Texas Department of Transportation

Recommended Span Lengths for Prestressed Concrete Beams

June 2025

Contents

Chapter 1
About this Guide

1.1 Overview

This document presents recommended span lengths based on beam type and spacing for bridges in Texas. This document should be used for preliminary planning. It does not supersede the following:

- TxDOT *Bridge Design Manual-LRFD*
- TxDOT *Bridge Design Guide*
- TxDOT *Bridge Standards*

For the purposes of this document, beam length is defined as CL Bent or Abutment to CL Bent or Abutment.

1.2 Document History

Updates to this guide are summarized in the following table.

Table 1.1 Guide Revision History

Version	Publication Date	Summary of Changes
2025-1	June 2025	New guide published. Replaces prior stand-a-lone tables

Chapter 2
Prestressed Concrete I-Girders

2.1 Overview

The table presented in the section provides recommended span lengths for I-Girders. These tables were developed assuming:

- Concrete Deck - 8.5” thick – fully composite
- Haunch – 3.5” parabolic
- Interior girder
- 0.6” 270 ksi low-relaxation strands
- $f'_{ci\ max}$ = 6 ksi, $f'_{c\ max}$ = 8.5 ksi
- 60% relative humidity
- Rail (T222) - 0.413 klf – distributed over 3 girders
- No sidewalk loads
- No overlay loads

2.2 I-Girder Span Length Tables

Table 2.1: I-Girders Span Lengths

Beam Type	Beam Depth	Approximate Structure Depth	Beam Spacing	Span Limit
Tx28	28 in.	40 in.	6 feet 7 feet 8 feet 9 feet	80 feet 75 feet 70 feet 70 feet
Tx34	34 in	46 in.	6 feet 7 feet 8 feet 9 feet	90 feet 90 feet 85 feet 80 feet
Tx40	40 in.	52 in.	6 feet 7 feet 8 feet 9 feet	105 feet 100 feet 95 feet 90 feet
Tx46	46 in.	58 in.	6 feet 7 feet 8 feet 9 feet	120 feet 115 feet 110 feet 105 feet
Tx54	54 in.	66 in.	6 feet 7 feet 8 feet 9 feet	135 feet 130 feet 125 feet 120 feet
Tx62	62 in.	74 in.	6 feet 7 feet 8 feet 9 feet	150 feet 140 feet 130 feet 130 feet
Tx70	70 in.	82 in.	6 feet 7 feet 8 feet 9 feet	160 feet* 155 feet* 150 feet 145 feet

* Spans should not exceed 150 feet due to shipping and handling. Coordinate with the Associated General Contractors of Texas (AGC) and the Precast Concrete Manufactures Association (PCMA) if beams longer than 150 feet are needed.

Chapter 3
Prestressed Concrete Slab Beams

3.1 Overview

The tables presented in the section provide recommended span lengths for adjacent and spread slab beams. These tables were developed assuming:

- Adjacent slab beams
    - Concrete Deck - 5” thick – fully composite
    - Maximum joint spacing – 3.31”
    - Haunch – 2.5” parabolic
- Spread slab beams
    - Concrete Deck – 8.5” thick – fully composite
    - Haunch – 3” parabolic
    - Interior beam
- 0.6” 270 ksi low-relaxation strands
- $f'_{ci\ max}$ = 6 ksi, $f'_{c\ max}$ = 8.5 ksi
- 60% relative humidity
- Rail (T222) - 0.413 klf – distributed over 3 beams
- No sidewalk loads
- No overlay loads

3.2 Adjacent Slab Beam Span Length Tables

Table 3.1 Adjacent Slab Beam Span Lengths

Beam Type	Beam Depth	Approximate Structure Depth	Span Limit
SB12	12 in.	19.5 in.	45 feet
SB15	15 in.	22.5 in.	50 feet

3.3 Spread Slab Beam Length Tables

Table 3.2 Spread Slab Beam Span Lengths

Beam Type	Beam Depth	Approximate Structure Depth	Beam Spacing	Span Limit
4SB12	12 in.	23.5 in.	6.5 feet* 7 feet 8 feet	45 feet 40 feet 40 feet
4SB15	15 in.	26.5 in.	6.5 feet* 7 feet 8 feet	50 feet 50 feet 50 feet
5SB12	12 in.	23.5 in.	6.5 feet* 7 feet 8 feet	50 feet* 45 feet 45 feet
5SB15	15 in.	26.5 in.	6.5 feet* 7 feet 8 feet	50 feet* 50 feet* 50 feet*

* Length is restricted to range of applicability for live load distribution factors

Chapter 4
Prestressed Concrete Box Beams

4.1 Overview

The tables presented in the section provide recommended span lengths for adjacent box beams and spread box (X Beams) beams. These tables were developed assuming:

- Adjacent box beams (box beams and X beams)
    - Concrete Deck - 5” thick – fully composite
    - Haunch – 3.5” parabolic
- Spread box beams (X beams)
    - Concrete Deck – 8.5” thick – fully composite
    - Haunch – 3.5” parabolic
    - Interior beam
- 0.6” 270 ksi low-relaxation strands
- $f'_{ci\ max}$ = 6 ksi, $f'_{c\ max}$ = 8.5 ksi
- 60% relative humidity
- Rail (T222) - 0.413 klf – distributed over 3 beams
- No sidewalk loads
- No overlay loads

4.2 Adjacent Box Beam Span Length Tables

Table 4.1 Adjacent Box Beam Span Lengths

Beam Type	Beam Depth	Approximate Structure Depth	Span Limit
B20	20 in	27 in.	65 feet
B28	28 in	35 in.	85 feet
B34	34 in	41 in.	110 feet
B40	40 in	47 in.	120 feet

Table 4.2 Adjacent X-Beam Span Lengths

Beam Type	Beam Depth	Approximate Structure Depth	Span Limit
XB20	20 in	27 in.	70 feet
XB28	28 in	35 in.	100 feet
XB34	34 in	41 in.	120 feet*
XB40	40 in	47 in.	120 feet*

* Length is restricted to range of applicability for live load distribution factors

4.3 Spread Box Beam (X-Beam) Span Length Tables

Table 4.3 Spread Box Beam (X-Beam) Span Lengths

Beam Type	Beam Depth	Approximate Structure Depth	Beam Spacing	Span Limit
5XB20	20 in.	32 in.	6 feet 7 feet 8 feet 9 feet	75 feet 75 feet 70 feet 65 feet
5XB28	28 in.	40 in.	6 feet 7 feet 8 feet 9 feet	100 feet 95 feet 90 feet 90 feet
5XB34	34 in.	46 in.	6 feet 7 feet 8 feet 9 feet	115 feet 110 feet 105 feet 105 feet
5XB40	40 in.	52 in.	6 feet 7 feet 8 feet 9 feet	130 feet 125 feet 120 feet 115 feet