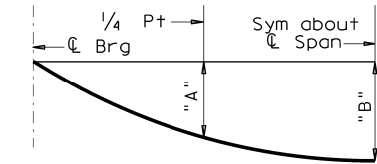
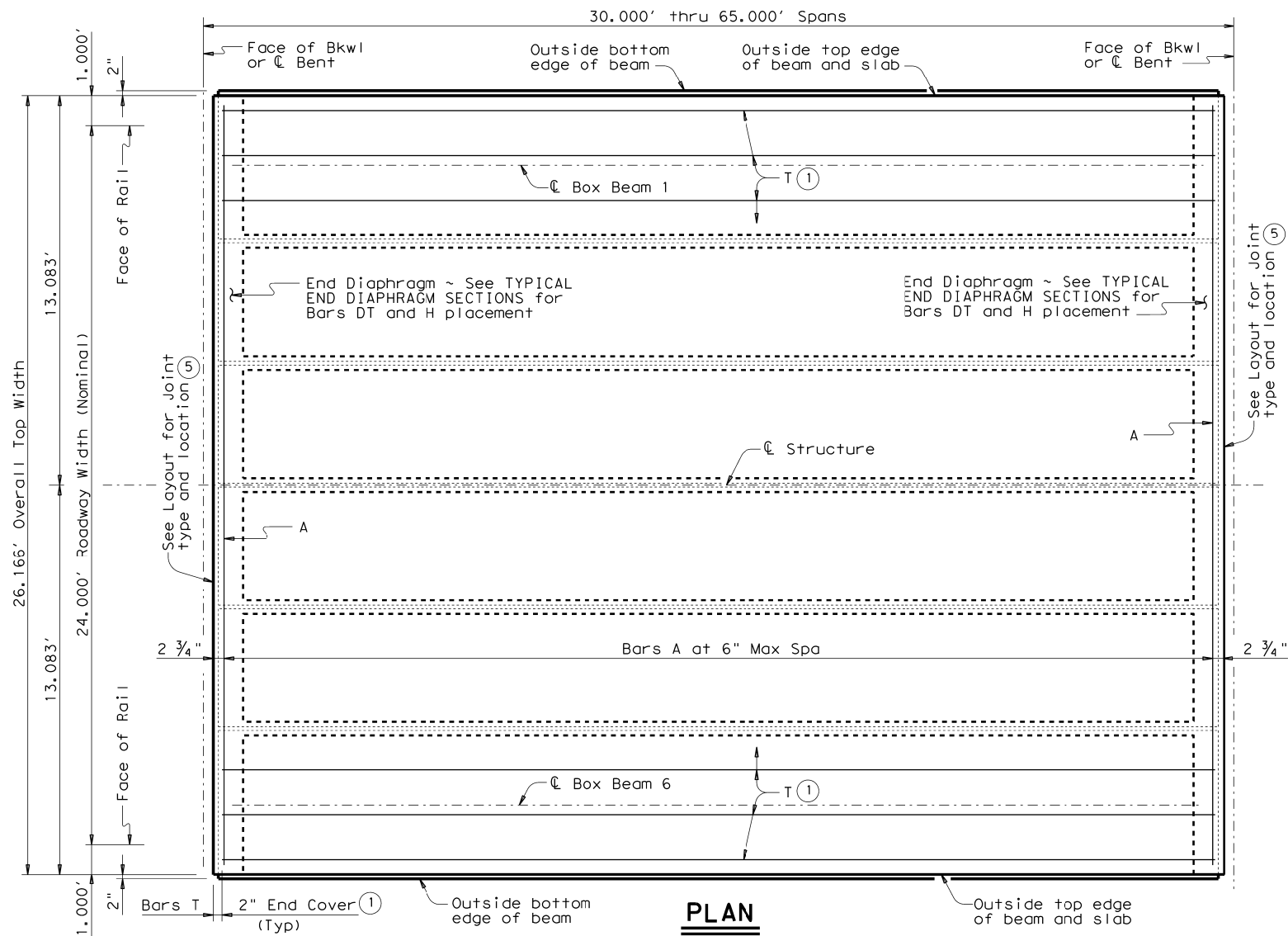


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Note: Deflections shown are due to shear key and concrete slab only, ( $E_c = 5 \times 10^3$  ksi). Calculated deflections shown are theoretical and actual dimension may be less. Deflections may be adjusted based on field observation.

