

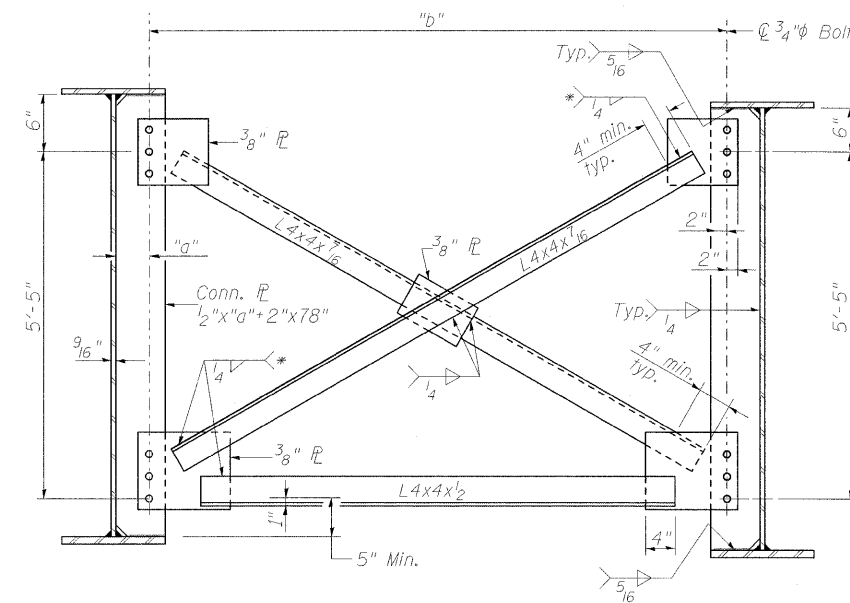
CROSS FRAME DIMENSIONS (a)

BAY	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18
Girder 1-2	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"
Girder 2-3	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"
Girder 3-4	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"
Girder 4-5	7"	7"	7"	7"	7"	7"	7"	7"	7"	6 15/16"	6 15/16"	6 15/16"	6 15/16"	6 15/16"	6 15/16"	6 15/16"	6 15/16"	6 7/8"
Girder 5-6	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/16"	7 1/16"	7 1/16"	7"	7"	7"	7"	7"	7"	7"
Girder 6-7	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 3/16"	7 3/16"	7 3/16"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"	7 1/8"
Girder 7-8	7 3/8"	7 3/8"	7 3/8"	7 3/8"	7 3/8"	7 3/8"	7 3/8"	7 5/16"	7 5/16"	7 5/16"	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 1/4"	7 3/16"	7 3/16"
Girder 8-9	7 1/2"	7 1/2"	7 1/2"	7 1/2"	7 1/2"	7 1/2"	7 7/16"	7 7/16"	7 7/16"	7 3/8"	7 3/8"	7 5/16"	7 5/16"	7 5/16"	7 5/16"	7 5/16"	7 1/4"	7 1/4"
Girder 9-10	7 5/8"	7 5/8"	7 9/16"	7 9/16"	7 9/16"	7 9/16"	7 9/16"	7 9/16"	7 1/2"	7 1/2"	7 7/16"	7 7/16"	7 3/8"	7 3/8"	7 3/8"	7 3/8"	7 3/8"	7 3/8"

BAY	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35	D36
Girder 11-12	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"	6 5/8"
Girder 12-13	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"
Girder 13-14	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"	6 11/16"
Girder 14-15	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"
Girder 15-16	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"	6 3/4"
Girder 16-17	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"
Girder 17-18	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"	6 13/16"
Girder 18-19	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"	6 7/8"

CROSS FRAME DIMENSIONS (b)

D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18
7'-9"	7'-7 1/2"	7'-5 5/8"	7'-3 11/16"	7'-1 11/16"	7'-0"	6'-10 1/16"	6'-8 3/16"	6'-6 1/4"	6'-4 3/8"	6'-2 1/2"	6'-0 5/8"	5'-10 11/16"	5'-9"	5'-7"	5'-5 1/16"	5'-3 1/8"	5'-1 7/16"
D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35	D36
7'-3 1/2"	7'-2 13/16"	7'-2 1/8"	7'-1 3/8"	7'-0 11/16"	7'-0"	6'-11 3/8"	6'-10 5/8"	6'-9 7/8"	6'-9 3/16"	6'-8 7/16"	6'-7 3/4"	6'-7"	6'-6 7/16"	6'-5 11/16"	6'-5"	6'-4 1/4"	6'-3 9/16"



TYPICAL INTERIOR CROSS FRAME

(9 Each D1-D18 for S.N. 100-0088 (N.B.))
(8 Each D19-D36 for S.N. 100-0089 (S.B.))

* Fillet weld angles along 3 sides
on one face of gusset plate.

All cross frames shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames at supports may be temporarily disconnected to install bearing anchor rods.

Detail ¹⁵/₁₆" diameter holes for all ³/₄" diameter bolts.

Two hardened washers required for each set of oversized holes.

