

PRECAST PRESTRESSED SLAB PRELIMINARY DESIGN CURVES

PRECAST PRESTRESSED SLAB W/ASPHALT OVERLAY

Section Properties and maximum span length curves for the precast prestressed slabs are included in this Article.

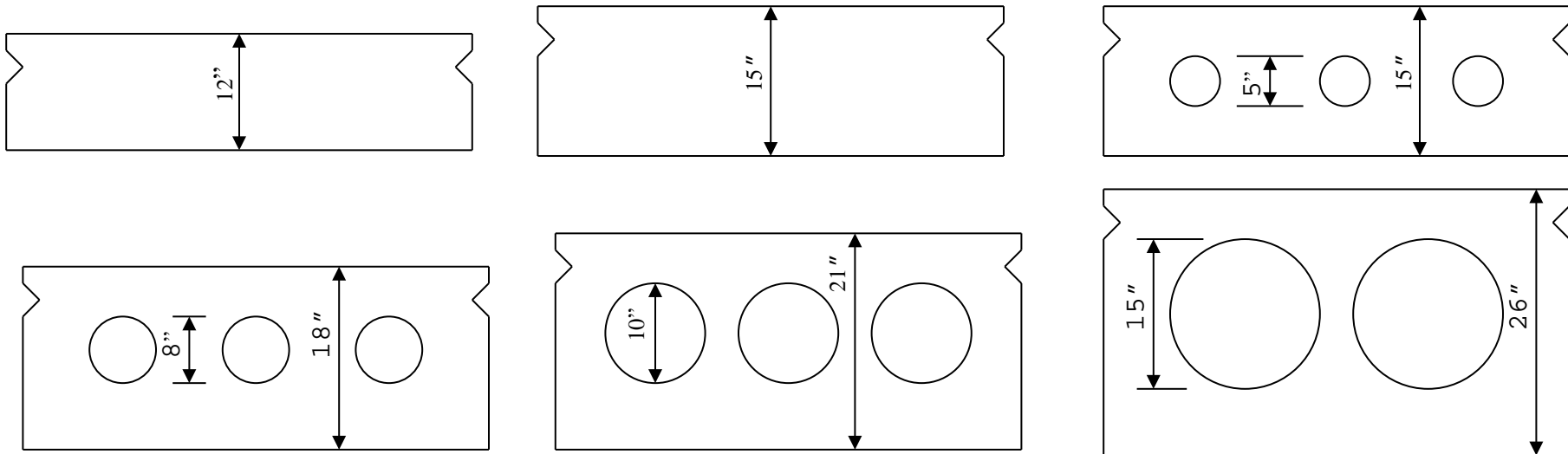
The maximum span length curves should only be used as an aid in preliminary design. The curves on based on the following design parameters:

- AASHTO LRFD Design Specifications using refined losses
- Simple Span lengths are centerline-centerline bearing
- All beams are parallel
- 44'-0" out-out bridge width
- 42" Single Slope Concrete parapet
- Girder $f'_c = 8$ ksi
- 0.6"Ø 270 ksi strand
- Total wearing surface = 9 psf (PPC Overlay)
- HL93 live load