**DEAD LOAD DEFLECTION DIAGRAM**

SPAN LENGTH (FT)	BEAM NO.	POINT	DEAD LOAD DEFLECTIONS (FT)			SECTION DEPTHS	
			SHEAR KEY	SLAB	TOTAL	"X" AT $\bar{C}$ BRG ②	"Y" AT $\bar{C}$ BRG ②
30	ALL	"A"	0.000	0.002	0.002	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
		"B"	0.001	0.002	0.003		
35	ALL	"A"	0.001	0.003	0.004	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
		"B"	0.001	0.004	0.005		
40	ALL	"A"	0.002	0.005	0.007	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
		"B"	0.003	0.007	0.010		
45	ALL	"A"	0.003	0.009	0.012	5 $\frac{1}{2}$ "	2'-1 $\frac{1}{2}$ "
		"B"	0.004	0.012	0.016		
50	ALL	"A"	0.005	0.013	0.018	5 $\frac{3}{4}$ "	2'-1 $\frac{3}{4}$ "
		"B"	0.006	0.019	0.025		
55	ALL	"A"	0.007	0.019	0.026	6 $\frac{1}{4}$ "	2'-2 $\frac{1}{4}$ "
		"B"	0.010	0.027	0.037		
60	ALL	"A"	0.010	0.028	0.038	6 $\frac{3}{4}$ "	2'-2 $\frac{3}{4}$ "
		"B"	0.014	0.039	0.053		
65	ALL	"A"	0.013	0.039	0.052	7"	2'-3"
		"B"	0.019	0.054	0.073		

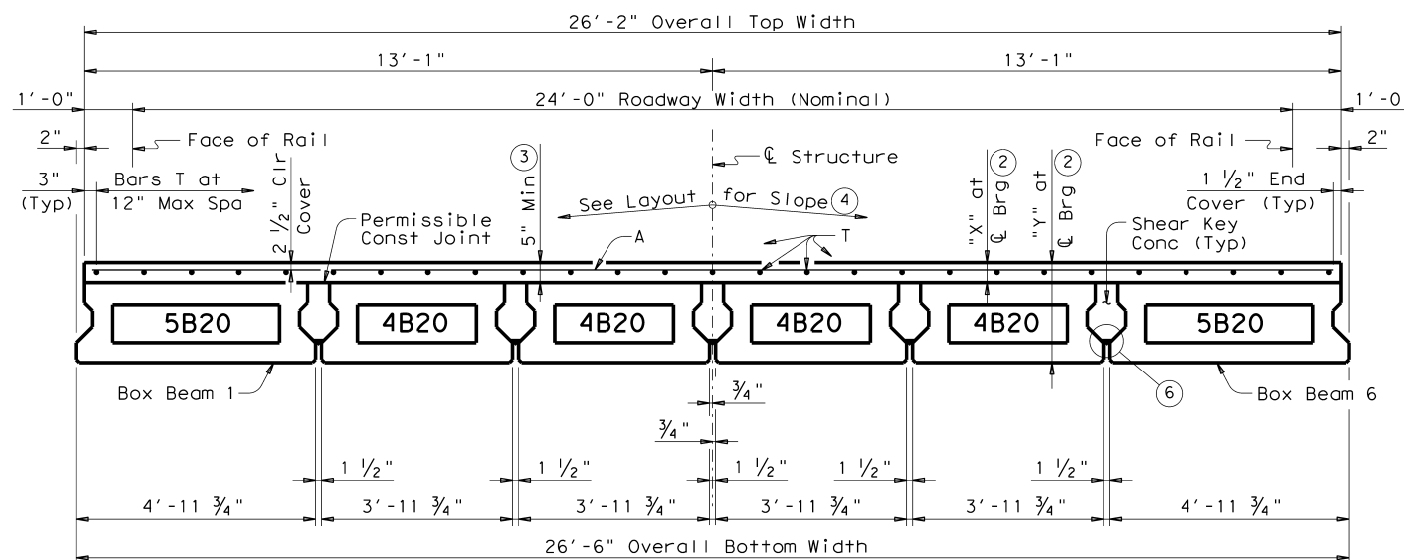
- ① If multi-span units (with slab continuous over Interior Bents) are indicated on the Bridge Layout, Bars T must be continuous through joint. See Continuous Slab Detail.
- ② Based on theoretical beam camber, dead load deflections of 5" Cast-in-place slab, shear key dead load and a constant grade. The contractor must adjust these values for any vertical curve.
- ③ Slab thickness at midspan of Beams may not exceed 7 inches.
- ④ This standard does not provide for changes in roadway cross slopes within the structure.
- ⑤ If using Type A expansion joints, the maximum distance between joints is 100 feet.
- ⑥ Form bottom of shear keys with foam backer rod or other material acceptable to the Engineer.