INTERIOR GIRDER MOMENT TABLE - SN 100-0088 (NB)

	0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.6 Sp. 3	
I _s	(in ⁴) 82155	113903	82155	113903	82155	
I _c (n)	(in ⁴) 174672	-	168590	-	161607	
I _c (3n)	(in ⁴) 129060	-	124535	-	119692	
I _c (cr)	(in ⁴) -	130064	-	127529	-	
S _s	(in ³) 2011	2619	2011	2619	2011	
S _c (n)	(in ³) 2831	-	2800	-	2762	
S _c (3n)	(in ³) 2553	-	2519	-	2481	
S _c (cr)	(in ³) -	3205	-	3118	-	
DC1	(k/')	1.23	1.26	1.11	1.12	1.03
M _{DC1}	(k)	100	3925	2658	3752	263
DC2	(k/')	0.20	0.20	0.20	0.20	0.20
M _{DC2}	(k)	36	54	61	50	34
DW	(k/')	0.42	0.42	0.42	0.42	0.42
M _{DW}	(k)	50	1378	1004	1347	35
M _{ℓ + IM}	(k)	1680	3195	2585	2955	1412
M _u (Strength I)	(k)	2695	12632	9429	11944	2047
φ _r M _n	(k)	15229	13831	13510	13688	13430
f _s DC1	(ksi)	0.60	17.98	15.86	17.19	1.57
f _s DC2	(ksi)	0.17	0.20	0.29	0.19	0.16
f _s DW	(ksi)	0.24	5.16	4.78	5.18	0.17
f _s (ℓ + IM)	(ksi)	7.12	11.96	11.08	11.37	5.98
f _s (Service II)	(ksi)	8.25	38.89	35.33	37.34	6.08
f _s (Total)(Strength I)	(ksi)	11.14	51.4	46.71	49.39	9.35
V _r	(k)	51.3	96.92	61.61	88.62	51.07

INTERIOR GIRDER MOMENT TABLE - SN 100-0089 (SB)

	0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.6 Sp. 3	
I _s	(in ⁴) 82155	110684	82155	110684	82155	
I _c (n)	(in ⁴) 172489	-	170220	-	167838	
I _c (3n)	(in ⁴) 127401	-	125719	-	123996	
I _c (cr)	(in ⁴) -	126090	-	125189	-	
S _s	(in ³) 2011	2590	2011	2590	2011	
S _c (n)	(in ³) 2820	-	2808	-	2795	
S _c (3n)	(in ³) 2541	-	2528	-	2515	
S _c (cr)	(in ³) -	3061	-	3053	-	
DC1	(k/')	1.17	1.22	1.13	1.16	1.09
M _{DC1}	(k)	140	3841	2587	3771	206
DC2	(k/')	0.20	0.20	0.20	0.20	0.20
M _{DC2}	(k)	54	99	106	100	54
DW	(k/')	0.39	0.39	0.39	0.39	0.39
M _{DW}	(k)	44	1255	904	1243	39
M _{ℓ + IM}	(k)	1551	3126	2488	3060	1512
M _u (Strength I)	(k)	2406	12278	9076	12058	2262
φ _r M _n	(k)	14934	13505	13593	13454	14262
f _s DC1	(ksi)	0.84	17.8	15.44	17.47	1.23
f _s DC2	(ksi)	0.25	0.39	0.5	0.39	0.26
f _s DW	(ksi)	0.21	4.92	4.29	4.88	0.19
f _s 1.3(ℓ + IM)	(ksi)	6.60	12.25	10.66	12.03	6.49
f _s (Service II)	(ksi)	7.33	39.04	34.09	38.38	6.75
f _s (Total)(Strength I)	(ksi)	9.87	51.6	45.02	50.7	9.2
V _r	(k)	53.6	96.02	58.4	93.14	52.42

INTERIOR GIRDER REACTION TABLE - SN 100-0088 (NB)

HL93 Loading

	N. Abut.	Pier 1	Pier 2	S. Abut.
R _{DC1}	(k) 24.58	230.80	211.53	14.66
R _{DC2}	(k) 4.11	37.49	35.44	4.66
R _{DW}	(k) 7.08	80.87	78.66	7.63
R _{ℓ + IM}	(k) 116.09	239.90	215.44	95.62
R _{Total}	(k) 151.85	541.06	803.71	122.57

INTERIOR GIRDER REACTION TABLE - SN 100-0089 (SB)

HL93 Loading

	N. Abut.	Pier 1	Pier 2	S. Abut.
R _{DC1}	(k) 22.05	224.12	214.00	18.17
R _{DC2}	(k) 4.46	36.01	35.74	4.23
R _{DW}	(k) 6.52	75.68	72.54	6.85
R _{ℓ + IM}	(k) 112.04	244.68	221.10	102.55
R _{Total}	(k) 145.07	580.49	543.38	131.79



FILE NAME =	USER NAME = Rob Heady	DESIGNED = BPD	REVISED =
... \237A-STRUCT STEEL DETAILS.II.NB-SB.dwg		CHECKED = WLB	REVISED =
		DRAWN = GLD	REVISED =
		CHECKED = BPD	REVISED =

DESIGNED = BPD	REVISED =
CHECKED = WLB	REVISED =
DRAWN = GLD	REVISED =
CHECKED = BPD	REVISED =

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS - II
STRUCTURE NO. 100-0088 (N.B.) & 100-0089 (S.B.)

SHEET NO. 46 OF 75 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
*	01-6-2HBRK-2	WILLIAMSON	968	631
* F.A.I. 57 AND F.A.P. 331 CONTRACT NO. 78182				
ILLINOIS FED. AID PROJECT				