

LIQUID APPLIED VAPOR/AIR BARRIER MEMBRANE SECTION 07130**PART 1 - GENERAL****1.01 SECTION INCLUDES:**

- A. Installation of liquid applied vapor/air barrier membrane on new masonry walls surfaces, as indicated on drawings, consisting of preparation of before mentioned surfaces, sealing of cracks, seams, joints and application of reinforced Barriseal, CCW 705 Vapor/Air Barrier Membrane by Carlisle or equal to provide an uninterrupted air/vapor barrier membrane on indicated surfaces

1.02 RELATED SECTIONS:

- A. Section 04200 - Masonry
- B. Section 07900 - Joint Sealers
- C. Section 09260 – Exterior wall sheathing

1.03 REFERENCES:

- A. ASTM D 412 Tests for Rubber Properties in Tension.
- B. ASTM E Puncture Resistance.
- C. ASTM E 96(B) Water Vapor Transmission of Materials.
- D. ASTM D 1970 Self-Adhering Polymer Modified Bituminous Sheet Materials.
UL 790 Tests for Fire Resistance of Roof Covering Materials.
- E. ASTM E 283 Tests for Air Leakage through Exterior Assemblies.
- F. ASTM E 331 Tests for Water Penetration of Exterior Assemblies.
- G. ASTM E 2178 Test for Air Permeance Rating.
- H. ASTM D 1187 Test for Asphalt-Base Emulsions
- I. ASTM D 2939 Test for Emulsified Bitumens

1.04 SYSTEM DESCRIPTION:

- A. Product provided by this Section is a self-adhesive liquid applied membrane of not less than 40 mils thickness, consisting of a water-based asphalt emulsion modified with a blend of synthetic rubbers and additives which cures to form a flexible, monolithic Vapor/Air Barrier.

1.05 SUBMITTALS:

- A. General: Submit in accordance with Section 01300.
- B. Product Data: Submit manufacturer's product literature, installation instructions and standard details.

- C. Subcontractor approval by manufacturer: Submit document stating manufacturer's acceptance of subcontractor as an Approved Applicator for the specified materials.
- D. Warranty: Submit a sample warranty identifying the terms and conditions stated herein.

1.06 QUALITY ASSURANCE:

- A. Applicator Qualifications: Applicator shall be experienced in applying the same or similar materials and shall be specifically approved in writing by the membrane manufacturer.
- B. Ordinances, and laws regarding use and application of products that contain volatile organic compounds (VOC).
- C. Pre-Application Conference: Prior to beginning work, convene a conference to review conditions, installation procedures, schedules and coordination with other work.
- D. Product Components: Vapor/Air components shall be sourced from one manufacturer, including sheet membrane, sealants, primers, adhesives and mastics.

1.07 WARRANTY:

- A. Upon completion and acceptance of the work required by this section, the manufacturer will issue a warranty agreeing to promptly replace defective materials for a period of 5 years.

1.08 DELIVERIES, STORAGE AND HANDLING:

- A. Deliver materials to project site in original, factory-sealed, unopened containers bearing manufacturer's name and label intact and legible with the following information.
 - 1. Name of material.
 - 2. Manufacturer's stock number and date of manufacture. Materials in protected and well ventilated area.

1.09 PROJECT CONDITIONS:

- A. Do not apply membrane if temperature is less than 40 degrees F. or to a damp, frosty or contaminated surface.
- B. Coordinate vapor/air barrier application with other trades. The applicator shall have sole right of access to the specified areas for the time needed to complete the installation.
- C. Warn personnel against breathing of vapors and contact of material with skin or eyes. Wear applicable protective clothing and respiratory protection gear.
- D. Keep flammable products away from spark or flame. Do not allow the use of spark producing equipment during application and until all vapors have dissipated. Post "NO SMOKING" signs.
- E. Maintain work area in a neat and orderly condition, removing empty containers, rags, and rubbish daily from the site.

PART 2 - PRODUCTS:

2.01 MANUFACTURERS:

- A. Specification is based on "Barriseal Membrane" as manufactured by Carlisle Coatings and Waterproofing Incorporated, 900 Hensley Lane; Wylie, Texas 75098, Phone: (800) 527-7092 Fax: (972) 442-0076.

