ITEM 11555.9001 M - CAST-IN-PLACE SUBSTRUCTURE CONCRETE DESIGNATED BY COMPRESSIVE STRENGTH
ITEM 11555.9002 M - CAST-IN-PLACE BARRIER CONCRETE DESIGNATED BY COMPRESSIVE STRENGTH

DESCRIPTION. This work shall consist of furnishing and placing portland cement concrete for those cast-in-place structural components for which minimum compressive strength has been specified on the Plans, with the exception of cast-in-place superstructure closure pours, as indicated on the Plans and in accordance with the Specifications. The requirements of §555 shall apply except as noted in this Specification.

MATERIALS. All of the provisions of §555-2 shall apply except as modified herein.

The Contractor shall be responsible for the design of any concrete mix covered by this Specification. Acceptance of the mix shall be based on meeting performance criteria of this Specification. The portland cement concrete shall consist of a homogeneous mixture of cement, fine aggregate, coarse aggregate, water, admixtures, and any supplementary cementitious materials (fly ash, microsilica, or ground granulated blast furnace slag) deemed necessary.

Materials used for the concrete shall meet the requirements of §501-2.02. In addition, the following shall apply:

1. Cement shall be either Type I, Type II, Type I/II, or Type III
2. Microsilica shall be in accordance with §711-11
3. Ground granulated blast furnace slag shall be in accordance with §711-12

The concrete shall satisfy the following performance criteria requirements:

1. Minimum compressive strength shall be as shown on the Plans. The minimum compressive strength shall be achieved at 28 days of age unless otherwise specified. Concrete to be put into service prior to 28 days shall achieve the minimum compressive strength prior to being put into service.
2. When no high range water reducing admixture is used, slump at point of discharge shall be 80 mm +/- 25 mm. When a high range water reducing admixture is used, slump at point of discharge before addition of the high range water reducing admixture shall not exceed 80 mm. After addition of the high range water reducing admixture, slump shall not exceed 200 mm.
3. Air content of fresh concrete shall be between 5% and 8%.
4. Water/total cementitious material ratio shall not exceed 0.40. Cementitious materials are defined as portland cement and supplementary cementitious materials.

After the materials have been selected for this work, the Contractor shall perform laboratory tests on trial batches to verify that the concrete satisfies the specified performance criteria. The Contractor shall engage a qualified independent testing laboratory, subject to the approval of the Department, to perform all mix development testing. Testing shall be in accordance with ASTM Standards C192, C39, C143, and C231. The designed concrete shall provide test results sufficient to assure all performance criteria requirements can be achieved during all production operations. At least one (1) month prior to the start of any concrete placement, the Contractor shall provide a copy of the mix design and trial batch test results to the Director, Materials Bureau, submitted through the Regional Materials Engineer, for evaluation. It shall be the

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Contractor's responsibility to submit sufficient data to permit the Director of the Materials Bureau to render an informed evaluation. The test results submitted shall include, but shall not be limited to, the following:

Concrete mix proportions
Sources of all materials
Air content of tested cylinder concrete
Slump of tested cylinder concrete
Compressive strength at 7, 14, and 28 curing days, and at all other ages for which minimum compressive strength requirements are specified on the Plans. A curing day is defined in §555-3.09.

Submittals of mix design and test results are to ensure general conformance with the Plans and Specifications only. The rendering of an evaluation of validity by the Director of the Materials Bureau shall not be interpreted as approval of the mix design. All changes to the mix design shall be submitted for evaluation in accordance with this specification.

CONSTRUCTION DETAILS. All the provisions of §555-5 shall apply except for the provisions of §555-3.01, Concrete Manufacturing and Transporting. Concrete Manufacturing and Transporting shall be in accordance with §501-3.02, Concrete Batch Plant Requirements, §501-3.03, Handling, Measuring, and Batching Materials, and §501-3.04, Concrete Mixing, Transporting, and Discharging.

METHOD OF MEASUREMENT. All of the provisions of §555-4 shall apply.

BASIS OF PAYMENT. All of the provisions of §555-5 shall apply except as modified herein.

The unit price bid shall include the cost of furnishing, placing, stressing, and grouting post-tensioned threadbar tendons as shown on the Plans and in accordance with Section 718-51.

Payment will be made under:

Item No.	Item	Pay Unit
11555.9001 M	Cast-in-Place Substructure Concrete Designated by Compressive Strength	Cubic meter
11555.9002 M	Cast-in-Place Barrier Concrete Designated by Compressive Strength	Cubic meter

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