SECTION 07 13 13

BITUMINOUS SHEET WATERPROOFING

(COLPHENE 3000, COLPHENE ICF)

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]

# GENERAL

## SUMMARY

### Work shall include, but is not limited to, the materials, labor, and related work to complete the following:

#### Cleaning and preparing substrates to receive waterproofing.

#### Bituminous sheet waterproofing, flashings, and sealants.

#### Provide all related work to receive the specified manufacturer’s [5][10]-year below grade waterproofing warranty.

## RELATED SECTIONS:

### 010000 – General Requirements

### 011000 – Summary of Work

### 072200 – Waterproofing Insulation

### 077200 – Waterproofing Overburden Accessories

## REFERENCES

### AMERICAN CONCRETE INSTITUTE (ACI).

#### ACI 301, Specifications for Structural Concrete.

#### ACI 308, Specification for Curing Concrete.

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

### ASTM INTERNATIONAL STANDARDS.

#### ASTM C472, Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete

#### ASTM C661, Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

#### ASTM C679, Standard Test Method for Tack-Free Time of Elastomeric Sealants

#### ASTM C794, Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.

#### ASTM C1278, Standard Specification for Fiber-Reinforced Gypsum Panel

#### ASTM C1305, Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane

#### ASTM D816, Standard Test Methods for Rubber Cements

#### ASTM D994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

#### ASTM D1002, Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)

#### ASTM D1475, Standard Test Method for Density of Liquid Coatings, Inks, and Related Products

#### ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers, Tension

#### ASTM D570, Standard Test Method for Water Absorption of Plastics.

#### ASTM D882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting

#### ASTM D903, Standard Test Method for Peel or Stripping Strength of Adhesive Bonds

#### ASTM D1475, Standard Test Method For Density of Liquid Coatings, Inks, and Related Products

#### ASTM D1876, Standard Test Method for Peel Resistance of Adhesives.

#### ASTM D1970, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

#### ASTM D5147, Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.

#### ASTM D5385, Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes.

#### ASTM D5601, Standard Test Method for Tearing Resistance of Roofing and Waterproofing Materials and Membranes.

#### ASTM D5602, Standard Test Method for Static Puncture Resistance of Roofing Membrane Specimens.

#### ASTM E96, Standard Test Methods of Water Vapor Transmission of Materials.

#### ASTM E154, Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

### INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI)

## SUBMITTALS

### Product Data Sheets:

#### Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.

### Safety Data Sheets:

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

### Sample/Specimen Warranty:

#### Submit specimen copy of manufacturer’s warranty and contractor’s warranty.

### Shop Drawings:

#### Submit waterproofing system detail drawings.

## CLOSEOUT SUBMITTALS

#### Warranties: Provide manufacturers and contractor’s warranties upon project completion.

## QUALITY ASSURANCE

### MANUFACTURER QUALIFICATIONS:

#### Manufacturer shall have 10 years of history manufacturing below grade waterproofing materials in the US.

#### Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.

### CONTRACTOR QUALIFICATIONS:

#### Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.

#### Applicators shall have completed projects of similar scope using similar waterproofing materials as specified herein.

#### Contractor shall provide full time, on-site superintendent or foreman experienced with the application of below-grade waterproofing.

#### Applicators shall be skilled in the application methods of below-grade waterproofing materials.

#### Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.

#### Contractor shall maintain a copy of all submittal documents, on-site, available always for reference.

## DELIVERY, STORAGE AND HANDLING

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

### Refer to product Safety Data Sheets (SDS) for storage and handling related hazards and take all necessary measures and precautions to comply with storage and handling requirements.

### 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.

### Store materials in a dry, well ventilated, weather tight area, at 70°F (21°C). Protect materials to prevent damages due to environmental exposures.

### Properly store and dispose of materials in accordance with building owner requirements, site conditions, and the requirements of local jurisdictions.

### All damaged and deficient materials shall be removed from job site and replaced with new, suitable materials as specified.

## SITE CONDITIONS

### SAFETY:

#### The contractor shall be responsible for complying with all project-related health, safety, and environmental requirements.

#### 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.

### ENVIRONMENTAL CONDITIONS:

#### 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.

#### Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry during, the application of the specified materials. Ensure all materials and substrates remain above the dew point temperature as required to prevent condensation and maintain acceptable substrate conditions.

#### Ambient temperature should be 35°F (2°C), and well above the dew point temperature, with no water, dew, or condensation present on surfaces.