**BAR TABLE**

BAR	SIZE
A	#4
DT	#4
H	#5
T	#4

**GENERAL NOTES:**

Designed according to AASHTO LRFD Specifications.  
 Provide Class S concrete ( $f'c = 4,000$  psi) for slab and shear key.  
 Provide Class S (HPC) concrete if shown elsewhere in the plans.  
 All reinforcing must be Grade 60.  
 Two-span or three-span units, with the slab continuous over Interior Bents, may be formed with the details on this standard. Unit Length cannot exceed 3.5 times length of the shortest end span.  
 Bar laps, where required, will be as follows:  
 Uncoated ~ #4 = 1'-5"  
 Epoxy coated ~ #4 = 2'-1"  
 It is recommended, with crown cross-slope, to erect beams adjacent to crown point first. For structures without a crown point, it is recommended to erect beams on the high side of cross-slope first and progress to the low side.  
 This sheet does not support the use of Transition Bents.  
 See railing details and standard BBRAS for rail anchorage.



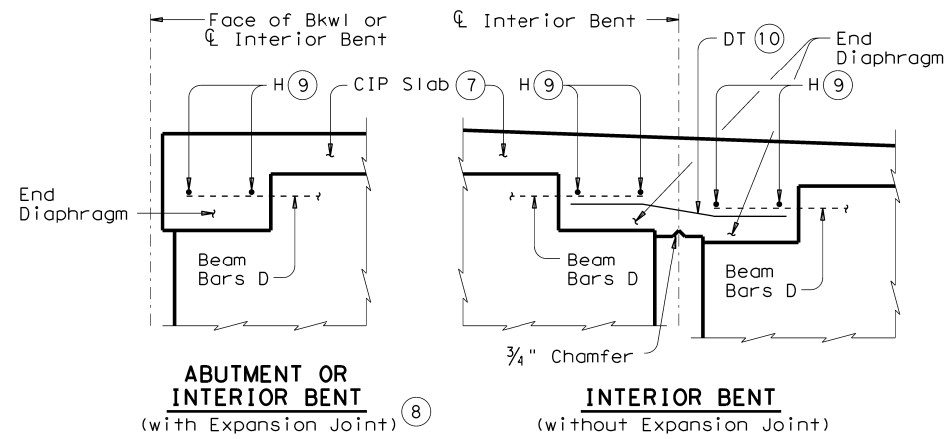
**Texas Department of Transportation** Bridge Division Standard

