

Design Memorandum

TO: All Design Section Staff

FROM: Bijan Khaleghi

DATE: March 14, 2009

SUBJECT: Minimum Depth Limitations on Precast Slab Members

This design memorandum requires limitations on precast slab members for minimum depth, introduces new standard precast slab sections, and provides guidance for usage of temporary top strands.

The minimum depth of precast slab members shall be at least 0.03 times the member length for both simple and continuous span bridges. Precast slab members with depths up to 36 in. can be used to accommodate the minimum depth requirement. For depths beyond 36 in., other types of superstructure members shall be used.

The standard width of precast slab members is 4.0 ft. The width of precast slab members can be increased in conjunction with depth to accommodate cross-sectional efficiency with circular voids as shown in Table 1. The width of precast slab members generally should not exceed 8.0 ft.

A minimum of 5 in. cast-in-place (CIP) concrete topping is required for precast slab bridges. Precast slab bridges are designed as noncomposite sections for self-weight and CIP topping dead load and as composite sections for live load and superimposed dead loads including traffic barrier and future overlay. The LRFD deflection criteria of article 2.5.2.6.2 shall be satisfied for these types of bridges.

Temporary top strands are not required for the lateral stability of precast slab members. Temporary top strands can be used if required to control concrete stresses due to plant handling, shipping and erection. These strands shall be bonded for 10 ft at both ends of the member, and unbonded for the remainder of the member length. Temporary strands shall be cut prior to casting of CIP topping.

PGSuper program will be revised to accommodate the new precast slab sections.

Background:

High strength concrete and large diameter strands allow engineers to design precast slab members beyond the conventional span-to-depth limitations. However, recent experience with precast slab bridge projects show inconsistencies between calculated and measured cambers. The minimum depth requirement is expected to mitigate the inconsistencies in camber growth of precast slab members.

If you have any questions regarding these issues, please contact Rick Brice at 705-7174 or Bijan Khaleghi at 705-7181.

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Precast Slab Designation	Max. Length (ft)	Depth (in.)	Nominal Width	Void Diameter (in.)
1'-0" - Solid Slab	33	12	4'-0"	N/A
1'-6" - Voided Slab	50	18	4'-0"	9
2'-2" - Voided Slab	72	26	4'-0"	16
2'-6" - Voided Slab	83	30	4'-4"	18
3'-0" - Voided Slab	100	36	5'-0"	22