDLING

A. Refer to each product data sheet or other published literature for specific requirements.

B. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.

C. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.

D. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in (100 mm) or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.

E. Carefully store roof membrane materials delivered in rolls on-end with selvage edges up. Store and protect roll storage to prevent damage.

F. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.10. SITE CONDITIONS

A. SAFETY:

1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
2. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid applied or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
3. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified hot asphalt-applied materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.

4. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

B. ENVIRONMENTAL CONDITIONS:

1. Monitor substrate and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.
3. Contractor shall implement odor control measures where required during the application of waterproofing materials and adjust methods as necessary to accommodate varying project conditions.

1.11. PERFORMANCE REQUIREMENTS

A. AIR PERMEANCE:

1. Vapor Retarder/Air Barrier meets or exceeds ASTM D2178 “Standard Test Method for Air Permeance of Building Materials.”

B. WATER VAPOR TRANSMISSION:

1. Vapor Retarder/Air Barrier meets or exceeds ASTM E96 (Procedure B) “Standard Test method for Water Vapor Transmission of Materials.”

C. WIND UPLIFT RESISTANCE:

1. Performance testing shall be in accordance with ANSI/FM 4474, FM 4450, FM 4470, UL 580 or UL 1897.
   a. Roof System Design Pressures: Calculated in accordance with ASCE 7, or applicable standard, for the specified roof system attachment requirements.
   b. Design Pressures:
      i. Field of Roof (Zone 1): - 0 psf.
      ii. Perimeter of Roof (Zone 2): - 0 psf.
      iii. Corners of Roof (Zone 3): - 0 psf.
   c. Approval Rating:
      i. FM 1-00
      ii. ANSI/FM 4474 Maximum Design Pressure -000.00

D. FIRE CLASSIFICATION:

1. Performance testing shall be in accordance with UL 790, ASTM E108, FM 4450 or FM 4470 to meet the _:12 roof slope requirement.
   a. Meets requirements of UL Class A or FM Class A.
2. Performance testing shall be in accordance with UL 1256, FM 4450 or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.
   a. Meets requirements of UL 1256, or FM Class 1.

E. ROOF SLOPE:

1. Finished roof slope shall be ¼ inch per foot (2 percent) minimum for roof drainage or as allowed by applicable building and jurisdictional codes for roof assembly.

F. IMPACT RESISTANCE:

1. Performance testing for impact resistance shall be in accordance with FM 4450, FM 4470, ASTM D3746 or CGSB 37-GP 56M to meet the specified impact resistance requirements.
   a. Meets requirements for FM-SH (Severe Hail), ASTM D3746, or CGSB 37-GP 56M.

G. CYCLIC FATIGUE:

1. The roof system shall pass ASTM D5849 Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement). Passing results shall show no signs of cracking, splitting or tearing over the joint.
   a. Roof system shall pass Test Condition 4, tested at 14°F (-10°C) in accordance with ASTM D5849. **(IMPERMITEK SA STANDARD BASE-PLY glass fiber reinforced membranes).**

H. LEED SUSTAINABLE SITES (SS) CREDITS:

1. SS 7.2, Heat Island Effect-Roof. Liquid-applied, reinforced membrane cap sheet shall be highly reflective with surfacing basis of design:
   a. Seventy-five percent of the low-slope roof area shall have an SRI value greater than, or equal to, 78 as published by the Cool Roof Rating Council (CRRC).

I. COOL ROOF RATING COUNCIL (CRRC):

1. The liquid-applied, reinforced membrane cap sheet shall be listed by the Cool Roof Rating Council (CRRC) with the following minimum published values, including CRRC 3-year Rapid Ratings:
   a. Solar Reflectance: Initial: 0.66 3-year: 0.62
   b. Thermal Emittance: Initial: 0.91 3-year: 0.91

c. Solar Reflectance Index (SRI): Initial: 81 3-year: 75

1.12. WARRANTY

A. Manufacturer's Standard No Dollar Limit (NDL) Waterproofing Warranty: The manufacturer shall provide the owner with the manufacturer's warranty providing labor and materials for 10 15 20 years from the date the warranty is issued.

B. The contractor shall guarantee workmanship and shall provide the owner with the contractor's warranty covering workmanship for a period of 2 years from completion date.

2. PRODUCTS

2.1. MANUFACTURER

A. SINGLE SOURCE MANUFACTURER: All liquid applied membrane and accessories shall be manufactured by a single supplier with 20 years or more manufacturing history.

1. Comply with the manufacturer's requirements as necessary to provide the specified warranty.

B. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company. A 'Quality Compliance Certificate (QCC) for reporting/ confirming the tested values of the membrane materials will be supplied upon request.

C. ACCEPTABLE MANUFACTURER:

Registered company name: Impermitek
Address: 5031 53 Ave, Mundare, AB, T0B 3H0, Canada
Telephone: +1 780 289 4542 or +1 780 906 4600
Fax: Not Available
Website: www.impermitek.com
Email: technical@impermitek.com

