SECTION 07 10 00
WATERPROOFING

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1.1 SECTION INCLUDES

A. CIM 800, two-component, cold liquid applied urethane waterproof barrier for above or below grade applications.

B. CIM 1000, fast drying, two-component, cold liquid applied asphalt extended urethane waterproof, corrosion protective and containment barrier for above or below grade applications.

C. CIM 1000 Trowel Grade, two-component, cold liquid applied, chemically thickened for trowel application, chemical and corrosion resistant urethane waterproofing for crack filler, vertical surface and corner flashing applications.

D. CIM 1061, two-component liquid applied urethane waterproofing for use in water and wastewater applications.

E. CIM ECO 1061, two-component, solvent-free, liquid applied coating approved for potable water contact.

F. CIM EMT Epoxy Primer, two-component, solvent-free epoxy primer for use on porous substrates requiring moisture tolerance.

G. CIM Eco Epoxy Primer, two-component, solvent-free epoxy coating formulated for porous and non-porous surfaces.

H. CIM VOC Compliant Bonding Agent, organo-silane adhesion promoter dispersed in acetone for use on non-porous substrates and cured coatings.

I. CIM Scrim, high strength, flexible stitch bonded polyester fabric used as reinforcement beneath liquid applied CIM coatings.

1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 05 10 00 - Structural Metal Framing.

C. Section 05 30 00 - Metal Decking.

D. Section 05 50 00 - Metal Fabrications.

E. Section 06 10 00 - Rough Carpentry.

F. Section 06 16 00 - Sheathing.

G. Section 07 18 00 - Traffic Coatings.

H. Section 07 27 00 - Air Barriers.

I. Section 07 60 00 - Sheet Metal Flashing and Trim.

J. Section 07 90 00 - Joint Protection.

K. Section 08 50 00 - Windows.

L. Section 08 44 00 - Curtain Walls.

M. Section 33 46 00 - Subdrainage.

1.3 REFERENCES

A. ASTM International (ASTM):
1. ASTM B117 - Standard Practice for Operating Salt Spray, Fog, Apparatus.
2. ASTM C836 - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
3. ASTM C957 - Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface.
4. ASTM D36 - Standard Test Method for Softening Point of Bitumen - Ring-and-Ball Apparatus.
5. ASTM D412- Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
6. ASTM D570 - Standard Test Method for Water Absorption of Plastics.
7. ASTM D624- Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
8. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
9. ASTM D751 - Standard Test Methods for Coated Fabrics.
10. ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
11. ASTM D1117 - Standard Guide for Evaluating Nonwoven Fabrics.
12. ASTM D1682 - Standard Test Methods for Breaking Load and Elongation of Textile Fabrics.
13. ASTM D2240 - Standard Test Method for Rubber Property-Durometer Hardness.
14. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
15. ASTM D3786 - Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
16. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
17. ASTM D7234 - Standard Test Method for Pull-Off Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
18. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials-Method E.

B. American National Standards Institute (ANSI):
1. ANSI-GRHC-SPRI VR-1-2011 - Procedure for Investigating Resistance to Root Penetration on Vegetative Roofs.
2. ANSI-NSF-CAN 61 - Drinking Water System Components-Health Effects.

3. ANSI 118.10-199 - Drinking Water System Components-Health Effects.

C. California Department of Public Health (CDPH):
   1. Section 01350 - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Standard Method, v 1.2, 2017.

D. U.S. Green Building Council (USGBC),

E. U.S. Environmental Protection Agency (US EPA):
   1. US EPA Method 24 - Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.

F. Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V. (FLL):
   1. E.V. Test-Green Roof Membrane/Root Barrier.

G. Green Roofs for Healthy Cities (GRHC).

H. International Building Code (IBC).

I. International Organization for Standardization (ISO):
   1. ISO 9001-2015 - Quality Management Systems-Requirements.

J. National Fire Protection Association (NFPA):
   1. NFPA 30, Class II, Class IB, Class IIIB - Flammable and Combustible Liquid Code.

K. Single Ply Roof Industry (SPRI).

L. Underwriters Laboratories (UL):
   1. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.

M. Uniform Plumbing Code (UPC).

N. Water Quality Association (WQA).

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data:
   1. Manufacturer's data sheets, including materials safety data sheets, compatibility data for any applied topcoat-maintenance coatings, and maintenance data, for each product to be used.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Typical installation methods.

C. Verification Samples: Two representative units of each type.

D. Shop Drawings: Include details of construction, substrate materials and substrate preparation, primers or bonding agents, and high performance coating. Include all system components, and relationship with adjacent construction.

E. Manufacturer's sample warranty.

F. Adhesion Tests: Submit adhesion test for use of high performance coatings over previous coatings or linings demonstrating compatibility.

G. Asphaltic Bleed Through Tests: Submit bleed through testing results for use of topcoats-maintenance coatings.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
   1. The intent of a mock-up is to demonstrate quality of workmanship and visual appearance.
   2. If the mock-up is not acceptable, rebuild the mock-up until satisfactory results are achieved.
   3. Retain mock-up during construction as a standard for comparison with completed work.
   4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store and handle each waterproofing system component in strict compliance with manufacturer's written instructions and recommendations.

B. Protect from damage due to weather, excessive temperature, and construction operations. Store aggregates use for reflective surfaces and topcoats to remain completely dry.