## WARRANTY

### Manufacturer's Warranty. The manufacturer shall provide the owner with the manufacturer’s standard below-grade waterproofing warranty for [5][10]-years from the date the warranty is issued.

# PRODUCTS

## MANUFACTURER

### SINGLE SOURCE MANUFACTURER: All waterproofing materials shall be provided by a single material supplier.

#### Comply with the manufacturer’s requirements as necessary to provide the specified warranty.

### ACCEPTABLE MANUFACTURERS:

#### SOPREMA, located at: 310 Quadral Drive, Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

#### Acceptable alternate manufacturers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## BITUMINOUS SHEET WATERPROOFING

### WATERPROOFING

#### SOPREMA COLPHENE 3000: Self-adhered, waterproofing membrane for use on below grade foundation and retaining walls, composed of an elastomeric styrene-butadiene-styrene (SBS) polymer modified bitumen with a tri-laminated woven HDPE composite facer.

##### Thickness: 60 mils (1.524 mm)

##### Width: 39.37 in (1 m)

##### Length: 61.35 ft (18.7 m)

##### Crack bridging ability, 100 cycles, @ -26°F (-32°C) per ASTM C1305: Pass

##### Tensile Strength - membrane, lbf/in2 (kN/m2) per ASTM D412, Die C: MD: 1,066 lbf/in2 (7,350 kN/m2) XMD: 600 lbf/in2 (4,137 kN/m2)

##### Elongation of rubberized asphalt per ASTM D412: >300%

##### Water absorption per ASTM D570: max 0.2%

##### Tensile Strength - facer, lbf/in2 (kN/m2) per ASTM D882: MD: 13,455 lbf/in2 (92,769 kN/m2) XMD: 8,545 lbf/in2 (58,916 kN/m2)

##### Peel resistance per ASTM D903: 7.5 lbf/in (1,313 N/m)

##### Lap adhesion per ASTM D1876: 9 lbf/in (1,576 N/m)

##### Low temperature flexibility per ASTM D1970: -40°F (-40°C)

##### Resistance to hydrostatic head per ASTM D5385: 381 ft (114m)

##### Water vapor transmission per ASTM E96 (Procedure A)): 0.0194 perms (1.106 ng/s.m2.Pa)

##### Water vapor transmission per ASTM E96 (Procedure B)): 0.0167 perms (0.952 ng/s.m2.Pa)

##### Puncture resistance per ASTM E154: 131 lbf (583 N)

#### SOPREMA COLPHENE ICF: Self-adhered, waterproofing membrane for use on below grade insulating concrete forms, composed of an elastomeric styrene-butadiene-styrene (SBS) polymer modified bitumen with a woven HDPE composite facer.

##### Thickness: 40 mils (1.016 mm)

##### Width: 36 in (0.91 m)

##### Length: 75 ft (22.86 m)

##### Peel resistance per ASTM D903: 17.5 lbf/in (3,065 N/m)

##### Lap peel adhesion per ASTM D1876: 11.4 lbf/in (1,996 N/m)

##### Tensile strength per ASTM D5147: MD: 73.7 lbf/in (12.9 kN/m) XMD: 72.5 lbf/in (12.7 kN/m)

##### Elongation at Break per ASTM D5147: MD: 14% XMD: 10%

##### Water absorption per ASTM D5147: < 0.2%

##### Tear resistance per ASTM D5601: MD: 84 lb (0.009 N) XMD: 90 lb (0.1 N)

##### Low temperature flexibility per ASTM D5147: -7°F (-22°C)

##### Static puncher resistance per ASTM D5602: 90 lb (0.01 N)

##### Water vapor transmission per ASTM E96 (Procedure B)): 0.029 perms (1.65 ng/s.m2.Pa).

## ACCESSORIES

### PRIMERS:

#### SOPREMA ELASTOCOL STICK ZERO: 0 g/L VOC solvent, self-adhesive membrane primer. Low VOC, solvent-based primer for the preparation of membrane substrates for adhering COLPHENE 3000.

#### SOPREMA ELASTOCOL STICK: Self-adhesive membrane primer. SBS polymer, resin and, solvent-based primer for the preparation of membrane substrates for adhering COLPHENE 3000.

#### SOPREMA ELASTOCOL STICK H2O: Self-adhesive membrane primer. Water based polymer emulsion primer for the preparation of membrane substrates for adhering COLPHENE ICF.