2.02 PRODUCTS:

- A. Self-Adhesive liquid applied Vapor/Air Barrier Membrane: Shall be single coat application of 40 mil liquid applied rubberized asphalt, and shall meet or exceed the following requirements:
 - 1. Resilience: 98% ASTM D-3407
 - 2. Ultimate Elongation: 1300% minimum, ASTM D-41
 - 3. Perm Rating: 0.02 ASTM E-9
 - 4. Transmission: 0.01 gm/sq.ft ASTM E-9

2.03 ACCESSORY PRODUCTS:

- A. Surface Primer: Shall be CCW-702 Solvent-Based Primer , CCW-AWP Water-Based primer or CCW-CAV-Grip.
- B. Detail Membrane: CCW-705 TWF
- C. Mastic: Shall be CCW-704 Mastic.
- D. Sealants: Shall be CCW-703 Vertical Grade Liquiseal membrane, PT-304 one component or CCW-201 two component Polyurethane Sealant.

PART 3 - EXECUTION:

3.01 INSPECTION:

- A. Before any barrier application is started the applicator shall thoroughly examine all surfaces for any deficiencies. Should any deficiencies exist, the architect, owner, or general contractor shall be notified in writing and corrections made.
- B. Condition of Concrete Block Surfaces:
 - 1. Concrete Block surfaces shall be of sound structural grade and shall have a smooth finish, free of holes, cracks, or other defects.
 - 2. All motor joints should be struck flush.
 - 3. Adjoining beams, and other substrates should be butted flush with concrete blocks.
 - 4. Irregularities shall be ground or filled as required to achieve flush surfaces.
 - 5. All adjacent metal flashing shall be galvanized or non-ferrous metal, tight screwed or nailed.
 - 6. Surfaces at joints shall be on the same plane.

3.02 SURFACE PREPARATION:

- A. The wall surface must be thoroughly clean, dry and free from any surface contaminates or cleaning residue that may harmfully affect the adhesion of the membrane.

- B. All cracks over 1/16" in width should be filled with material compatible to the substrate. Most masonry and wood applications can be filled with exterior grade urethane caulking.
- C. All crack filler compound to thoroughly cure prior to proceeding.
- D. Trim or detail all door, window, and penetrations using Carlisle's standard details.
- E. Brick ledge flashing should be in-place prior to application of Vapor/Air Barrier.

3.03 APPLICATION:

- A. Clean surfaces to remove residual dust before priming and install membrane and joint treatments in strict accordance with membrane manufacturers printed instruction.
- B. Detail – At all joints, seams, penetrations apply a strip of CCW-705 membrane to completely cover with generous overlap the joint, seam and penetration, on a primed surface.
- C. Apply Barriseal from base of wall working up to allow water to drain over the applied area. Install at 31 sq ft per gallon
- D. Terminations: Apply the Barriseal on to the edge of brick ledge flashing, door and window flashing tapes. Extend the Barriseal up above the interior living space or on to the roof vapor/air barrier.
- E. Protection: Vapor/Air Sheet Membranes are not designed for permanent exposure and should be covered as soon as construction scheduling allows.

END OF SECTION

CRYSTALLINE WATERPROOFING**SECTION 07145****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Elevator pit waterproofing; all horizontal and vertical surfaces, and treatment of joints and penetrations.

1.02 RELATED SECTIONS

- A. Division 3 - Concrete Work.

1.03 REFERENCES

- A. Applicable standards; standards of the following as referenced herein:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. Army Corps of Engineers (CRD).

1.04 SYSTEM DESCRIPTION

- A. Crystalline Waterproofing: Mix of Portland cement, fine treated silica sand and active proprietary chemicals which when mixed with water and applied as a cementitious coating, causes a catalytic reaction which generates a non-soluble crystalline formation of dendritic fibers within the pores and capillary tracts of concrete. This process shall cause concrete to become permanently sealed against the penetration of water or liquids from any direction.
- B. Testing requirements: Perform the following tests according to the standards listed. Follow the conditions as listed:
 - 1. Testing shall be performed by an independent laboratory meeting requirements of ASTM E329-90 and certified by the United States National Bureau of Standards. Testing Laboratory shall obtain concrete samples and waterproofing product samples.
 - 2. Perform independent testing according to CRD C48-73 Permeability of Concrete under the following conditions:
 - a. Concrete samples shall be 6 inches (150 mm) in diameter and no thicker than 2 inches (50 mm).
 - b. Coatings shall be a maximum thickness of 0.05 inches (1 mm) per coat with up to 2 coats permitted.