C. Handle products in a manner that prevents contamination with water or moisture. Keep all pails and jugs tightly closed until ready for use,

1.8 PROJECT CONDITIONS

A. Maintain environmental temperature, humidity, ventilation, dew point, and sunlight conditions within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

B. All equipment, air supplies and application substrates must be absolutely dry.

C. Do not apply waterproofing when products or substrate may become wet withing 6 hours of application.

D. Comply with manufacturer's written instructions for applying waterproofing in confined spaces.

E. Comply with manufacturer's written instructions for applying waterproofing in cold temperatures, and when substrate temperatures are in decline.

1.9 WARRANTY

A. Manufacturer's Limited Warranty: Manufacturer's standard limited warranty for waterproofing coating warrants that, when properly mixed and installed, the product will not become brittle or crack and will provide a water barrier.
   1. Warranty Period: 5 years from date of shipment to initial purchaser.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Chase Corporation, which is located at:
375 University Ave.
Westwood, MA 02090
Tel: 781-750-0525
Fax: 781-332-0701
Email:request info (insidesales@chasecorp.com);Web:https://chasecorp.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.

2.2 COLD LIQUID-APPLIED WATERPROOFING

A. Basis of Design: CIM 800, as manufactured and supplied by C.I.M. Industries, Inc.
   1. Two-component, weather durable, seamless, self-adhering, self-flashing, cold liquid-applied urethane waterproof barrier for above or below grade applications.
   2. Performance and Design Requirements:
      a. Standards Compliance:
         1) ANSI-GRHC-SPRI VR-1, 2011.
         2) ANSI 118.10.
         3) ASTM C836.
         4) ASTM C957.
         5) ASTM D36.
         6) ASTM D412.
         7) ASTM D624, Die C.
         8) ASTM D648.
         9) ASTM D751.
         10) ASTM D2240.
         11) ASTM D2859.
         12) ASTM D4060.
         13) ASTM E96, Method E.
         14) IBC.
         15) NFPA 30.
         16) UL 790.
         17) UPC.
      b. Performance Requirements:
         1) Abrasion Resistance: ASTM D4060, CS-17 Wheel, 1000 gr (1.0 kg), 1000 rev, 0.0000012 kg (1.2 mg) loss.
         2) Adhesion to Concrete, Dry: ASTM D7234, greater than 350 psi (2.41 MPa).
         3) Deflection Temperature, Minimum Use Temperature: ASTM D648, below -40 deg F (-40 deg C).
         4) Density:
            a) Premix: 8.0 lbs gal (0.96 kg L).
            b) Activator: 10.1 lbs gal (1.21 kg L).

c) Mixed and Cured: 8.5 lbs gal 1.02 kg L).

5) Elastomeric Waterproofing: ASTM C836, ASTM C957, exceeds all criteria.
6) Extension to Break: ASTM D412, 400 percent.
7) Flammability:
a) ASTM D2859, pass, combustible substrate.
b) UL 790: Class A.
8) Flooring and Shower Lining: UPC-IBC-ANSI 118.10, pass.
9) Hardness, Shore A: ASTM D2240, at 77 deg F (25 deg C), 60.
10) Liner Performance Crack Bridging:
a) 10 Cycles at -15 deg F (-26.1 deg C): Greater than 1/8 inch (3.18 mm).
b) After Heat Aging: Greater than 1/4 inch (6.35 mm).
11) Liner Weight: 37.8 lbs per 100 sq ft (1.85 kg m2).
12) Permeability to Water Vapor: ASTM E96, Method E at 100 deg F (37.8 deg C), 100 mil (2.54 mm) sheet, 0.03 perms (1.72 Pa s m2).
13) Recovery from 100 Percent Extension after 5 Minutes: 98 percent.
a) After 24 Hours: 100 percent.
14) Service Temperature: -60 deg F (- 51.1 deg C) to 180 deg F to (82.2 deg C).
15) Softening Point, Ring and Ball: ASTM D36, 275 deg F (135 deg C).
16) Tear Strength: ASTM D624, Die C, 115 lbs inch (20.1 N mm).
17) Tensile Strength: ASTM D412, 100 mil (2.54 mm) sheet, 800 psi (5.52 MPa).

c. Design Requirements:
1) Minimum Coating Thickness: 60 mils (1.52 mm), wet.
2) Solids by Volume, Mixed: 90 percent, 1448 mil x sq ft per gal (903 microns m2 L).
3) Traffic Resistance: Durable, foot traffic.
4) UV Exposure Limit: No longer than 180 days.
5) VOC: 0.80 lbs gal (95 g L).

3. Shipping and Safety Properties:
a. Premix:
1) Flash Point: 101 deg F (38.3 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 20-110 deg F (-6.7-43.3 deg C).
5) Shelf Life: 2 years.
6) NFPA 30: Class II.

b. Activator:
1) Flash Point: Greater than 400 deg F (204.4 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 70-95 deg F (21.1-35 deg C).
5) Shelf Life: 1 year.
6) NFPA 30: Class III B.

4. Aggregates: Kiln dried, bagged.
a. Vertical and Sloped Surfaces:
1) Fine Aggregate: 60 mesh or smaller.
2) Light Aggregate: 60 mesh or smaller.

b. Roofs:
1) Roofing granules up to 1/4 inch.
2) 20-30 boiler slag, black beauty.
3) Play sand.

c. Parking Decks: 30-60 boiler slag.
d. Pedestrian Decks: Finer aggregate.

5. Physical Properties:
    a. Color: Black. Glossy when wet, flat when dry.
    b. Color Surface Finishes: As selected by the Architect.
    c. Reflective Surfaces: As selected by the Architect.
    d. Mix Ratio:
        1) By Weight: 7.7:1.
        2) By Volume: 9.6:1.
    e. Mullen Burst Strength: ASTM D751, 50 mil (1.27 mm), 100 psi (1.03 MPa).

