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.
- Schedule Number 2 concrete is intended for placement in the superstructure. Typical placement is above the beam seats.

Use Schedule Number 1 and Schedule Number 2 concrete for wingwalls that have a horizontal construction joint at the beam seat.
Use Schedule Number 1 concrete for wingwalls that do not have a horizontal construction joint at the beam seat.

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.

Class	Strength-psi	
Seal	NA	Use for underwater placement for sealing cofferdams
15	1500	Use for a leveling course
30	3000	Not recommended for structural applications.
40AF		Recommended for decks and curbs/parapets to increase durability, reduce cracking, and provide higher entrained air content.
40A		Recommended for abutments, piers, pier caps, columns, wingwalls, and cast-in-place/precast culverts to provide higher entrained air content.

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.

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.

Oct 2023	Clarified the use of Sch No 1 and Sch No 2 concrete in wingwalls. Revised the description of Class 40A and Class 40AF Deleted Bid Items paragraph.