

No. of Strands
* Prestress Force

LEGEND
 --- All strands fully bonded
 - - - Requires debonding of ends of some strands (see table)
 (12) Depth of box (Inches)

* Total force after all losses have occurred

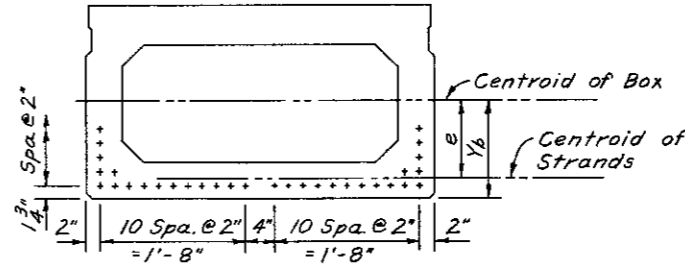
DESIGN NOTES

- This drawing conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway Officials, 1971, including the Ohio "Supplement" to these specifications.
- Design Loading:**
Live Load HS 20-44 with Interstate alternate loading.
Superimposed Dead Load 2.25 lbs. per lin. ft.
- Concrete Stresses:**
Min. concrete strength at 28 days $f'_c = 5500$ p.s.i.
Min. concrete strength at time of initial prestress $f'_{ci} = 4000$ p.s.i.
- Prestressing strands,** $\frac{1}{2}$ " Dia. 270K seven-wire, uncoated, stress-relieved strand. $A_s = .154$ sq. in.
Initial Tension = 28,900 lbs. per strand.
Tension at release = 26,600 lbs. per strand. (Assumed)
Final Tension = 21,700 lbs. per strand after all losses. (Assumed)
- Intermediate Diaphragms:** Beams are designed for 3 ft. wide diaphragms.
Span ≤ 50 ft. one diaphragm.
50 ft. < Span ≤ 75 ft. two diaphragms.
75 ft. < Span three diaphragms.
- Initial camber given is at time of transfer of stress and includes deflection due to weight of beam but does not include an allowance for creep.
- Reference shall be made to Standard Drawing PSBD-1-71 for details of beams.
- This drawing provides information for the designer and is not intended for use as a standard drawing.

DESIGN DATA

Box	Span % Brg. Ft.	Min. Req'd P FINAL Kips	Mid-span e in.	No. of Strands	Strand Location From bottom of box										Tensile Bars at Top			Initial Camber in.								
					Number and Length of Strands Debonded.										Full Length											
					1-6"	2-6"	4-0"	5-6"	6-6"	1-6"	2-6"	4-0"	5-6"	6-6"	No.	Size	No.		Size	Length						
B12-48	15	145	4.22	8																	8	4	-	-	-	0.11
	20	220	4.22	10																	9	4	-	-	-	0.23
	25	335	3.72	16																	8	4	-	-	-	0.48
	30	447	3.82	20																	8	4	-	-	-	0.83
B17-48	20	136	6.80	6																	6	4	-	-	-	0.08
	25	182	6.80	10																	6	4	2	4	6'-6"	0.21
	30	231	6.80	12																	6	4	4	4	7'-6"	0.34
	35	284	6.80	14																	6	4	4	4	8'-3"	0.50
B21-48	40	352	6.80	16																	6	4	4	4	8'-9"	0.69
	30	179	8.82	8																	6	4	2	4	3'-6"	0.14
	35	219	8.82	10																	6	4	3	4	5'-0"	0.23
	40	268	8.82	12																	6	4	4	4	6'-0"	0.34
B27-48	45	324	8.82	16																	6	4	4	4	8'-3"	0.60
	50	384	8.82	18																	6	4	6	4	8'-9"	0.77
	55	467	8.82	22																	6	4	6	4	10'-0"	1.11
	40	204	11.86	10																	4	5	2	5	4'-0"	0.19
B33-48	45	244	11.86	12																	4	5	3	5	5'-0"	0.27
	50	287	11.86	14																	4	5	4	5	6'-0"	0.37
	55	344	11.86	16																	4	5	5	5	6'-6"	0.45
	60	403	11.86	20																	4	5	6	5	8'-3"	0.72
B42-48	65	465	11.86	22																	4	5	6	5	8'-9"	0.86
	55	279	14.86	14																	4	5	5	5	5'-3"	0.29
	60	324	14.86	16																	4	5	6	5	6'-3"	0.37
	65	372	14.86	18																	4	5	7	5	7'-0"	0.46
B42-48	70	424	14.86	20																	4	5	8	5	7'-6"	0.56
	75	480	14.86	22																	4	5	8	5	8'-3"	0.65
	80	559	14.55	26																	4	5	8	5	8'-6"	0.86
	85	643	13.93	30																	4	5	8	5	8'-6"	0.99
B42-48	65	297	19.38	14																	4	5	6	5	5'-0"	0.19
	70	337	19.38	16																	4	5	8	5	5'-9"	0.25
	75	379	19.38	18																	4	5	9	5	6'-9"	0.31
	80	437	19.38	20																	4	5	11	5	7'-0"	0.32
B42-48	85	486	19.21	24																	4	5	11	5	8'-3"	0.52
	90	547	19.07	26																	4	5	10	5	8'-9"	0.57
	95	624	18.45	30																	4	5	10	5	9'-0"	0.73
	100	716	17.50	34																	4	5	10	5	8'-3"	0.81

* These values are for maximum tension stress in concrete. All others are for ultimate moment.



TYPICAL STRAND LOCATION

Strands shall be distributed over the beam width as evenly as possible. Strand pattern and the debonded lengths shall be symmetrical about vertical ϵ of beam. Debonded strands shall be in bottom layer. Length of strands to be debonded is measured from ends of beam.

Box	A in ²	I in ⁴	Y _b in.	Z _T in ³	Z _b in ³
B12-48	567.8	6850	5.97	1136	1147
B17-48	554.3	18307	8.55	2167	2141
B21-48	606.3	32456	10.57	3172	3071
B27-48	678.8	64649	13.61	4828	4750
B33-48	733.5	108150	16.61	6599	6511
B42-48	823.5	198418	21.13	9507	9390

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

DESIGN DATA FOR
PRESTRESSED CONCRETE BRIDGE
NON-COMPOSITE
48" ADJACENT BOX BEAMS
WITH STRAIGHT STRANDS

DESIGNED	DRAWN	TRACED	CHECKED	REVISIONS	DATE	REVISED
FFE	FFE		J.D.R.	W.J.J.	5-30-72	