2.2. ROOFING SYSTEM

A. LIQUID APPLIED WATERPROOFING MEMBRANE SYSTEM

B. SBS SELF-ADHERED BASE PLY:

1. IMPERMITEK SA STANDARD BASE PLY: SBS-modified bitumen, self-adhesive membrane with release film on the bottom surface and a sanded top surface. Glass fiber reinforcement. Meets or exceeds ASTM D6163, Type I, Grade S, per ASTM D5147 test methods:
    a. *Thickness: 87 mils (2.2 mm)*
    b. *Width: 39.4 in (1 m)*
    c. *Length: 49.2 ft (15 m)*
    d. *Roll weight: 73 lb (33.3 kg)*
    e. *Net mass per unit area, lb/100 sq ft (g/sq m): 45.5 lb (2220 g)*
    f. *Peak load @ 0°F (-18°C), lbf/in (kN/m): MD 100 lbf/in (17.5 kN/m), XMD 90 lbf/in (15.8 kN/m)*
    g. *Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m): MD 4%, XMD 4%*
    h. *Peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 50 lbf/in (8.8 kN/m), XMD 40 lbf/in (7.0 kN/m)*
    i. *Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m): MD 5%, XMD 4%*
    j. *Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m): MD 45%, XMD 45%*
    k. *Tear Strength @ 73.4°F (23°C), lbf (N): MD 60 lbf (267 N), XMD 60 lbf (267 N)*
    l. *Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)*
    m. *Dimensional stability, %: MD/XMD: Less than 0.1%*
    n. *Compound stability, °F (°C): MD/XMD: 250°F (121°C)*

2. IMPERMITEK SA FOIL-FACED BASE PLY: SBS-modified bitumen, self-adhesive membrane with release film on the bottom surface and a laminated foil film top surface. Glass fiber reinforcement. Meets or exceeds ASTM D6163, Type I, Grade S, per ASTM D5147 test methods:
    a. *Thickness: 24 mils (0.6 mm) minimum*
    b. *Width: 39.4 in (1 m)*
    c. *Length: 49.2 ft (15 m)*
    d. *Roll weight: +/-62 lb (+/-28 kg)*

C. COLD LIQUID APPLIED FIELD & FLASHING MEMBRANE:
1. IR-26 RESIN:
    a. Rapid curing, flexible hybrid polyester liquid resin with an embedded fiberglass reinforcement fabric used for monolithic waterproofing field membranes.
        i. Color: White, Light Grey

2.3. ACCESSORIES

A. PRIMERS:

1. IMPERMITEK SA STANDARD PRIMER: Rapid curing, spray or roller applied high-performance polymeric primer for bonding the IMPERMITEK Carrier membranes and vapor control layers to a variety of substrates.
   a. Color: Copper/Green

2. IMPERMITEK SA CANISTER PRIMER: Rapid curing, self-contained canister spray applied high-performance polymeric primer for bonding the IMPERMITEK Carrier membranes and vapor control layers to a variety of substrates.
   a. Color: Black

3. IMPERMITEK SA LVOC PRIMER: Rapid curing, spray or roller applied high-performance synthetic polymer-based low VOC primer for bonding the IMPERMITEK Carrier membranes and vapor control layers to a variety of substrates.
   a. Color: Copper

4. IMPERMITEK SA ZERO PRIMER: Rapid curing, spray or roller applied high-performance synthetic polymer-based zero VOC primer for bonding the IMPERMITEK Carrier membranes and vapor control layers to a variety of substrates.
   a. Color: Copper

5. IMPERMITEK SA H2O PRIMER: Rapid curing, spray or roller applied high-performance water-based polymer emulsion zero VOC primer for bonding the IMPERMITEK Carrier membranes and vapor control layers to a variety of substrates.
   a. Color: Blue

6. IMPERMITEK GENERAL PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of IMPERMITEK membranes over asphaltic substrates, wood, concrete, and approved coverboard substrates.
   a. Color: White

7. IMPERMITEK POROUS SURFACE PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of IMPERMITEK membranes over approved porous and coverboard substrates.
   a. Color: White

8. IMPERMITEK METAL DETAILING PRIMER: One component primer used to improve the adhesion of IMPERMITEK membranes to metal substrates.
    a. Color: Black

9. IMPERMITEK SINGLE PLY/PLASTIC PRIMER: One component moisture curing primer used to improve the adhesion of IMPERMITEK membranes to single-ply membranes.
    a. Color: Yellowish

10. IMPERMITEK QUICK DRY 2-PACK EPOXY PRIMER: Low odor, two-part, epoxy-based primer for a variety of approved substrates.
    a. VOC content: <100 g/L
    b. Color: Beige

11. AC TECH 2170 FC Primer: Low odor, two-component, 100% reactive solids moisture mitigation epoxy-based primer for concrete and approved substrates.
    a. AC TECH 2170 FC PART A:
        i. VOC content: 0 g/L
        ii. Color: Clear
    b. AC TECH 2170 FC PART B:
        i. VOC content: 0 g/L
        ii. Color: Yellowish

B. CATALYST:
1. IMPERMITEK CATALYST POWDER: Reactive agent used to cure IR-26 and IMPERMITEK PMMA liquid resins.

C. REINFORCING FABRIC:
1. IMPERMITEK TEKMAT 225 REINFORCEMENT: Non-woven chop strand fiberglass mat reinforcement used in IR-26 liquid applied membrane and flashing applications.
    a. Weights: 225 g/m^2
    b. Width: 38 in (96.5 cm), 38 in (96.5 cm)
    c. Length: 492 ft (150 m), 172.6 ft (52.6 m)

2. IMPERMITEK TEKMAT 450 REINFORCEMENT: Non-woven chop strand fiberglass mat reinforcement used in IR-26 liquid applied membrane and flashing applications.
    a. Weights: 450 g/m^2
    b. Width: 38 in (96.5 cm), 37.4 in (96.5 cm)
    c. Length: 268 ft (81.8 m), 103.6 ft (31 m)

3. IMPERMITEK TEKMAT FLASHING 450 REINFORCEMENT: Non-woven chop strand fiberglass mat reinforcement used in IR-26 liquid applied membrane and flashing applications.
   a. Weights: 450 g/m^2
   b. Width: 12 in (300 mm)
   c. Length: 59 ft (18 m)