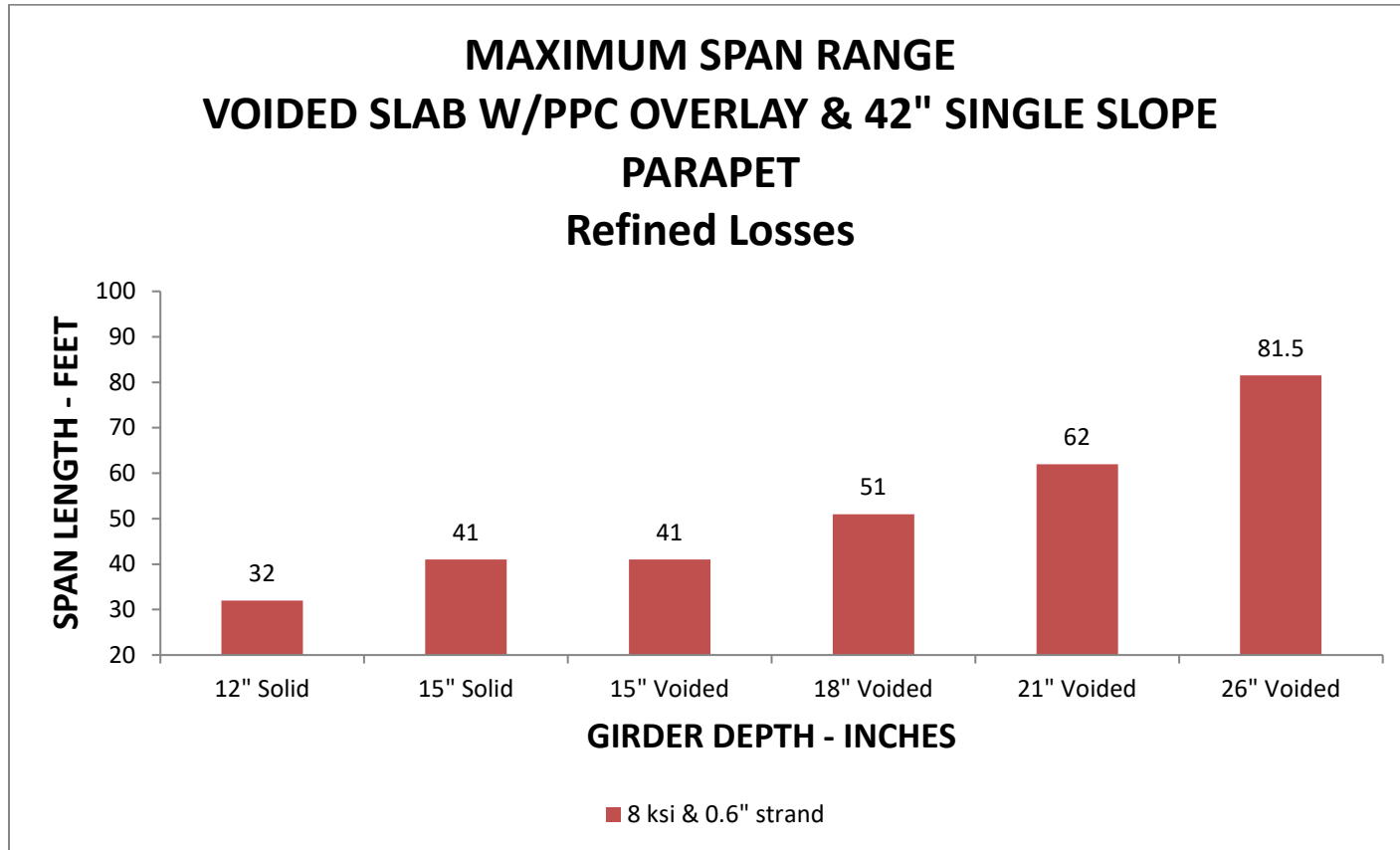
PRECAST PRESTRESSED SLAB SECTION PROPERTIES

DEPTH	AREA	CENTER OF GRAVITY		MOMENT OF INERTIA	SECTION MODULUS		WEIGHT LB/FT
		TOP	BOTTOM		TOP	BOTTOM	
12" SOLID	561.188	6.055	5.945	6782	1120	1141	585
15" SOLID	705.188	7.573	7.427	13223	1746	1780	735
15" VOID	646.283	7.579	7.421	13131	1733	1770	673
18" VOID	698.391	9.103	8.897	22233	2442	2499	728
21" VOID	757.568	10.622	10.378	34798	3276	3353	789
26" VOID	879.758	13.144	12.856	63943	4865	4974	917

ALL UNITS IN INCHES EXCEPT WEIGHT



All slabs are 48" wide



NOTES TO DESIGNER FOR PRECAST PRESTRESSED SLAB

The Standard Drawings for precast prestressed slabs are shown in Appendix B for Section 5.

The following criteria shall be used in developing details for projects utilizing precast prestressed slabs:

PRESTRESSING STEEL

Prestressing steel shall be designed as straight strand. Strand shall not be debonded.

TIE RODS

Tie rods spacing shall be as follows:

SPAN \leq 40' at centerline span

SPAN $>$ 40' at 1/3 points

Tie rods shall be oriented as follows:

skew angle $<$ 20° parallel to centerline bearing

skew angle $>$ 20° perpendicular to slab centerline

When tie rod lengths greater than 20' are required, specify heavy-duty sleeve nuts to obtain the required length.

BEARING PADS

Bearing pads should be designed in accordance with Article 14.7.5 of the Bridge Design Manual.

The beam seat shall be parallel to the bottom of the beams.

MEMBRANE SEAL

A waterproof membrane seal shall be applied to the top surface of the slabs when an asphalt wearing surface is used. The membrane seal shall be a spray-applied waterproofing membrane that conforms to Section 511. A 0.2' asphalt wearing surface should be used at initial construction. The height of the 42" single slope concrete parapet does not need to be increased for the 0.2' overlay at initial construction.

When a PPC overlay is used, no asphalt future wearing surface is used.

Revisions:

- July 2009 Corrected references on page 3 to Section 511 and System Type D.
- Feb 2012 Added maximum span chart based upon refined losses.
- Mar 2015 Revised maximum span curves for using 0.4' total asphalt pavement.
- Jan 2016 Revised maximum span curves for using 0.2' total asphalt pavement and 2014 live load distribution factors and resistance factors.
- Oct 2017 Revised maximum span curves for using 0.4' total asphalt pavement.
- Nov 2019 Revised 18" Voided Slab section properties due to changing the center of the voids from 8½" to 9" to meet the requirements of AASHTO Article 5.12.3.2.2.
Revised 15" Voided Slab section properties due to changing the center of the voids from 7" to 7½" to meet the requirements of AASHTO Article 5.12.3.2.2.
Clarified design assumptions for total asphalt wearing surface to be 0.2' initial and nothing in the future.
Revised Maximum Span Range curves for 9 psf PPC overlay and 42: single slope parapet.