### GENERAL PURPOSE SEALANT

#### SOPREMA SOPRASEAL SEALANT: Fast-setting, moisture curing, low VOC, polyether adhesive-sealant.

##### Packaging: 10.1 oz tubes.

##### ASTM C920, Type S, Grade NS, Class 25.

##### Viscosity, cP @ 73°F (23°C), per ASTM D2983: 1,200,000 +/- 400,000 cP

##### Density, lbs/gal, per ASTM D1475: 11.8 +/- 0.2 lbs/gal

##### Tack-free time, minutes: 20 +/- 10 min.

##### Shore A hardness, per ASTM C836 (ASTM D2240): 32-42

##### Elongation at break, percent, per ASTM D412: 275-325%

##### Tensile Strength, lbf/in2 (kN/m2) per ASTM D412: 325-375 psi

##### Low temperature flexibility @ -10°F (-23°C), ASTM D816: Pass

##### Shrinkage: No visible shrinkage after 14 days

##### Service temperature range, degrees °F (°C): -40 to 200°F (-40 to 93°C)

##### VOC (g/L): < 15

#### SOPREMA SOPRAMASTIC SP1: General purpose, paintable, gun-grade, elastomeric, polyether moisture curing sealant for sealing SBS membrane terminations, Kynar 500 PVDF, horizontal and vertical construction joints.

##### VOC Content: 20 g/L or less.

##### Meets or exceeds ASTM C920, Type S, Grade NS, Class 50.

### PROTECTION COURSE, ASPHALTIC BOARD

#### SOPREMA 1/8in SOPRABOARD: Mineral fortified, asphaltic roof substrate board with glass fiber facers. For use as roof cover-board and for vertical flashing substrate.

##### Weight: lb/ft2 (kg/m2): 0.9 (4.4)

##### Thickness in (mm) 1/8 (3.2)

##### Dimensions [4 x 4] [4 x 5] [4 x 8] ft. ([1.2 x 1.2] [1.2 x 1.5] [1.2 x 2.4] m)

##### Water absorption: Less than 1 percent per ASTM D994.

##### Compressive strength, psi (kPa) measured at 50 percent compression, per ASTM C472: 1,610 (11,100)

##### Puncture resistance, lbf (N) per ASTM E154: 90 (400)

#### SOPREMA 1/4in SOPRABOARD: Mineral fortified, asphaltic roof substrate board with glass fiber facers. For use as roof cover-board and for vertical flashing substrate.

##### Thickness in (mm) 1/4 (6.4)

##### Dimensions: [4 x 4] [4 x 5] [4 x 8] ft. ([1.2 x 1.2] [1.2 x 1.5] [1.2 x 2.4] m)

##### Weight: lb/ft2 (kg/m2): 1.9 (9.3)

##### Water absorption: Less than 1 percent per ASTM D994.

##### Compressive strength, psi (kPa) measured at 50 percent compression, per ASTM C472: 1,320 (9,100)

##### Puncture resistance, lbf (N), per ASTM E154: 100 (445)

# EXECUTION

## EXAMINATION

### GENERAL

#### Examine all substrates prior to beginning work. Examination includes, but not limited to, visual observations, qualitative analysis, and or quantitative testing measures as necessary to ensure conditions are satisfactory to begin work.

#### During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified waterproofing and associated work.

### SURFACE CONDITIONS

#### Examine substrates to ensure substrates are flat, free of fins or planar irregularities greater than 6.4 mm in 3 m (1/4 inch in 10 ft). Verify that no excess mortar exists on masonry ties, shelf angle and other obstructions.

#### Examine concrete substrates to ensure surfaces have a profile of ICRI Concrete Surface Profile (CSP) 2, 3, or 4.

#### Examine masonry joints to ensure joints are stuck flush and filled with mortar.

### MOISTURE

#### Examine concrete and confirm concrete is sufficiently cured as specified, visibly dry and free of surface moisture. Refer to ACI 301 and ACI 308 for examination and evaluation of concrete substrates.

#### New concrete shall be cured sufficiently for a minimum of 3 to 7 days, and as specified.

##### When necessary to quantify relative humidity (RH) of concrete, testing shall be completed in accordance with ASTM F2170.

#### Examine vertical substrates and ensure walls are capped to prevent moisture and precipitation from entering the walls during construction.

