

## **SPECIAL SPECIFICATION**

### **SECTION 07160S**

#### **CEMENT BASED WATERPROOFING FOR CONCRETE**

##### PART 1 - GENERAL

###### 1.01 SECTION INCLUDES

A. Provisions for applying cementitious, high-build, waterproof coating modified with an acrylic polymer emulsion admixture, to above grade, exterior cementitious surfaces indicated; including surface substrate testing, preparation and application.

1. Coating system includes 2 coats.

###### 1.02 RELATED SECTIONS

A. Section 03300S - Cast-in-Place Concrete.

###### 1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

B. Federal Specification and Standards

###### 1.04 SUBMITTALS

A. Submit:

1. Submit manufacturer's technical bulletins and MSDS on each product.
2. List of project references as documented in this specification under Article 1.04, Quality Assurance. Include contact name and phone number of person charged with oversight of each project.
3. Sample of manufacturer's limited warranty and warranty application procedures.

###### 1.05 QUALITY ASSURANCE

A. Qualifications:

1. Applicator:

- a. Minimum of 5 years experience in the successful preparation for and application of cementitious coatings.
- b. Successful completion of a minimum of 3 projects of similar size and complexity to the specified work.

2. Manufacturer:

- a. Minimum 5 years experience in manufacturing of cementitious products and acrylic admixtures.
- B. Mock-Up: Install at the project site a pre-selected job mock-up, 5 feet by 5 feet, using specified coating system. Obtain Architect/Engineer/Owner's approval of surface preparation, repair, color, finish and workmanship as a standard by which remainder of the project will be judged. Apply material in strict accordance with manufacturer's written application instructions. Mock-up must be approved and accepted prior to start of system application. Maintain mock-up during construction for workmanship comparison. Do not alter, move or destroy mock-up until the work is completed and approved by the Owner's representative.

#### 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with provisions in Sections 01650 and 01660.
- B. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Deliver coating system materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Store tightly sealed coating system materials off the ground and away from moisture, direct sunlight, heat and freezing temperatures.

#### 1.07 PROJECT CONDITIONS

- A. Substrate and ambient air temperature shall be a minimum of 40 degrees F (4 degrees C) and rising at application time and remain above 40 degrees F (4 degrees C) for at least 24 hours after application.
- B. Do not apply coatings in snow, rain, fog, mist or in hot, drying winds. Allow surfaces to attain and conditions specified before proceeding with coating application.

#### 1.08 WARRANTY

- A. Submit manufacturer's standard warranty form for specified system. Approval of warranty period and confirmation of system compatibility with substrate is required prior to system application.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. "Thoroseal" by ChemRex Inc. or approved equal; 2-Coat Waterproofing System
- B. Performance Requirements: A two coat system shall meet or exceed the following performance standards:

1. Compressive Strength	ASTM C 109-80	7 days = 4200 psi 28 days = 6030 psi
2. Flexural Strength	ASTM C 348-80	7 days = 360 psi 28 days = 1027 psi
3. Tensile Strength	ASTM C 190-77	7 days = 250 psi 28 days = 440 psi
4. Modulus of Elasticity	ASTM C 469	28 days = $2.75 \times 10^6$ psi
5. Sand Abrasion Resistance	Fed Spec TT-P-141B	Passes at 3000 liters
6. Accelerated Weathering	ASTM G 26-77 ASTM G 23-77 Atlas Type DMC Weatherometer	5000 hours = No failure 500 hours = No failure No cracking, loss of adhesion, checking or other defect
7. Coefficient of Thermal Exp.	ASTM C 531	28 days = $5 \times 10^{-7}$ mm/mm degrees C $6.99 \times 10^{-6}$ in/in degrees F
8. Fungus Resistance	Fed Spec TT-P-29B	21 days = No growth
9. Salt Spray Resistance	ASTM B-117	300 hours = No defect
10. Wind Driven Rain Resistance	Fed Spec TT-P-0035 para 4.4.7	8 hours = excellent
11. Water Vapor Permeability	ASTM E 96	12 Perms
12. Impact Resistance	Fed Spec TT-P-0035	No chipping
13. Freeze Thaw Resistance	ASTM C 666B	200 cycles = No change
14. Surface Burning	ASTM E84-86	Flame spread 0 Smoke developed 5
15. Water Absorption	ASTM C 67 Sec. 7.3	3.6 percent at 24 hours Boiling water submersion
16. Hardness	Fed Spec TT-P-0035 para 4.4.9	7 days = 35 14 days = 47 21 days = 52

## 2.02 RELATED MATERIALS

### A. Sealant

1. Refer to Section 0700S for Sealant requirements:

### B. Mortar Joint Repair

1. "Thoro Dryjoint", by ChemRex, or approved equal; a non-shrink, cement-based, tuck-pointing mortar.