4. IMPERMITEK TEKMAT BANDAGE 450 REINFORCEMENT: Non-woven chop strand fiberglass mat reinforcement used in IR-26 liquid applied membrane and flashing applications.
   a. Weights: 450 g/m^2
   b. Width: 3 in (75 mm)
5. Length: 360 ft (110 m)

6. IMPERMITEK TEKMAT SMOOTH REINFORCEMENT: Non-woven chop strand fiberglass mat reinforcement used in IR-26 liquid applied flashing applications.
   a. Weights: 100 g/m^2
   b. Width: 6 in (150 mm)
   c. Length: 328 ft (100 m)

D. CLEANER:

1. IMPERMITEK CLEANER: Clear, blended solvent used to clean and prepare plastic and metal surfaces and used to clean existing IR-26 membrane surfaces prior to the application of IR-26 liquid applied membrane, flashings, and optional IMPERMITEK surfacing.
   a. Color: Clear

E. AESTHETIC SURFACING & WALKWAY PROTECTION:

1. *IMPERMITEK IMPERMIGRIP LT (Light Texture): Rapid curing, polymethyl methacrylate (PMMA) pigmented resin with integrally mixed medium grain aggregate for slip resistant traffic surfacing and walkways.*

2. IMPERMITEK IMPERMIGRIP HT (Heavy Texture): Rapid curing, polymethyl methacrylate (PMMA) pigmented resin with integrally mixed coarse grain aggregate for slip resistant traffic surfacing and walkways.

3. *IMPERMITEK IMPERMIFINISH (smooth): Rapid curing, polymethyl methacrylate (PMMA) pigmented resin used as an aesthetic color finish.*

F. PASTE AND SUBSTRATE REPAIR MORTAR:

1. IMPERMITEK PASTE: Rapid curing, polymethyl methacrylate (PMMA) paste resin used to fill small cracks and voids on non-traffic bearing substrates prior to the application of waterproofing membranes.
   a. VOC content: 4.4 g/L
   b. Color: Grey

2. IMPERMITEK SELF-LEVELING MORTAR: Rapid curing, polymethyl methacrylate (PMMA) liquid resin-mortar used as for substrate patching and repairs.
   a. *IMPERMITEK SL MORTAR Part A: Rapid curing, polymethyl methacrylate (PMMA) liquid resin.*
      i. VOC content: <5 g/L
      ii. Color: Pebble Grey
   b. IMPERMITEK SL MORTAR Part B: Filler powder.

2.4. MISCELLANEOUS ACCESSORIES

A. SHEET METAL FLASHING:

1. Contractor shall furnish all sheet metal flashings, counter flashings, roof edge system, and all other related sheet metal flashings and associated fasteners necessary to flash and counter flash the specified waterproofing system.
2. Sheet metal flashing materials and fasteners shall be compatible with adjacent materials, to accommodate all project related exposures.
3. Pre-Finished (Mill Finished) Sheet Metal Flashing Material: Aluminum, Galvanized Steel, Stainless Steel, Copper.
4. Roof Edge System: Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.

3. EXECUTION

3.1. EXAMINATION

A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions are satisfactory to begin and remain satisfactory throughout the project.

B. The contractor shall examine all waterproofing substrates including, but not limited to decks, walls, curbs, equipment, fixtures, and wood blocking.

C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing and waterproofing materials.

D. During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.

3.2. PREPARATION

A. GENERAL

1. Before commencing work each day, the contractor shall prepare all waterproofing substrates to ensure conditions are satisfactory to proceed with the installation of specified waterproofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.
2. Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor's acceptance of conditions.

3.3. EXISTING ROOF SYSTEM PREPARATION

A. Preparation of existing roof substrates shall includes, but is not limited to, the following:

1. General:
   a. All substrates must be clean, dry, and free from gross irregularities, loose, unsound, or foreign material such as dirt, ice, snow, water, grease, oil, release agents, lacquers, or any other condition that would be detrimental to adhesion of primer and/or resin materials to the substrate. Most flashing surfaces will require mechanical abrasion in the form of scarifying, shot blasting or grinding to achieve a suitable substrate.
   b. Substrate preparation includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, cleaning and the following:

      i. The existing roof membrane shall remain in-place and all existing flashings shall be complete removed. All substrates shall be dry and prepared as required for application of the new roof system. All new flashings shall extend 8 inches (200 mm) above the top vertical surface of the existing in-place roof membrane.

      - or-

   c. The existing roof membrane and flashings shall remain in-place and be prepared as a substrate for application of the new roof system. All substrates shall be dry and prepared as required for application of the new roof system. All new flashings shall extend 4 inches (100 mm) above the top vertical termination of exist flashings to remain and shall be no less than 8 inches (200 mm) above the top vertical surface of the existing in-place roof membrane. Where required, existing vertical flashings shall be cut back and re-fastended as required to provide sufficient height for

vertical termination of new liquid applied flashings as indicated above. The area above existing flashings shall be prepared as recommended or required below.

d. Inspect all substrates and correct defects before application of waterproofing materials. Fill all surface voids 1/16 in (1.5 mm) or greater wide and/or deep with appropriate fill material.

