

Section 2 – Structures Design

directed by the Authority's Engineering Department. The concrete strength used for deck slab design using HPC shall be 4,000 psi.

Concrete for use in precast prestressed slabs, box beams and girders shall have a minimum compressive strength at 28 days of 5,000 psi. Higher strengths may be used, if required by the design, where this can be justified on grounds of economy. The required minimum concrete compressive strength at the time of application of the prestress force (f'_{ci}) shall be computed and shown on the plans to the nearest 100 psi and shall not normally be less than $0.8 (f'_c)$.

Concrete Class A, with a minimum compressive strength at 28 days (f'_c) of 4,500 psi, shall be used for median barriers, barrier parapets, cast-in-place concrete bearing piles and all precast concrete except prestressed precast concrete.

Concrete Class B, with a minimum compressive strength (f'_c) of 4,000 psi, shall be used for deck slab rehabilitations, approach slabs, safetywalks, sidewalks, culverts and for all pier elements.

Concrete Class C, with a minimum compressive strength (f'_c) of 3,500 psi, shall be used for all cast-in-place walls, abutments and footings.

The value of the concrete strength (f'_c) to be used for the design of reinforced concrete using Class A, B or C concrete shall be 500 psi less than the specified minimum compressive strength except for deck slabs using high performance concrete.

Reinforcement Steel

Reinforcement steel shall conform to the requirements of ASTM Designation A615, Grade 60 plain carbon steel. Low-alloy, low-carbon steel conforming to the requirements of ASTM Designation A706, Grade 60, may be substituted in situations where welding is employed to expedite the assembly of reinforcement cages. See Subsection 2.2.4.2 for reinforcement requirements on Deck Slabs.

Reinforcement steel conforming to the requirements of ASTM Designation A615 shall not be welded. Additionally, welding of intersecting bars shall not be permitted in deck slabs.

Superstructure Design

Stringers and Beams

1. General

Continuous superstructures should be used whenever foundation conditions and structure layout permit. The most important considerations in this choice are the reduction in the number of deck joints, economy and the possible reduction in structure depth. The effects of differential settlement shall be included in the design. When the settlement cannot be reliably predicted, consideration should be given to the use of pile foundations.