

5.4 MATERIAL PROPERTIES

The designer is responsible for selecting the proper class of concrete for the degree of exposure and intended placement. The classes of concrete specified should meet the requirements of Section 502 of the Standard Specifications.

SCHEDULE OF CONCRETE

Concrete placement is divided into schedules for structures that have definite superstructure and substructure elements; e.g., prestressed girder bridges. Unscheduled concrete is used for culverts, retaining walls, etc.

- Schedule Number 1 concrete is intended for placement in the substructure. Typical placement is below the beam seats at abutment and piers and at wing walls.
- Schedule Number 2 concrete is intended for placement in the superstructure. Typical placement is above the beam seats.

CLASS OF CONCRETE

The class of concrete is specified in 100 psi 28-day strength. Refer to Bridge LRFD Manual Article 5.12 for additional requirements on classes of deck concrete.

<u>Class</u>	<u>Strength-psi</u>	
Seal	NA	Use for underwater placement for sealing cofferdams
15	1500	Use for a leveling course
30	3000	Not recommended for structural applications.
40	4000	Recommended for most structural members.
40AF		Intended for use when high entrained air and low slump are necessary for extreme exposure and wear. Typical applications are deck slabs, curbs, and parapets.
40A		Intended for use when air entrained concrete is desirable for substructure elements. Typical applications are abutments, piers, pier caps, columns, and wing walls.

The properties for structural concrete placed underwater shall be specified by a Special Provision.

ALKALI SILICA REACTIVITY

All coarse and fine aggregate for concrete shall be tested for ASR according to the Standard Specifications subsection 703.02. Aggregates found to be potentially reactive shall require mitigating measures. The mitigative additives may be fly ash, lithium or other additives in any combination. The proposed mix design shall be tested with the mitigative additives.

BID ITEMS

Concrete should be specified as follows:

- Class 40A and Seal Concrete bid items should be used.
- Class 40AF is recommended for decks and curbs/parapets to increase durability and reduce cracking.

Commentary

The contractor may add fly ash to enhance the mix design at his option. Fly ash reduces the heat of hydration which results in reduced cracking.

Revisions:

June 2006	Fly ash concrete paragraph deleted and replaced with ASR paragraph to conform to the 2004 ITD Standard Specifications.
April 2008	Added Seal, Class 15, and Underwater structural concrete to Class of Concrete

June 2013 Deleted Class 40B concrete to conform to the January 2012 Supplemental Specifications.
Deleted reference to 703.03 to conform to 2012 Standard Specifications.
Added Class 40AF concrete for bridge decks and parapets.
Deleted the first sentence in the Commentary to agree with the Standard Specifications.