### ADHESION

#### Qualitative peel tests:

##### Examine adhesion by conducting qualitative peel tests.

##### The contractor shall examine adhesion between specified waterproofing materials and prepared substrates using the following qualitative methods:

###### 180-degree peel test. Basis of test is ASTM C794:

###### Choose 3 or more areas, representative of each substrate.

###### Clean and prepare the substrate as specified, allow to dry.

###### Cut 1 inch (2.54 cm) wide x 12 inch (30.48 cm) long strips of specified polyester reinforcing fabric.

###### Apply specified waterproofing materials to fully encapsulate an 8-to-9-inch (20.32 to 22.86) long section of the 12-inch (30.48) strip of reinforcing fabric, allow a 3 to 4 inch (7.62 to 10.16 cm) “dry tail” to remain un-coated.

###### Based on conditions, allow sufficient time for samples to fully cure for optimum results.

###### Grip the “dry tail” end of the reinforcing fabric and pull 180 degrees, parallel with the surface. Use a small fish scale or similar scale to measure quantitative results in pounds of resistance where quantitative results are desired.

###### For masonry and concrete substrates, results shall demonstrate resistance to peel, with cohesive failure where most of the coating remains adhered to the substrate.

###### Record results with digital photos for reference.

## PREPARATION

### GENERAL:

#### Before commencing work, the contractor shall prepare and clean all work areas to ensure conditions are satisfactory to proceed with the installation of specified waterproofing materials.

#### Eliminate water discharge and condensation from substrate surfaces and ensure substrate surfaces are free of surface moisture before and during the application of waterproofing. Allow sufficient time for surfaces to dry before applying the specified waterproofing.

### CONCRETE SUBSTRATE PREPARATION

#### Remove concrete form-release agents, curing compound residue, laitance, oxidation, oils, wax, standing water or all other foreign materials that interfere with adhesion.

#### Prepare concrete in accordance with ASTM D5295.

#### Clean concrete in accordance with ASTM D4258.

### MATERIAL PREPARATION

#### COLPHENE LM BARR waterproofing:

##### Stir COLPHENE LM BARR pails using a paddle mixer and low speed drill prior to use.

##### COLPHENE LM BARR spray grade supplied in drums and totes may be applied directly from the drum or tote without stirring.

##### COLPHENE LM BARR shall not be mixed or thinned using solvents, water, or other materials.

#### During cold weather, store waterproofing materials in heated areas at or above 70°F (21°C) before and during application to ensure the material temperature is at or above 70°F (21°C).

#### Cold weather spray application:

##### Provide band-type drum and pail heaters designed to pre-heat containers.

##### Pre-condition drums and maintain waterproofing materials at or above 70 °F (21.1 °C) for optimum application.

## FLASHINGS, SEALANTS AND DETAILING

### GENERAL

#### Refer to manufacturer’s published details and manuals for guidelines.

#### Flashings, sealants, and detailing shall be installed before the waterproofing membrane application, unless otherwise noted.

### SURFACE IRREGULARITIES

#### Small spalls, voids, bug holes, static cracks (less than 1/8 in deep) and other similar imperfections shall be cleaned and filled flush with the concrete surface using COLPHENE BARR FLASHING, COLPHENE LM BARR waterproofing or SOPRASEAL SEALANT.

### HORIZONTAL-TO-VERTICAL TRANSITIONS (static, non-moving joints)

#### At horizontal-to-vertical transitions, where necessary to flash the waterproofing membrane, apply a bead of COLPHENE BARR FLASHING along the joint to create a 45-degree cant with a ¾ in face.

#### Apply COLPHENE LM BARR 3 to 4 in onto the horizontal surface and 3 to 4 in up onto the vertical surface.

#### Immediately apply a 6 in wide strip of POLYFLEECE reinforcement into COLPHENE LM BARR, 3 in up the vertical and 3 in onto the horizontal surface. Immediately apply more COLPHENE LM BARR and work the COLPHENE LM BARR into the POLYFLEECE to ensure the POLYFLEECE is fully encapsulated along the transition.

#### Refer to manufacturer’s published details.

### CORNERS:

#### Refer to manufacturer’s published details.

##### VERTICAL CORNERS WITH REINFORCEMENT:

###### Precut POLYFLEECE 6 in wide to extend 3 in on either side of inside and outside corners.

###### Apply COLPHENE BARR FLASHING at corner area and immediately embed POLYFLEECE reinforcement.

###### Use tool to work POLYFLEECE into base coat so the POLYFLEECE is fully encapsulated.

###### Apply more COLPHENE BARR FLASHING over the POLYFLEECE, ensure there are no skips, voids, or exposed reinforcement.