2. Roof Field Areas:
   a. Smooth BUR or Granulated Surface Modified Bitumen Membrane:
      i. Using a manual or mechanical method, remove the loose granules from the surface of the existing roof system.
      ii. Cut out and remove all blisters and ridges on the existing roof and patch using new dry materials that are compatible with the new roofing system.
      iii. Sweep and/or blow off the roof to ensure all surfaces are free of dirt and debris. When required, lightly power wash and dry the surface and/or employ hydro-vacuuming to remove all dirt and fines. Note: Any dirt left on the surface will act as a bond breaker and prevent proper adhesion of the new materials.
      iv. Cut out and remove all blisters and ridges on the existing roof and patch using new dry materials that are compatible with the new roofing system.
      v. Wet or damaged areas of existing membrane must be removed and replaced with new, dry materials compatible with the new roofing system. Care should be taken to ensure that the existing membrane and membrane surface is dry.

   b. Gravel Surfaced BUR:
      i. Spud the roof using a manual or mechanical method to remove all the gravel from the surface of the existing BUR membrane. After removal of the gravel, the existing membrane surface must be flat and smooth with no remaining gravel, sharps, or protrusions.
      ii. Sweep and/or blow off the roof to ensure all surfaces are free of dirt and debris. When required, lightly power wash and dry the surface and/or employ hydro-vacuuming to remove all dirt and fines. Note: Any dirt left on the surface will act as a bond breaker and prevent proper adhesion of the new materials.
      iii. Cut out and remove all blisters and ridges on the existing roof and patch using new dry materials that are compatible with the new roofing system.

iv. Remove all existing base and penetration flashings as recommended or required.

v. Wet or damaged areas of existing membrane must be removed and replaced with new, dry materials compatible with the new roofing system. Care should be taken to ensure that the existing membrane and membrane surface is dry.

vi. When recommended or required, after priming, apply a smoothing screed of manufacturers proprietary PMMA mortar over the existing roof membrane to fill divots, fissures, and voids. Alternately install manufacturers self-adhered SBS modified bitumen base-ply when recommended or approved by liquid applied membrane manufacturer.

c. Existing Smooth APP or Bituminous Emulsion Coated Roofs:

i. Sweep and/or blow off the roof to ensure all surfaces are free of dirt and debris. When required, lightly power wash and dry the surface and/or employ hydro-vacuuming to remove all dirt and fines. Note: Any dirt left on the surface will act as a bond breaker and prevent proper adhesion of the new materials.

ii. Cut out and remove all blisters and ridges on the existing roof and patch using new dry materials that are compatible with the new roofing system.

iii. Wet or damaged areas of existing membrane must be removed and replaced with new, dry materials compatible with the new roofing system. Care should be taken to ensure that the existing membrane and membrane surface is dry.

iv. The top surface of existing smooth APP modified bitumen membrane and bituminous emulsion coated roofs shall be broadcast with 0.7 - 1.2 mm quartz silica. Liquified the top surface of the in-place membrane using a torch and broadcast silica aggregate into the liquid asphalt to excess. After the asphalt has cooled, remove all loose granules, dust and dirt shall be removed from the surface of the membrane by brooming and power vacuuming.

3.4. LIQUID APPLIED MEMBRANE & FLASHING SUBSTRATE PREPARATION

A. Before commencing work each day the contractor shall prepare all substrates to ensure conditions are satisfactory to proceed with the installation of specified materials.

B. Preparation of substrates includes, but is not limited to, the following:

1. General:
    a. All substrates must be clean, dry, and free from gross irregularities, loose, unsound, or foreign material such as dirt, ice, snow, water, grease, oil, release agents, lacquers, or any other condition that would be detrimental to adhesion of primer and/or resin materials to the substrate. Most surfaces will require mechanical abrasion in the form of scarifying, shot blasting or grinding to achieve a suitable substrate.
    b. Inspect all substrates and correct defects before application of waterproofing materials. Fill all surface voids 1/16 in (1.5 mm) or greater wide and/or deep with appropriate fill material.

2. Concrete Substrates:
    a. Concrete shall comply with requirements of ACI 301 and ACI 308.
    b. Concrete compressive strength: 3,500 psi for all primers or 2,500 psi minimum when use of a moisture mitigation primer is required.
    c. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
    d. Surface: Scarify, shot blast or grind to ICRI Concrete Surface Profile CSP 3 to CSP 5; CSP 3 being the preferred profile.
    e. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
    f. Areas of spalls, voids, bug holes and other deterioration on vertical or horizontal surfaces shall be repaired as required or recommended.

3. Masonry Substrates:
    a. Walls shall be structurally sound built of hard kiln dried brick, reinforced concrete block, or waterproof concrete block construction.
    b. Liquid applied membrane must not be applied over soft or scaling brick or block, faulty mortar joints, or walls with broken, damaged, or leaking coping. Areas of spalls, voids, bug holes and other deterioration on vertical surfaces shall be repaired as required or recommended.
    c. Walls of ordinary hollow tile, or other materials which in themselves are not waterproofed, should not be accepted as suitable to receive liquid applied membrane unless properly waterproofed to prevent moisture infiltration from above or behind the new liquid applied membrane.
    d. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.

e. Surface: Scarify, shot blast or grind to ICRI Concrete Surface Profile CSP 2 to CSP 4.

f. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.

4. Metal Substrates:

a. Clean and prepare metal to near-white metal in accordance with SSPC – SP3 (power tool clean) to a point maximum 1/8 in (3 mm) beyond the termination of liquid applied membrane materials and wipe with solvent cleaner to remove oils, debris, or contaminants.

b. Stainless Steel Series 300 and 400: Abrade to provide rough, open surface and wipe with solvent cleaner to remove oils, debris, or contaminants.

c. Galvanized & Zinc-Rich Metals: Galvanized and/or zinc rich metals are coated with either a layer of oil to prevent white rust or is passivated which must be completely removed prior to applying primer or liquid applied waterproofing. This can be confirmed by applying a coat of copper sulfate solution to the prepared and cleaned galvanized/zinc metal. A properly prepared surface will turn black indicating the passivator has been removed. If the surface does not turn black, additional abrasive cleaning will be required.

d. Adhesion: Examine metal substrates by conducting adhesion testing. Prime with specified metal primer where required to achieve adequate adhesion.