B. Basis of Design: CIM 1000, as manufactured and supplied by C.I.M. Industries, Inc.
1. Two-component, UV stable, cold liquid-applied asphalt extended urethane waterproof barrier for applications that require corrosion protection, containment of water and containment of most aqueous chemicals.
2. Performance and Design Requirements:
    a. Standards Compliance:
        1) ANSI 118.10.
        2) ASTM B117.
        3) ASTM C836.
        4) ASTM C957.
        5) ASTM D36.
        6) ASTM D412.
        7) ASTM D624, Die C.
        8) ASTM D648.
        9) ASTM D751.
        10) ASTM D822.
        11) ASTM D2240.
        12) ASTM D2859.
        13) ASTM D4060.
        14) ASTM E96, Method E.
        15) FLL.
        16) IBC.
        17) NFPA 30.
        18) UL 790.
        19) UPC.
        20) WQA.
    b. Performance Requirements:
        1) Abrasion Resistance: ASTM D4060, Weight Loss Taber Abraser CS-17 Wheel, 1000 gr (1.0 kg), 1000 rev, 0.0000012 kg (1.2 mg) loss.
        2) Adhesion to Concrete, Dry: Elcometer, 350 psi (2.41 MPa).
        3) Deflection Temperature, Minimum Use Temperature: ASTM D648, below -60 deg F (- 51.1 deg C).
        4) Density:
            a) Premix: 8.0 lbs gal (0.96 kg L).
            b) Activator: 10.1 lbs gal (1.21 kg L).
            c) Mixed and Cured: 8.3 lbs gal (0.99 kg L).
        5) Elastomeric Waterproofing: ASTM C836, ASTM C957, exceeds all criteria.
        6) Extension to Break: ASTM D412, 400 percent.
        7) Flammability:
            a) ASTM D2859, pass, combustible substrate.
            b) UL 790: Class A1.
        8) Flooring and Shower Lining: UPC-IBC-ANSI 118.10, pass.
        9) Green Roof Membrane - Root Barrer: FLL, Pass.
        10) Hardness, Shore A: ASTM D2240, at 77 deg F (25 deg C), 60.
        11) Liner Performance Crack Bridging:
            a) 10 Cycles at -15 deg F (-261 deg C): Greater than 1/8 inch (3.18

mm).
b) After Heat Aging: Greater than 1/4 inch (6.35 mm).
12) Liner Weight: 60 Mil (1.52 mm) Wet Film Thickness: 31 lbs per 100 sq ft (1.51 kg m)
13) Permeability to Water Vapor: ASTM E96, Method E at 100 deg F (37.8 deg C), 100 mil (2.54 mm) sheet, 0.03 perms (1.72 Pa s m2).
14) Recovery from 100 Percent Extension after 5 Minutes: 98 percent.
a) After 24 Hours: 100 percent.
15) Salt Spray: ASTM B117, Pass, 2000 hours.
16) Service Temperature: -60 deg F (- 51.1 deg C) to 220 deg F to (104.4 deg C).
17) Softening Point, Ring and Ball: ASTM D36, Greater than 325 deg F (162.8 deg C).
18) Tear Strength: ASTM D624, Die C, 150 lbs inch (26.3 N mm).
19) Tensile Strength: ASTM D412, 100 mil (2.54 mm) sheet, 900 psi (6.21 MPa).

c. Design Requirements:
1) Minimum Coating Thickness: 60 mils (1.52 mm), wet.
2) Solids by Volume, Mixed: 88 percent, 1413 dry mil x sq ft per gal (0.88 microns m2 L).
3) Traffic Resistance: Durable, vehicular and foot traffic.
4) Weathering: ASTM D822, Pass, 5000 hours.
5) VOC: 0.76 lbs gal (91.1 g L).

3. Shipping and Safety Properties:
a. Premix:
1) Flash Point: 101 deg F (38.3 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 20-110 deg F (-6.7-43.3 deg C).
5) Shelf Life: 2 years.
6) NFPA 30: Class II.

b. Activator:
1) Flash Point: Greater than 400 deg F (204.4 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 70-95 deg F (21.1-35 deg C).
5) Shelf Life: 1 year.
6) NFPA 30: Class III B.

4. Aggregates: Kiln dried, bagged.
a. Vertical and Sloped Surfaces:
1) Fine Aggregate: 60 mesh or smaller.
2) Light Aggregate: 60 mesh or smaller.

b. Roofs:
1) Roofing granules up to 1/4 inch.
2) 20-30 boiler slag, black beauty.
3) Play sand.

c. Parking Decks: 30-60 boiler slag.
d. Pedestrian Decks: Finer aggregate.

5. Physical Properties:
a. Color: Black. Glossy when wet, flat when exposed to direct sunlight 3 - 6 months.
b. Color Surface Finishes: As selected by the Architect.
c. Reflective Surfaces: As selected by the Architect.
d. Mix Ratio:
1) By Weight: 7:1.
2) By Volume: 9:1.

e. Mullen Burst Strength: ASTM D751, 50 mil (1.27 mm), 150 psi (1.03 MPa).

