Index D20399 Overlay and Deflection Data for Prestressed Slab Units

Design Criteria

AASHTO LRFD Bridge Design Specifications; ***Structures Detailing Manual (SDM)***; ***Structures Design Guidelines (SDG)***

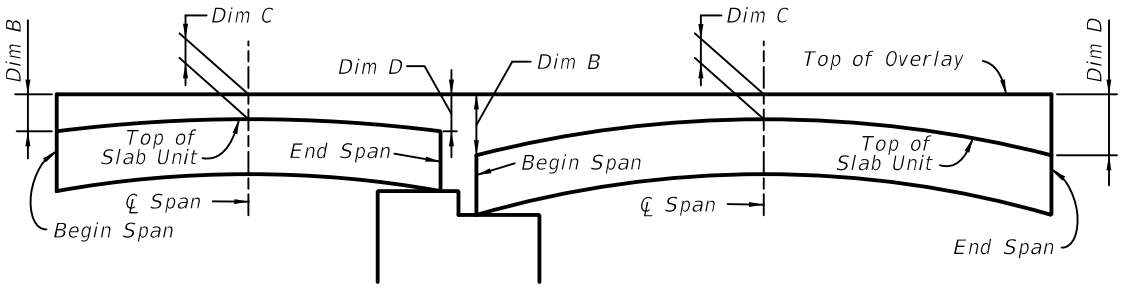
Design Assumptions and Limitations

Use this standard in conjunction with Indexes D20350, D20353, D20354, D20355, D20363, D20364 and D20365.

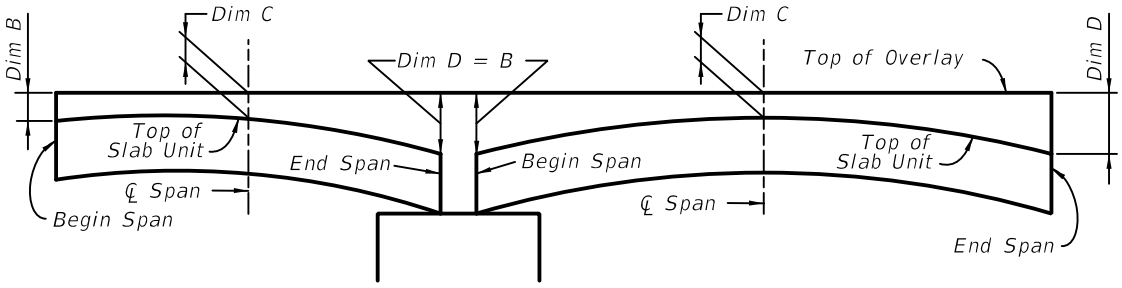
Unless otherwise required as a design parameter, slab unit camber for computing the theoretical overlay must be based on 120-day old concrete.

Place slab units parallel to the cross slope of the bridge. Consider the effects of horizontal curvature with bridge deck cross slope when determining the minimum theoretical overlay over the tip of the inside edge of slab units. Consider that the vertical curve geometry is along the effective alignment along a chord at the centerline of the slab unit, which may be different from the alignment parallel to the Profile Grade Line.

For a given thickness slab unit, slab unit camber and associated Dim B and Dim D will vary due to span lengths. Dim B and Dim D will also vary from span to span along the length of a bridge due to deck geometry. To provide for better aesthetics and potentially easier detailing of the supporting pedestals, where possible adjust the values of Dim B and Dim D over equal height slab units in adjacent spans so as to allow the bottoms of the slabs to line up. Dim B and Dim D do not necessarily have to be the same value for a single slab unit. See the following sketch:



AVOID WHEN POSSIBLE



PREFERRED

BUILD-UP DETAIL SHOWING ADJACENT NON-EQUAL SPANS WITH DIFFERENT SLAB UNIT CAMBERS

Plan Content Requirements

Insert the entire ***Developmental Design Standards*** Index, received from the Central Office monitor, into the appropriate component plan set in accordance with ***PPM***, Volume 2, Section 3.8.

Complete the following "Overlay and Deflection Data Table for Prestressed Slab Units" and include it on the superstructure detail sheets. Refer to the Instructions for Indexes D20350 & D20360 for overlay thickness requirements. See Introduction I.3 for more information regarding use of Data Tables.

OVERLAY & DEFLECTION DATA TABLE FOR PRESTRESSED SLAB UNITS							Table Date 01/01/12
LOCATION		REQUIRED THEORETICAL OVERLAY ON ℄ SLAB UNIT			NET BEAM CAMBER (PRESTRESS - DEAD LOAD OF SLAB UNIT) @ 120 DAYS (in.)	DEAD LOAD DEFLECTION DURING OVERLAY POUR @ 120 DAYS DIM A (in.)	OVERLAY CASE NO.
SPAN NO.	SLAB UNIT NO.	AT BEGIN SPAN DIM B (in.)	AT ℄ SPAN DIM C (in.)	AT END SPAN DIM D (in.)			

NOTE: Work this sheet with Developmental Design Standard Index No. D20399.

Payment

Item number	Item description	Unit Measure
400-2-41	Concrete Class II, Precast Deck Overlay	CY
400-4-41	Concrete Class IV, Precast Deck Overlay	CY

In the absence of more refined calculations, the following method to calculate estimated concrete overlay quantities may be used:

For Case 1, 2 & 3: $$V = \frac{LW\left[C + \left(\frac{B + D - 2C}{6}\right)\right]}{27}$$

For Case 4: $$V = \frac{LW\left[\left(\frac{B + D}{2}\right) + \left(\frac{2}{3}\left(C - \frac{B + D}{2}\right)\right)\right]}{27}$$

Where:

V = Total Volume of overlay per Span (CY) not including diaphragms

L = Span Length (ft)

W = Width of Bridge Deck (ft)

B; C; D = Overlay Thickness (ft)