

DIVISION III

MATERIALS DETAILS

NOTE: Where pertinent, a "Manufacturer's Certificate of Compliance" covering materials as specified in this Division may be required and shall be furnished by the Contractor, when requested by the Engineer, at no cost to the Contracting Agency.

SECTION 701

HYDRAULIC CEMENT

SCOPE

701.01.01 MATERIALS COVERED

- A. This specification covers the types of Hydraulic cement as defined by ASTM C150, ASTM C595, and ASTM C1157. Unless otherwise provided, the cement will be used for all Hydraulic cement concrete, mortar, cement treated base, and cement treated subgrade. The type of cement used shall be as listed in Table 1 with the minimum sack requirements in **Section 501, "Portland Cement Concrete."**

Table 1 - Types of Cement Permitted
ASTM C150 Type II & Coal Ash ³
ASTM C595 IL (MS) ¹ , IP (MS), IS (MS) and IT (MS) & Coal Ash ³
ASTM C595 IL (MS) ¹ , IP (MS), IS (MS) and IT (MS)
ASTM C150 Type V
ASTM C595 Type IL (HS) ² , IP (HS), IS (HS) and IT (HS)
ASTM C150 Type V & Coal Ash ³
ASTM C595 Type IL (HS) ² , IP (HS), IS (HS) and IT (HS) & Coal Ash ³

¹ ASTM C595 Type IL (MS) Type IP (MS), Type IS (MS), and Type IT (MS) are equivalent to ASTM C150 Type II.

² ASTM C595 Type IL (HS), Type IP (HS), Type IS (HS), and Type IT (HS) are equivalent to ASTM C150 Type V.

³ Natural pozzolans, slag, and silica fume may be substituted per Section 729.

MATERIALS

701.01.02 GENERAL

- A. Unless otherwise specified, the type of cement used shall be at the Contractor's option based on availability, and no additional compensation will be allowed for substitution of any type of cement for another.
- B. Cement to be removed and replaced with SCMs shall be a minimum of 20 percent of the weight of cement. SCMs added at the mixer shall be in an equal proportion to the weight of cement removed.
- C. Class F coal ash, Class N Pozzolans, Slag, or Silica Fume conforming to the requirements of **Section 729, "Supplementary Cementitious Materials (SCMs),"** shall be used.

PHYSICAL PROPERTIES AND TESTS

701.02.01 REQUIREMENTS

- A. Type II and Type V Portland cements shall conform to ASTM C150 except as hereinafter provided.
- B. Type IL, Type IP, Type IS, and Type IT blended hydraulic cement shall conform to ASTM C595 except as hereinafter provided.
- C. SCMs shall conform to **Subsection 702.03.04, "Supplementary Cementitious Materials (SCMs)."**
- D. Additionally, both ASTM C150 Type II and Type V cements and ASTM C595 Type IL, Type IP, Type IS, and Type IT cements shall conform with the following requirements:
 - 1. The cement shall not contain more than 0.60 percent by mass of alkalis calculated as Na₂O plus 0.658 K₂O.
 - 2. ASTM C150 Type II and Type V cements and ASTM C595 Type IL, Type IP, Type IS, and Type IT cements that exceed the allowable alkali content may be used if mortar bars made and tested according to Subparagraph 1 above, using the proposed cement and a selected highly alkali-reactive aggregate, show no more than 0.05 percent expansion at 6 months.