C. Basis of Design: CIM 1000 Trowel Grade, as manufactured and supplied by C.I.M. Industries, Inc.
1. Trowel grade, two-component, UV stable, cold liquid-applied asphalt extended urethane waterproof barrier, chemically thickened for trowel applications with minimum sag.
2. Performance and Design Requirements:
a. Standards Compliance:
1) ANSI 118.10.
2) ANSI-NSF 61.
3) ASTM B117.
4) ASTM C836.
5) ASTM C957.
6) ASTM D36.
7) ASTM D412.
8) ASTM D624, Die C.
9) ASTM D648.
10) ASTM D751.
11) ASTM D822.
12) ASTM D2240.
13) ASTM D2859.
14) ASTM D4060.
15) ASTM E96, Method E.
16) FLL.
17) IBC.
18) NFPA 30.
19) UL 790.
20) UPC.
21) WQA.
b. Performance Requirements:
1) Abrasion Resistance: ASTM D4060, Weight Loss Taber Abraser CS-17 Wheel, 1000 gr (1.0 kg), 1000 rev, 0.0000012 kg (1.2 mg) loss.
2) Adhesion to Concrete, Dry: Elcometer, 350 psi (2.41 MPa).
3) Deflection Temperature: ASTM D648, below -60 deg F (- 51.1 deg C).
4) Density:
a) Premix: 7.9 lbs gal (0.95 kg L).
b) Activator: 10.1 lbs gal (1.21 kg L).
c) Mixed and Cured: 8.3 lbs gal (0.99 kg L).
5) Elastomeric Waterproofing: ASTM C836, ASTM C957, exceeds all criteria.
6) Extension to Break: ASTM D412, 300 percent.
7) Flammability:
a) ASTM D2859, pass, combustible substrate.
b) UL 790: Class A1.
8) Flooring and Shower Lining: UPC-IBC-ANSI 118.10, pass.
9) Green Roof Membrane - Root Barrer: FLL, Pass.
10) Hardness, Shore A: ASTM D2240, at 77 deg F (25 deg C), 60.
11) Liner Performance Crack Bridging:
a) 10 Cycles at -15 deg F (-26.1 deg C): Greater than 1/8 inch (3.18 mm).
b) After Heat Aging: Greater than 1/4 inch (6.35 mm).
12) Liner Weight: 60 Mil (1.52 mm) Wet Film Thickness: 31 lbs per 100 sq ft (1.51 kg m2).
13) Permeability to Water Vapor: ASTM E96, Method E at 100 deg F (37.8 deg C), 100 mil (2.54 mm) sheet, 0.03 perms (1.72 Pa s m2).

14) Potable Water Service: ANSI-NSF 61, To 180 deg F (82.2 deg C), UL File Number MH17445, WQA certified.
15) Recovery from 100 Percent Extension after 5 Minutes: 98 percent.
a) After 24 Hours: 100 percent.
16) Salt Spray: ASTM B117, Pass, 2000 hours.
17) Service Temperature: -60 deg F (- 51.1 deg C) to 220 deg F to (104.4 deg C).
18) Softening Point, Ring and Ball: ASTM D36, Greater than 325 deg F (162.8 deg C).
19) Tear Strength: ASTM D624, Die C, 150 lbs inch (26.3 N mm).
20) Tensile Strength: ASTM D412, 100 mil (2.54 mm) sheet, 800 psi (5.52 MPa).

c. Design Requirements:
1) Minimum Coating Thickness: 60 mils (1.52 mm), wet.
2) Solids by Volume, Mixed: 88 percent, 1428 dry mil x sq ft per gal (0.89 microns m2 L).
3) Weathering: ASTM D822, Pass, 5000 hours.
4) VOC: 0.74 lbs gal (88.7 g L).

3. Shipping and Safety Properties:
a. Premix:
1) Flash Point: 101 deg F (38.3 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 101 deg F (38.3 deg C).
5) Shelf Life: 2 years.
6) NFPA 30: Class II.

b. Activator:
1) Flash Point: Greater than 400 deg F (204.4 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 70-95 deg F (21.1-35 deg C).
5) Shelf Life: 1 year.
6) NFPA 30: Class III B.

4. Aggregates: Kiln dried, bagged.
a. Vertical and Sloped Surfaces:
1) Fine Aggregate: 60 mesh or smaller.
2) Light Aggregate: 60 mesh or smaller.

b. Roofs:
1) Roofing granules up to 1/4 inch.
2) 20-30 boiler slag, black beauty.
3) Play sand.

c. Parking Decks: 30-60 boiler slag.
d. Pedestrian Decks: Finer aggregate.

5. Physical Properties:
a. Color: Black. Glossy when wet, flat when exposed to direct sunlight 3 - 6 months.
b. Color Surface Finishes: As selected by the Architect.
c. Reflective Surfaces: As selected by the Architect.
d. Mix Ratio:
1) By Weight: 6.1:1.
2) By Volume: 7.7:1.

e. Mullen Burst Strength: ASTM D751, 50 mil (1.27 mm), 150 psi (1.03 MPa).

D. Basis of Design: CIM 1061, as manufactured and supplied by C.I.M. Industries, Inc.
1. Potable water certified, two-component, UV stable, cold liquid-applied elastomeric urethane waterproof barrier for use in water and wastewater applications.