5. Rigid Plastics (PVC & ABS):

a. Rigid plastics should be lightly abraded and wiped with solvent cleaner. Extend preparation maximum 1/8 in (3 mm) beyond the specified termination of the liquid applied membrane flashing materials.

6. Wood Substrates:

a. Provide sanded ¾ in (19 mm) minimum thickness APA A-C, Group 1, Exterior or Exposure 1, 48 in (1220 mm) x 96 in (2440 mm) tongue & groove sheathing panels. Install all panels with “A” side up, edges supported by blocking or structural framing, fastened using only non-corrosive screw fasteners with heads installed flush with sheathing applied at 6 in (150 mm) minimum o.c. along panel edges and 12 in (300 mm) o.c. over intermediate supports and/or additional fastening as required by jurisdictional codes. All new plywood substrates shall be structural panels performance-rated pursuant to National Institute of Standards and Technology

(NIST) voluntary product standard PS-1-95; identified with American Plywood Association (APA) grade designations.

b. Hygroscopic building materials such as wood plank, timber or plywood will normally have higher moisture content (in the range of 8% to 12%) as they adsorb or desorb moisture to reach equilibrium moisture content with the surrounding air. Cold liquid applied primer and reinforced membrane should not be applied to damp or wet sheathing materials but may be applied to materials with higher moisture contents as indicated above, provided the exposed surface is clean and dry. Ultimately, determinations of moisture content and the resulting bond strength should be performed periodically to determine acceptability. If poor adhesion or blistering occurs, substrate will require additional drying time before proceeding.

c. After priming plywood panels, fill joint gaps, holes, and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 1 in (25 mm) wide bond breaker tape followed with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint. Cover knot holes or cracks with strips of cold liquid applied reinforced waterproofing membrane.

7. Acceptable Rigid Insulation & Roof Cover Boards:

a. After panels, fill joint gaps, holes, and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint.

3. Tie-In to Emulsion Coated or Smooth APP Modified Bitumen Membranes:

a. The top surface of existing emulsion coated, or smooth APP modified bitumen membrane shall be broadcast to excess with #1 (0.7 - 1.2 mm) kiln-dried quartz silica. Liquefy the top surface of the in-place membrane using a torch and broadcast silica aggregate into the liquid asphalt to excess. After the asphalt has cooled, remove all loose granules, dust, dirt, or debris from the surface of the membrane by broom, blower or power vacuuming.

4. Other Flashing Surfaces:

a. Remove all contaminants and prepare substrate as needed to receive liquid applied waterproofing.

b. Adhesion: Examine substrates by conducting adhesion testing. Prime with specified primer where required to achieve adequate adhesion.

C. Where conditions are found to be unsatisfactory, work shall not begin until conditions are adjusted appropriately. Commencing of work shall indicate contractor's acceptance of conditions.

3.5. PRIMER APPLICATION (GENERAL)

A. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.

B. Examine all substrates and conduct adhesion peel tests as necessary to ensure satisfactory adhesion is achieved.

3.6. SBS SELF-ADHERED BASE-PLY PRIMER APPLICATION

A. Wood roof decks, gypsum thermal barriers and other roof substrates require specified self-adhesive primer for self-adhered SBS membrane. Refer to manufacturer's published requirements and agency approvals.

B. Where primer is required, apply specified self-adhesive primer using roller or spray. Ensure primer is tacky to-the-touch, but not wet. Primer should not transfer to the fingertips when touched. Do not proceed if primer is wet or becomes fully dry and dirty. If primer becomes fully dry, dirty and loses all tack, re-prime the substrate as necessary to achieve membrane adhesion.

C. Examine all substrates, and conduct adhesion peel tests as necessary, to ensure satisfactory adhesion is achieved.

D. Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the membrane. Adjust primer and membrane application methods as necessary to achieve the desired results.

3.7. SBS MODIFIED BITUMEN BASE-PLY APPLICATION (SELF-ADHESIVE APPLIED)

A. Follow material product data sheets and published general requirements for installation instructions.

B. Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application of the self-adhesive membrane.

C. Unroll membrane onto the roof surface and allow time to relax prior to installing the membrane.

D. Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.

E. Ensure all roofing and flashing substrates are prepared and acceptable to receive the self-adhesive membrane.

F. Ensure primer is tacky to-the-touch, but not wet. Primer should not transfer to the fingertips when touched. Do not proceed if primer is wet or becomes fully dry and dirty. If primer becomes fully dry, dirty and loses all tack, re-prime the substrate as necessary to achieve membrane adhesion.

G. Cut rolls to working lengths and widths to conform to rooftop conditions and lay out to always work to a selvage edge.

H. Ensure membrane side-laps and end-laps are maintained.

I. Peel the release film from the underside of the membrane. Press and adhere the leading edge of the membrane to the substrate but leaving the 6 in (150 mm) end-lap un-adhered in order to heat weld the end-lap.

J. As the release film is peeled away, use a weighted roller to firmly set the sheet in place. Ensure full contact is made between the ply and the substrate for full adhesion. Use a hand-roller to roll-in vertical flashings and confined areas to firmly apply pressure.

K. At the 6 in (150 mm) end-laps, use a torch or hot-air welded to melt plastic burn-off film from the top surface where present. Embed granules or otherwise remove surfacing where present using a torch or hot-air welder. For sanded membrane, specified cold adhesive may be used to adhered end-laps. Adhere all base ply and Cap Sheet end-laps using torch or hot-air welder or adhere using specified cold adhesive.

L. At 6 in end-laps, cut a 45-degree dog-ear away from the 3 in (75 mm) selvage edge, or otherwise ensure the membrane is fully heat-welded or adhered watertight at all T-joints.