##### VERTICAL CORNERS WITHOUT REINFORCEMENT:

###### Apply a ¾ in bead of COLPHENE BARR FLASHING to all inside and outside corners and immediately tool to ensure good contact with substrate.

###### Use tool to apply sealant uniformly and eliminate voids.

###### Apply a topcoat of COLPHENE BARR FLASHING.

### SEALANT JOINTS

#### Refer to ASTM C1193 for design and installation of sealant joints.

##### Install specified closed cell backer rod into gap and apply appropriate joint sealant to accommodate building joint conditions.

### FLASHED PENETRATIONS

#### Flashed penetrations are flashed watertight using specified sealants and fully reinforced COLPHENE LM BARR.

##### Fixtures consist of structural elements, utilities, services, equipment, and other materials penetrating the waterproofing substrate. Refer to manufacturer’s published details and guidelines.

##### Ensure the fixture is properly cleaned, prepared, and secured to prevent movement.

##### Pre-seal all gaps and joints using COLPHENE BARR FLASHING. Tool sealant to seal the gap between the substrate and fixture.

##### Precut POLYFLEECE to conform to conditions. Ensure POLYFLEECE is cut to fully reinforce COLPHENE LM BARR

##### Apply COLPHENE LM BARR to substrate and immediately embed POLYFLEECE reinforcement.

##### Use brush or trowel to work POLYFLEECE into base coat so the POLYFLEECE is fully encapsulated.

##### Apply more COLPHENE LM BARR over the POLYFLEECE, ensure there are no skips, voids, or exposed reinforcement.

### TIE-INS

#### COLPHENE LM BARR tie-ins:

##### Where COLPHENE LM BARR materials have cured, apply new COLPHENE LM BARR overlapped onto the cured COLPHENE LM BARR a minimum of 6 in.

##### Where COLPHENE LM BARR has been exposed for an extended period (72 hours or more), become dirty, clean the surface using a clean cloth and xylene solvent.

##### Apply new COLPHENE LM BARR overlapped 6 in onto the clean, dry waterproofing surface.

## VERTICAL WATERPROOFING, UNREINFORCED

### GENERAL:

#### Unreinforced COLPHENE LM BARR shall be limited to vertical, below-grade waterproofing.

#### Reinforced flashings, sealants and detailing shall be installed before the vertical waterproofing application, unless otherwise noted.

#### Allow 24 hours for sealants, flashings, and related materials to cure before applying the COLPHENE LM BARR waterproofing.

#### Ensure materials are properly prepared, cleaned, dry and cured before applying COLPHENE LM BARR at tie-ins over sealants, flashings, and related materials.

#### Refer to manufacturer’s published details and manuals for guidelines.

### VERTICAL COLPHENE LM BARR WATERPROOFING, UNREINFORCED:

#### Apply uniform applications of COLPHENE LM BARR brush, roller or squeegee-grade waterproofing using specified application tools and equipment.

#### Apply uniform applications of COLPHENE LM BARR spray-grade waterproofing using specified spray equipment.

#### Apply a uniform application of 60 wet mils (3.7 gal/square) of COLPHENE LM BARR.

#### Use wet mil gage to confirm minimum thickness during application.

#### Examine work to ensure there are no voids, skips, pin holes or shadows while applying COLPHENE LM BARR.

## PROTECTION COURSE, CONCEALED:

### GENERAL

#### Refer to drawings to determine location and placement of the specified protection course.

#### Apply protection course and/or overburden within 60 days of application of waterproofing.

#### Thoroughly inspect waterproofing, and make all necessary repairs, prior to installing the protection course.

### SOPREMA Inc. SOPRABOARD

#### Ensure all waterproofing and flashing substrates are complete, prepared, clean and ready to receive the protection course.

#### Cut SOPRABOARD to fit tight at penetrations, terminations, and transitions.

#### Adhere SOPRABOARD to the waterproofing:

##### Fully adhered: Apply COLPHENE LM BARR adhesive layer over waterproofing at 1-1/2 to 2 gallons per square, or as required, to hold the protection course in place.

##### Partially adhered: Apply COLPHENE LM BARR adhesive in ribbons or spots as necessary to hold the protection course in place.

#### Install SOPRABOARD with joints butted together.

#### Ensure SOPRABOARD is installed to protect all surfaces during the placement of back-fill materials.

## CLEAN UP

### Visually inspect the waterproofing each day for debris, trash and other housekeeping issues. Take corrective actions as required to maintain satisfactory conditions.

END OF SECTION