**PRESTRESSED CONCRETE BOX BEAM SPANS**  
 TYPE B20 24' RDWY (WITH SLAB)

**SBBS-B20-24**

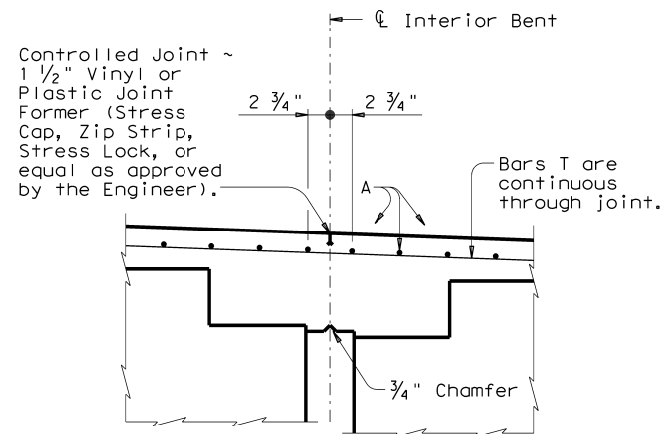
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 ©TxDOT December, 2006 CONT SECT JOB HIGHWAY  
 REVISIONS  
 01-12: Cover, 10-15: Table of Est Quantities, Notes. DIST COUNTY SHEET NO.

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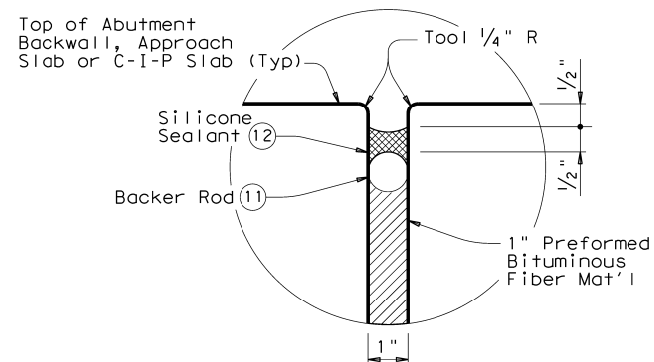
**TYPICAL END DIAPHRAGM SECTIONS**

(along centerline of Box Beam)



**CONTINUOUS SLAB DETAIL**

(Diaphragm reinforcing not shown for clarity)



**TYPE A JOINT DETAIL 5**

TABLE OF ESTIMATED QUANTITIES					
SPAN LENGTH	SHEAR KEY	REINF CONC SLAB (BOX BEAM)	PRESTR CONCRETE BOX BEAMS (TY 4B20) (13)	PRESTR CONCRETE BOX BEAMS (TY 5B20) (13)	TOTAL REINF STEEL (14)
FT	CY	SF	LF	LF	Lb
30	4.0	785	118.00	59.00	1,570
35	4.6	916	138.00	69.00	1,832
40	5.3	1,047	158.00	79.00	2,094
45	6.0	1,177	178.00	89.00	2,354
50	6.6	1,308	198.00	99.00	2,616
55	7.3	1,439	218.00	109.00	2,878
60	8.0	1,570	238.00	119.00	3,140
65	8.6	1,701	258.00	129.00	3,402

- 5 If using Type A expansion joints, the maximum distance between joints is 100 ft.
- 7 Slab reinforcing omitted for clarity.
- 8 See Bridge Layout for Joint type.
- 9 Provide 1 1/2" end cover to Bars H. After all beams have been placed, weld one Bar H to two Bars D at each end of all beams.
- 10 Lap Bars DT 9" Min with each Beam Bar D at Interior Bents without Expansion Joints. Bars DT shown bent for clarity only.
- 11 Backer rod must be 25% larger than joint opening and must be compatible with the sealant.
- 12 Use Class 7 silicone sealant. Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints".
- 13 Fabricator must adjust beam lengths for beam slopes as required.
- 14 Reinforcing steel weight is based on an approximate factor of 2.0 lbs per square foot of slab.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation  
**PRESTRESSED CONCRETE BOX BEAM SPANS**  
 TYPE B20 24' RDWY (WITH SLAB)  
**SBBS-B20-24**

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