M. Offset self-adhered end-laps 3 ft (1 m).

N. Each day physically inspect all side and end-laps, and ensure the membrane is watertight. Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.

O. Inspect the installation each day to ensure the plies are fully adhered. Repair all un-adhered voids, wrinkles, open laps and all other deficiencies.

P. Offset cap sheet side and end-laps away from the base ply laps so that cap sheet laps are not located within 18 in (450 mm) of base ply laps.

Q. Follow material product data sheets and published general requirements for installation instructions.

3.8. PMMA PRIMER APPLICATION (IMPERMITEK GENERAL PRIMER & IMPERMITEK POROUS PRIMER)

A. Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
C. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
D. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
E. Allow primer to fully cure before membrane application.

3.9. EPOXY PRIMER APPLICATION (IMPERMITEK QUICK DRY 2-PACK EPOXY PRIMER)

A. Low Odor Primer Applications:

1. *Mix A and B parts using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.*
2. *Apply primer to compatible, clean, and prepared substrate preferably with falling temperature to reduce potential for pinholes from "off-gassing" and as required to enhance adhesion of new specified waterproofing materials.*
3. *Apply primer using notched squeegee and roller or brush at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.*
4. *When primer will be left exposed beyond recommended recoat times, broadcast to excess with #1 (0.7 – 1.2mm) kiln-dried quartz into the final coat of epoxy primer while still wet at the rate of 30 lb/100 ft² (1.5 kg/m²) as a mechanical bonding layer. After cure, remove loose aggregate and keep dry until subsequent system components are applied.*
5. *Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.*
6. *Allow primer to fully cure and remove excess aggregate before membrane application.*

3.10. MOISTURE MITIGATION EPOXY PRIMER APPLICATION (AC TECH 2170 FC EPOXY PRIMER)

A. Moisture Mitigation Primer Applications:

1. *Mix A and B parts using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.*
2. *Apply primer to compatible, clean, and prepared substrate preferably with falling temperature to reduce potential for pinholes from "off-gassing" and as required to enhance adhesion of new specified waterproofing materials.*
3. *Apply primer using a notched squeegee and roller or brush at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.*
4. *Allow primer to fully cure and inspect for bubbles, blisters, voids or pinholes.*
5. *Repair bubbles, blisters, voids, and pinholes as recommended by manufacturer.*
6. *For steep slope, vertical and flashing applications, minimum two coats of primer are required.*

7. *When primer will be left exposed beyond recommended recoat times, following any required primer repairs, apply a second coat of primer over the in-place primer and broadcast to excess with #1 (0.7 – 1.2mm) kiln-dried quartz into the final coat of epoxy primer while still wet at the rate of 30 lb/100 ft² (1.5 kg/m²) as a mechanical bonding layer. After cure, remove loose aggregate and keep dry until subsequent system components are applied.*
8. *Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.*
9. *Allow primer to fully cure and remove excess aggregate before membrane application.*

3.11. METAL PRIMER APPLICATION (IMPERMITEK METAL DETAILING PRIMER)

A. Mix primer resin approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
C. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
D. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
E. Allow primer to fully cure before membrane application.

3.12. SUBSTRATE PATCHING, LEVELING & REPAIR (IMPERMITEK PASTE OR IMPERMITEK SELF-LEVELING MORTAR)

A. GENERAL:
1. After priming and before commencing with application of liquid applied waterproofing, the contractor shall patch, level, or repair all substrates as required to eliminate bug holes, voids, cavities, low spots, repair cracks or any other condition that may be detrimental to proper application of the liquid applied waterproofing.

B. PATCHING, LEVELING & REPAIRS:
1. Contractor shall use proprietary paste or resin-mortar for all patching, leveling or repairs wherever possible. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
2. Traffic bearing substrates: Use only resin-mortar for all substrate leveling, patching and repairs.
3. Non-traffic bearing horizontal or vertical substrates: Use paste or resin-mortar for all substrate leveling, patching and repairs.
4. Application:

a. Install paste or resin-mortar over a fully cured primer.
b. The substrate shall be dry and free of any dust or loose particles.
c. Mix paste resin and/or resin-mortar using a slow speed agitator prior to pouring into a larger container.
d. When required, combine the paste or resin-mortar with #1 (0.7 – 1.2mm) kiln-dried quartz aggregate as recommended for deep voids or large areas.
e. Mix paste and/or resin-mortar and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
f. Apply the catalyzed paste and/or resin-mortar onto the substrate using a smoothing trowel, working the material into the surface for complete coverage and full adhesion.
g. Paste and/or resin-mortar should be placed in lifts no greater than the maximum thicknesses recommended.
h. If additional lifts will be required, broadcast top surface of the placed paste or resin-mortar with clean dry #1 (0.7 - 1.2 mm) kiln-dried quartz aggregate at approximately 25% coverage while the paste and/or resin-mortar is wet. Place next lift once the paste and/or resin-mortar has cured.

C. NON-MOVING (STATIC) CRACKS – 1 mm or less:
1. Determine that crack is non-moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin mortar or paste as required.

D. MOVING (DYNAMIC) CRACKS – 1 mm or less:
1. Determine that crack is moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin-mortar or paste as required. After the resin-mortar or paste has cured, apply minimum 4 in (100 mm) wide strip of reinforced cold liquid applied membrane centered over crack.

E. MOVING (DYNAMIC) CRACKS – 3 mm or less:
1. Determine that crack is moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin-mortar or paste as required. After the resin-mortar or paste has cured, apply bond breaker tape 5 times in width greater than the maximum anticipated expansion. Then cover with a strip of reinforced cold liquid applied membrane centered over crack sized to provided 2 in (50 mm) minimum cover beyond all side of the bond breaker tape but no less than 6 in (150 mm) minimum width.

