ARTICLE XIII – CONCRETE WORK

13.1 GENERAL

A. Work under this Article includes furnishing of all labor, materials, and equipment required to complete all concrete work as indicated on the drawings and/or specified herein. The work includes but is not limited to the following:

1. Demolition and removal of eleven existing light pole pedestals

2. Concrete repairs for the associated light pole pedestals

B. All work shall be in accordance with the following sections of the Standard Specifications except as modified or supplemented herein:

Section 503 Concrete Structures
Section 601 Structural Concrete
Section 602 Reinforcing Steel
Section 711 Concrete Curing Materials and Admixtures

Sections on Materials referenced in the above sections are hereby incorporated.

13.2 MATERIALS

A. Concrete

1. Concrete shall be Class f'c = 5,000 psi conforming to Section 601 "Structural Concrete" of the Standard Specifications.

B. Admixture - Admixture to be used in the concrete shall be approved by the Harbors Construction Engineer and shall conform to Section 711 of the Standard Specifications. Contractor shall strictly adhere to the manufacturer's recommendations regarding the use of admixtures including storage, transportation and method of mixing.

CORTEC MCI 2005NS migrating corrosion inhibiting admixture manufactured by Cortec Corporation or approved equal shall be added at the following rate and as recommended by the manufacturer.

CORTEC MCI 2005NS: 1.5 pints per cubic yard of concrete

To combat climate change and reduce the concrete carbon footprint, supplementary cementitious material(s) shall be used to reduce the cement content in the concrete for this project. The following supplementary cementitious material shall be substituted for cement by weight at the following rate and as recommended by the concrete supplier.

Silica Fume: 10% of cement by weight

The maximum water to cementitious materials ratio shall be 0.40 and the mix water shall be reduced as necessary to account for the admixture.

C. New Reinforcing Steel – New reinforcing shall be ASTM A615 Grade 60.

D. Reinforcing Steel Anti-Corrosion Coating – Anti-corrosion coating with a minimum 7 day open time for reinforcing steel shall be Sika Armatec 110 Epocem by Sika, or approved equal.

E. Epoxy Grout - Epoxy for grouting of dowels shall be Set 3G by Simpson Strong-Tie, or approved equal.

F. Curing Compound for concrete repairs shall be acceptable to the Harbors Division Construction Engineer.

G. Forms shall conform to Section 503.03.C "Forms" of the Standard Specifications.

H. Snap ties and inserts shall be plastic or stainless steel. All loose reinforcing steel shall be secured with ties at all intersections with adjacent reinforcing steel.

I. Non-Shrink Grout – Non-shrink grout to be installed under base plates shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 3,000 psi in 1 day and 5,000 psi in 28 days.

13.3 CONSTRUCTION METHODS

A. Concrete construction shall conform to the American Concrete Institute (ACI) ACI 318R and ACI 546R-14.

B. Concrete Demolition and Removal - Concrete shall be removed as shown on the drawings. Cut existing anchor bolts and conduits as required and coat with anti-corrosion coating. Removed material shall be disposed of away from the project site in a lawful manner at no cost to the State. The Contractor will not be allowed to deposit removed material into State waters.

C. Live Load Limitation - Forklift and heavy live loads shall not be placed within 20 feet of light pole repairs during concrete curing starting from the time of concrete placement and allowed to cure a minimum of 48 hours. The repair area shall remain barricaded with barriers visible at night from traffic during this period. Repair concrete shall be allowed to cure for 7 days or obtain a minimum compressive strength of f'c = 4,000 psi before light pole installation.

D. Anchor bolts, reinforcing bars and other items to be cast in concrete shall be secured in position prior to placement of concrete.

E. Anti-Corrosion Coating - All existing reinforcing steel and miscellaneous steel items shall be liberally coated with anti-corrosion coating per manufacturer's recommendations.

F. Epoxy Grouting - Blow holes completely clean of all concrete debris to allow for adequate bonding of the epoxy. The holes shall be filled with epoxy gel before inserting and turning the supplemental reinforcement to displace the grout.

G. Formwork - Formwork shall be installed in accordance with Section 503.03.C - "Forms" of the Standard Specifications. Forms shall be designed to provide the minimum concrete cover over reinforcing steel specified on the drawings.

H. Placing Concrete - Concrete shall be placed in accordance with Section 503.03 - "Construction" of the Standard Specifications.

I. Finish - Concrete finish shall conform to Section 503.3(M)(2) - "Class 2 Rubbed Finish" of the Standard Specifications.

J. Formwork Removal - Formwork for all repairs shall not be removed for a minimum of three (3) days after concrete placement.

K. Concrete Curing - Concrete shall be cured by covering the surface with a curing compound approved by the Harbors Construction Engineer and per manufacturer's recommendations.

L. Defective Work - After forms have been removed, the repaired area shall be tested by tapping with a hammer. Any "hollow" sound emitted shall indicate the presence of voids and shall be sufficient cause for removal of repair work and reconstruction. The method of repairing defects shall be subject to the approval of the Harbors Construction Engineer. All defects shall be corrected by the Contractor at no additional cost to the State.

13.4 PAYMENT - Payment for Concrete Work will not be measured and paid for separately but shall be considered incidental to the applicable items in Article X of these Specifications.