

SECTION M.14
PRESTRESSED CONCRETE MEMBERS

M.14.01--Materials for pretensioned members shall conform to the following requirements:

1--Concrete: The concrete for the members shall be air-entrained concrete composed of portland cement, fine and coarse aggregates, admixtures and water. The air-entraining feature may be obtained by the use of either air-entraining portland cement or an approved air-entraining admixture. The entrained air content shall be not less than 4 percent or more than 6 percent.

The Contractor shall design and submit to the Engineer a concrete mix which shall attain a minimum 28-day strength (f'c) as shown on the plans. The compressive strength (f'ci) at the time of transfer of prestressing load shall be as shown on the plans. The Contractor shall further provide a certificate stating that the mix submitted shall meet the requirements. Its ultimate strength at 28 days (f'c) shall have the minimum value shown on the plans.

- a) **Coarse Aggregate** shall consist of broken stone, having a maximum size of 19 mm, conforming to the requirements of Article M.03.01.
- b) **Fine Aggregate, Water, Air-Entraining Admixture and Retarder Admixture** shall conform to the requirements of Article M.03.01.
- c) **Portland Cement** for the members shall conform to the requirements of M.03.01, except that Type III or Type IIIA portland cement may be used at no additional cost to the State.
- d) **Water-Reducing Admixture:** The Contractor may submit, for the approval of the Engineer, water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.

When the Engineer has previously approved the use of a high range water reducer in the concrete mix, the entrained air content shall be not less than five (5) percent nor more than eight (8) percent.

(e) **Calcium Chloride:** The addition to the mix of calcium chloride or admixture containing calcium chloride will not be permitted.

2--Prestressing Steel: Prestressing elements shall be uncoated, high tensile strength, seven-wire strand conforming to the requirements of AASHTO M 203.

Before incorporating the elements into the work, a minimum of one sample, 2.2 m in length, shall be furnished to the Engineer for testing. When reel packs are identified with the same heat number, only one sample need be tested for every five (5) reel packs.

3--Reinforcing Steel and Tie Wire: All deformed bars, stirrups, dowels, threaded dowels and tie wire shall conform to the requirements of Article M.06.01-1.

4--Paint for the main prestressing strand ends shall conform to the requirements of Article M.08.01-5 for coating material.

5--Strapping for the beams shall be 19 mm X 0.9 mm, uncoated or galvanized, heavy-duty steel strapping having a minimum ultimate tensile strength of 760 MPa. Strapping shall be obtained from a manufacturer approved by the Engineer.

Before incorporating the strapping in the work, samples of the strapping at least 1 m long shall be furnished from each coil for testing. Approval of the material shall be obtained before the material is incorporated in the work.

6--Lifting Hooks, Pipe Sleeves, Base Protective Plates, Threaded Inserts, devices and attachments shall be of the size indicated on the plans or of a design satisfactory for the purpose intended.

7--Transverse Tie Strands shall be galvanized 7-wire strand, of the size noted on the plans, specially manufactured for prestressing, and shall conform to the pertinent requirements of Article M.14.01-2. The tie strands shall be coated with an approved high quality corrosion-resistant mastic and inserted into a black polyethylene tube having a minimum wall thickness of 0.9 mm. The strands shall be clamped at each end by an aluminum strandvice coated with clean vinyl paint or an approved equal.

8--Nonsrink Grout for Longitudinal Shear Keys between Deck Units and for Recesses at Ends of Transverse Tie Strands and Deck Units. The mortar shall conform to the requirements of Article M.03.01-12. At exposed locations, the mortar used for patching shall match the color of the adjacent surface.

9--Void Forms: Internal voids may be formed by the use of heavy paper or fiber forms, specially made for this purpose, or with an alternate acceptable to the Engineer. These forms must be of substantial construction and adequately waterproofed in order to maintain their shape during the entire construction cycle. The end caps shall also be of similar construction. Before incorporation of the forms in the work, a sample 1.2 m in length with end caps shall be furnished the Engineer for testing. Approval of the material shall be obtained before the material is incorporated in the work.