F. MOVING (DYNAMIC) CRACKS – Greater than 3 mm:
1. Moving cracks greater than 3 mm must be treated as an expansion joint.

2. INSTALLATION & STAGING

A. In a normal cold liquid applied membrane application the substrate is prepared and primed, flashings are installed, followed by the application of the waterproofing membrane and finish. When applying broadcast aggregate, the aggregate should not be left subject to the elements, and therefore must be top coated with finish the same day of application whenever possible.

B. If work is interrupted for more than 12 hours use manufacturer's proprietary cleaner to clean and reactivate applied primer, resin mortar, flashing membrane or field membrane transition areas. Cleaner should be allowed a minimum of 20 minutes evaporation time after application and covered within 60 minutes of application or as recommended by the manufacturer.

3. FLASHING MEMBRANE APPLICATION (IMPERMITEK IR-26 MEMBRANE)

A. General:

1. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
2. Provide a minimum vertical height of 8 in (200 mm) for all flashing terminations wherever possible. Flashing height shall be at least as high as the potential water level that could be reached because of a deluging rain and/or poor slope.
3. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.
4. All flashing shall be terminated as required by the manufacturer. Cap flashings or counter flashings may be constructed of metal, stone, tile or other materials properly installed in accordance with industry-accepted practice.
5. Install all flashing membranes before installing field membranes.
6. The primed substrate shall be dry and free of any dust, loose particles, or contaminants.
7. Precut reinforcing mat to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side laps and extend flashing 4 in (100 mm) minimum horizontally onto deck unless otherwise specified. Ensure the completed liquid applied flashing membrane is fully reinforced.
8. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of waterproofing resin that can be used within the application time.
9. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
10. Immediately apply the reinforcing mat into the wet base coat of resin. Using a brush or roller, work the reinforcing mat into the wet resin while completely encapsulating the mat. Avoid any folds, dry spots, and wrinkles.

11. Immediately following base coat cure, apply the second coat of catalyzed waterproofing resin for complete encapsulation and coverage of the mat.
12. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane where required.

B. Penetrations & Flashings
   1. Pipes, Conduits, Posts, Supports and Unusual Shaped Penetrations:
      a. Pipes, conduits, and other items to be flashed must be separated with ½ in (13 mm) minimum clearance or as recommended by manufacturer to adequate waterproof each individual penetration.
      b. All penetrations must be flashed individually. Two or more items ganged together in a flashing will NOT be permitted.
      c. Flash penetrations using cold liquid applied reinforced membrane or proprietary fibrated flashing resin as recommended. Flashing shall be applied using factory pre-cut fleece wherever possible consisting of a reinforced deck skirt/target flashing applied over a reinforced vertical wrap finger flashing.

   2. Drains:
      a. Flash drains using cold liquid applied membrane. Flashing shall consist of a membrane target extending minimum 12 in (300 mm) horizontally onto the substrate applied over a finger flashing extended into the prepared drain bowl a minimum of 3 in (75 mm).
      b. At no time should the cold liquid applied membrane be installed to restrict or reduce the drain inlet in size.
      c. For new drains, contractor shall include cost of all plumbing work, piping and connection to existing storm sewer system.

   3. Hot Pipes:
      a. Protect cold liquid applied membrane components from direct contact with steam or heat sources when the in-service temperature exceeds 150°F (65.5°C). In all such cases flash to an intermediate "cool" sleeve.
      b. Fabricate "cool" sleeve in the form of a metal cone using non-ferrous metal in accordance with manufacturer details.
      c. Flash sleeve using cold liquid applied reinforced membrane similar to a standard pipe flashing. Flashing shall consist of a reinforced target applied over a reinforced vertical wrap finger flashing.

   4. Flexible Penetrations:
      a. Provide a weather-tight gooseneck set in manufacturers resin paste and secured to the deck.

b. Flash gooseneck penetrations using cold liquid applied reinforced membrane as recommended. Flashing shall consist of a reinforced target and reinforced vertical wrap finger flashing.

5. Walls, Curbs and Bases:
   a. Flash all walls, curbs and bases using cold liquid applied reinforced membrane. Wherever possible extend flashing up and over tops of walls, curbs, and bases so the membrane terminates on the opposite face of the vertical element.

6. Expansion Joints:
   a. Flash all expansion joints with minimum two layers of manufacturer's cold liquid applied reinforced membrane applied over an expansion joint compressible filler, expansion tube, backer rod and/or bond breaker tape as recommended by manufacturer.

7. Non-standard Flashing Details:
   When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations, or protrusions.

8. Thru-Wall Flashings, Mud-set Masonry, & Poured-In-Place Concrete (Bonding/Protection Layer):
   a. For all areas to receive new direct applied cement, concrete, or mortar setting bed, apply a supplementary wearing coat of membrane manufacturer's cold liquid applied resin.
      i. Using a lambswool roller, apply an even layer of cold liquid applied resin at the minimum consumption of 30 lb/100 ft^2 (1.5 kg/m^2) or as recommended by the membrane manufacturer and broadcast #1 (0.7 - 1.2mm) kiln-dried quartz aggregate into the wet resin to excess for full coverage.
      ii. Allow resin bonding layer to cure as recommended by the membrane manufacturer prior to continuing application or applying loads. Remove excess un-adhered aggregate from surface by broom, vacuum, or oil-free blower prior to apply overburden.
      iii. When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations, or protrusions.

4. FIELD MEMBRANE APPLICATION (IMPERMITEK IR-26 MEMBRANE)

A. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
B. Install all flashing membranes before installing field membranes.