2. Performance and Design Requirements:
    a. Standards Compliance:
        1) ANSI 118.10.
        2) ANSI-NSF 61.
        3) ASTM C836.
        4) ASTM C957.
        5) ASTM D36.
        6) ASTM D412.
        7) ASTM D624, Die C.
        8) ASTM D648.
        9) ASTM D751.
        10) ASTM D822.
        11) ASTM D2240.
        12) ASTM D4060.
        13) ASTM E96, Method E.
        14) FLL.
        15) IBC.
        16) NFPA 30.
        17) UL.
        18) UPC.
        19) WQA.
    b. Performance Requirements:
        1) Abrasion Resistance: ASTM D4060, Weight Loss Taber Abraser CS-17 Wheel, 1000 gr (1.0 kg), 1000 rev, 0.0000012 kg (1.2 mg) loss.
        2) Adhesion to Concrete, Dry: Elcometer, 350 psi (2.41 MPa).
        3) Deflection Temperature: ASTM D648, below -60 deg F (- 51.1 deg C).
        4) Density:
            a) Premix: 8.0 lbs gal (0.96 kg L).
            b) Activator: 10.1 lbs gal (1.21 kg L).
            c) Mixed and Cured: 8.3 lbs gal (0.99 kg L).
        5) Elastomeric Waterproofing: ASTM C836, ASTM C957, exceeds all criteria.
        6) Extension to Break: ASTM D412, 300 percent.
        7) Flooring and Shower Lining: UPC-IBC-ANSI 118.10, pass.
        8) Green Roof Membrane-Root Barrer: FLL, Pass.
        9) Hardness, Shore A: ASTM D2240, at 77 deg F (25 deg C), 65.
        10) Liner Performance Crack Bridging:
            a) 10 Cycles at -15 deg F: Greater than 1/8 inch (3.18 mm).
            b) After Heat Aging: Greater than 1/4 inch (6.35 mm).
        11) Liner Weight: 60 Mil (1.52 mm) Wet Film Thickness: 31 lbs per 100 sq ft (1.51 kg m2).
        12) Permeability to Water Vapor: ASTM E96, Method E at 100 deg F (37.8 deg C), 100 mil (2.54 mm) sheet, 0.03 perms (1.72 Pa s m2).
        13) Potable Water Service: ANSI-NSF 61, To 180 deg F (82.2 deg C), UL File Number MH17445, WQA certified.
        14) Recovery from 100 Percent Extension after 5 Minutes: 98 percent.
            a) After 24 Hours: 100 percent.
        15) Service Temperature: -60 deg F (- 51.1 deg C) to 220 deg F to (104.4 deg C).
        16) Softening Point, Ring and Ball: ASTM D36, Greater than 325 deg F (162.8 deg C).
        17) Tear Strength: ASTM D624, Die C, 180 lbs inch (31.5 N mm).
        18) Tensile Strength: ASTM D412, 100 mil (2.54 mm) sheet, 1000 psi (6.89 MPa).
    c. Design Requirements:
        1) Minimum Coating Thickness: 60 mils (1.52 mm), wet.

2) Solids by Volume, Mixed: 88 percent, 1416 dry mil x sq ft per gal (0.88 microns m2 L).
3) Weathering: ASTM D822, Pass, 5000 hours.
4) VOC: 0.75 lbs gal (89.9 g L).

3. Shipping and Safety Properties:
   a. Premix:
      1) Flash Point: 101 deg F (38.3 deg C).
      2) Shipping Name: Not regulated.
      3) DOT Class: Not regulated.
      4) Storage Temperature: 20-110 deg F (-6.7-43.3 deg C).
      5) Shelf Life: 2 years.
      6) NFPA 30: Class II.
   b. Activator:
      1) Flash Point: Greater than 400 deg F (204.4 deg C).
      2) Shipping Name: Not regulated.
      3) DOT Class: Not regulated.
      4) Storage Temperature: 70-95 deg F (21.1-35 deg C).
      5) Shelf Life: 1 year.
      6) NFPA 30: Class III B.
4. Aggregates: Kiln dried, bagged.
   a. Vertical and Sloped Surfaces:
      1) Fine Aggregate: 60 mesh or smaller.
      2) Light Aggregate: 60 mesh or smaller.
   b. Roofs:
      1) Roofing granules up to 1/4 inch.
      2) 20-30 boiler slag, black beauty.
      3) Play sand.
   c. Parking Decks: 30-60 boiler slag.
   d. Pedestrian Decks: Finer aggregate.
5. Physical Properties:
   a. Color: Black. Glossy when wet, flat when exposed to direct sunlight 3-6 months.
   b. Color Surface Finishes: As selected by the Architect.
   c. Reflective Surfaces: As selected by the Architect.
   d. Mix Ratio:
      1) By Weight: 6.2:1.
      2) By Volume: 7.8:1.
   e. Mullen Burst Strength: ASTM D751, 50 mil (1.27 mm), 150 psi (1.03 MPa).

E. Basis of Design: CIM ECO 1061, as manufactured and supplied by C.I.M. Industries, Inc.
1. Potable water certified, two-component, UV stable, solvent and VOC free, self-leveling, cold liquid-applied elastomeric urethane waterproof barrier for potable water applications.
2. Performance and Design Requirements:
   a. Standards Compliance:
      1) ANSI 118.10.
      2) ANSI-NSF-CAN 61.
      3) ASTM C836.
      4) ASTM C957.
      5) ASTM D36.
      6) ASTM D412.
      7) ASTM D570.
      8) ASTM D624, Die C.
      9) ASTM D648.
      10) ASTM D751.
      11) ASTM D822.
      12) ASTM D2240.

