

## SECTION 03 05 10 – CSXTREME (PRAH) PERMEABILITY REDUCING ADMIXTURE FOR HYDROSTATIC CONDITIONS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. CSXtreme (PRAH) integral liquid concrete admixture for used for waterproofing, shrinkage reducing, corrosion inhibiting and internal curing for all new exterior or below grade concrete. Applications include below grade parking structures, mat/raft foundations, pools, lagoons, underground vaults, tunnels, elevator pits, manholes, cisterns, foundations walls, footings, bridge decks, support walls, pavement, sidewalks, slabs-on-grade, planters, fountains, elevated slabs, and roof decks.
- B. Related Sections:
  - 1. Division 01 Section: Sustainable Design Requirements”.
  - 2. Division 03 Section: "Cast-in-Place Concrete."
  - 3. Division 07: Waterproofing Sections:
  - 4. Division 09 Flooring: Sections for all moisture sensitive flooring materials installed over power-troweled or burnished concrete substrates requiring nonporous adhesives.

#### 1.2 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 306R-10 Guide to Cold Weather Concreting
  - 2. ACI 305R-10 Guide to Hot Weather Concreting
  - 3. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture Sensitive Flooring
  - 4. ACI 308R-16 Guide to Curing Concrete
  - 5. ACI 302.1R- 96 Guide for Concrete Floor Slab Construction (Topping Depth)
  - 6. ACI 503R-93& 98 Use of Epoxy Compounds with Concrete
  - 7. ACI 544 Fibers

#### 1.3 SUBMITTALS

- A. Product Data Sheet
- B. Safety Data Sheet

#### 1.4 PHYSICAL PROPERTIES & TESTING

- A. ASTM C 494 /C494M: Pass
- B. ASTM C 157 (Shrinkage Reduction): 86% Average or Greater Reduction
- C. ASTM C 1543 (Reduction in Corrosion - Ponding): 80%
- D. ASTM C 1202 (Reduction in Corrosion – Rapid Chloride Ion Test): 42%
- E. ASTM C 1260 (Potential Alkali Silica Reactivity of Aggregates): Pass
- F. ASTM C 1567 (Potential Alkali Reactivity of Combinations of Cementitious Materials and Aggregate): Pass
- G. ASTM C 39 (Strength- PSI): 22% Average Increase or Greater
- H. ASTM D 5084 (Hydraulic Conductivity): <6.0 x 10<sup>-9</sup> maximum flow rate from project specific samples

- I. ASTM C 666 (Freeze Thaw Resistance- Reduction to Mass Change): 63% or Greater
- J. ASTM C 232 (Reduction of Bleed Water In Concrete): 19.20% or Greater
- K. ASTM C 672 (Scaling Resistance of Concrete Surfaces): No Scaling
- L. ASTM C 1152 (Acid Soluble Chloride in Mortar and Concrete): Pass
- M. ASTM G 109 (Effects on Chemical Admixtures on Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments): No Notable Corrosion
- N. ACI 212.3R (Permeability Reducing Admixture For Hydrostatic Conditions (PRAH)): Yes
- O. MIP (Mercury Intrusion & Porosimetry (Reduction Of Pore Structure) (Normal Mix): 15%+
- P. Mercury Intrusion & Porosimetry (Reduction Of Pore Structure) (Normal Mix): 36%+
- Q. Water To Cementitious Materials Ratio Range: (0.31 – 0.52)
- R. Integral Biocide to Inhibit Growth of Mold and Bacteria: Yes
- S. Sodium Silicate Free: Yes

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver CSXtreme (PRAH) in manufacturer's original, undamaged containers.
- B. Store and protect CSXtreme (PRAH) from exposure to harmful weather conditions and in a temperature-controlled area above 36F degrees.
- C. Do not allow product to freeze. Should product freeze, immediately contact Barrier One Concrete Admixtures for further instructions.
- D. Utilization of CSXtreme (PRAH) product on hand or in inventory is acceptable as long as the product has not reached its expiration date and is registered with Barrier One Concrete Admixtures.

#### 1.6 WARRANTY REQUIREMENTS:

- A. CSXtreme (PRAH) must be installed according to, and in compliance with the Technical Data Sheet.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis-of-Design: CSXtreme by Barrier One Concrete Admixtures : 640 Garden Commerce Parkway, Winter Garden, Florida 34787. Phone: (800) 562-9986 Email: [contactus@barrierone.com](mailto:contactus@barrierone.com)

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Pre-installation Conference: Verify that all parties review CSXtreme (PRAH) technical data sheet, concrete mix designs and placement and curing processes ensuring field quality of concrete materials.
- B. Add CSXtreme (PRAH) in accordance with Technical Data Sheet.
- C. Use of water reducing admixtures are recommended to achieve slumps greater than 4" (102mm).
- D. Use of other admixtures in the same batch as CSXtreme (PRAH) is acceptable as long as each admixture is added separately.
- E. The dosing or inclusion of a shrink reducing admixture (SRA) is not acceptable.

F. The dosing or addition of a crystalline growth admixture is not acceptable.

### 3.2 CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305 for hot-weather protection during curing.
- B. Cure concrete slabs to receive moisture sensitive coatings in accordance with ACI 302.2R-06.

END OF SECTION 03 05 10