C. The primed substrate shall be dry and free of any dust, loose particles, or contaminants.

D. Precut reinforcing mat to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side laps and extend flashing 4 in (100 mm) minimum horizontally onto deck unless otherwise specified. Ensure the completed liquid applied flashing membrane is fully reinforced.

E. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of waterproofing resin that can be used within the application time.

F. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.

G. Immediately apply the reinforcing mat into the wet base coat of resin. Using a brush or roller, work the reinforcing mat into the wet resin while completely encapsulating the mat. Avoid any folds, dry spots, and wrinkles.

H. Immediately following base coat cure, apply the second coat of catalyzed waterproofing resin for complete encapsulation and coverage of the mat.

I. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane where required.

5. WATERPROOFING CONTINUITY TESTING & QC EVALUATION

A. Prior to applying surfacing or finish, contractor shall conduct a complete evaluation of the installed liquid applied waterproofing membrane and flashings which shall include visual inspection as well as an acceptable method for (low voltage, high voltage, or water-flood) continuity testing when required.

B. Immediately following evaluation and continuity testing, repair all deficiencies identified in liquid applied waterproofing membrane and flashings.

C. Upon satisfactory completion of all required repairs, proceed with application of finish layers.

12. AESTHETIC SURFACING & FINISH (Optional)

A. GENERAL:

1. Refer to manufacturer's detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
2. Layout and install all surfacing and finish using manufacturer's recommended practice and procedure with appropriate masking for clean lines between sections. Where possible use color breaks reviewed and approved by the owner and/or owners' representative. Color breaks should help improve appearance, hide minor variations in color or texture and allow for localized repairs of the surfacing and finish if needed.
3. Install surfacing and finish layers over fully cured membrane layer.

4. The substrate shall be dry and free of any dust, loose particles, or contaminants.
5. Mix resins using a slow speed agitator prior to pouring into a larger container.
6. Mix surfacing or finish resins with catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
7. Apply the catalyzed surfacing or finish resin onto the substrate as recommended, working the material into the surface for complete coverage and full adhesion.
8. At tie-ins and previously applied membrane, clean cured surface with specified cleaner before application of subsequent resin materials.
9. Traffic Surfacing and Finish are semi-rigid materials formulated for durability and performance. As semi-rigid components, when applied over softer or more flexible materials, cracks and micro fissures may occur in the surfacing and finish layer. Although this does not affect the system performance, it will impact the cosmetic appearance of the surfacing and finish. To help reduce or avoid potential cosmetic cracks or fissures, surfacing and finish should not be applied over areas of potential movement including the following:
    a. Hold surfacing & finish back ½ in from horizontal to vertical transitions at walls, penetrations, and leading edge of any bond breaker.
    b. Do not apply surfacing & finish over any metal components where stripped in with membrane to allow for movement.
    c. Do not apply surfacing & finish over expansion joints or other joints where movement is possible.

******CHOOSE ONE OF THE FOLLOWING******

B. SURFACING – AESTHETIC COLOR FINISH

1. Provide waterproofing manufacturer's proprietary monochromatic color finish resin to create a smooth and readily cleanable surface. This surfacing option is not recommended where slip-resistant surfaces are required.

    a. IMPERMITEK IMPERMIFINISH Surfacing Layer
        i. Apply an even topcoat of pigmented finish resin using a notched hard rubber squeegee at minimum recommended consumption. Use an appropriate roller to remove excess resin or puddling.

C. SURFACING – TEXTURED FINISH

1. Provide waterproofing manufacturer's textured resin finish with integrally mixed aggregate to create a highly slip-resistant wearing surface.

    a. IMPERMITEK IMPERMIGRIP LT (light textured) Surfacing Layer
        i. Apply an even topcoat of pigmented textured finish resin using a flat or V-notched trowel at minimum recommended consumption. Use an appropriate roller to remove excess resin or puddling. Roll textured finish resin in one direction, then roll in the cross direction to obtain a uniform finish. Immediately remove masking before surfacing resin cures.

D. SURFACING LAYER APPLICATION:

    a. Plan and tape-out the area of work in a checkerboard fashion using fiber reinforced masking tape. After mixing, apply surfacing resin to clean, prepared and dry substrate at the required consumption.

    b. Immediately remove masking before surfacing resin cures. Following cure, re-apply masking (back tape) at completed section of surfacing before continuing and applying subsequent sections of surfacing resin.

1. ROOF WALKWAYS & PROTECTION

A. Where walkways are required for normal rooftop traffic and as a protective layer to service all rooftop equipment, provide waterproofing manufacturers textured wearing coat with integrally mixed aggregate to create a highly slip-resistant wearing surface.
    1. IMPERMITEK IMPERMIGRIP LT (Light Textured) or HT (Heavy Textured) Surfacing Layer
        a. Mix and apply an even topcoat of pigmented textured finish resin using a flat or V-notched trowel at minimum recommended consumption. Use an appropriate roller to remove excess resin or puddling. Roll textured finish resin in one direction, then roll in the cross direction to obtain a uniform finish.
    2. Walkway Surfacing Application:
        a. Mask out walkway sections to be no longer than 10 ft (3 m), with a 6 in (150 mm) minimum gap between each section to allow for drainage.
        b. Immediately remove masking before surfacing resin cures.

14. CLEAN UP

A. Uncured resin is considered a hazardous material. Unused resin must be catalyzed and cured prior to disposal.

B. Clean up and properly dispose of waste and debris resulting from these operations each day as required to prevent damage and disruptions to operations.

15. PROTECTION

A. Upon completion of new work (including all associated work), institute appropriate procedures for surveillance and protection of finished work during remainder of construction period. Protect all areas where waterproofing membrane has been installed.

END OF SECTION