13) ASTM D4060.
14) ASTM D7234.
15) ASTM E96, Method E.
16) CDPH 01350, Method, v 1.2.
17) IBC.
18) LEED V4.1.
19) NFPA 30.
20) UL.
21) UPC.
22) US EPA, Method 24.
23) WQA.

b. Performance Requirements:
1) Abrasion Resistance: ASTM D4060, Weight Loss Taber Abraser CS-17 Wheel, 1000 gr (1.0 kg), 1000 rev, 0.0000012 kg (1.2 mg) loss.
2) Adhesion to Concrete, Dry: ASTM D7234, 350 psi (2.41 MPa).
3) Deflection Temperature: ASTM D648, below -60 deg F (- 51.1 deg C).
4) Density:
a) Premix: 8.0 lbs gal (0.96 kg L).
b) Activator: 10.1 lbs gal (1.21 kg L).
c) Mixed and Cured: 8.3 lbs gal (0.99 kg L).
5) Elastomeric Waterproofing: ASTM C836, ASTM C957, exceeds all criteria.
6) Extension to Break: ASTM D412, 330 percent.
7) Flooring and Shower Lining: UPC-IBC-ANSI 118.10, pass.
8) Hardness, Shore A: ASTM D2240, at 77 deg F (25 deg C), 70.
9) Liner Performance Crack Bridging:
a) ASTM C836, 10 Cycles at -15 deg F (-26.1 deg C): Greater than 1/8 inch (3.18 mm).
b) After Heat Aging: Greater than 1/4 inch (6.35 mm).
10) Liner Weight: 60 Mil (1.52 mm) Wet Film Thickness: 31 lbs per 100 sq ft (1.51 kg m2).
11) Permeability to Water Vapor: ASTM E96, Method E, 100 mil (2.54 mm) sheet, Less than 0.05 perms (2.87 Pa s m2).
12) Potable Water Service: Cold Water: ANSI-NSF 61.
13) Recovery from 100 Percent Extension after 5 Minutes: 98 percent.
a) After 24 Hours: 100 percent.
14) Service Temperature: -60 deg F (- 51.1 deg C) to 220 deg F to (104.4 deg C).
15) Softening Point, Ring and Ball: ASTM D36, Greater than 325 deg F (162.8 deg C).
16) Tear Strength: ASTM D624, Die C, 150 lbs inch (26.3 N mm).
17) Tensile Strength: ASTM D412, 900 psi (6.21 MPa).

c. Design Requirements:
1) Minimum Coating Thickness: 60 mils (1.52 mm), wet.
2) Solids by Volume, Mixed: 100 percent, 1604 dry mil x sq ft per gal (1.0 microns m2 L).
3) Water Absorption: ASTM D570, Long Term, Less than 0.5 percent,
4) Weathering: ASTM D822, Pass, 5000 hours.
5) VOC: VOC free.

3. Shipping and Safety Properties:
a. Premix:
1) Flash Point: 101 deg F (38.3 deg C).
2) Shipping Name: Coating Solution.
3) DOT Class: Not regulated.
a) Reclassified: UN1139, Coating Solutions, Class 3, PGIII.
4) Storage Temperature: 20-110 deg F (-6.7-43.3 deg C).

5) Shelf Life: 2 years.
6) NFPA 30: Class II.

b. Activator:
1) Flash Point: Greater than 400 deg F (204.4 deg C).
2) Shipping Name: Not regulated.
3) DOT Class: Not regulated.
4) Storage Temperature: 70-95 deg F (21.1-35 deg C).
5) Shelf Life: 1 year.
6) NFPA 30: Class III B.

4. Aggregates: Kiln dried, bagged.
a. Vertical and Sloped Surfaces:
1) Fine Aggregate: 60 mesh or smaller.
2) Light Aggregate: 60 mesh or smaller.

b. Roofs:
1) Roofing granules up to 1/4 inch.
2) 20-30 boiler slag, black beauty.
3) Play sand.

c. Parking Decks: 30-60 boiler slag.
d. Pedestrian Decks: Finer aggregate.

5. Physical Properties:
a. Color: Black. Glossy when wet, flat when exposed to direct sunlight 3-6 months.
b. Color Surface Finishes: As selected by the Architect.
c. Reflective Surfaces: As selected by the Architect.
d. Mix Ratio:
1) By Weight: 6.2:1.
2) By Volume: 7.8:1.

e. Mullen Burst Strength: ASTM D751, 50 mil (1.27 mm), 150 psi (1.03 MPa).

2.3 ANCILLARY INSTALLATION MATERIALS

A. Basis of Design: CIM EMT Epoxy Primer, as manufactured and supplied by C.I.M. Industries, Inc.

1. Two-component, solvent free, moisture tolerant epoxy primer for porous and non-porous surfaces.
2. Performance and Design Requirements:
a. Standards Compliance:
1) ASTM E96.

b. Performance Requirements:
1) Permeability: ASTM E96 Procedure B, 0.29 perms (16.6 Pa s m2).
2) Reduction in Permeability on Concrete: Greater than 99 percent.
3) Solids by Volume, Mixed: 97 percent, 1556 mil x sq ft gal (0.97 microns m2 L).
4) VOC: 0.3 lbs gal (35.9 g L).

c. Design Requirements:
1) Minimum Coating Thickness Per Coat: 15-20 mils (0.38-0.51 mm), wet.

3. Shipping and Safety Properties:
a. Resin:
1) Density: 12.5 lbs gal (1.50 kg L).
2) Flash Point: 300 deg F (148.9 deg C).
3) DOT Class: Not regulated.

b. Hardener:
1) Density: 8.4 lbs gal (1.01 kg L).
2) Flash Point: 210 deg F (98.9 deg C).
3) Shipping Name: Amines liquid, corrosive, n.o.s.
4) DOT Class: Class 8, UN2735, PGIII.

