

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

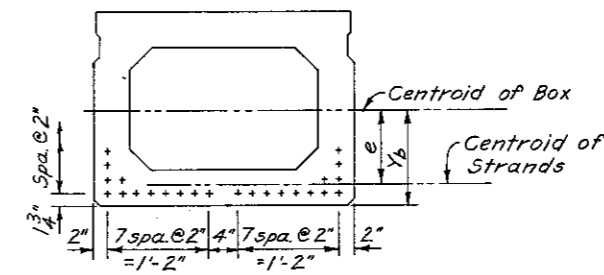
\* Total force after all losses have occurred

Box	Span % Brg. Ft.	Min. Req'd. PFINAL Kips	Mid- span e in.	No. of Strands	Strand Location From bottom of box						Number and Length of Strands Debonded					Tensile Bars at Top			Initial Camber in.			
					3/4"	3 3/4"	5 3/4"	7 3/4"	9 3/4"	1'-6"	2'-6"	4'-0"	5'-6"	6'-6"	No.	Size	No.	Size		Length		
					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.		No.		
B12-36	15	113	4.21	6	6												4	5	-	-	.11	
	20	168	4.21	8	8												4	5	-	-	.25	
	25	259	3.54	12	8	4				2	2						4	5	-	-	.45	
	30	343	3.71	16	12	4				2	2	2					4	5	-	-	.90	
B17-36	20	103	6.67	6	6												4	5	-	-	.11	
	25	138	6.67	8	8												4	5	-	-	.22	
	30	174	6.67	8	8												4	5	-	-	.27	
	35	215	6.67	10	10					2							4	5	1	5	7'-6"	.44
	40	267	6.67	14	14					2	2	2					4	5	1	5	8'-6"	.84
45	331	6.67	16	16					2	2	2	2				4	5	1	5	9'-6"	1.14	
B21-36	30	137	8.64	8	8												4	5	1	5	6'-0"	.21
	35	169	8.64	8	8												4	5	1	5	5'-3"	.24
	40	204	8.64	10	10												4	5	2	5	6'-9"	.38
	45	248	8.64	12	12					2							4	5	2	5	8'-0"	.55
	50	294	8.64	14	14					2	2						4	5	2	5	9'-0"	.75
	55	363	8.42	18	16	2				2	2	2	2				4	5	2	5	10'-3"	1.13
B27-36	40	156	11.61	8	8												4	5	1	5	6'-0"	.19
	45	188	11.61	10	10												4	5	3	5	6'-9"	.31
	50	219	11.61	12	12												4	5	4	5	7'-9"	.44
	55	264	11.61	14	14					2							4	5	4	5	8'-6"	.58
	60	309	11.61	16	16					2	2						4	5	4	5	9'-6"	.75
	65	359	11.39	18	16	2				2	2	2					4	5	4	5	9'-6"	.90
	70	421	11.21	20	16	4				4	2	2					4	5	4	5	10'-6"	1.05
B33-36	55	216	14.53	10	10												4	5	4	5	5'-3"	.21
	60	251	14.53	12	12												4	5	5	5	6'-6"	.31
	65	288	14.53	14	14												4	5	6	5	7'-9"	.42
	70	329	14.53	16	16					2	2						4	5	6	5	8'-9"	.55
	75	376	14.31	18	16	2				2	2						4	5	6	5	9'-0"	.66
	80	448*	13.80	22	16	4				4	2	2					4	5	5	5	9'-6"	.90
85	517*	13.36	24	16	4	2	2		4	2	2					4	5	5	5	9'-0"	.91	
B42-36	65	232	18.97	12	12												4	5	9	5	6'-6"	.23
	70	263	18.97	14	14												4	5	9	5	7'-9"	.32
	75	297	18.97	14	14												4	5	9	5	7'-6"	.25
	80	343	18.97	16	16					2							4	5	9	5	8'-0"	.28
	85	397*	18.57	20	16	4				2	2	2					4	5	8	5	9'-9"	.54
	90	454*	18.24	22	16	4	2	2		4	2	2					4	5	7	5	9'-9"	.60
95	516*	17.80	24	16	4	2	2		4	2	2					4	5	6	5	9'-9"	.61	

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

**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 HS20-44 with Interstate alternate loading  
Superimposed Dead Load 175 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  $\leq 50$  ft. one diaphragm  
50 ft.  $<$  Span  $\leq 75$  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.



**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  $\phi$  of beam. Debonded strands shall be in bottom layer. Length of strands to be debonded is measured from ends of beam.

Box	A in <sup>2</sup>	I in. <sup>4</sup>	$\gamma_b$ in.	$Z_t$ in. <sup>3</sup>	$Z_b$ in. <sup>3</sup>
B12-36	423.8	5122	5.96	848	859
B17-36	426.3	13840	8.42	1613	1644
B21-36	479.8	24893	10.39	2346	2396
B27-36	539.8	48647	13.36	3567	3641
B33-36	594.5	82048	16.28	4907	5040
B42-36	684.5	152479	20.72	7165	7359

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

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

DESIGNED	DRAWN	TACED	CHECKED	REVIEWED	DATE	BY
FFE	FFE		J.D.R.	W.J.J.	5-30-72	