### C. Repairing Vertical Spalled Areas

1. "Thorite General Purpose with Acryl 60" by ChemRex, or approved equal; a polymer modified patching mortar.

D. Repairing Leaking Static Cracks, Joints and Voids

1. "Waterplug" by ChemRex, or approved equal; a quick set, water stop repair mortar.

2.03 MIXES

A. Mix coating system materials in accordance with manufacturer's printed recommendations and product technical bulletins. Mix with approved mechanical mixers to ensure homogenous distribution of materials.

1. Prepare a mixing solution of 1 part "Acryl 60" and 3 parts water. Prepare enough solution to several days work. Solution will remain usable if kept in tightly covered containers.
2. Mix one 50-pound bag of "Thoroseal" with approximately 6 to 8 quarts of mixing liquid, add powder to liquid.
3. Do not use frozen, caked or lumped materials. Mix to consistency of smooth, heavy batter.
4. Allow to rest undisturbed for a minimum of 10 to 15 minutes to fully wet out the powder. Once re-mixed, a batch can be re-tempered one additional time

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during coating system application.

B. Test and clean substrate in accordance with coating system manufacturer's recommendations and the following national standards:

1. ASTM D 4258-83 (1988) Surface Cleaning Concrete for Coating
2. ASTM D 4259-88 Practice for Abrading Concrete.
3. ASTM D 4261-83 (1988) Practice for Surface Cleaning Concrete Masonry for Coating
4. ASTM D 4285-83 (1988) Indicating Oil or Water in Compressed Air
5. ASTM D 4541-85 (1989) Pull-Off Strength of Coatings Using Portable Adhesion Testers
6. astm d 4260-88 Practice for Acid Etching Concrete
7. ASTM D 4262-83 (1988) pH of Chemically Cleaned or Etched Concrete Surfaces
8. ASTM D 4263-83 (1988) Indicating Moisture in Concrete by the Plastic Sheet Method

- C. Substrate shall be sound, clean, dry and free of all dust, dirt, oils, grease, laitance, efflorescence, mildew, fungus, biological residues, chemical contaminants, previous coatings that could prevent proper adhesion. Removal shall be by approved methods demonstrated during mock-up.
- D. Chip, sand blast, shot blast or wet blast substrate to remove contaminants. Allow water blasted or water soaked surfaces to become unsaturated and surface dry before application.
- E. Repair all spalled areas and voids with “Thorite General Purpose”.
- F. Remove all loose, soft, friable mortar. Replace with “Thoro Dryjoint” to match existing mortar. Cure replacement mortar 7 days.
- G. Treat, neutralize and remove efflorescence, mold, and mildew prior to coating application.
- H. Repair static cracks showing signs of active water leaks with Waterplug”.

### 3.02 APPLICATION

- A. Dampen substrate with clean, potable water prior to application. Surface shall remain damp during application.
- B. Apply “Thorseal” by spray, tampico fiber brush or 10 inch “Thoro” broom to achieve prescribed surface texture and finish.
- C. Apply first coat of “Thorseal” at a recommended spread rate of 4.5 square feet per pound (225 feet per 50-pound bag).
  - 1. Spray application shall be back-brushed or back-broomed into substrate to fill pores and voids.
- D. Maintain or place necessary expansion and control joints in structure to which “Thorseal” is applied.
- E. Allow 24 hours before applying second coat at a recommended spread rate of 9 square feet per pound (450 square feet per 50-pound bag).
- F. Allow final application to air cure a minimum 7 days before back-filling or top-coating. Use moisture cure techniques if extreme hot, dry, or windy conditions exist.
- G. Match approved samples for color, texture and coverage. Remove, refinish or re-coat work not in compliance with Contract Documents.

### 3.03 CLEANING AND PROTECTION

- A. Remove temporary coverings and protection of adjacent work areas. Remove over-spray coating areas not intended to be coated. Remove construction debris from project site.
- B. Protect applied coating system finish from damage during construction.

END OF SECTION