4. Physical Properties:

a. Resin Color: White.
b. Hardener Color: Semi-Transparent Brown.
c. Mixed and Cured Color: Clear appearance on concrete.
d. Mixing Ratio, by Volume: 2 parts resin, 1 part hardener.

B. Basis of Design: CIM ECO Epoxy Primer, as manufactured and supplied by C.I.M. Industries, Inc.
1. Two-component, solvent free, epoxy primer for porous and non-porous applications.
2. Performance and Design Requirements:
a. Standards Compliance:
1) ASTM E96.
b. Performance Requirements:
1) Permeability: ASTM E96 Procedure B, 0.50 perms (28.6 Pa s m2).
2) Solids by Volume, Mixed: 97 percent, 1556 mil x sq ft gal (0.97 microns m2 L).
3) VOC: 0.3 lbs gal (40 g L).
c. Design Requirements:
1) Minimum Coating Thickness Per Coat: 5 to 10 mils (0.13-0.25 mm), wet.
3. Shipping and Safety Properties:
a. Resin:
1) Density: 13.6 lbs gal (1.63 kg L).
2) Flash Point: 300 deg F (148.9 deg C).
3) DOT Class: Not regulated.
b. Hardener:
1) Density: 8.4 lbs gal (1.01 kg L).
2) Flash Point: 300 deg F (148.9 deg C).
3) DOT Class: Not regulated.
4. Physical Properties:
a. Resin Color: Tan.
b. Hardener Color: Semi-Transparent Brown.
c. Mixed and Cured Color: Tan appearance.
d. Mixing Ratio, by Volume: 2.5 parts resin, 1 part hardener.

C. Basis of Design: CIM VOC Compliant Bonding Agent, as manufactured and supplied by C.I.M. Industries, Inc.
1. Single component, organo-silane compound dispersed in acetone for improving adhesion of high performance coatings and linings to non-porous coating applications.
2. Performance and Design Requirements:
a. Standards Compliance:
1) ANSI-NSF 61.
b. Performance Requirements:
1) Solids by Volume, Mixed: 1 percent.
2) VOC: 0.
c. Design Requirements:
1) Recommended Coverage: Porous Surfaces: 300 sq ft gal (7.36 m2 L). Non-Porous Surfaces: 600 sq ft gal (14.73 m2 L).
3. Shipping an Safety Properties:
a. Flash Point: 0 deg F (-17.8 deg C).
b. Shipping Name: Acetone Mixture.
c. DOT Class: Class 3, UN1090, PGII.
d. Storage Temperature: 20-90 deg F (-6.7-32.2 deg C).
e. Shelf Life: 2 years at recommended storage.
f. NFPA 30: Class 1B.
4. Physical Properties:
a. Color: Clear.

D. Basis of Design: CIM Scrim, as manufactured and supplied by C.I.M. Industries, Inc.
   1. High-strength, flexible, weather and UV resistant stitch bonded polyester for liner and roofing applications.
   2. Performance and Design Requirements:
      a. Standards Compliance:
         1) ASTM D1117.
         2) ASTM D1682.
         3) ASTM D3786.
      b. Physical Properties:
         1) Elongation: ASTM D1682, 61.65 percent average.
         2) Mullen Burst: ASTM D3786, 176.8 lbs (786.4 N).
         3) Tensile: ASTM D1682, 57.1 lbs (254.0 N) average.
         4) Trapezoidal Tear Strength: ASTM D1117, 16.1 lbs (71.6 N) average.
         5) Weight: 3 oz sq yd (101.7 g m2).
      c. Design Requirements:
         1) Width and Length: 6 inch x 100 yd (152.4 mm x 91.44 m).
         2) Width and Length: 12 inch x 100 yd (304.8 mm x 91.44 m).
         3) Width and Length: 40 inch x 108 yd (1.016 x 98.89 m).
         4) Width and Length: 120 inch x 100 yd (3.038 x 91.44 m).

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Examine substrates prior to the application of any primer, bonding agent, or waterproof coating, verifying compliance with manufacturers written instructions for cleanliness, moisture, temperature, and confirm adequate preparation.

B. Epoxy Primer Examination: Prior to application of CIM membrane, visually inspect cured primer surface. Surface must be clear and glossy, and free from milky, hazy or oily film amine blush.
   1. pH Verification: Verify pH of cured epoxy primer surface. Acceptable pH range is 7 to 8.
   2. If pH is greater than 8 or if visual amine blush is present, solvent wipe affected area with methyl ethyl ketone until pH is within recommended range.
   3. Do not apply CIM membrane coating to primer that exhibits pH greater than 8. Where solvent wiping fails to remove amine blush, contact manufacturer for specific repair recommendations.

C. Do not begin installation until the substrates have been properly constructed and prepared.

D. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

A. Clean surfaces thoroughly in compliance with manufacturer's written instructions prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Porous Substrates, General: Substrate must be clean, dry, and free of surface contaminates, oils grease or loose debris.
   1. Concrete: ICRI-CSP 4-6 surface profile exposing aggregates. Concrete must be at minimum 3,000 psi (20.68 MPa) compressive strength and free of release agents, curing compounds, and be clean, surface dry and free of contamination.