- c. Concrete samples shall have a design strength of 2000 psi or less. No admixtures will be permitted.
- d. A minimum of four samples shall be tested; 2 treated and 2 untreated. Untreated samples shall exhibit leakage at 10 psi or less.
- e. Test samples to a pressure of 175 psi (405 foot head of water). Treated samples, after crystalline growth has occurred, shall exhibit no measurable leakage whatsoever.

1.05 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Product Data: Submit product data including installation methods for surface applications, treatment of penetrations and junctures, etc. for each type of product required, to demonstrate products comply with Contract Documents.
- C. Test Reports: Submit and obtain acceptance of independent laboratory test reports of tests specified herein, prior to application of cementitious crystalline waterproofing material.
- D. Manufacturer's Certification: Provide a copy of manufacturer's representative's report certifying that surfaces to which waterproofing is to be applied are in an acceptable condition to receive same, that materials to be installed comply with specified requirements, and that applicator has the experience to install the materials in accord with manufacturer's product data.

1.06 DELIVERY AND STORAGE

- A. Waterproofing materials shall be delivered to the project site in original sealed containers with manufacturer's name and brand clearly identified, shall be stored in dry locations with adequate ventilation, and shall be handled in a manner to prevent damage or contamination.

1.07 QUALITY ASSURANCE

- A. Provide products of a manufacturer with no less than 10 years experience in manufacturing the principal materials for the required work.
- B. Applicator: Waterproofing applicator shall be a firm experienced in the installation of cementitious crystalline waterproofing as demonstrated by previous successful installation. Waterproofing applicator shall be acceptable to the manufacturer and such acceptance shall be indicated in writing.
- C. Pre-installation Conference: Schedule a meeting, before start of construction of surfaces to receive waterproofing, with waterproofing applicator, applicators of work adjacent to or which penetrates waterproofing, waterproofing manufacturer's technical representative, Architect and Owner's representative to review procedures for substrate preparation and waterproofing application.
 - 1. Review Contract Document requirements for waterproofing and waterproofing manufacturer's product data including application instructions.

2. Document discussion in writing, including issues requiring action, and distribute report to entities concerned with waterproofing work.

1.08 PROJECT CONDITIONS

- A. Comply with manufacturer's product data regarding condition of substrate to receive waterproofing, weather conditions before and during installation, and protection of the installed waterproofing system including work which will penetrate waterproofing.

1.09 WARRANTY

- A. Applicator, individually and separate from performance bonds, shall warrant his work from the Date of Substantial Completion, covering the surfaces treated, and binding him to repair, at his expense, any and all leaks through the surfaces treated which are not due to structural weaknesses or other causes beyond his control, such as fire, earthquake, tornado, and hurricanes, for a period of five years after Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Acceptable products: "Xypex Concrete Waterproofing by Crystallization" by Xypex Chemical Corporation and "Penetron" by Penetron Corporation or HAY'DI K-11.
- B. Provide products manufactured or approved by prime waterproofing manufacturer.

2.02 MIXES

- A. General:
 1. Mix waterproofing material by volume with clean water, which is free from salt and deleterious materials. Mix materials in quantities which can be applied within 20 to 30 minutes from the time of mixing. As mixture thickens, stir frequently, but do not add additional water.
 2. Do not mix bonding agents or admixtures, with crystalline waterproofing materials.
- B. Brush application mix:
 1. Measure dry powder and place in mixing container. Measure water and mix into powder with a paddle on a slow speed electric drill (250 RPM) or other type mixer which will ensure mixing and is acceptable to manufacturer.
 2. Mixing proportions shall be as follows:

<u>Coverage</u>	<u>Proportions (by Vol.)</u>
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1.5 lbs. per sq. yd	5 powder to 2 water
2.0 lbs. per sq. yd.	3 powder to 1 water

C. Spray application mix:

1. Mixing shall be same as specified for brush application, except that mix shall be thinner. Use the following proportions only as a guide. Adjust proportions in order to match type of equipment and pressures used.
2. Mixing proportions shall be as follows:

<u>Coverage</u>	<u>Proportions (by Vol.)</u>
1.5 lbs. per sq. yd	5 powder to 3 water

- D. Dry-Pac mix: Using a trowel, mix 1 part clean water with 6 parts waterproofing powder for 10 to 15 seconds. Lumps may be present in mixture and will be acceptable. Mix only as much as can be applied in 15 minutes.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to start of waterproofing installation, arrange a visit to project site by waterproofing material manufacturer's representative. Representative shall inspect and certify that surfaces to which waterproofing is to be applied are in acceptable condition.
- B. Verify that surfaces are sound and clean.
- C. Verify that form release agents, methods, and materials used to cure concrete surfaces are compatible with waterproofing materials.

3.02 PREPARATION

- A. General: Examine surfaces to be waterproofed for form tie holes and structural defects such as honeycombing, rock pockets, faulty construction joints, and cracks. Repair these defects in accord with manufacturer's product data and as follows:
 1. Form tie holes, faulty construction joints and cracks: Chip defective areas in a "U" shaped slot 3/4 inch to 1 inch wide and a minimum of 1 inch deep. Clean slot of debris and dust. Soak with water and remove surface water. Apply a slurry coat of waterproofing materials at the rate of 1.5 lb. per sq. yd. to the slot. Allow slurry to reach an initial set, then fill cavity with Dry-Pac. Compress into cavity using pneumatic packer or block and hammer.
 2. Rock pockets, honeycombing or other defective concrete: Rout out defective areas to sound concrete. Remove loose materials and saturate with water. Remove

surface water and apply one slurry coat of waterproofing material. After slurry has set, but while it is still "green", fill cavity to surface with non-shrink grout.

B. Construction joints:

1. Apply waterproofing materials in slurry form at rate of 2.0 lb. per sq. yd. to joint surfaces between pours. Moisten surfaces prior to slurry application.
2. Where joint surfaces are not accessible prior to pouring new concrete, consult manufacturer for application.

C. Coves and sealing strips:

1. Prepare concrete surfaces which will come into contact with coves and sealing strips by applying one coat of waterproofing material in slurry form at a rate of 1.5 lb. per sq. yd. Apply dry-pac or mortar while slurry coat is still "green" but after it has reached an initial set. Install flexible sealant in expansion joints as specified in sealant section.
2. Coves: Trowel and pack waterproofing mortar into cove shape where indicated on Drawings. This application relates to block/slab interfaces or planter construction joints only.
3. Sealant Strips: Where indicated on the Drawings, preformed grooves 3/4 inch wide by a minimum of 1 inch deep, located at construction joints, shall be filled with waterproofing dry-pac and compacted using a pneumatic packer or hammer and block. Forming of sealing strip grooves shall be responsibility of General Contractor.

D. Concrete finish:

1. Concrete surfaces shall have an open capillary system to provide tooth and suction and shall be clean; free from scale, excess form oil, laitance, curing compounds and foreign matter. Smooth surfaces caused by steel forms and surfaces covered with excess form oil or other contaminants shall be washed, lightly sandblasted, waterblasted, or acid-etched with muriatic acid as necessary to provide a clean absorbent surface. Saturate surfaces to be acid-etched with water prior to application of acid.
2. Vertical surfaces may have a sacked finish.
3. On horizontal surfaces where a trowel finish is required, apply waterproofing by dry shake method in accordance with manufacturers product data.
4. On horizontal surfaces which do not require a trowel finish, a broom finish shall be provided. Do not apply waterproofing material to this surface if concrete is less than 20 hours old.

5. Apply waterproofing material to "green" concrete as soon as possible after forms have been stripped, or to existing concrete which has been saturated with water. Moisten surfaces to be treated prior to application, as required to insure migration of crystalline chemicals into capillary voids in concrete. Remove free water prior to treatment with waterproofing material.
- E. Surface Application: After repair, patching and sealing strip placement has been completed in accord with manufacturer's product data and as specified herein, treat concrete surfaces with waterproofing material slurry applied at rates and locations indicated on Drawings and in accord with manufacturer's product data.
 - F. Brushing: Use a semi-stiff bristle brush or broom to work slurry into concrete surface, filling hairline cracks and surface pores.
 - G. Spraying: Hold spray nozzle close enough to ensure that slurry is forced into surface pores, and hairline cracks.
 - H. Second Coat: Apply while first coat is still "green", but after it has reached an initial set. Lightly pre-water when rapid drying conditions occur.

3.03 CURING

- A. General:
 1. Begin curing as soon as waterproofing materials have set up sufficiently so as not to be damaged by a fine spray. Fog-spray treated surfaces three times a day for a two day period, or cover treated surfaces with damp burlap for the prescribed period.
 - a. In warm climates, more than 3 sprayings per day may be necessary to prevent excessive drying of coating.
 - b. Do not lay plastic sheeting directly on waterproofing coating as air contact is required for proper curing.
 - c. For structures holding hot or corrosive liquids, cure waterproofing for 3 days and allow to set for 18 days.
 - d. If there is poor air circulation in treated areas, provide fans or blown air to aid in curing of waterproofing.
 2. Horizontal surfaces: Begin curing as soon as final set has occurred but before surface starts to dry. Conventional moist procedures such as water spray, and wet burlap may be used. Cure for a minimum of 48 hours.
 3. In hot, dry, sunny conditions, consult manufacturer's product data.
- B. If moist curing is not possible, a chemical curing agent manufactured for or compatible with each approved waterproofing material shall be available for the work. Chemical agent shall have at least 2 years of successful field use to be eligible for acceptance.

- C. Protect cured surfaces from damage to wind, sun, rain and temperatures below 36 degrees F. for a period of not less than 48 hours after application. If plastic sheeting is used as protection, it shall be raised off waterproofing coating to allow air circulation.

3.04 INTERFACE WITH OTHER PRODUCTS

- A. Backfilling: Do not backfill for 36 hours after application. If backfill takes place within seven days after application, backfill material shall be moist, so as not to draw moisture from waterproof coating.

3.05 PROTECTION AND CLEANING

- A. Protect completed coating from damage after application for balance of construction period.
- B. Do not permit traffic on unprotected coating.
- C. Clean spillage and soilage from adjacent surfaces, using cleaning agents and procedures recommended by manufacturer of surface.

END OF SECTION



BUILDING INSULATION**SECTION 07210****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Labor, materials, tools, and equipment, to perform all operations necessary for thermal insulation work indicated or specified.
- B. The applications of thermal insulation specified in this section include the following:
 - 1. Blanket type building insulation.
 - 2. R-values are indicated on the Drawings.

1.02 QUALITY ASSURANCE

- A. Thermal Resistance Values: Provide, if required, adjusted thicknesses of insulation (based on the insulation's thermal conductivity) to maintain the required thermal resistance. R-values are based on requirements of SPRR 257-55 of the U.S. Department of Commerce.
- B. Fire and Insurance Ratings: Comply with the fire resistance, flammability and insurance ratings indicated, and comply with code interpretations by governing authorities.
- C. Provide insulation with a flame spread rating of less than 25 and a smoke development rating of 450 or less.

1.03 SUBMITTALS

- A. Manufacturer's Data: Submit 2 copies of manufacturer's specifications and installation instructions for each type of insulation required. Include data substantiating that the materials comply with specified requirements.

1.04 PRODUCT HANDLING

- A. Protection From Deterioration: Do not allow insulation materials to become wet or soiled, or covered with ice. Comply with manufacturer's recommendations for handling, storage and protection during installation.

1.05 JOB CONDITIONS

- A. Examination of Substrate: The Installer must examine the substrate and the conditions under which the insulation work is to be performed, and notify the Contractor in writing of any unsatisfactory conditions. Do not proceed with the insulation work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