2. Wood: Substrate must be clean, dry and free of surface contamination.

D. Non-Porous Substrates, General: Substrate must be clean, dry and free of contamination.
   1. Steel: Minimum 3 mil (0.076 mm) profile.
      a. General, Non-Immersion: SSPC-SP6 or NACE No. 3 Commercial Blast.
      b. Immersion Service SSPC-SP10 or NACE No. 2 Near White Blast.
   2. Other Metals: SSPC-SP1 solvent clean and abrade substrate to roughen and de-gloss surface.
   3. Glass: Thoroughly clean. For immersion services, roughen surface.
   4. Previous Coatings or Linings: Verify adhesion test results to confirm adequacy of surface preparation.

E. Earth: Not applicable.

F. Verify surface temperature and humidity limits, and limits for direct sunlight are within manufacturer's written instructions for limitations.

G. Waterproofing Material Preparation, Mixing: Mix waterproofing components in strict compliance with manufacturer's written instructions.
   1. Mixing and Induction Time: Mix and maintain minimum induction time in strict accordance with manufacturer's instructions.
   2. Do not use mixing jigs.

H. Liquid Topcoat-Maintenance Coat Preparation: Perform test patches for adhesion and asphaltic bleed through prior to application. Consult with manufacturer for pass fail criteria.

3.3 INSTALLATION

A. Apply Primer in strict compliance with manufacturer's written instructions, including when substrate temperature is declining, ensuring a uniform coat, free of pinholes and holidays.
   1. Primer Curing Time: Allow primer to cure for a minimum of 4 hours at an ambient and substrate temperature of 70 deg F (21 deg C).
   2. Do not apply subsequent membrane coating until primer has achieved minimum cure time.

B. Recoating, Epoxy Primer: Where recoating of primer is required, apply the subsequent CIM coating after a minimum of 4 hours and a maximum of 48 hours at 70 deg F (21 deg C). If more than 48 hours have elapsed since the prior coat application, or if the cured primed surface is otherwise contaminated, the following remediation steps are required:
   1. Surface Inspection: Prior to coating application, test the cured epoxy surface and visually inspect for contamination such as dirt, dust, moisture, or amine blush.
      a. For CIM EMT Epoxy Primer, the pH must be 7 to 8.
   2. Solvent Wipe, Required for pH Greater than 8 or Contamination: If the pH is high or contaminants are present, solvent wipe surface using methyl ethyl ketone until the pH is within the recommended range.
   3. Remediation Procedure, Select Based on Primer:
      a. CIM ECO Epoxy Primer: After solvent wiping, reapply CIM ECO Epoxy Primer.
      b. CIM EMT Epoxy Primer: After solvent wiping, select one of the following procedures:
         1) Reapply Primer: Reapply if within 30 days of initial application.
         2) Abrasion and Bonding Agent: Abraded the existing CIM EMT Epoxy Primer and apply CIM VOC Compliant Bonding Agent in strict compliance with manufacturer's written instructions.
      c. Primer Repair, CIM EMT Epoxy Primer: If the existing is damaged or compromised during the abrasion process, an additional application of Primer may be necessary to insure a monolithic primer application prior to applying the membrane.

C. Aggregate Installation:
   1. Base Coat: Apply base coat minimum of CIM at 60-65 wet mils.
   2. Tack Coat Timing: Apply a tack coat of CIM after the base coat of CIM becomes tack free and within the recoat window (approximately 2-4 from initial application.
   3. Tack Coat Thickness: Apply tack coat thickness based on aggregate size.
      a. Fine Aggregates: 10 wet mils.
      b. 20-30 Mesh Aggregates: 20 wet mils.
      c. Aggregates up to 1/4 Inch: Up to 120 wet mil tack coat.
   4. Aggregate Broadcast: Immediately broadcast dry, clean aggregate into tack coat until refusal.
      a. Never broadcast aggregate into initial base coat of CIM.
   5. Application Rate: Standard: 0.5 to 1.5 lbs sq ft.
   6. Applicate Rate: Class A Fire Rating: 4 lbs sq ft.
   7. Curing: Allow completed system to cure a minimum of 24 hours at 70 deg F (deg C).
   8. Aggregate Clean Up: Sweep off and dispose of excess aggregate after completion of cure time. Do not reuse aggregate.
   9. Traffic and Overburden:
      a. Wait 72 hours before exposing system to vehicular traffic.
      b. Prior to installing overburden, perform water test to assure coating is watertight.

D. Apply waterproofing coatings in strict compliance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   1. Comply with manufacturer's written instructions for application when substrate surface is declining.

E. Recoating, Waterproofing, General: Recoat waterproofing in strict compliance with manufacturer's written instructions.
   1. Where multiple coats are required, the subsequent coat must be applied within the specific products recoat time window:
      a. CIM 800, CIM 1000, CIM 1000 Trowel Grade, CIM 1061 must be recoated soon after the coating no longer comes off on polyethylene, typically within 4 hours of mixing.
      b. CIM ECO 1061 contact CIM Industries for specific recommendations and instruction guides.
   2. If coating has cured longer than specified products time:
      a. Surface Preparation: Surface must be abraded using surface grinder or other mechanical means, in compliance with manufacturer's written instructions.
      b. Cleaning: Abraded surface must be free of dust and debris.
      c. Bonding Agent: Apply CIM VOC Compliant Bonding Agent in strict compliance with manufacturer's written instructions.

F. Topcoat-Maintenance Coating Application: Comply with coating manufacturer's written instructions and approved Shop Drawings.

## 3.4 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

C. Cure Times: Verify and document that waterproof coating has been allowed to cure the minimum cure time, in strict compliance with manufacturer's written instructions, prior to proceeding with service use or further installation of assembly components indicated.

## 3.5 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturers recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION