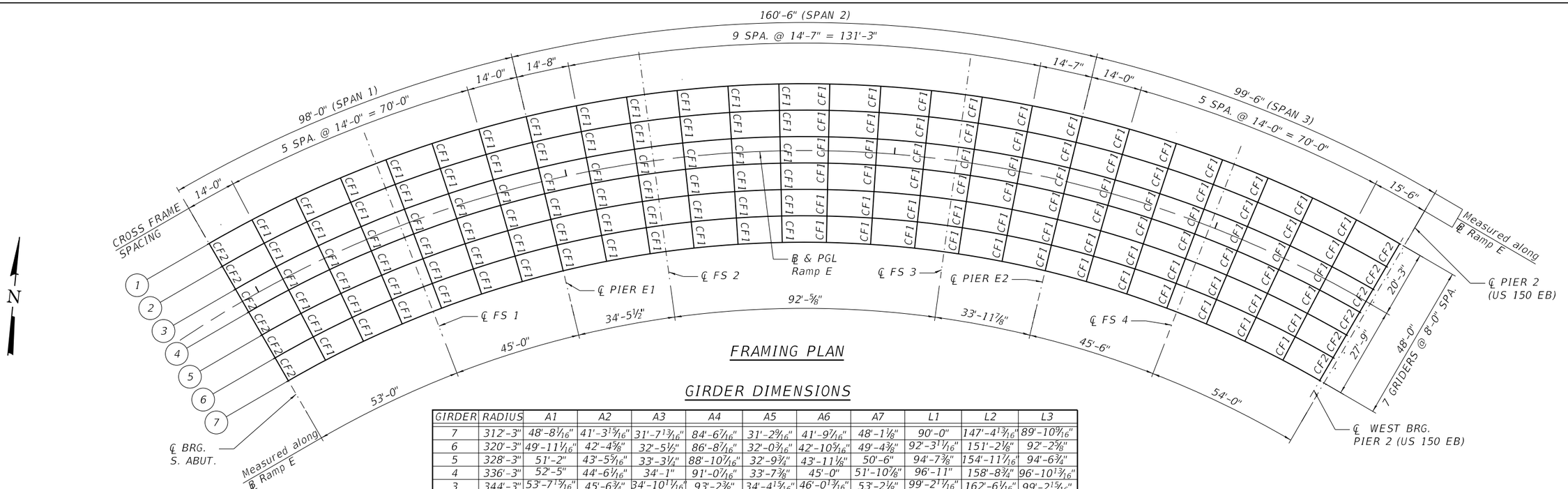
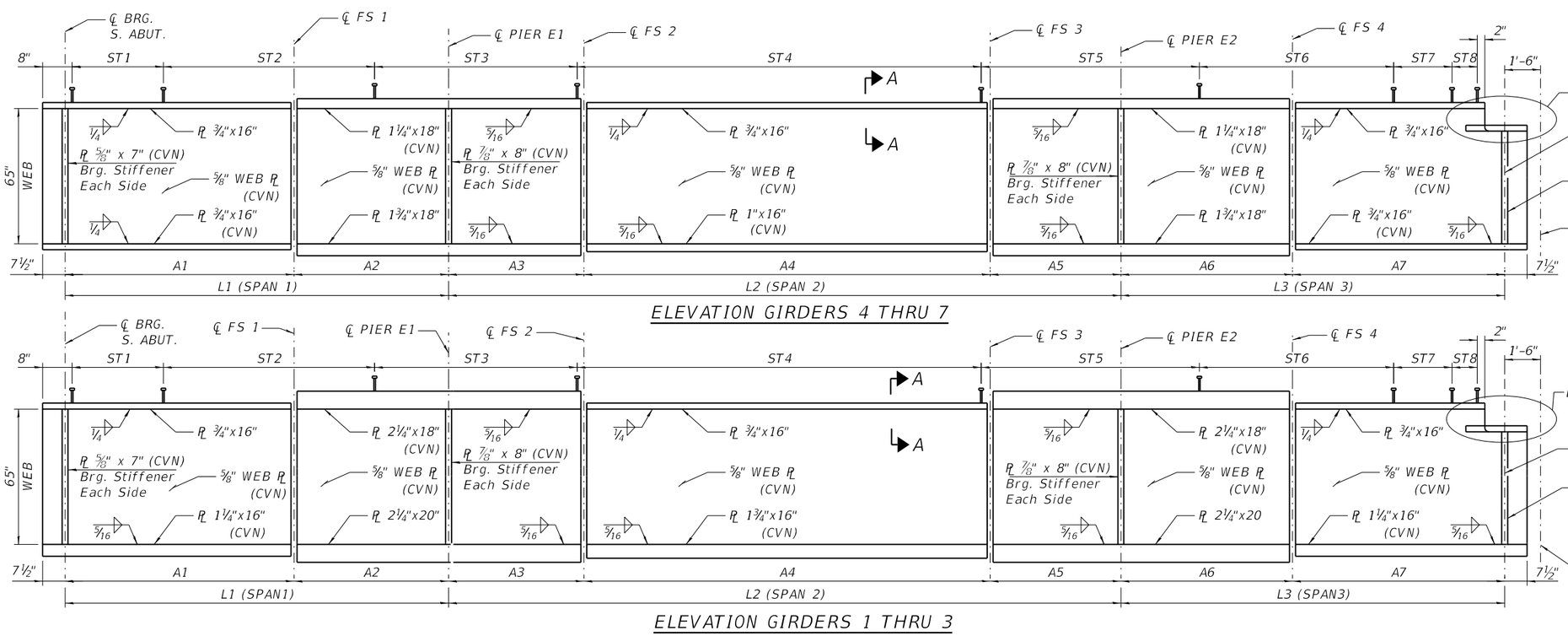


FRAMING PLAN

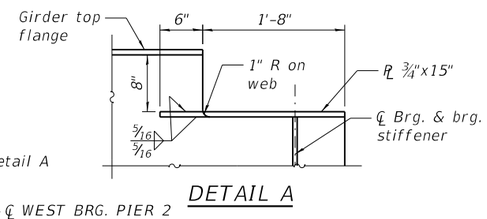
GIRDER DIMENSIONS

GIRDER	RADIUS	A1	A2	A3	A4	A5	A6	A7	L1	L2	L3
7	312'-3"	48'-8 1/16"	41'-3 15/16"	31'-7 13/16"	84'-6 7/16"	31'-2 9/16"	41'-9 7/16"	48'-1 1/8"	90'-0"	147'-4 3/16"	89'-10 9/16"
6	320'-3"	49'-11 1/16"	42'-4 7/8"	32'-5 1/2"	86'-8 7/16"	32'-0 3/16"	42'-10 5/16"	49'-4 3/8"	92'-3 1/16"	151'-2 1/8"	92'-2 5/8"
5	328'-3"	51'-2"	43'-5 5/16"	33'-3 1/4"	88'-10 1/16"	32'-9 1/4"	43'-11 1/8"	50'-6"	94'-7 3/8"	154'-11 7/16"	94'-6 3/4"
4	336'-3"	52'-5"	44'-6 1/16"	34'-1"	91'-0 7/16"	33'-7 3/8"	45'-0"	51'-10 7/8"	96'-11"	158'-8 3/4"	96'-10 13/16"
3	344'-3"	53'-7 13/16"	45'-6 3/4"	34'-10 11/16"	93'-2 3/8"	34'-4 15/16"	46'-0 13/16"	53'-2 1/8"	99'-2 11/16"	162'-6 1/16"	99'-2 15/16"
2	352'-3"	54'-10 15/16"	46'-7 7/16"	35'-8 1/16"	95'-4 3/8"	35'-2 9/16"	47'-1 11/16"	54'-5 3/8"	101'-6 7/8"	166'-3 3/8"	101'-7"
1	360'-3"	56'-1 7/8"	47'-8 3/16"	36'-6 3/16"	97'-6 3/8"	36'-0 3/16"	48'-2 1/2"	55'-8 5/8"	103'-10 1/16"	170'-0 1/16"	103'-11 1/8"



ELEVATION GIRDERS 4 THRU 7

ELEVATION GIRDERS 1 THRU 3



DETAIL A

Notes:

1. Cross frame orientation, pier and abutment ℄'s are placed radial to the ℄ Ramp E.
2. All cross frames between girders shall be installed with erection pins and bolts in accordance with the erection plan approved by the Engineer. Individual cross frames at supports may be temporarily disconnected to install bearing anchor rods.
3. "CVN" denotes Charpy-V-Notch requirements, Zone 2.
4. For shear stud spacing and dimensions see sheet S-197 of 445.
5. For Section A-A, see Sheet S-198 of 445.

TYLIN INTERNATIONAL
200 S. WACKER DR.
SUITE 1400
CHICAGO, IL 60606
TEL: 312-777-2900

USER NAME = CHORBACZ	DESIGNED - RH	REVISED -	
	CHECKED - SP	REVISED -	
PLOT SCALE = 0:2.0000 '=' / in.	DRAWN - RH	REVISED -	
PLOT DATE = 12/12/2018	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN - RAMP E
STRUCTURE NO. 090-0180
SHEET S-195 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR\BR	PEO/TAZ	1361	1101
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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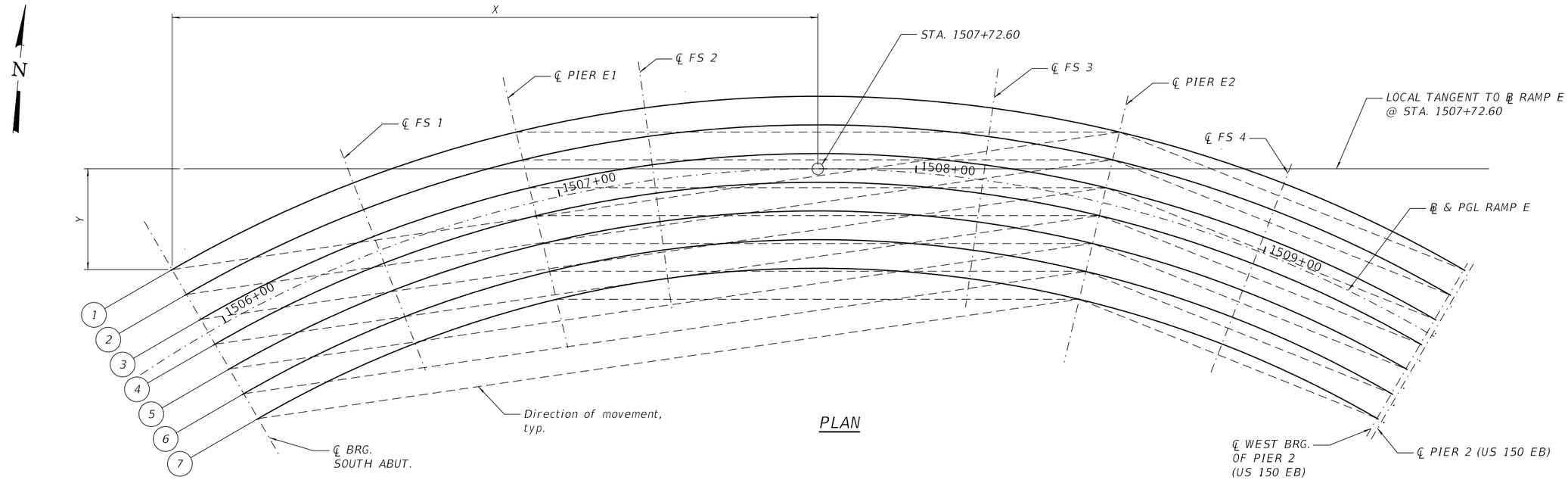
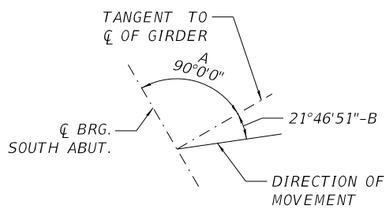
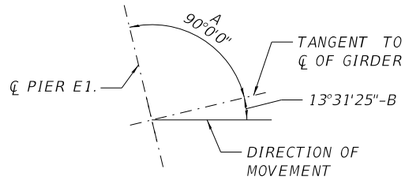
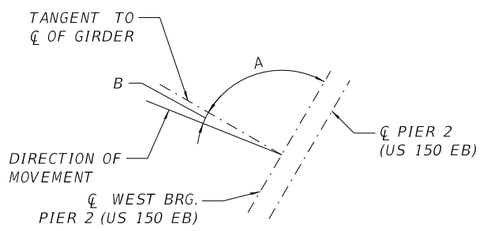


PLAN

GIRDER	℄ BRG. SOUTH ABUT.		℄ FS 1		℄ PIER E1		℄ FS 2		℄ FS 3		℄ PIER E2		℄ FS 4		℄ WEST BRG. PIER 2 (US 150 EB)	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
1	-180.333	-28.134	-129.729	-3.919	-84.242	10.262	-48.369	16.988	48.865	16.921	84.242	10.262	130.223	-4.110	180.410	-28.179
2	-176.328	-35.06	-126.848	-11.382	-82.371	2.484	-47.295	9.061	47.780	8.994	82.372	2.484	127.331	-11.569	176.375	-35.087
3	-172.323	-41.985	-123.967	-18.845	-80.501	-5.295	-46.220	1.133	46.695	1.068	80.501	-5.295	124.439	-19.028	172.340	-41.995
4	-168.319	-48.911	-121.086	-26.309	-78.630	-13.073	-45.146	-6.795	45.610	-6.858	78.630	-13.073	121.547	-26.487	168.305	-48.903
5	-164.314	-55.836	-118.205	-33.772	-76.759	-20.851	-44.072	-14.722	44.525	-14.784	76.759	-20.851	118.655	-33.946	164.269	-55.811
6	-160.310	-62.762	-115.324	-41.235	-74.888	-28.629	-42.998	-22.65	43.439	-22.71	74.889	-28.629	115.763	-41.405	160.234	-62.718
7	-156.305	-69.688	-112.444	-48.699	-73.018	-36.407	-41.924	-30.577	42.354	-30.636	73.018	-36.407	112.872	-48.864	156.199	-69.626







GIRDER	ANGLE	
	A	B
1	90°14'19"	8°15'52"
2	90°14'38"	8°15'42"
3	90°14'59"	8°15'32"
4	90°15'20"	8°15'21"
5	90°15'43"	8°15'10"
6	90°16'6"	8°14'58"
7	90°16'31"	8°14'46"

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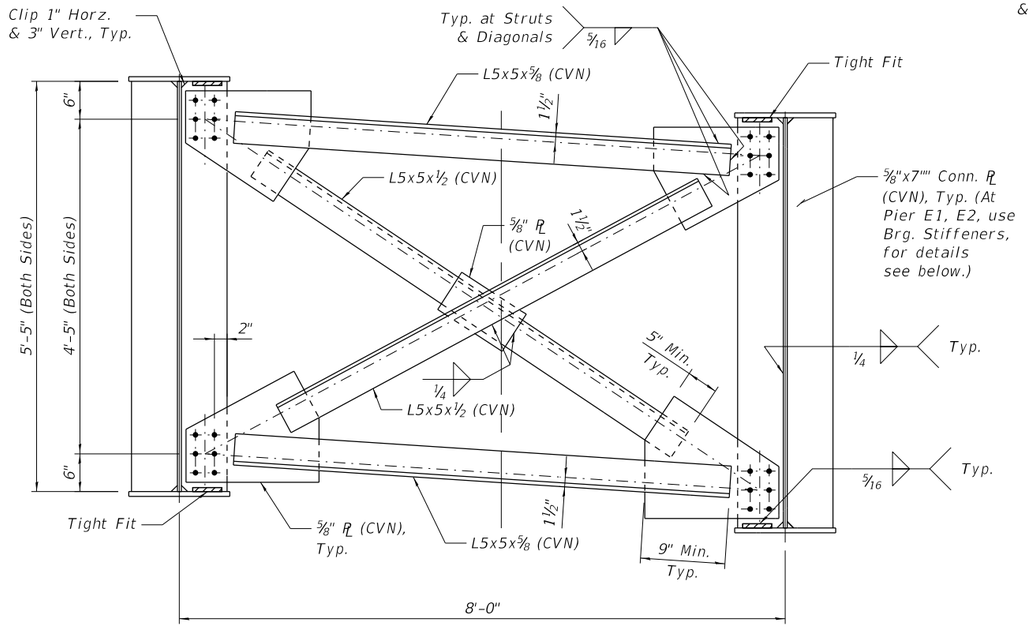
USER NAME = CHORBACZ	DESIGNED - RH	REVISED -	
	CHECKED - SP	REVISED -	
PLOT SCALE = 0:2.0000 ':' / in.	DRAWN - RH	REVISED -	
PLOT DATE = 12/12/2018	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER LAYOUT - RAMP E
STRUCTURE NO. 090-0180

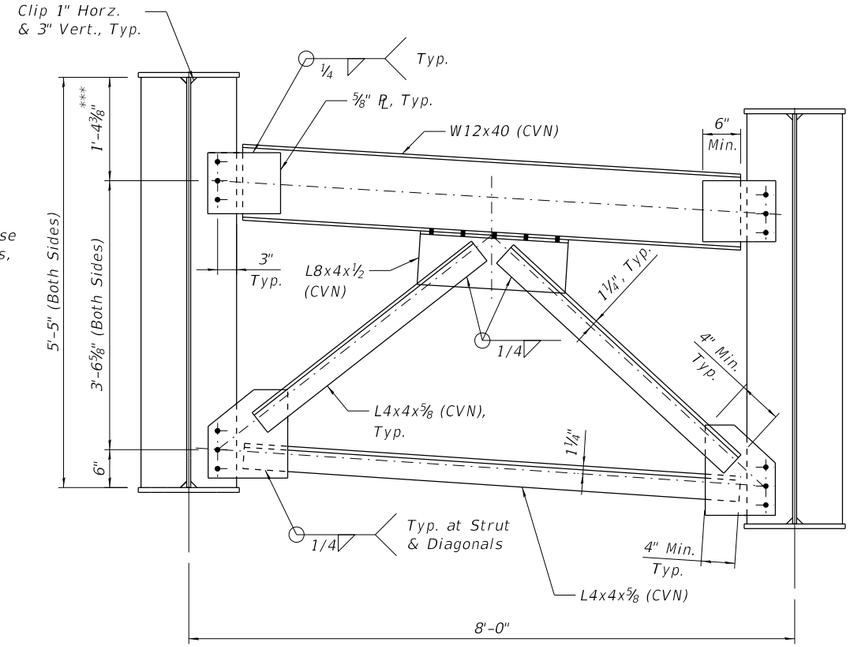
SHEET S-196 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1102
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



INTERIOR CROSS FRAME – CF1

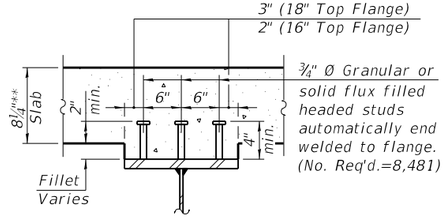
(144 Required)



END CROSS FRAME – CF2

(12 Required)

*** Contractor to coordinate with modular joint manufacturer.



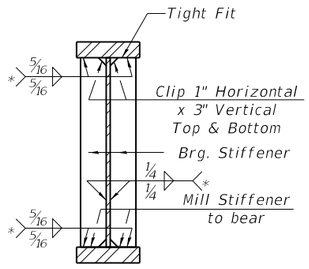
SECTION A–A

** Prior to grinding

Deflection Notes:

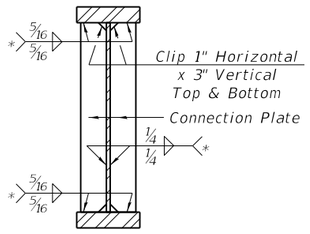
1. The calculated deflections of the primary girders under steel self weight shall be used to detail the cross frame connections and to erect the structural steel such that the girders will be plumb to within a tolerance of ± ½" per vertical foot thoughout when supporting their own weight.

2. The Contractor shall either:
   a. Ream cross frame connection holes during shop assembly, or
   b. Provide detailing and fabrication controls acceptable to the Engineer which ensures accuracy such that field reaming will not exceed the amount permitted in Article 505.08(I) of the Standard Specifications.



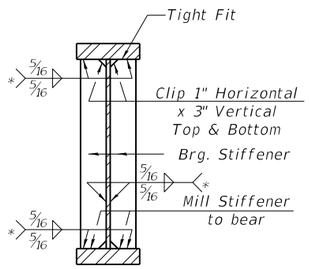
BEARING STIFFENERS

(At S. Abut. & Pier 2)



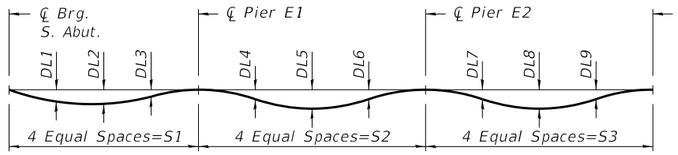
CONNECTION PLATE

* Terminate ¼" (±⅛") from the end of plate intersects.



BEARING STIFFENERS

(At Pier E1 and E2)

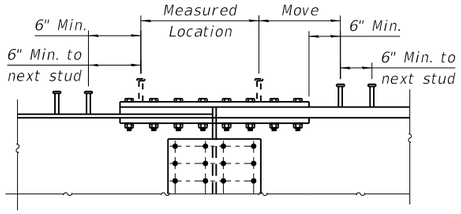


DEAD LOAD DEFLECTION DIAGRAM
STEEL SELF WEIGHT

(Includes weight of structural steel only.)

STEEL SELF WEIGHT DEFLECTION TABLE

Girder	DL1	DL2	DL3	DL4	DL5	DL6	DL7	DL8	DL9	S1	S2	S3
1	0"	0"	-⅛"	⅝"	1"	⅝"	-⅛"	0"	0"	22'-6"	36'-10 3/16"	22'-5⅜"
2	0"	0"	-⅛"	½"	⅞"	½"	-⅛"	0"	0"	23'-0 15/16"	37'-9 7/16"	23'-0 1/16"
3	0"	0"	0"	½"	⅞"	½"	0"	0"	0"	23'-7⅛"	38'-8⅛"	23'-7 1/16"
4	⅛"	0"	0"	⅜"	¾"	⅜"	0"	0"	⅛"	24'-2¾"	39'-8⅛"	24'-2 11/16"
5	⅛"	0"	0"	⅜"	⅝"	⅜"	0"	0"	⅛"	24'-9 11/16"	40'-7½"	24'-9¾"
6	⅛"	⅛"	0"	⅜"	½"	⅜"	0"	⅛"	⅛"	25'-4⅝"	41'-6 13/16"	25'-4¾"
7	⅛"	⅛"	0"	¼"	½"	¼"	0"	⅛"	⅛"	25'-11½"	42'-6 3/16"	25'-11 13/16"

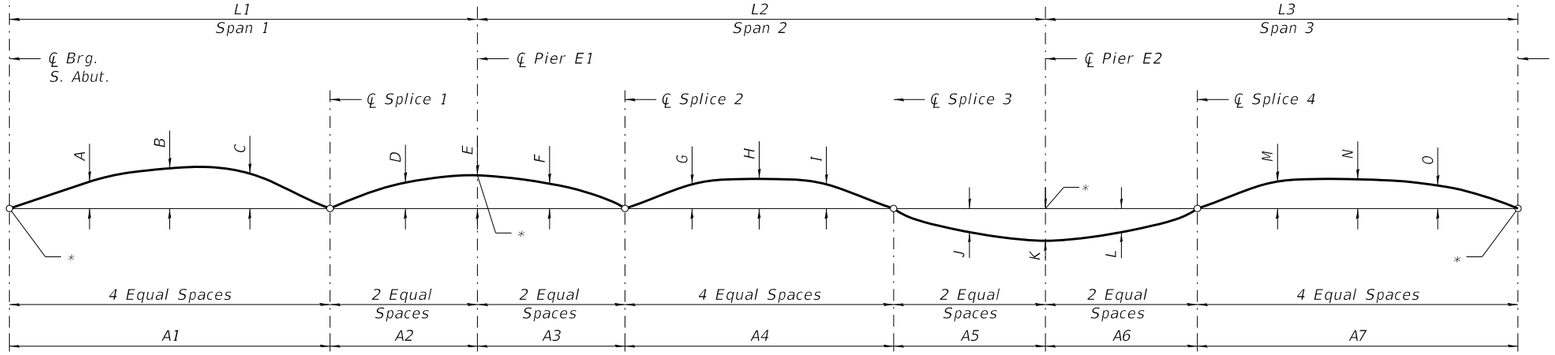


SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.

WELDED STUD SPACING

Girder	1		2		3		4		5		6		7	
Location	# Spaces	@	# Spaces	@	# Spaces	@	# Spaces	@	# Spaces	@	# Spaces	@	# Spaces	@
ST1	376	12"	21	12"	105	9"	20	12"	19	12"	19	12"	48	12"
ST2			79	9"	54	12"	76	9"	75	9"	73	9"	35	9"
ST3			56	12"	123	9"	53	12"	51	12"	50	12"	18	12"
ST4			126	9"	57	12"	125	9"	120	9"	117	9"	115	15"
ST5			57	12"	103	9"	52	12"	51	12"	50	12"	18	12"
ST6			80	9"			89	9"	75	9"	74	9"	33	9"
ST7			20	12"			17	6"	19	12"	17	12"	47	12"
ST8	1	6⅞"	1	4¾"	1	5 11/16"	1	3 9/16"	1	4 9/16"	1	5 7/16"	1	3⅜"



CAMBER DIAGRAM RAMP E

* See Table for Final Top of Web Elevations at abutments and piers.

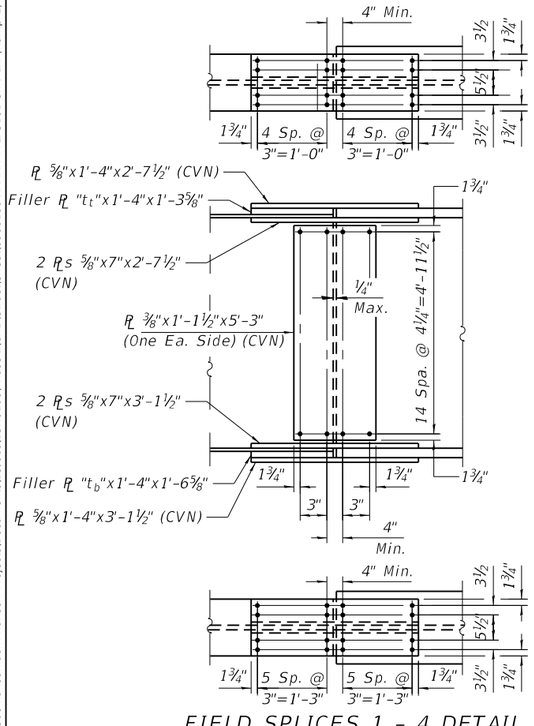
***TOP OF WEB ELEVATIONS

UNIT 1A (RAMP E)	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7
℄ Brg. W. Abut.	500.43	499.95	499.47	498.99	498.51	498.24	498.08
℄ Splice 1	501.97	501.50	501.03	500.65	500.17	499.91	499.75
℄ Pier E1	502.87	502.39	501.90	501.50	501.02	500.74	500.58
℄ Splice 2	503.24	502.74	502.24	501.83	501.34	501.05	500.88
℄ Splice 3	502.50	502.00	501.51	501.10	500.60	500.32	500.14
℄ Pier E2	501.98	501.50	501.02	500.62	500.14	499.87	499.70
℄ Splice 4	501.42	500.97	500.51	500.13	499.67	499.41	499.25
℄ W. Brg. Pier 2 (US 150 EB)	500.69	500.37	500.09	499.74	499.42	499.21	499.05

*** For Fabrication Only

CAMBER DIMENSIONS

Girder	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1½"	2"	1½"	1¾"	2¼"	1¾"	4"	5¼"	4"	½"	¾"	½"	½"	¾"	½"
2-3	1½"	2"	1½"	1¾"	2¼"	1¾"	3¾"	5"	3¾"	½"	¾"	½"	½"	¾"	½"
4	1¼"	1¾"	1¼"	1¾"	2¼"	1¾"	2¾"	3¾"	2¾"	½"	¾"	½"	0"	0"	0"
5	1¼"	1¾"	1¼"	1¾"	2¼"	1¾"	2¾"	3½"	2¾"	½"	¾"	½"	0"	0"	0"
6-7	1¼"	1¾"	1¼"	1¾"	2¼"	1¾"	2½"	3¼"	2½"	½"	¾"	½"	0"	0"	0"

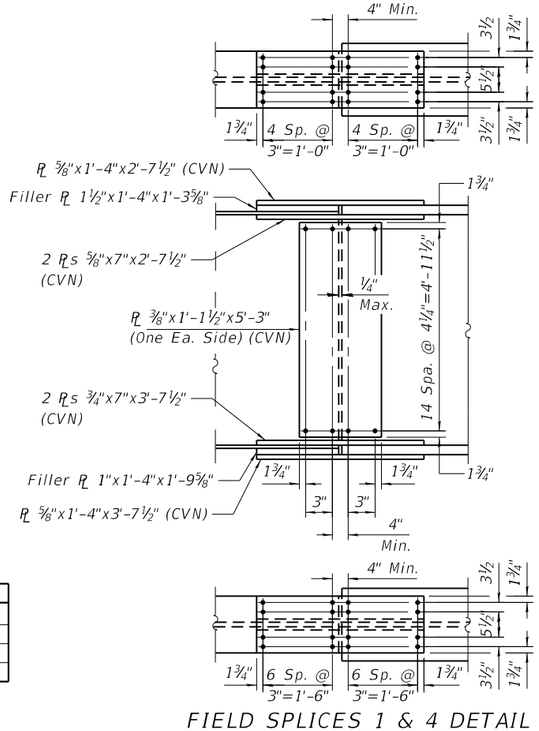


FIELD SPLICES 1 - 4 DETAIL

(For Girders 4 - 7)

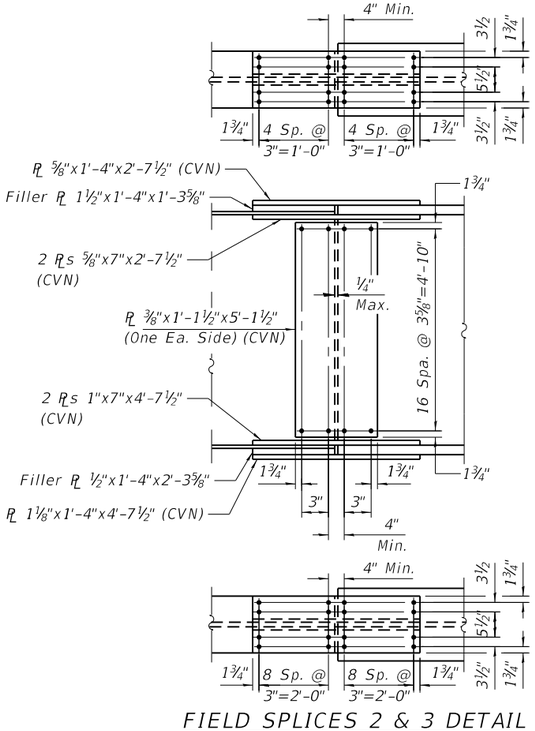
GIRDERS 4-7

Field Splice	t_t	t_b
1	½"	1"
2	½"	¾"
3	½"	¾"
4	½"	1"



FIELD SPLICES 1 & 4 DETAIL

(For Girders 1 - 3)



FIELD SPLICES 2 & 3 DETAIL

(For Girders 1 - 3)

GIRDER 1

EXTERIOR GIRDER MOMENT TABLE						
		0.3 Sp. 1	Pier E1	0.5 Sp. 2	Pier E2	0.7 Sp. 3
Is	(in^4)	48,232	110,828	54,852	110,828	48,232
Ic(n)	(in^4)	114,621	187,439	135,966	187,439	114,621
Ic(3n)	(in^4)	83,511	146,383	96,825	146,383	83,511
Ic(cr)	(in^4)		123,127		123,127	
Ss	(in^3)	1,605	3,303	1,991	3,303	1,605
Sc(n)	(in^3)	2,177	3,782	2,682	3,782	2,177
Sc(3n)	(in^3)	1,984	3,571	2,448	3,571	1,984
Sc(cr)	(in^3)		3,422		3,422	
Sxc	(in^3)	53.3	150.0	74.7	150.0	53.3
DC1	(k/')	1.08	1.26	1.11	1.26	1.08
MDC1	('k)	356	2,988	1,627	2,991	352
DC2	(k/')	0.19	0.19	0.19	0.19	0.19
MDC2	('k)	68	479	305	481	67
DW	(k/')	0.40	0.40	0.40	0.40	0.40
MDW	('k)	139	982	625	986	137
M_{L+IM}	('k)	1,644	3,084	2,775	3,102	1,668
fℓ (Strength I)	('k)	15	104	39	104	14
Mu + ⅓fℓ Sxc	('k)	3,620	11,238	8,222	11,282	3,653
Ø Mn	('k)					
fs DC1	(ksi)	2.66	10.85	9.81	10.87	2.63
fs DC2	(ksi)	0.41	1.68	1.50	1.69	0.41
fs DW	(ksi)	0.84	3.44	3.06	3.46	0.83
fs (L+IM)	(ksi)	9.06	10.81	12.42	10.88	9.19
fℓ (Service II)	(ksi)	2.47	6.27	4.69	6.26	2.37
fs+ $f_f/_2$ (Service II)	(ksi)	16.93	33.17	32.85	33.28	17.00
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs + $f_f/_3$ (Total)(Strength I)	(ksi)	22.1	42.5	42.5	42.7	22.2
Ø Fn	(ksi)	50.00	50.00	50.00	50.00	50.00
Vf	(k)	37.10	39.70	35.10	41.00	37.30

GIRDER 2

INTERIOR GIRDER MOMENT TABLE						
		0.3 Sp. 1	Pier E1	0.5 Sp. 2	Pier E2	0.7 Sp. 3
Is	(in^4)	48,232	110,828	54,852	110,828	48,232
Ic(n)	(in^4)	117,166	191,320	139,256	191,320	117,166
Ic(3n)	(in^4)	85,704	148,936	99,518	148,936	85,704
Ic(cr)	(in^4)		123,127		123,127	
Ss	(in^3)	1,605	3,303	1,991	3,303	1,605
Sc(n)	(in^3)	2,190	3,799	2,697	3,799	2,190
Sc(3n)	(in^3)	2,001	3,586	2,468	3,586	2,001
Sc(cr)	(in^3)		3,422		3,422	
Sxc	(in^3)	53.3	150.0	74.7	150.0	53.3
DC1	(k/')	1.10	1.28	1.13	1.28	1.10
MDC1	('k)	394	3,198	1,492	3,195	387
DC2	(k/')	0.19	0.19	0.19	0.19	0.19
MDC2	('k)	75	502	269	502	73
DW	(k/')	0.40	0.40	0.40	0.40	0.40
MDW	('k)	153	1,030	552	1,029	149
M_{L+IM}	('k)	1,358	2,609	2,185	2,618	1,327
fℓ (Strength I)	('k)	13	97	32	97	12
Mu + ⅓fℓ Sxc	('k)	3,196	10,768	6,864	10,779	3,125
Ø Mn	('k)					
fs DC1	(ksi)	2.95	11.62	8.99	11.61	2.89
fs DC2	(ksi)	0.45	1.76	1.31	1.76	0.44
fs DW	(ksi)	0.92	3.61	2.68	3.61	0.89
fs (L+IM)	(ksi)	7.44	9.15	9.72	9.18	7.27
fℓ (Service II)	(ksi)	2.15	5.90	3.84	5.87	2.00
fs+ $f_f/_2$ (Service II)	(ksi)	15.06	31.83	27.54	31.85	14.68
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs + $f_f/_3$ (Total)(Strength I)	(ksi)	19.6	40.7	35.6	40.8	19.1
Ø Fn	(ksi)	50.00	50.00	50.00	50.00	50.00
Vf	(k)	27.50	28.60	24.40	29.40	27.50

GIRDER 4

INTERIOR GIRDER MOMENT TABLE						
		0.3 Sp. 1	Pier E1	0.5 Sp. 2	Pier E2	0.7 Sp. 3
Is	(in^4)	40,243	73,101	44,439	73,101	40,243
Ic(n)	(in^4)	93,397	150,972	105,506	150,972	93,397
Ic(3n)	(in^4)	70,017	112,640	78,123	112,640	70,017
Ic(cr)	(in^4)		85,786		85,786	
Ss	(in^3)	1,210	2,357	1,409	2,357	1,210
Sc(n)	(in^3)	1,681	2,927	1,936	2,927	1,681
Sc(3n)	(in^3)	1,529	2,716	1,765	2,716	1,529
Sc(cr)	(in^3)		2,503		2,503	
Sxc	(in^3)	32.0	94.5	42.7	94.5	32.0
DC1	(k/')	1.07	1.17	1.09	1.17	1.07
MDC1	('k)	358	2,129	1,068	2,126	368
DC2	(k/')	0.19	0.19	0.19	0.19	0.19
MDC2	('k)	62	352	187	350	66
DW	(k/')	0.40	0.40	0.40	0.40	0.40
MDW	('k)	128	721	384	717	136
M_{L+IM}	('k)	821	1,737	1,433	1,732	876
fℓ (Strength I)	('k)	8	63	21	62	8
Mu + ⅓fℓ Sxc	('k)	2,157	7,243	4,659	7,222	2,282
Ø Mn	('k)					
fs DC1	(ksi)	3.55	10.84	9.10	10.83	3.65
fs DC2	(ksi)	0.49	1.69	1.27	1.68	0.52
fs DW	(ksi)	1.00	3.46	2.61	3.44	1.07
fs (L+IM)	(ksi)	5.86	8.33	8.88	8.30	6.25
fℓ (Service II)	(ksi)	2.33	6.05	4.39	5.99	2.34
fs+ $f_f/_2$ (Service II)	(ksi)	13.82	29.83	26.72	29.73	14.53
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs + $f_f/_3$ (Total)(Strength I)	(ksi)	17.8	38.1	34.4	38.0	18.8
Ø Fn	(ksi)	50.00	50.00	50.00	50.00	50.00
Vf	(k)	19.80	23.30	18.60	23.50	20.20

GIRDER 7

EXTERIOR GIRDER MOMENT TABLE						
		0.3 Sp. 1	Pier E1	0.5 Sp. 2	Pier E2	0.7 Sp. 3
Is	(in^4)	40,243	73,101	44,439	73,101	40,243
Ic(n)	(in^4)	91,554	147,677	103,319	147,677	91,554
Ic(3n)	(in^4)	68,335	110,154	76,184	110,154	68,335
Ic(cr)	(in^4)		85,786		85,786	
Ss	(in^3)	1,210	2,357	1,409	2,357	1,210
Sc(n)	(in^3)	1,671	2,912	1,925	2,912	1,671
Sc(3n)	(in^3)	1,516	2,698	1,751	2,698	1,516
Sc(cr)	(in^3)		2,503		2,503	
Sxc	(in^3)	32.0	94.5	42.7	94.5	32.0
DC1	(k/')	1.05	1.16	1.07	1.16	1.05
MDC1	('k)	391	1,956	788	1,939	384
DC2	(k/')	0.19	0.19	0.19	0.19	0.19
MDC2	('k)	68	326	137	318	67
DW	(k/')	0.40	0.40	0.40	0.40	0.40
MDW	('k)	140	668	282	653	137
M_{L+IM}	('k)	1,052	2,180	1,718	2,141	1,037
fℓ (Strength I)	('k)	9	62	19	61	9
Mu + ⅓fℓ Sxc	('k)	2,628	7,690	4,592	7,568	2,587
Ø Mn	('k)					
fs DC1	(ksi)	3.88	9.96	6.71	9.87	3.81
fs DC2	(ksi)	0.54	1.56	0.94	1.52	0.53
fs DW	(ksi)	1.11	3.20	1.93	3.13	1.08
fs (L+IM)	(ksi)	7.55	10.45	10.71	10.26	7.45
fℓ (Service II)	(ksi)	2.59	5.93	3.98	5.81	2.40
fs+ $f_f/_2$ (Service II)	(ksi)	16.64	31.28	25.50	30.78	16.30
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs + $f_f/_3$ (Total)(Strength I)	(ksi)	21.6	40.1	33.0	39.5	21.1
Ø Fn	(ksi)	50.00	50.00	50.00	50.00	50.00
Vf	(k)	26.80	34.00	26.70	34.00	30.50

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads (in.⁴ and in.³).

Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short term composite live loads (in.⁴ and in.³).

Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to long-term composite (superimposed) dead loads (in.⁴ and in.³).

Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs(Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in.⁴ and in.³).

Sxc: Section modulus about the major axis of section to the controlling flange, tension or compression, taken as yield moment with respect to the controlling flange over the yield strength of the controlling flange (in.³).

DC1: Un-factored non-composite dead load (kips/ft.).

MDC1: Un-factored moment due to non-composite dead load (kip-ft.).

DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).

MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).

DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).

MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

M_{L+IM}: Un-factored live load moment plus dynamic load allowance (impact)(kip-ft.).

Mu (Strength I): Factored design moment (kip-ft.).
$1.25\ (MDC1+ MDC2) + 1.5\ MDW + 1.75\ M_{L+IM}$

fℓ: Factored calculated normal stress at edge of flange for controlling flange plate due to lateral bending, Strength I or Service II as applicable (kip-ft.).

Ø Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft.).

fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1 / Snc

fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2 / Sc(3n) or MDC2 / Sc(cr) as applicable.

fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW / Sc(3n) or MDW / Sc(cr) as applicable.

fs (L+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live plus impact loads as calculated below (ksi).
M_{L+IM} / Sc(n) or M_{L+IM} / Sc(cr) as applicable.

fs + $f_f/_2$ (Service II): Sum of stresses as computed below (ksi).
$fsDC1 + fsDC2 + fsDW + 1.3\ fs(_{L+IM}) + f_f/_2$

0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

fs + $f_f/_3$ (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
$1.25\ (fsDC1 + fsDC2) + 1.5\ fsDW + 1.75\ fs(_{L+IM}) + f_f/_3$

Ø Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

Vf: Maximum factored shear range in span computed according to Article 6.10.10.

Note:
M_L and R_L include the effects of centrifugal force and superelevation.

GIRDER 1

EXTERIOR GIRDER REACTION TABLE					
		S. Abut.	Pier E1	Pier E2	Pier 2
RDC1	(k)	31.8	145.4	145.2	30.4
RDC2	(k)	5.3	23.8	23.8	5.3
RDW	(k)	10.9	48.8	48.7	10.9
R_{L+IM}	(k)	95.8	148.2	146.8	96.0
RTotal	(k)	143.8	366.2	364.5	142.6

GIRDER 2

INTERIOR GIRDER REACTION TABLE					
		S. Abut.	Pier E1	Pier E2	Pier 2
RDC1	(k)	33.6	227.9	228.1	32.1
RDC2	(k)	5.6	36.3	36.4	5.5
RDW	(k)	11.5	74.5	74.6	11.3
R_{L+IM}	(k)	89.6	195.8	195.6	89.3
RTotal	(k)	140.3	534.5	534.7	138.2

GIRDER 4

INTERIOR GIRDER REACTION TABLE					
		S. Abut.	Pier E1	Pier E2	Pier 2
RDC1	(k)	29.7	165.2	165.6	29.3
RDC2	(k)	4.7	27.8	27.8	5.0
RDW	(k)	9.7	57.0	57.1	10.2
R_{L+IM}	(k)	73.4	146.4	144.0	75.3
RTotal	(k)	117.5	396.4	394.5	119.8

GIRDER 7

EXTERIOR GIRDER REACTION TABLE					
		S. Abut.	Pier E1	Pier E2	Pier 2
RDC1	(k)	31.0	184.5	183.8	28.9
RDC2	(k)	5.1	30.8	30.5	4.9
RDW	(k)	10.7	63.2	62.5	10.0
R_{L+IM}	(k)	77.7	187.5	186.5	75.9
RTotal	(k)	124.5	466.0	463.3	119.7

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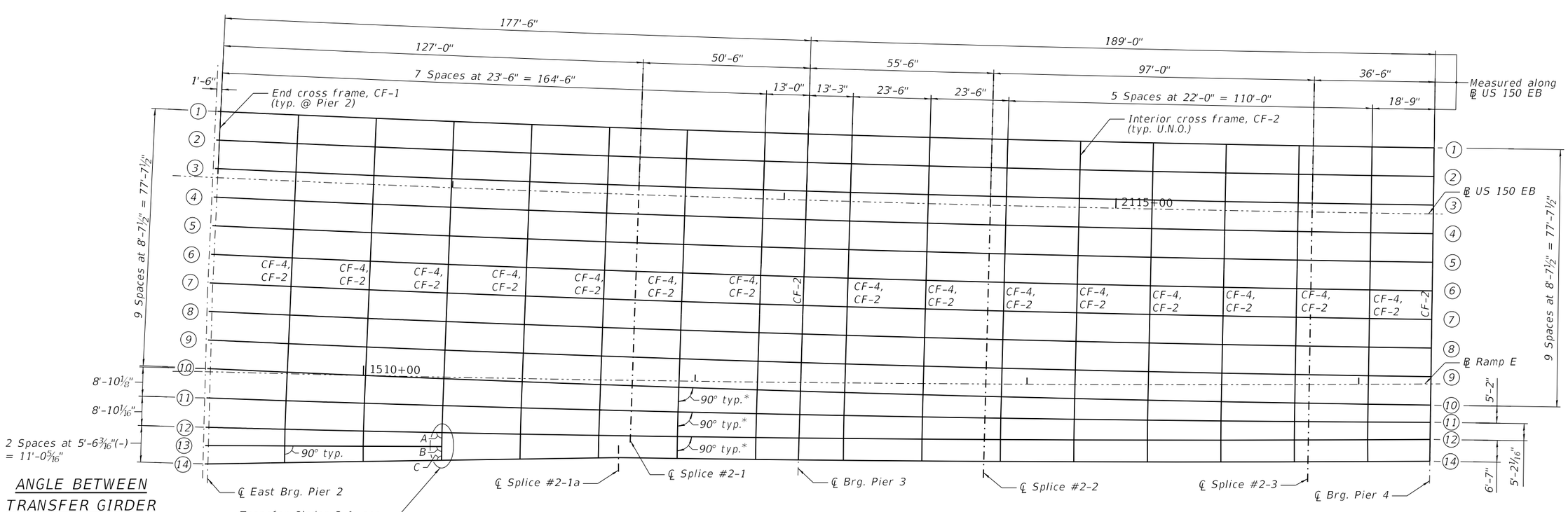
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - RAMP E, 3 OF 3
STRUCTURE NO. 090-0180
SHEET S-199 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1105
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



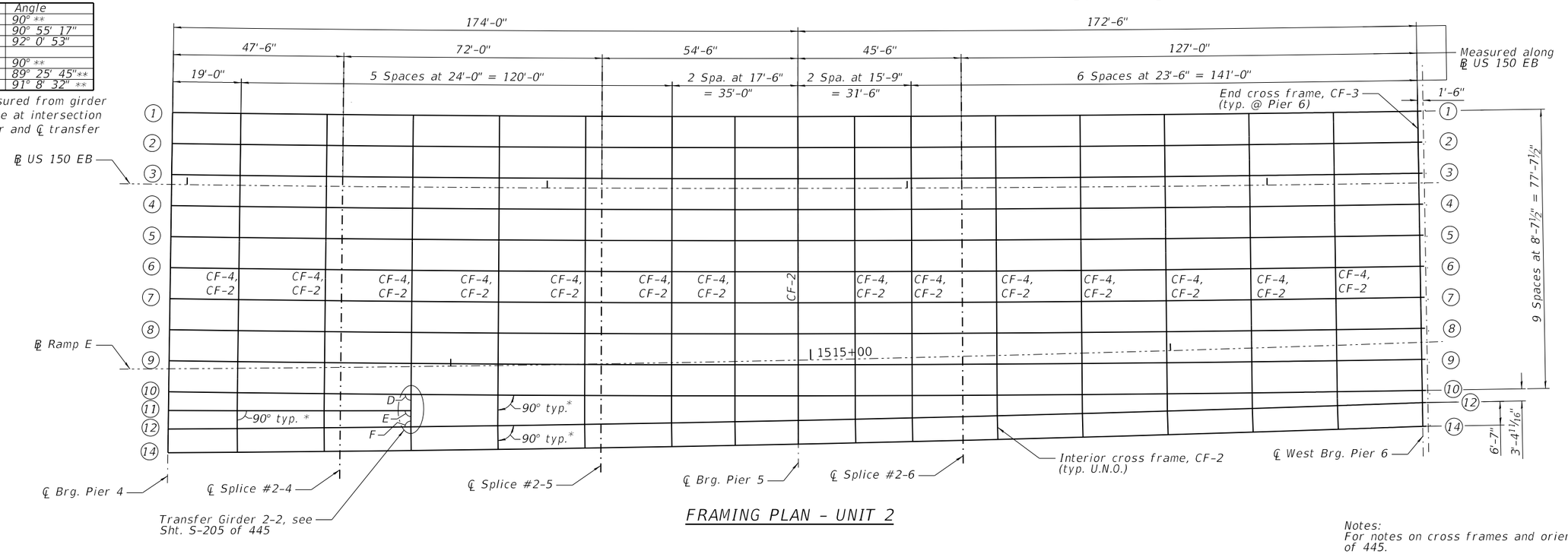
FRAMING PLAN – UNIT 2

* 90° as measured from girder tangent line at intersection of ℄ girder and ℄ cross frame.

ANGLE BETWEEN TRANSFER GIRDER AND GIRDERS

Location	Angle
Girder 12	90° **
Girder 13	90° 55' 17"
Girder 14	92° 0' 53"
Girder 10	90° **
Girder 11	89° 25' 45"**
Girder 12	91° 8' 32" **

** As measured from girder tangent line at intersection of ℄ girder and ℄ transfer girder



FRAMING PLAN – UNIT 2

Notes:
For notes on cross frames and orientation, see sheet S-204 of 445.

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FRAMING PLAN - UNIT 2
STRUCTURE NO. 090-0180
SHEET S-200 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1106
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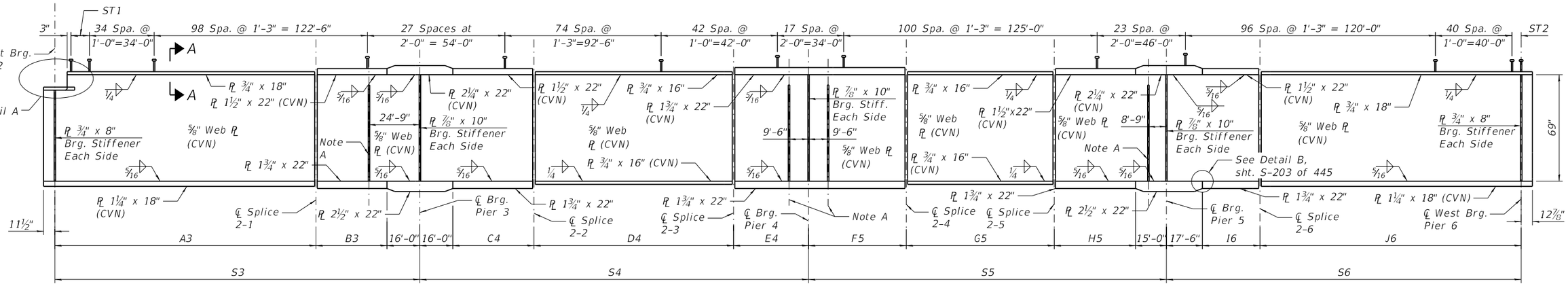


"CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.

UNIT 2 – GIRDER ELEVATION

(Girders 1-10, 12 and 14)

Note A:
Intermediate Stiffener

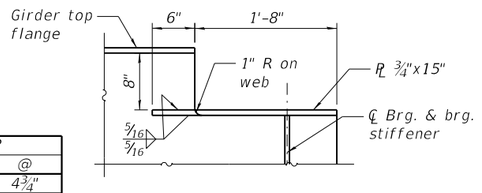
GIRDER DIMENSIONS

Girder	Radius	S3	S4	S5	S6	A3	B3	C4	D4	E4	F5	G5	H5	I6	J6
1	11480'-0½"	177'-2¼"	188'-8 1/16"	173'-8⅜"	172'-2⅜"	126'-9 5/16"	34'-4 1/16"	39'-4⅞"	96'-10"	36'-5¼"	47'-5"	71'-10½"	39'-4⅞"	27'-11 1/16"	126'-9 9/16"
2	11488'-8"	177'-3⅛"	188'-9¾"	173'-9 15/16"	172'-3 15/16"	126'-10½"	34'-5⅜"	39'-5 9/16"	96'-10⅞"	36'-5 9/16"	47'-5 7/16"	71'-11 3/16"	39'-5⅜"	27'-11 7/16"	126'-10 7/16"
3	11497'-3½"	177'-5½"	188'-11 7/16"	173'-11½"	172'-5½"	126'-11⅜"	34'-5⅞"	39'-5 13/16"	96'-11¾"	36'-5⅞"	47'-5⅞"	71'-11 13/16"	39'-5 13/16"	27'-11⅞"	126'-11⅝"
4	11505'-11"	177'-7⅛"	189'-1⅜"	174'-1 1/16"	172'-7 1/16"	127'-0 3/16"	34'-6 9/16"	39'-6⅜"	97'-0⅝"	36'-6 1/16"	47'-6⅜"	72'-0 1/16"	39'-6⅜"	28'-0 9/16"	127'-0¾"
5	11514'-6½"	177'-8 1/16"	189'-2⅞"	174'-2⅜"	172'-8⅜"	127'-1 5/16"	34'-6¾"	39'-6 13/16"	97'-1½"	36'-6 9/16"	47'-6 1/16"	72'-1⅛"	39'-6 13/16"	28'-0 1/16"	127'-1 15/16"
6	11523'-2"	177'-10 5/16"	189'-4⅝"	174'-4 3/16"	172'-10 3/16"	127'-3⅛"	34'-7¼"	39'-7 5/16"	97'-2⅝"	36'-6⅞"	47'-7⅛"	72'-1¾"	39'-7 5/16"	28'-1⅛"	127'-3 3/16"
7	11531'-9½"	177'-11 5/16"	189'-6¼"	174'-5¾"	172'-11¾"	127'-4¼"	34'-7 1/16"	39'-7 13/16"	97'-3¼"	36'-7 1/16"	47'-7 9/16"	72'-2 7/16"	39'-7 13/16"	28'-1½"	127'-4¼"
8	11540'-5"	178'-0 1/16"	189'-7 15/16"	174'-7 5/16"	173'-1 5/16"	127'-4¼"	34'-8⅛"	39'-8 5/16"	97'-4⅛"	36'-7½"	47'-8"	72'-3 1/16"	39'-8 5/16"	28'-1 5/16"	127'-5⅜"
9	11549'-0½"	178'-0"	189'-9 1/16"	174'-8⅞"	173'-2⅞"	127'-3 7/16"	34'-8 1/16"	39'-8 3/16"	97'-4 5/16"	36'-7⅞"	47'-8 7/16"	72'-3 1/16"	39'-8¾"	28'-2 5/16"	127'-6 9/16"
10	11557'-8"	177'-11⅞"	189'-11⅜"	174'-10½"	173'-4 7/16"	127'-2 9/16"	34'-9 1/16"	39'-9 3/16"	97'-5 1/16"	36'-8 1/16"	47'-8⅞"	72'-4⅜"	39'-9¼"	28'-2¾"	127'-7 1/16"
12	11575'-5¾"	177'-10⅞"	190'-2¼"	175'-0 7/16"	173'-5 13/16"	127'-0 15/16"	34'-9 15/16"	39'-10¼"	97'-7 5/16"	36'-8 1 1/16"	47'-9 1/16"	72'-5 3/16"	39'-9 13/16"	28'-3⅛"	127'-8⅝"
14	11582'-0¾"	177'-11 13/16"	190'-3½"	175'-1⅞"	173'-7"	123'-9 9/16"	38'-2¼"	39'-10⅝"	97'-7 15/16"	36'-8 15/16"	47'-9¾"	72'-5 1/16"	39'-10 7/16"	28'-3 7/16"	127'-9½"

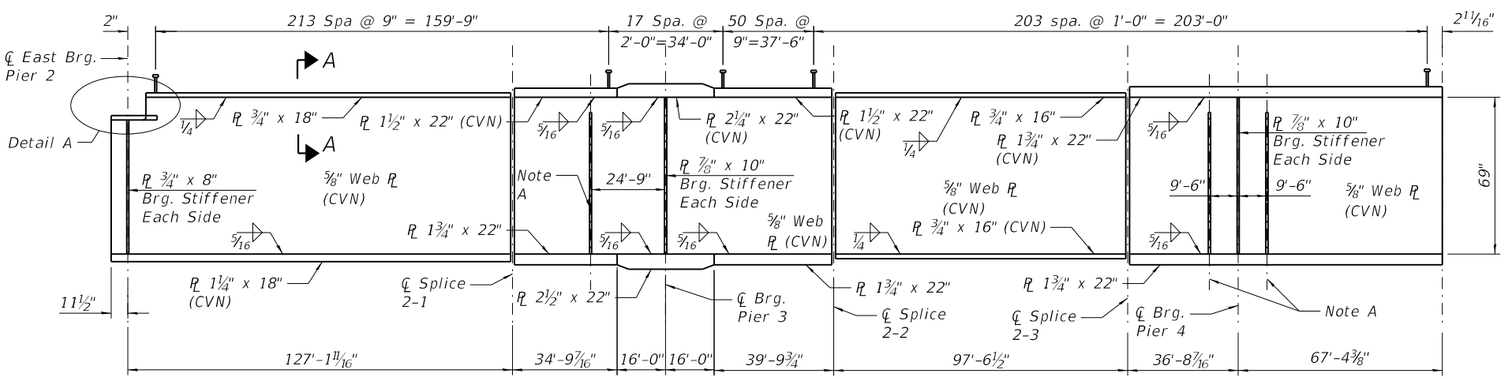
Note: Girder 14, Segment A3 has no curvature.

WELDED STUD SPACING

	ST1		ST2	
Girder	# Spa.	@	# Spa.	@
1	1	4 1/16"	1	4¾"
2	1	8"	1	8"
3	1	8 1/16"	2	7 3/16"
4	1	9 9/16"	2	9 1/16"
5	2	9"	2	8 1/16"
6	2	10"	2	10⅛"
7	2	10"	3	9⅜"
8	2	10½"	3	10 13/16"
9	3	10"	3	9 9/16"
10	3	10½"	3	10 5/16"
12	3	11"	3	11⅜"
14	3	12"	3	12"

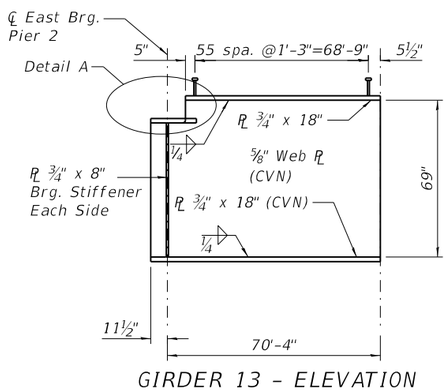


DETAIL A



GIRDER 11 – ELEVATION

(Radius = 11574'-2 1/16")



GIRDER 13 – ELEVATION

(No Curvature)

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GIRDER ELEVATIONS - UNIT 2
STRUCTURE NO. 090-0180
SHEET S-201 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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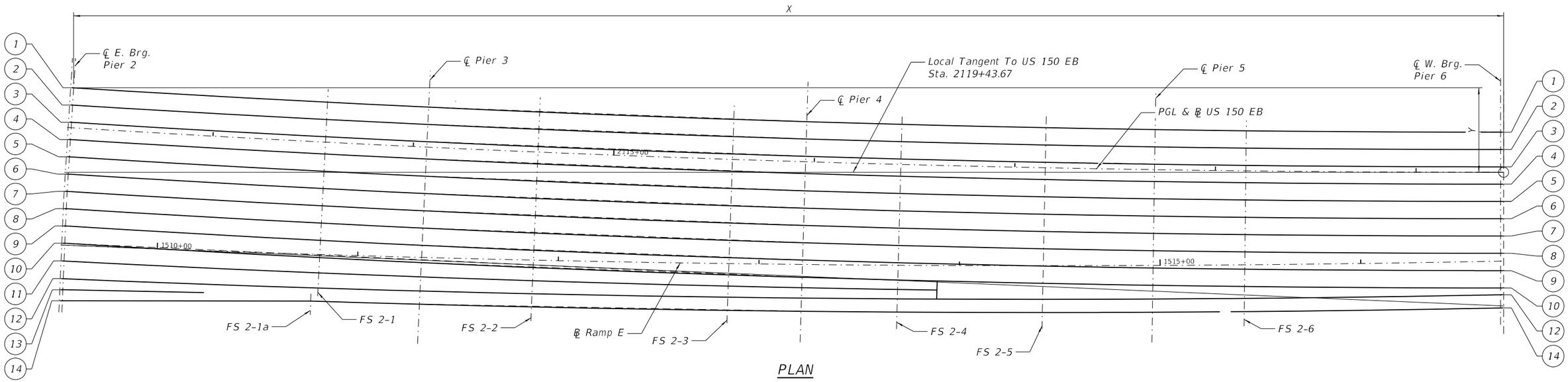
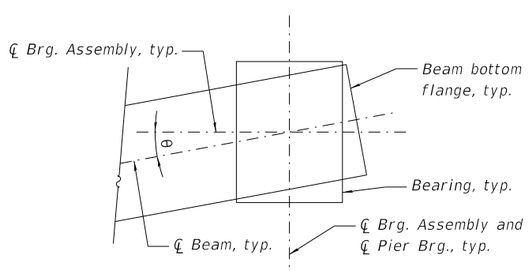


PLAN

GIRDER	℄ W. BRG. Pier 2		℄ FS 2-1		℄ PIER 3		℄ FS 2-2		℄ FS 2-3		℄ PIER 4		℄ FS 2-4		℄ FS 2-5		℄ Pier 5		℄ FS 2-6		℄ E. Brg. Pier 6	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
1	712.794	42.108	586.220	34.936	535.868	32.247	480.519	30.019	383.756	26.374	347.339	25.214	299.941	23.877	228.084	22.224	173.687	21.272	128.270	20.675	1.497	19.958
2	713.330	33.500	586.661	26.322	536.271	23.856	480.880	21.402	384.044	17.754	347.600	16.593	300.167	16.255	228.255	13.601	173.818	12.648	128.366	12.050	1.497	11.333
3	713.867	24.892	587.101	17.708	536.674	15.241	481.241	12.784	384.333	9.134	347.861	7.972	300.392	6.633	228.426	4.978	173.948	4.024	128.463	3.426	1.497	2.708
4	714.404	16.283	587.542	9.094	537.076	6.625	481.602	4.167	384.621	0.516	348.122	-0.651	300.617	-1.989	228.598	-3.646	174.079	-4.600	128.559	-5.198	1.497	-5.917
5	714.940	7.375	587.982	0.479	537.479	-1.991	481.963	-4.450	384.909	-8.106	348.383	-9.270	300.843	-10.611	228.769	-12.269	174.209	-13.224	128.656	-13.823	1.497	-14.542
6	715.477	-0.932	588.423	-8.133	537.881	-10.606	482.324	-13.068	385.198	-16.727	348.644	-17.891	301.068	-19.233	228.940	-20.892	174.340	-21.848	128.752	-22.447	1.497	-23.167
7	716.013	-9.541	588.863	-16.747	538.284	-19.222	482.685	-21.685	385.486	-25.347	348.905	-26.512	301.293	-27.855	229.112	-29.515	174.470	-30.472	128.848	-31.072	1.497	-31.792
8	716.456	-18.156	589.303	-25.361	538.687	-27.837	483.046	-30.303	385.774	-33.967	349.166	-35.133	301.519	-36.477	229.283	-38.139	174.601	-39.096	128.945	-39.696	1.497	-40.417
9	716.824	-26.774	589.744	-33.974	539.089	-36.453	483.407	-38.920	386.063	-42.587	349.427	-43.754	301.744	-45.099	229.454	-46.762	174.731	-47.720	129.041	-48.321	1.497	-49.042
10	714.193	-35.393	590.184	-42.588	539.492	-45.069	483.768	-47.538	386.351	-51.207	349.688	-52.375	301.969	-53.721	229.626	-55.385	174.862	-56.344	129.137	-56.945	1.497	-57.667
11	717.571	-44.227	590.571	-50.149	539.822	-52.124	484.041	-54.038	386.536	-56.738	349.844	-57.541	282.488***	-58.712***	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	717.949	-53.057	590.958	-57.711	540.151	-59.183	484.313	-60.542	386.721	-62.271	350.000	-62.708	302.215	-63.103	229.784	-63.325	174.965	-63.191	129.204	-62.881	1.497	-61.059
13	718.185	-58.565	647.866*	-59.970*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	718.421	-64.074	594.626**	-64.183**	540.459	-65.760	484.589	-67.121	386.941	-68.852	350.200	-69.290	302.387	-69.658	229.914	-69.908	175.065	-69.775	129.277	-69.466	1.497	-67.644

* Coordinate is for end of girder 13.
** Coordinate is for FS 2-1a.
*** Coordinate is for end of girder 11.



Note: Positive angle shown. For negative angle, ℄ Beam will be on opposite side of ℄ Brg. Assembly

BEARING ORIENTATION

Pier	Girder	θ
2	11	-0°32'02"
	12	0°2'14"
	13	1°18'23"
	14	2°23'59"
3	11	0°34'19"
	12	1°8'33"
	14	1°8'31"
5	12	1°8'31"
	14	1°8'28"
6	12	1°8'1"
	14	1°7'59"

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GIRDER LAYOUT - UNIT 2
STRUCTURE NO. 090-0180
SHEET S-202 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1108
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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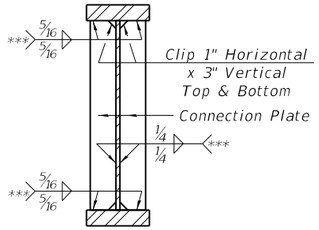
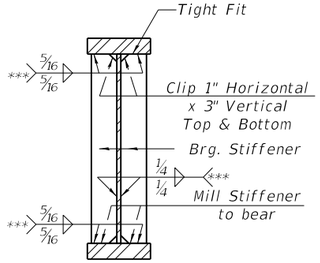
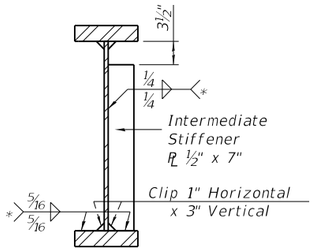


CONNECTION PLATE

*** Terminate 1/4" (±1/8") from the end of plate intersects.

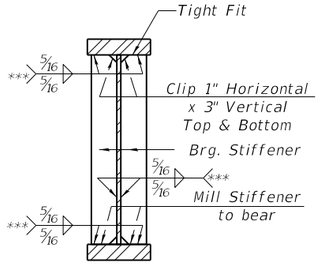


BEARING STIFFENERS
(At Piers 2 & 6)

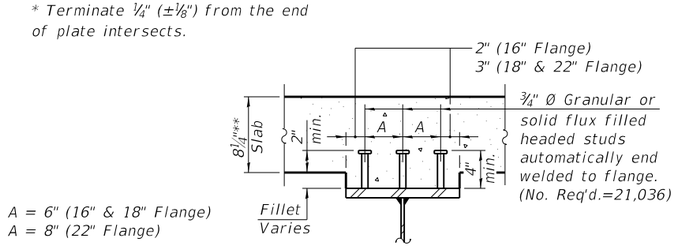


INTERMEDIATE STIFFENER

* Terminate 1/4" (±1/8") from the end of plate intersects.



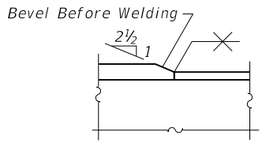
BEARING STIFFENERS
(At Piers 3-5)



A = 6" (16" & 18" Flange)
A = 8" (22" Flange)

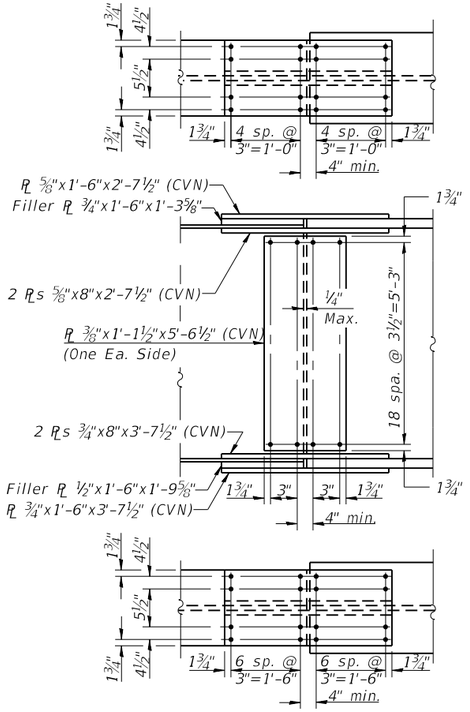
SECTION A-A

** Prior to grinding



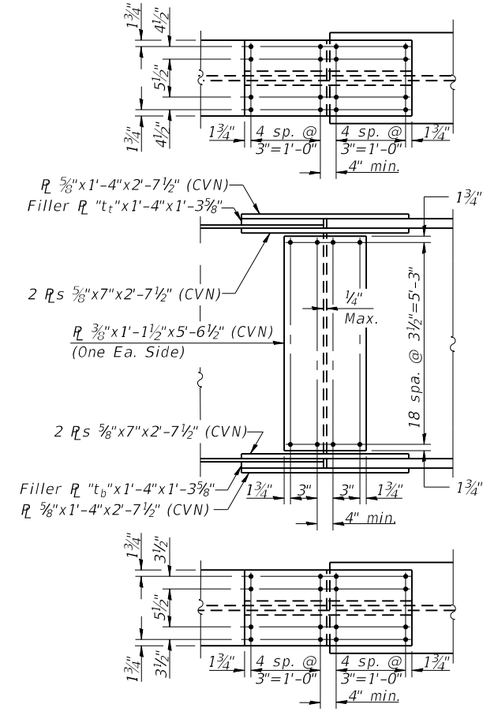
DETAIL "B"

"CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.



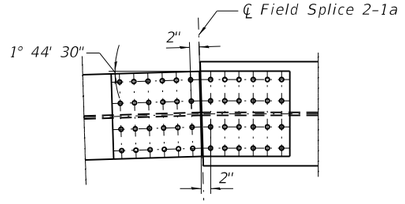
FIELD SPLICE 2-1 & 2-6 DETAIL

"CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.



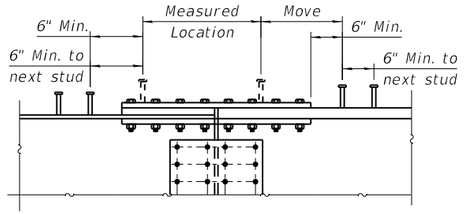
FIELD SPLICE 2-2 THRU 2-5 DETAIL

Field Splice	t_t	t_b
2-2	3/4"	1"
2-3	1"	1"
2-4	1"	1"
2-5	3/4"	1"



ANGLED FLANGE SPLICE #2-1a

All dimensions shown for non-angled field splice plate shall apply to angled field splice plate. Fabricator shall make any necessary adjustments to splice plate dimensions, bolt spacings, etc. to account for bent plates.



SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.

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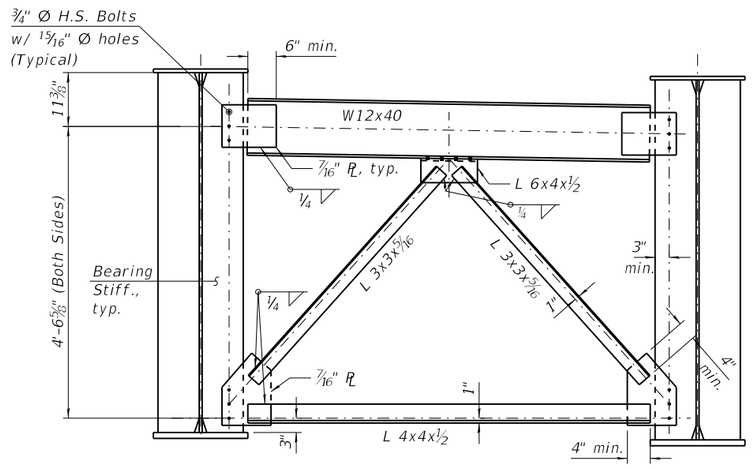
GIRDER DETAILS - UNIT 2, 1 of 5
STRUCTURE NO. 090-0180
SHEET S-203 OF 445 SHEETS

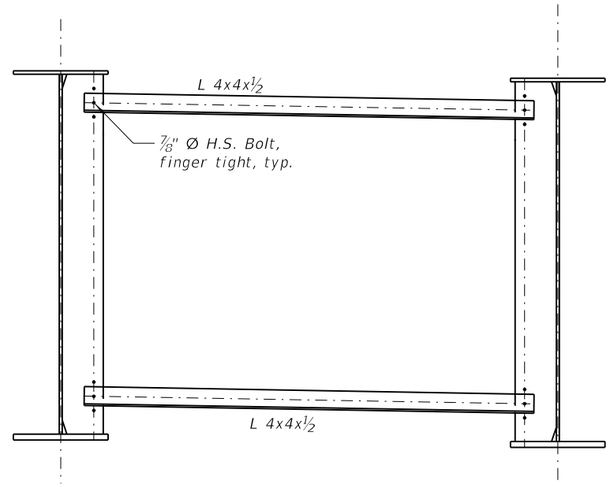
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR\BR	PEO/TAZ	1361	1109
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT	NHPP-YRP3(905)		



END CROSS FRAME - CF-1

(13-Required)

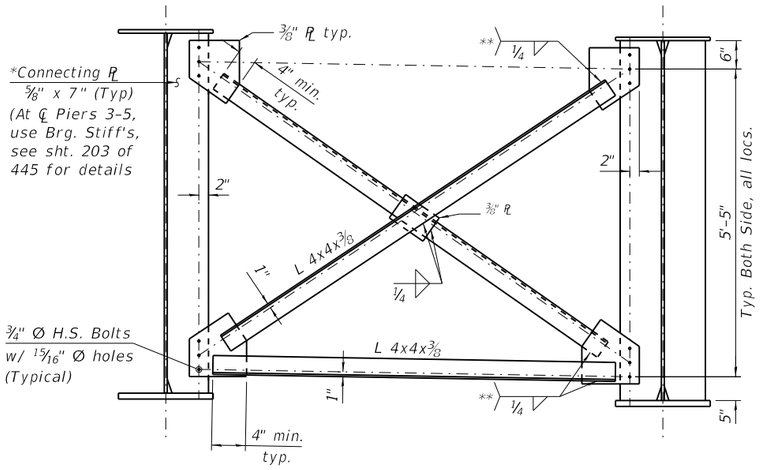
Note:
Interior cross frames and end cross frames shall have two hardened washers for each set of oversized holes.



TEMPORARY BRACING CROSS FRAME - CF-4

(29-Required)

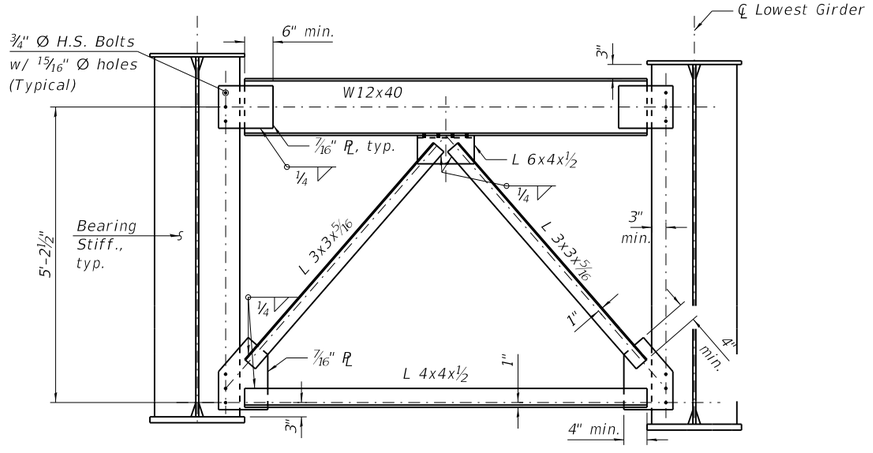
Notes on CF-4:
Install Cross Frame CF-4, prior to deck pour.
Install CF-2 upon completion of closure pour.



INTERIOR CROSS FRAME - CF-2

(371-Required)

* Connecting plate not required on outside of exterior girder.
** Fillet weld angles along 3 sides on one face of gusset plate.



END CROSS FRAME - CF-3

(11-Required)

Notes:
1. Cross frames between Girders 1-2 thru 9-10 are placed radial to the ℄ US 150 EB. Remaining bays are oriented as shown.
2. All cross frames between girders shall be installed with erection pins and bolts in accordance with the erection plan approved by the Engineer. Individual cross frames at supports may be temporarily disconnected to install bearing anchor rods.

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		CHECKED - SP	REVISED -	
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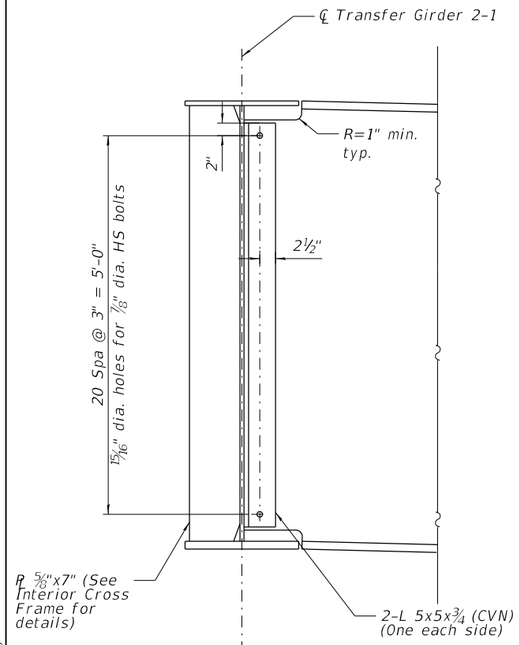
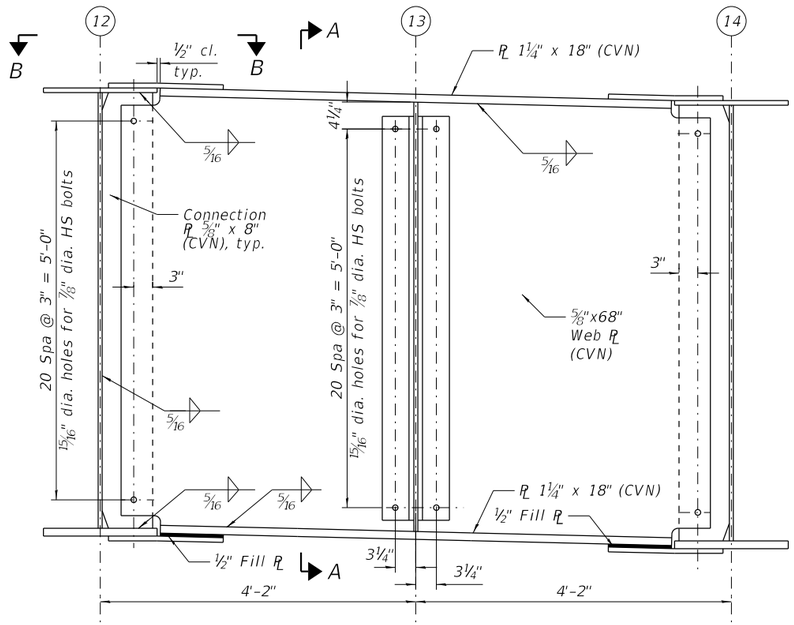
	PLOT DATE = 1/28/2019	CHECKED -	REVISED -	

GIRDER DETAILS - UNIT 2, 2 OF 5
STRUCTURE NO. 090-0180
SHEET S-204 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1110
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

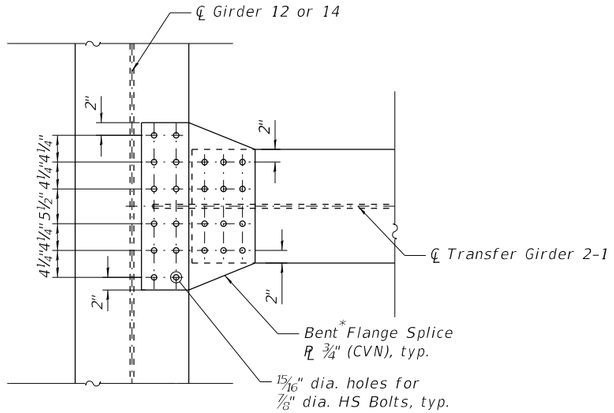


SECTION A-A



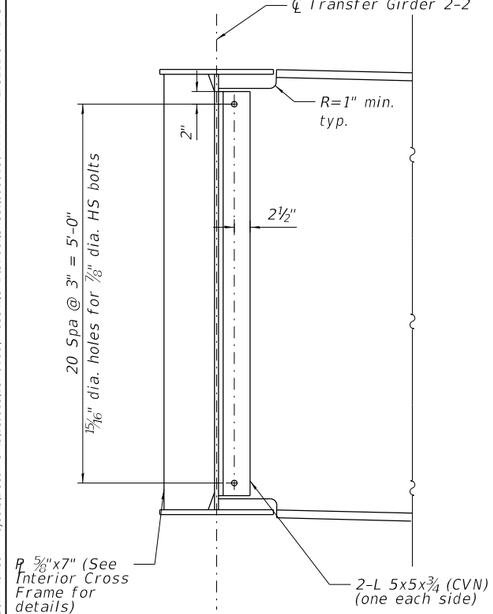
TRANSFER GIRDER 2-1 ELEVATION

(Looking upstation)

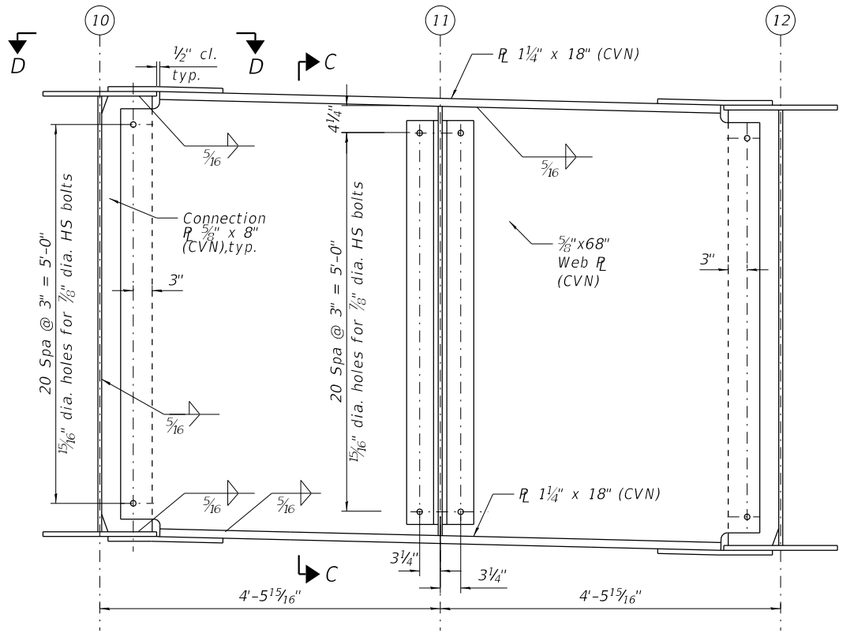


VIEW B-B

*Bend splice plate at flange edge to accomodate slope of transfer girder.

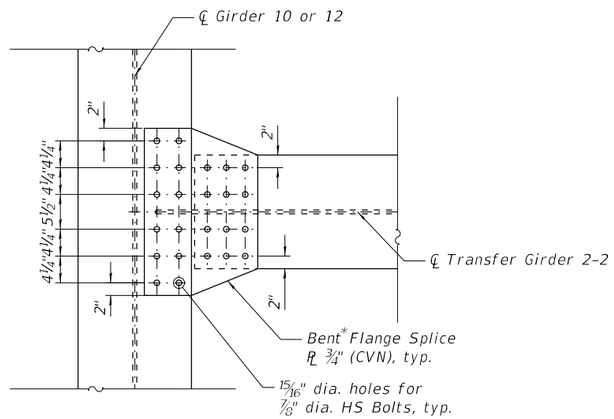


SECTION C-C



TRANSFER GIRDER 2-2 ELEVATION

(Looking upstation)



VIEW D-D

NOTES:

1. Transfer Girder is considered a System Redundant member. Fabrication of the girder and its connections shall be in accordance with the requirements of Chapter 12 of the AWS D1.5 Bridge Welding Code.
2. All structural steel for the Transfer Girder, including all connection plates, shall be AASHTO M270 Grade 50 and meet CVN.
3. Load carrying components designated "CVN" shall conform to the Charpy-V-Notch impact energy requirements, zone 2.
4. Adjust shear stud spacing to miss top connection plate.

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GIRDER DETAILS - UNIT 2, 3 OF 5
STRUCTURE NO. 090-0180

SHEET S-205 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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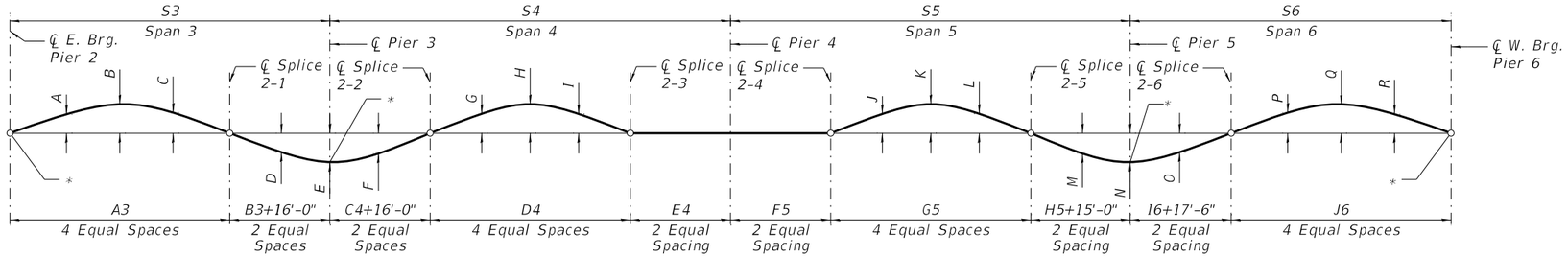
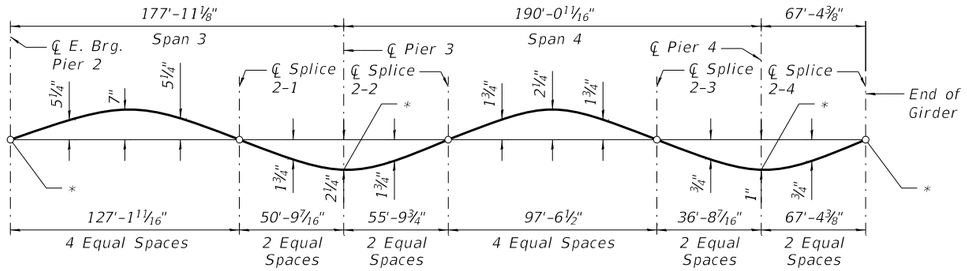


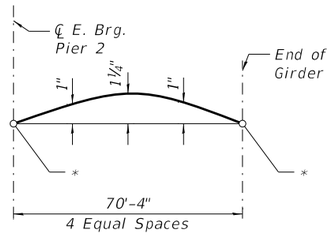
CAMBER DIAGRAM UNIT 2 - GIRDERS 1-10, 12 & 14

* See Table for Final Top of Web Elevations at abutments and piers.



CAMBER DIAGRAM UNIT 2 - GIRDER 11

* See Table for Final Top of Web Elevations at abutments and piers.



CAMBER DIAGRAM UNIT 2 - GIRDER 13

* See Table for Final Top of Web Elevations at abutments and piers.

***TOP OF WEB ELEVATIONS

UNIT 2	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7	Girder 8	Girder 9	Girder 10	Girder 11	Girder 12	Girder 13	Girder 14
℄ E. Brg. Pier 2	500.59	500.76	500.93	501.08	501.13	501.00	500.83	500.60	500.27	499.92	499.58	499.29	499.18	499.07
℄ Splice 2-1	498.24	498.43	498.60	498.74	498.80	498.61	498.48	498.33	498.16	498.00	497.88	497.70	498.98**	497.61
℄ Pier 3	496.98	497.16	497.33	497.47	497.53	497.37	497.22	497.06	496.89	496.71	496.58	496.44	N/A	496.32
℄ Splice 2-2	495.94	496.11	496.29	496.43	496.48	496.34	496.18	496.02	495.85	495.63	495.54	495.36	N/A	495.28
℄ Splice 2-3	494.05	494.23	494.40	494.54	494.61	494.45	494.30	494.13	493.96	493.75	493.68	493.52	N/A	493.43
℄ Pier 4	493.34	493.51	493.68	493.82	493.84	493.74	493.58	493.41	493.25	493.07	492.97	492.87	N/A	492.73
℄ Splice 2-4	492.40	492.57	492.75	492.89	492.94	492.81	492.65	492.48	492.31	492.19	491.88**	492.01	N/A	491.82
℄ Splice 2-5	491.27	491.44	491.61	491.76	491.81	491.68	491.52	491.34	491.17	491.06	N/A	490.91	N/A	490.72
℄ Pier 5	490.68	490.86	491.03	491.17	491.23	491.07	490.93	490.76	490.59	490.40	N/A	490.28	N/A	490.15
℄ Splice 2-6	490.57	490.75	490.93	491.07	491.12	490.94	490.81	490.65	490.48	490.24	N/A	490.10	N/A	490.02
℄ W. Brg. Pier 6	490.26	490.43	490.60	490.74	490.80	490.67	490.50	490.33	490.16	489.98	N/A	489.91	N/A	489.78

** End of Girder 11 and Girder 13
*** For Fabrication Only

CAMBER DIMENSIONS

Girder	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1-5	3 1/4"	4 1/4"	3 1/4"	1 1/2"	2"	1 1/2"	2"	2 1/2"	2"	1 1/4"	1 1/2"	1 1/4"	2"	2 1/2"	2"	2"	2 1/2"	2"
6	2 3/4"	3 3/4"	2 3/4"	1 1/2"	2"	1 1/2"	2"	2 1/2"	2"	1 1/4"	1 1/2"	1 1/4"	2"	2 1/2"	2"	1 1/2"	2"	1 1/2"
7	3"	4"	3"	1 1/2"	2"	1 1/2"	2"	2 1/2"	2"	1 1/4"	1 1/2"	1 1/4"	2"	2 1/2"	2"	1 3/4"	2 1/4"	1 3/4"
8	3"	4"	3"	1 1/2"	2"	1 1/2"	2"	2 1/2"	2"	1 1/4"	1 1/2"	1 1/4"	2"	2 1/2"	2"	2"	2 3/4"	2"
9	3 3/4"	5"	3 3/4"	1 1/2"	2"	1 1/2"	2"	2 1/2"	2"	1 1/4"	1 1/2"	1 1/4"	2"	2 1/2"	2"	2"	2 3/4"	2"
10	4 1/2"	6"	4 1/2"	1 1/2"	2"	1 1/2"	2"	2 1/2"	2"	1 1/4"	1 1/2"	1 1/4"	2"	2 1/2"	2"	1 1/4"	1 3/4"	1 1/4"
12	5 3/4"	7 1/2"	5 3/4"	1 1/4"	1 3/4"	1 1/4"	1 3/4"	2 1/4"	1 3/4"	1 1/4"	1 1/2"	1 1/4"	1 3/4"	2 1/4"	1 3/4"	1 1/4"	1 3/4"	1 1/4"
14	5 1/4"	7"	5 1/4"	1 1/4"	1 3/4"	1 1/4"	1 3/4"	2 1/4"	1 3/4"	1 1/4"	1 1/2"	1 1/4"	1 3/4"	2 1/4"	1 3/4"	1 1/2"	2"	1 1/2"

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USER NAME = spantazis	DESIGNED - RH	REVISED -	
	CHECKED - SP	REVISED -	
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PLOT DATE = 2/2/2019	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 2, 4 OF 5
STRUCTURE NO. 090-0180
SHEET S-206 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1112
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

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INTERIOR GIRDER MOMENT TABLE								
		0.4 Sp. 3	Pier 3	0.5 Sp. 4	Pier 4	0.5 Sp. 5	Pier 5	0.6 Sp. 6
Is	(in^4)	60,003	149,997	46,301	113,483	46,301	149,997	60,003
Ic(n)	(in^4)	146,690	–	111,022	–	111,022	–	146,690
Ic(3n)	(in^4)	107,016	–	82,933	–	82,933	–	107,016
Ic(cr)	(in^4)	–	165,008		127,017	–	165,008	
Ss	(in^3)	1,892	3,935	1,314	3,131	1,314	3,935	1,892
Sc(n)	(in^3)	2,581	–	1,863	–	1,863	–	2,581
Sc(3n)	(in^3)	2,358	–	1,690	–	1,690	–	2,358
Sc(cr)	(in^3)	–	4,620	–	3,797	–	4,620	–
DC1	(k/')	1.202	1.435	1.161	1.341	1.161	1.435	1.202
MDC1	('k)	2,486	5,273	1,117	3,127	695	4,751	2,452
DC2	(k/')	0.175	0.175	0.175	0.175	0.175	0.175	0.175
MDC2	('k)	371	727	188	460	114	636	370
DW	(k/')	0.430	0.430	0.430	0.430	0.430	0.430	0.430
MDW	('k)	887	1,786	462	1,129	281	1,563	910
LLDF		0.609	0.642	0.583	0.627	0.595	0.652	0.614
M_{L+IM}	('k)	3,082	3,841	2,296	3,355	2,244	3,701	2,976
Mu (Strength I)	('k)	10,295	16,901	6,342	12,049	5,360	15,555	10,101
Øf Mn	('k)	12,284	–	9,209	–	9,544	–	12,304
fs DC1	(ksi)	15.77	16.08	10.20	11.99	6.35	14.49	15.55
fs DC2	(ksi)	1.89	1.89	1.34	1.45	0.81	1.65	1.88
fs DW	(ksi)	4.51	4.64	3.28	3.57	2.00	4.06	4.63
fs (L+IM)	(ksi)	14.33	9.98	14.79	10.60	14.45	9.61	13.84
fs (Service II)	(ksi)	40.80	35.58	34.05	30.79	27.94	32.70	40.05
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	–	46.88	–	40.71	–	43.09	–
Øf Fn	(ksi)	–	50.00	–	50.00	–	49.80	–
Vf	(k)	34.00	34.50	34.10	34.70	35.00	37.90	33.70

GIRDER REACTION TABLE											
		Pier 2		Pier 3		Pier 4		Pier 5		Pier 6	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
LLDF		0.858	0.688	0.858	0.688	0.858	0.688	0.858	0.688	0.858	0.688
OCF		———	1.0	———	1.0	———	1.0	———	1.0	———	1.0
RDC1	(k)	78.8	74.7	271.2	257.7	204.4	194.1	258.8	246.2	78.2	74.1
RDC2	(k)	10.8	11.4	35.4	37.6	27.7	29.3	33.0	35	10.8	11.4
RDW	(k)	28.1	28.1	92.3	92.4	72.1	72.0	86.0	86.1	28.0	28.0
R_L	(k)	101.1	81.1	216.7	173.8	205.8	165.0	212.9	170.7	100.1	80.3
R_{IM}	(k)	19.0	15.2	34.2	27.4	33.6	26.9	34.2	27.4	19.0	15.2
RTotal	(k)	237.8	210.5	649.8	588.9	543.6	487.3	624.9	565.4	236.1	209.0

GIRDER 11 MOMENT TABLE					
		0.4 Sp. 3	Pier 3	0.5 Sp. 4	Pier 4
Is	(in^4)	60,003	149,997	46,301	113,483
Ic(n)	(in^4)	143,915		102,416	–
Ic(3n)	(in^4)	104,626		75,399	–
Ic(cr)	(in^4)	–	163,057		123,421
Ss	(in^3)	1,892	3,935	1,314	3,131
Sc(n)	(in^3)	2,568		1,817	
Sc(3n)	(in^3)	2,342		1,631	
Sc(cr)	(in^3)	–	4,323	–	3,221
DC1	(k/')	1.134	1.368	0.905	1.085
MDC1	('k)	2,452	4,781	816	2,029
DC2	(k/')	0.188	0.188	0.188	0.188
MDC2	('k)	391	809	218	453
DW	(k/')	0.400	0.310	0.310	0.240
MDW	('k)	905	1,539	314	637
LLDF		0.578	0.608	0.462	0.543
M_{L+IM}	('k)	2,841	3,463	1,569	2,969
Mu (Strength I)	('k)	9,883	15,356	4,509	9,254
Øf Mn	('k)	12,254	–	9,220	–
fs DC1	(ksi)	15.55	14.58	7.45	7.78
fs DC2	(ksi)	2.00	2.25	1.60	1.69
fs DW	(ksi)	4.64	4.27	2.31	2.37
fs (L+IM)	(ksi)	13.28	9.61	10.36	11.06
fs (Service II)	(ksi)	39.45	33.59	24.84	26.22
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	–	44.26	–	34.75
Øf Fn	(ksi)	–	50.00	–	50.00
Vf	(k)	32.50	32.50	31.10	33.50

GIRDER 13 REACTION TABLE		
		Pier 2
LLDF		0.584
OCF		———
RDC1	(k)	28.2
RDC2	(k)	6.6
RDW	(k)	8.5
R_L	(k)	49.6
R_{IM}	(k)	12.0
RTotal	(k)	104.9

GIRDER 11 REACTION TABLE				
		Pier 2	Pier 3	Pier 4
LLDF		0.814	0.682	0.584
OCF		———	———	———
RDC1	(k)	75.9	243.8	139.7
RDC2	(k)	12.2	41.0	29.1
RDW	(k)	27.0	79.3	42.5
R_L	(k)	94.5	200.9	164.3
R_{IM}	(k)	18.0	32.4	30.0
RTotal	(k)	227.6	597.4	405.6

GIRDER 13 MOMENT TABLE			
		0.5 Sp. 3	
Is	(in^4)	49,950	
Ic(n)	(in^4)	100,713	
Ic(3n)	(in^4)	74,463	
Ic(cr)	(in^4)	–	
Ss	(in^3)	1,417	
Sc(n)	(in^3)	1,880	
Sc(3n)	(in^3)	1,688	
Sc(cr)	(in^3)	–	
DC1	(k/')	0.780	
MDC1	('k)	482	
DC2	(k/')	0.188	
MDC2	('k)	116	
DW	(k/')	0.242	
MDW	('k)	150	
LLDF		0.507	
M_{L+IM}	('k)	865	
Mu (Strength I)	('k)	2,486	
Øf Mn	('k)	9,571	
fs DC1	(ksi)	4.08	
fs DC2	(ksi)	0.82	
fs DW	(ksi)	1.07	
fs (L+IM)	(ksi)	5.52	
fs (Service II)	(ksi)	13.15	
0.95Rh Fyf	(ksi)	47.50	
fs (Total)(Strength I)	(ksi)	–	
Øf Fn	(ksi)	–	
Vf	(k)	20.50	

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads ($in.^4$ and $in.^3$).

Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads ($in.^4$ and $in.^3$).

Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).

Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).

DC1: Un-factored non-composite dead load (kips/ft.).

MDC1: Un-factored moment due to non-composite dead load (kip-ft.).

DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).

MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).

DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).

MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

M_{L+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).

Mu (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 M_{L+IM}

Øf Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).

fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ Snc

fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ Sc(3n) or MDC2/ Sc(cr) as applicable.

fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ Sc(3n) or MDW/ Sc(cr) as applicable.

fs (L+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
M_{L+IM} / Sc(n) or M_{L+IM} / Sc(cr) as applicable.

fs (Service II): Sum of stresses as computed below (ksi).
fsDC1 + fsDC2 + fsDW + 1.3 fs($L+IM$)

0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

fs (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 (fsDC1 + fsDC2) + 1.5 fsDW + 1.75 fs($L+IM$)

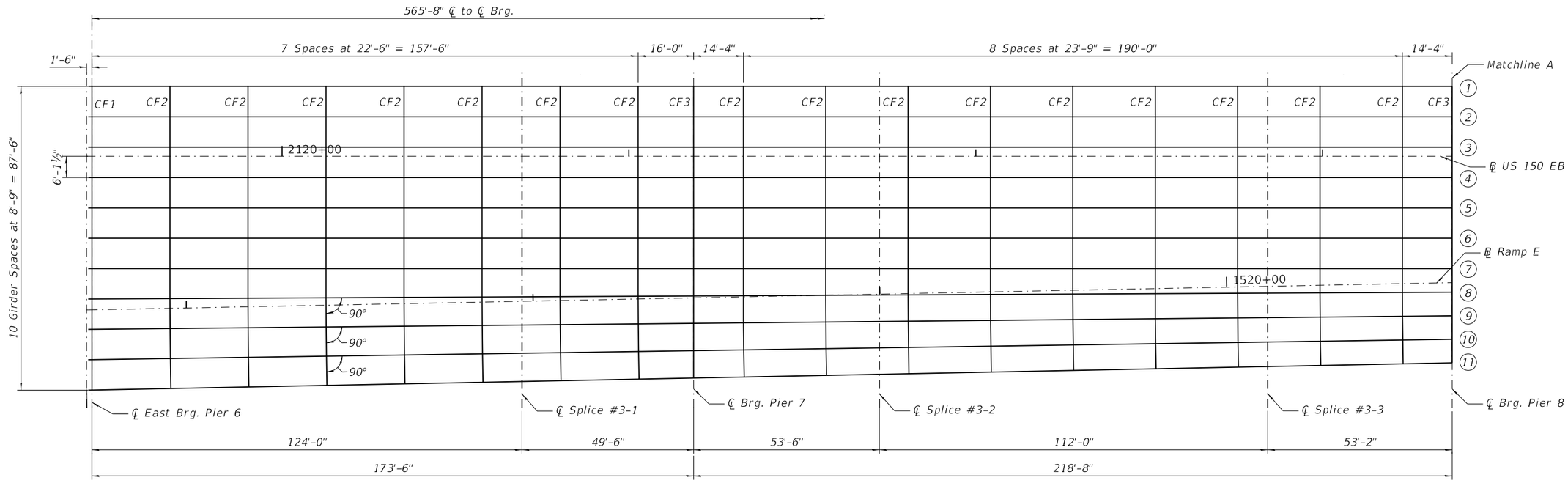
Øf Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

Vf: Maximum factored shear range in span computed according to Article 6.10.10.

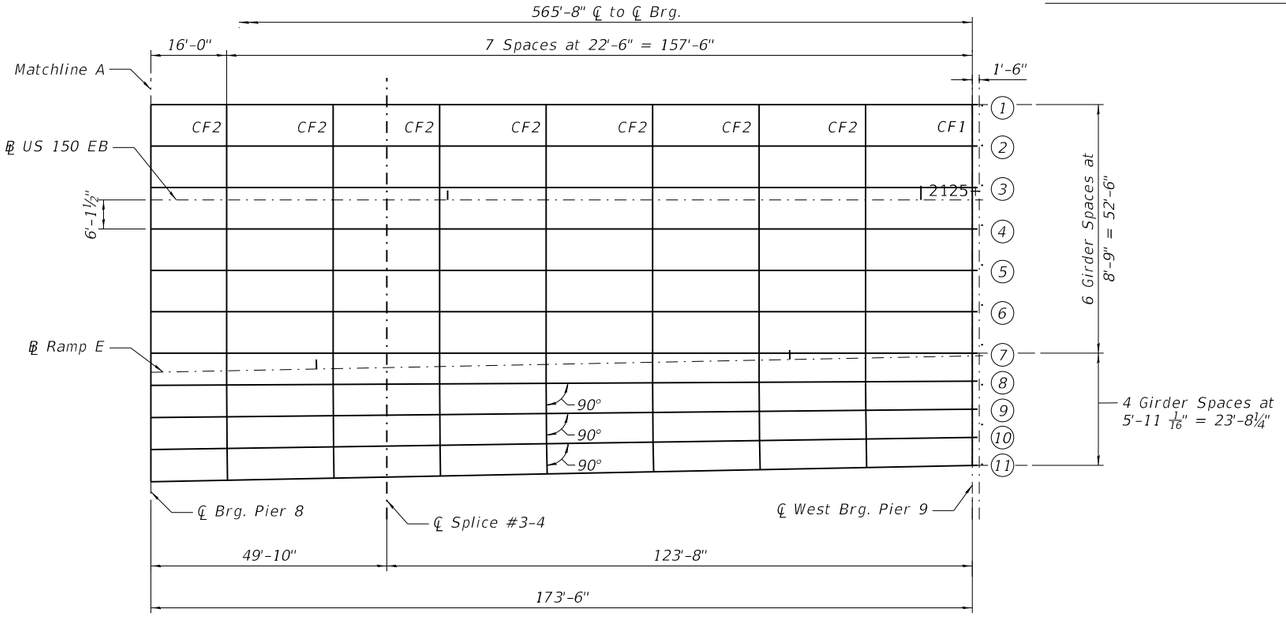
LLDF: Live Load Distribution Factor

OCF: obtuse Correction Factor

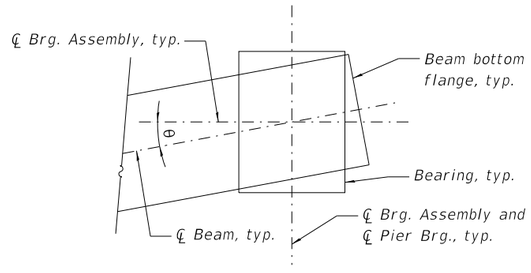
Note:
M_L and R_L include the effects of centrifugal force and superelevation.



UNIT 3 – FRAMING PLAN



UNIT 3 – FRAMING PLAN



BEARING ORIENTATION

Pier	Girder	θ
6	8	0°17'11"
	9	0°34'22"
	10	0°51'34"
	11	1°8'45"
7	8	0°17'11"
	9	0°34'22"
	10	0°51'34"
	11	1°8'45"
9	8	0°17'11"
	9	0°34'22"
	10	0°51'34"
	11	1°8'45"

Notes:

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

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USER NAME = CHORBACZ	DESIGNED - SP	REVISED -	
	CHECKED - SP	REVISED -	
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PLOT DATE = 12/12/2018	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN - UNIT 3
STRUCTURE NO. 090-0180
SHEET S-208 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1114
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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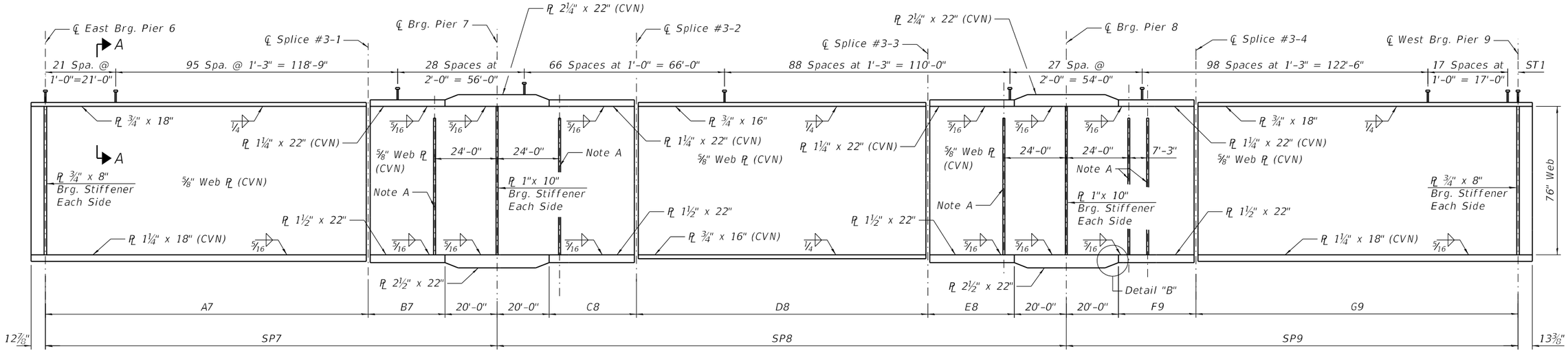


Note A:
Intermediate Stiffener

GIRDER ELEVATION

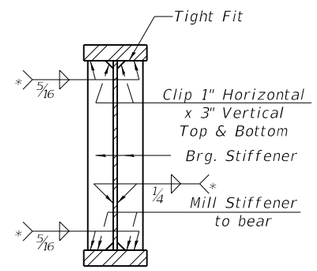
"CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.

GIRDER DIMENSIONS

Girder	SP7	SP8	SP9	A7	B7	C8	D8	E8	F9	G9
1-8	173'-6"	218'-8"	173'-6"	124'-0"	29'-6"	33'-6"	112'-0"	33'-2"	29'-10"	123'-8"
9	173'-6 1/16"	218'-8 1/16"	173'-6 1/16"	124'-0 1/16"	29'-6"	33'-6 1/16"	112'-0 1/16"	33'-2 1/16"	29'-10"	123'-8 1/16"
10	173'-6 1/4"	218'-8 3/16"	173'-6 1/4"	124'-0 3/16"	29'-6 1/16"	33'-6 1/16"	112'-0 1/8"	33'-2 1/16"	29'-10 1/16"	123'-8 3/16"
11	173'-6 7/16"	218'-8 1/2"	173'-6 7/16"	124'-0 5/16"	29'-6 1/8"	33'-6 1/8"	112'-0 1/4"	33'-2 1/8"	29'-10 1/8"	123'-8 5/16"

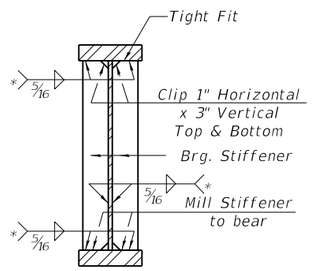
WELDED STUD SPACING

Girder	ST1
1-8	5"
9	5 3/8"
10	5 13/16"
11	6 3/8"



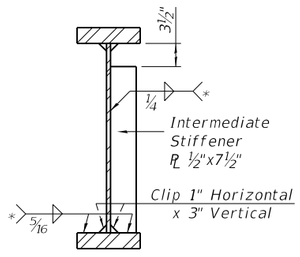
BEARING STIFFENERS

(At ℄ East Brg. Pier 6 & ℄ West Brg. Pier 9)

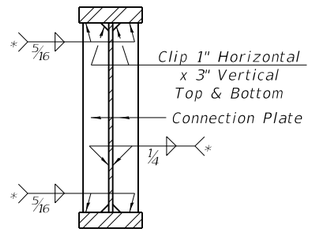


BEARING STIFFENERS

(At ℄ Brg. Pier 7 & ℄ Brg. Pier 8)

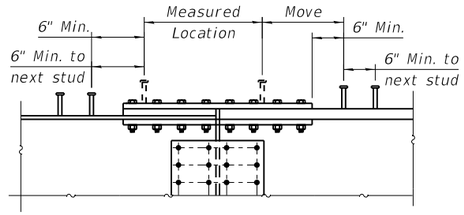


INTERMEDIATE STIFFENER



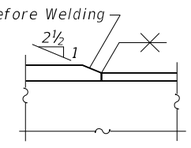
CONNECTION PLATE

* Terminate ¼" (±⅛") from the end of plate intersects.

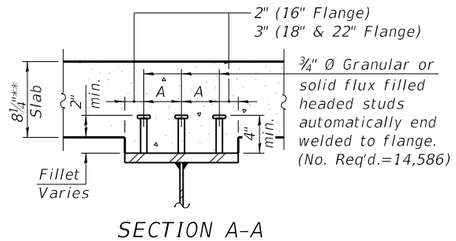


SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.



DETAIL "B"



A = 6" (16" & 18" Flange)
A = 8" (22" Flange)

SECTION A-A

** Prior to grinding

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200 S. WACKER DR.
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TEL: 312-777-2900

USER NAME = CHORBACZ	DESIGNED - SP	REVISED -	
	CHECKED - RH	REVISED -	
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - CH	REVISED -	
PLOT DATE = 12/12/2018	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER ELEVATIONS - UNIT 3
STRUCTURE NO. 090-0180
SHEET S-209 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1115
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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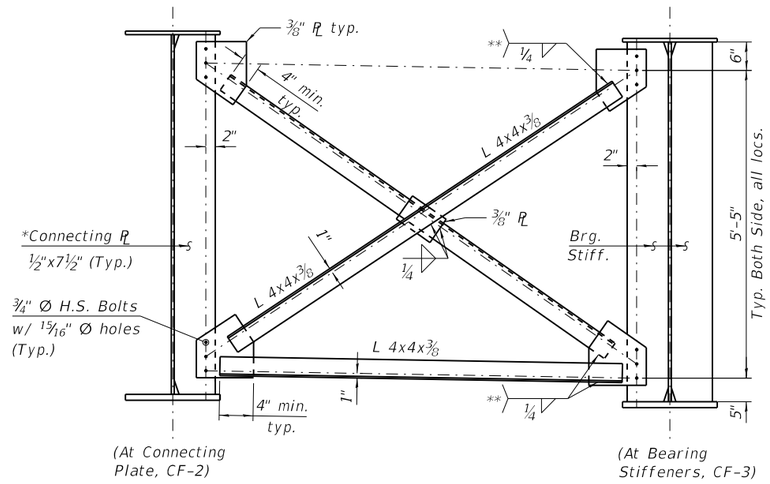
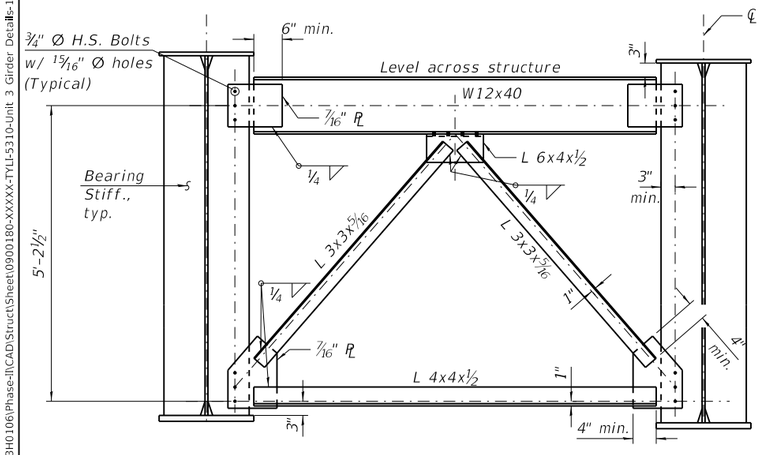


INTERIOR CROSS FRAME CF-2 & CF-3

(230 Required CF-2; 20 Required CF-3)

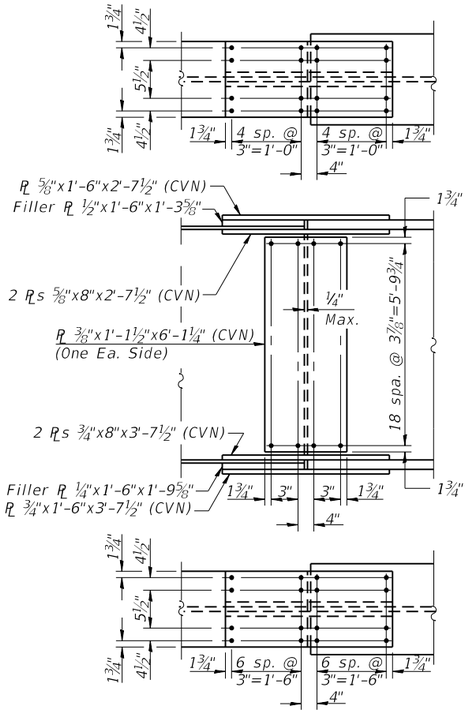
* Connecting plate not required on outside of exterior girder.
** Fillet weld angles along 3 sides on one face of gusset plate.

Note:
Interior cross frames and end cross frames shall have two hardened washers for each set of oversized holes.

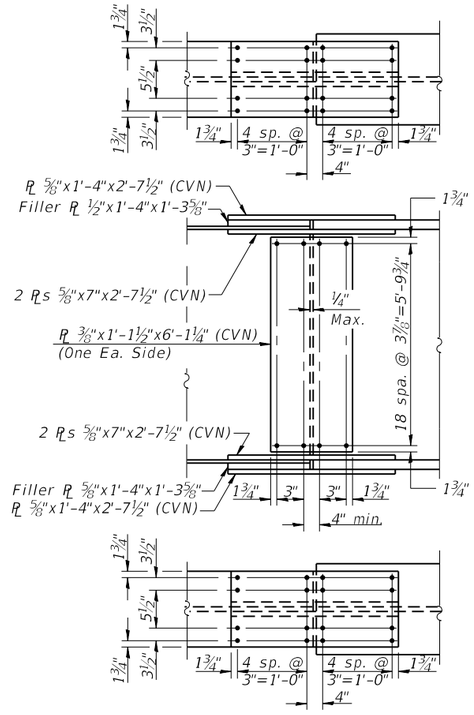


END CROSS FRAME CF-1

(20-Required)



FIELD SPLICE 3-1 & 3-4 DETAIL



FIELD SPLICE 3-2 & 3-3 DETAIL

Notes:

1. Use ⅞" Ø H.S. Bolts with 15/16" Ø holes for all splice connections.
2. "CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.
3. For bearing stiffener and connecting plate details, see sheet S-209 of 445.

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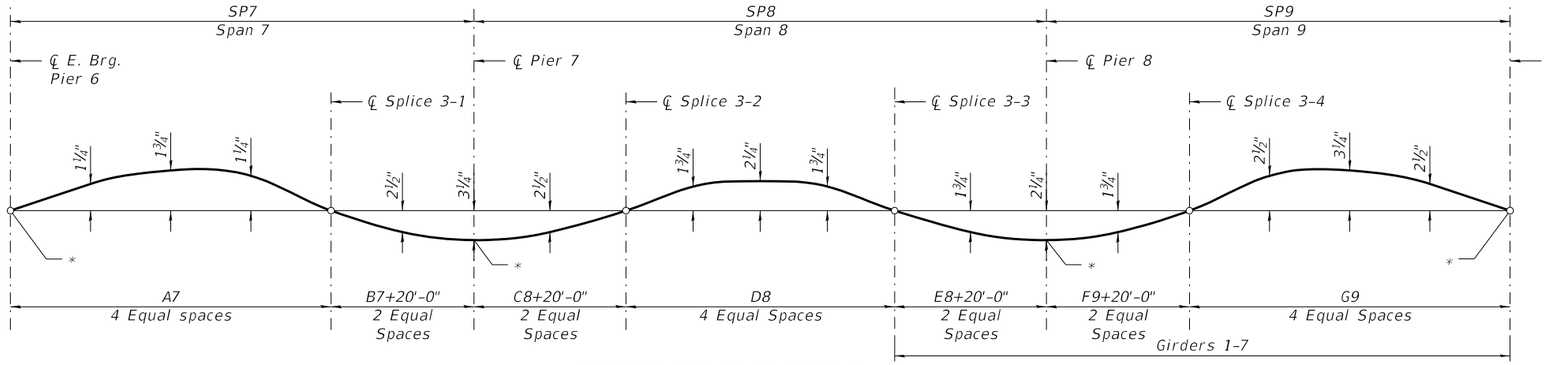
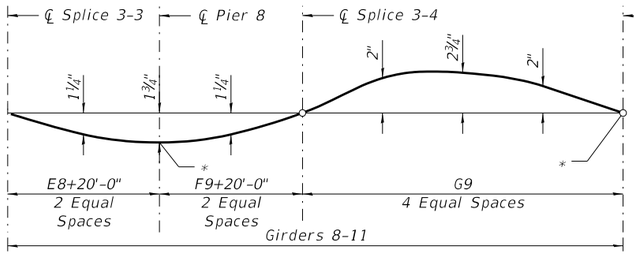
GIRDER DETAILS - UNIT 3, 1 OF 2
STRUCTURE NO. 090-0180
SHEET S-210 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1116
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



CAMBER DIAGRAM UNIT 3

* See Table for Final Top of Web Elevations at abutments and piers.



***TOP OF WEB ELEVATIONS

UNIT 3	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7	Girder 8	Girder 9	Girder 10	Girder 11
℄ E. Brg. Pier 6	490.26	490.44	490.61	490.76	490.80	490.67	490.50	490.32	490.15	489.97	489.80
℄ Splice 3-1	491.26	491.45	491.62	491.77	491.81	491.68	491.51	491.31	491.17	491.01	490.84
℄ Pier 7	491.65	491.83	492.01	492.15	492.20	492.07	491.89	491.71	491.57	491.41	491.25
℄ Splice 3-2	492.64	492.81	492.99	493.13	493.18	493.05	492.87	492.71	492.57	492.41	492.26
℄ Splice 3-3	494.90	495.07	495.24	495.39	495.43	495.30	495.13	495.00	494.86	494.72	494.57
℄ Pier 8	495.88	496.06	496.23	496.38	496.42	496.29	496.12	496.00	495.86	495.69	495.60
℄ Splice 3-4	497.16	497.34	497.52	497.66	497.71	497.58	497.40	497.21	497.08	496.89	496.84
℄ W. Brg. Pier 9	499.57	499.74	499.92	500.06	500.11	499.98	499.80	499.68	499.57	499.45	499.33

*** For Fabrication Only

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 7 or 0.6 Sp. 9	Piers 7 & 8	0.5 Sp. 8
Is	(in^4)	74,840	183,092	58,208
Ic(n)	(in^4)	180,559	–	138,331
Ic(3n)	(in^4)	131,608	–	103,003
Ic(cr)	(in^4)	–	200,967	–
Ss	(in^3)	2,135	4,390	1,502
Sc(n)	(in^3)	2,919	–	2,136
Sc(3n)	(in^3)	2,660	–	1,931
Sc(cr)	(in^3)	–	5,134	–
DC1	(k/')	1.230	1.463	1.189
MDC1	('k)	2,227	5,670	1,642
DC2	(k/')	0.175	0.175	0.175
MDC2	('k)	320	780	267
DW	(k/')	0.437	0.437	0.437
MDW	('k)	799	1,948	666
LLDF		0.632	0.648	0.578
M_{L+IM}	('k)	3,198	4,177	2,628
Mu (Strength I)	('k)	9,979	18,294	7,984
Øf Mn	('k)	14,282	–	10,260
fs DC1	(ksi)	12.52	15.50	13.12
fs DC2	(ksi)	1.44	1.82	1.66
fs DW	(ksi)	3.60	4.55	4.14
fs (L+IM)	(ksi)	13.15	9.76	14.76
fs (Service II)	(ksi)	34.65	34.57	38.11
0.95Rh Fyf	(ksi)	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	–	45.57	–
Øf Fn	(ksi)	–	50.00	–
Vf	(k)	35.60	34.80	34.71

GIRDER REACTION TABLE					
		Pier 7/Pier 8		Pier 6/Pier 9	
		Interior	Exterior	Interior	Exterior
LLDF		0.867	0.682	0.867	0.682
OCF		———	1.0	———	1.0
RDC1	(k)	284.4	269.5	76.0	71.8
RDC2	(k)	38.8	38.8	10.7	10.7
RDW	(k)	96.9	69.4	26.7	19.1
R_L	(k)	224.3	176.5	102.3	80.5
R_{IM}	(k)	34.9	27.5	19.2	15.1
RTotal	(k)	679.3	581.7	234.9	197.2

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads ($in.^4$ and $in.^3$).

Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads ($in.^4$ and $in.^3$).

Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).

Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).

DC1: Un-factored non-composite dead load (kips/ft.).

MDC1: Un-factored moment due to non-composite dead load (kip-ft.).

DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).

MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).

DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).

MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

M_{L+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).

Mu (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 M_{L+IM}

Øf Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).

fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ Snc

fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ Sc(3n) or MDC2/ Sc(cr) as applicable.

fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ Sc(3n) or MDW/ Sc(cr) as applicable.

fs (L+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
M_{L+IM} / Sc(n) or M_{L+IM} / Sc(cr) as applicable.

fs (Service II): Sum of stresses as computed below (ksi).
fsDC1 + fsDC2 + fsDW + 1.3 fs($L+IM$)

0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

fs (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 (fsDC1 + fsDC2) + 1.5 fsDW + 1.75 fs($L+IM$)

Øf Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

Vf: Maximum factored shear range in span computed according to Article 6.10.10.

LLDF: Live Load Distribution factor

OCF: obtuse Correction Factor

Note:
M_L and R_L include the effects of centrifugal force and superelevation.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 3, 2 OF 2
STRUCTURE NO. 090-0180
SHEET S-211 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1117
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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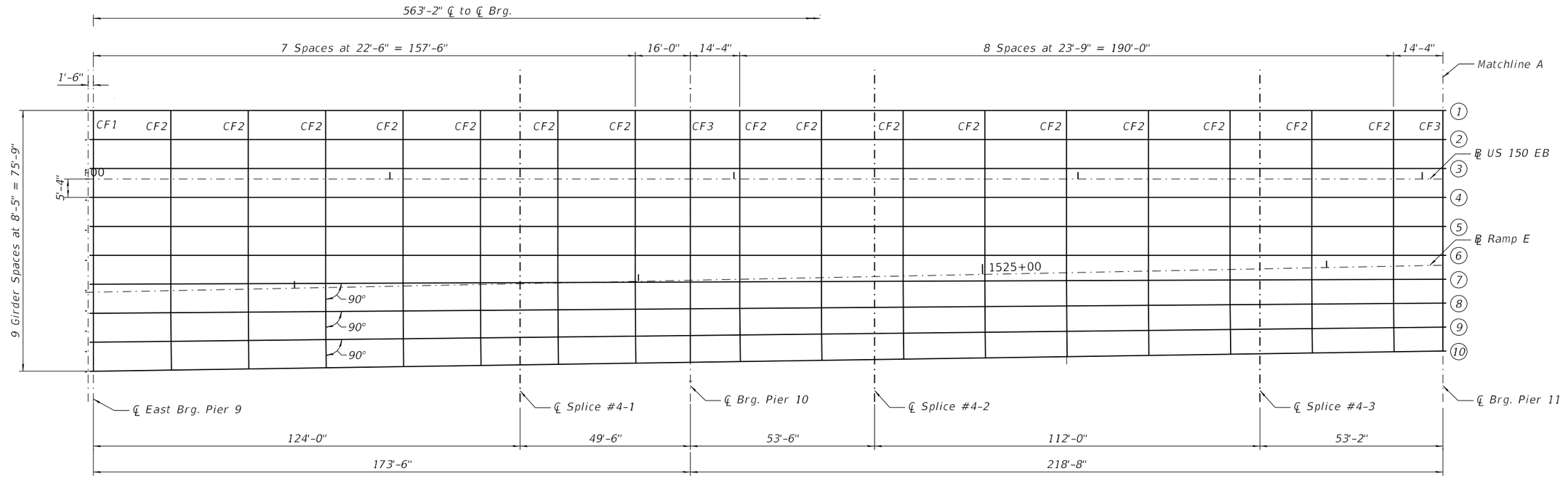
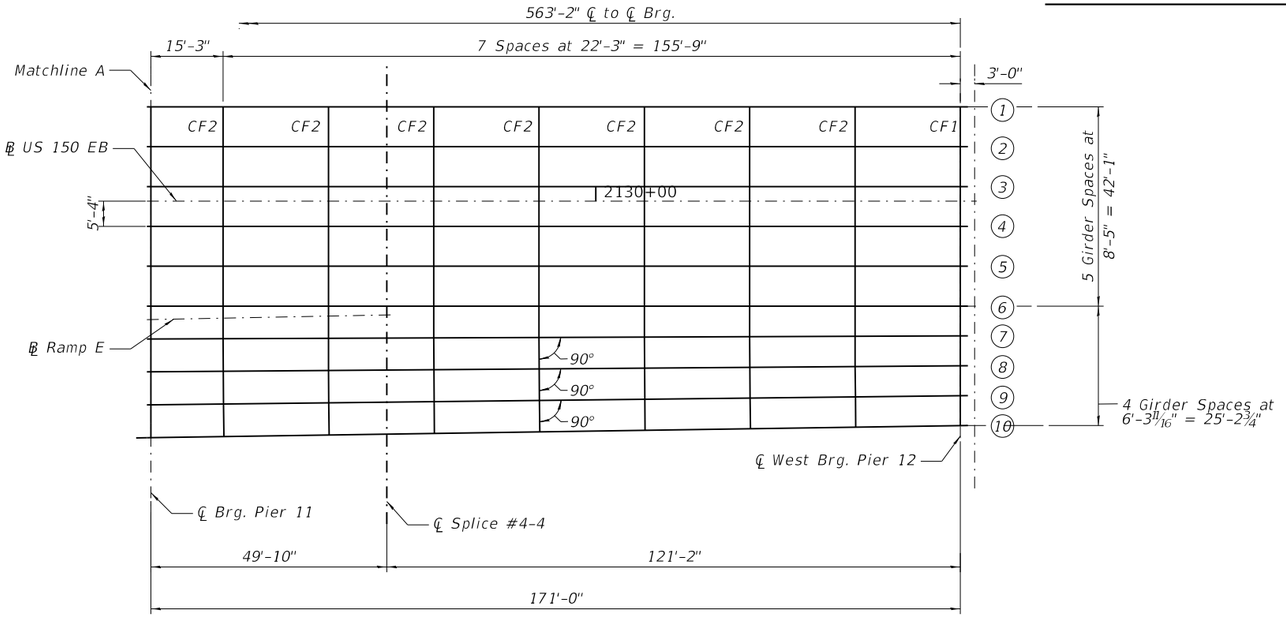
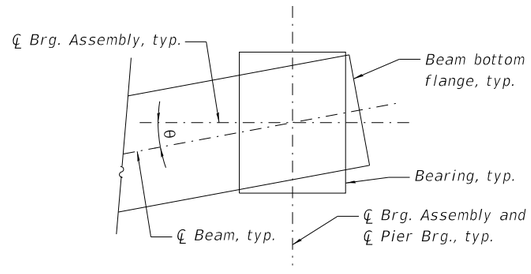


UNIT 4 - FRAMING PLAN



UNIT 4 - FRAMING PLAN



BEARING ORIENTATION

Pier	Girder	θ
9	7	0°12'53"
	8	0°25'45"
	9	0°38'38"
	10	0°51'30"
10	7	0°12'53"
	8	0°25'45"
	9	0°38'38"
	10	0°51'30"
12 (West Brgs.)	7	0°12'53"
	8	0°25'45"
	9	0°38'38"
	10	0°51'30"

Notes:
All diaphragms shall be installed as steel is erected and secured with erection pins and bolts. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

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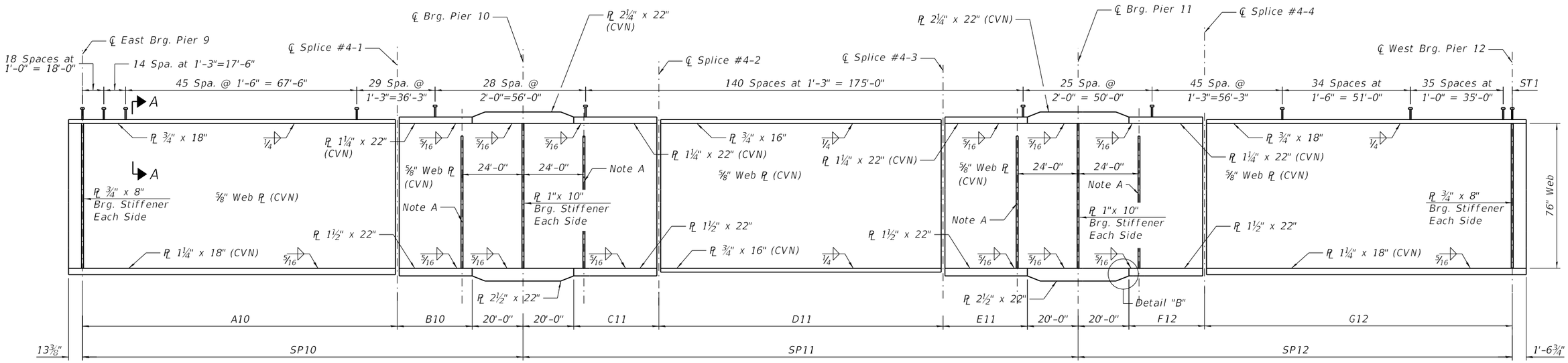
FRAMING PLAN - UNIT 4
STRUCTURE NO. 090-0180
SHEET S-212 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1118
		CONTRACT NO. 68B46		
		ILLINOIS FED. AID PROJECT NHPP-YRP3(905)		



Note A:
Intermediate Stiffener

GIRDER ELEVATION

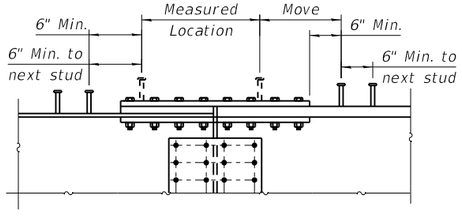
"CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.

GIRDER DIMENSIONS

Girder	SP10	SP11	SP12	A10	B10	C11	D11	E11	F12	G12
1-7	173'-6"	218'-8"	171'-0"	124'-0"	29'-6"	33'-6"	112'-0"	33'-2"	29'-10"	121'-2"
8	173'-6 1/16"	218'-8 1/16"	171'-0 1/16"	124'-0 1/16"	29'-6"	33'-6"	112'-0 1/16"	33'-2"	29'-10"	121'-2 1/16"
9	173'-6 3/16"	218'-8 3/16"	171'-0 1/8"	124'-0 1/8"	29'-6 1/16"	33'-6 1/16"	112'-0 1/16"	33'-2 1/16"	29'-10 1/16"	121'-2 1/16"
10	173'-6 1/4"	218'-8 1/4"	171'-0 1/4"	124'-0 3/16"	29'-6 1/16"	33'-6 1/16"	112'-0 1/8"	33'-2 1/16"	29'-10 1/16"	121'-2 3/16"

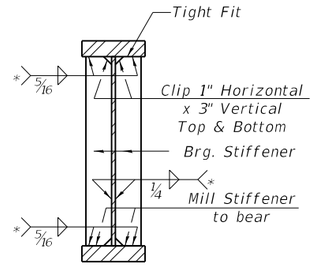
WELDED STUD SPACING

Girder	ST1
1-7	8"
8	8 3/16"
9	8 7/16"
10	8 13/16"



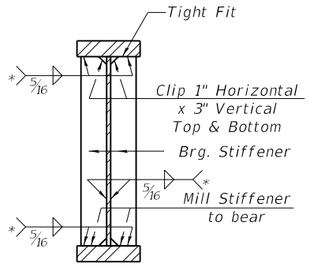
SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.



BEARING STIFFENERS

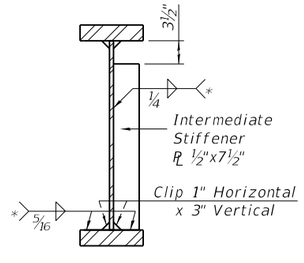
(At ℄ East Brg. Pier 6 & ℄ West Brg. Pier 9)



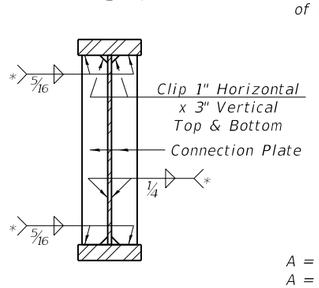
BEARING STIFFENERS

(At ℄ Brg. Pier 7 & ℄ Brg. Pier 8)

* Terminate ¼" (±⅛") from the end of plate intersects.

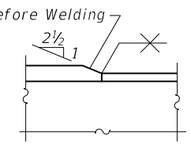


INTERMEDIATE STIFFENER

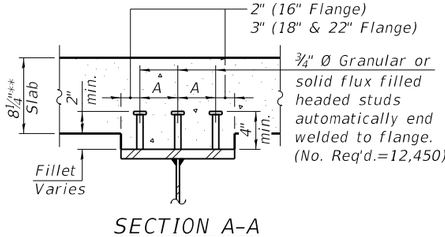


CONNECTION PLATE

A = 6" (16" & 18" Flange)
A = 8" (22" Flange)



DETAIL "B"



SECTION A-A

** Prior to grinding

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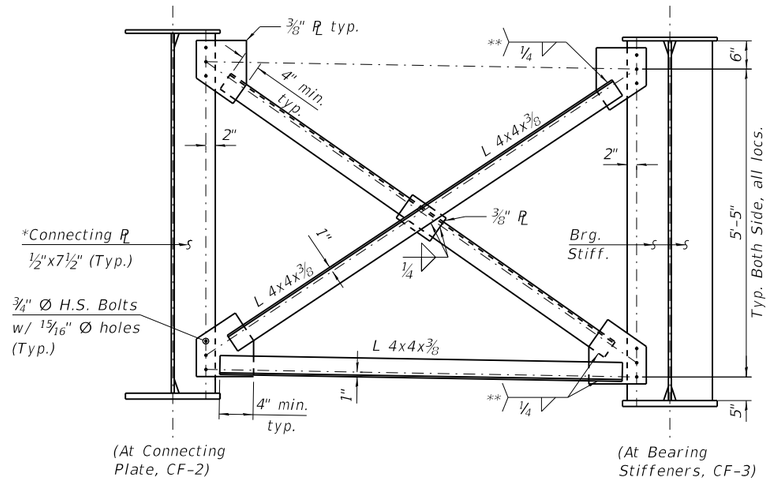
GIRDER ELEVATIONS - UNIT 4
STRUCTURE NO. 090-0180
SHEET S-213 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1119
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

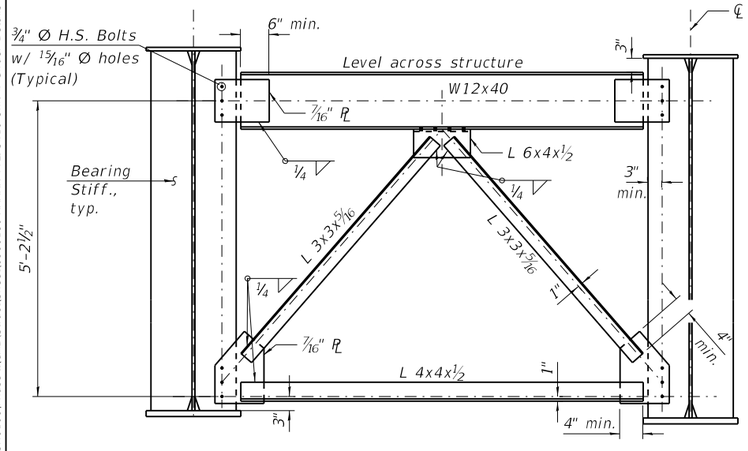


INTERIOR CROSS FRAME CF-2 & CF-3

(207 Required CF-2; 18 Required CF-3)

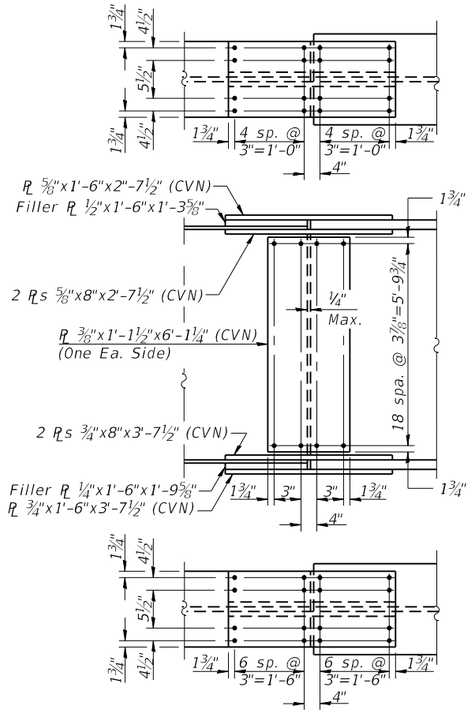
* Connecting plate not required on outside of exterior girder.
** Fillet weld angles along 3 sides on one face of gusset plate.

Note:
Interior cross frames and end cross frames shall have two hardened washers for each set of oversized holes.

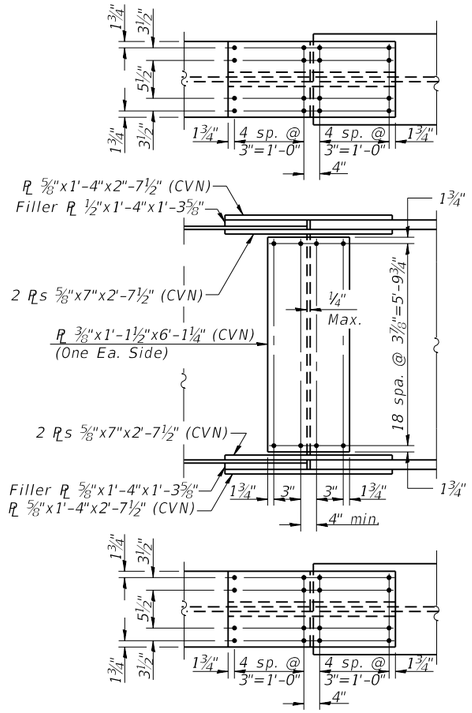


END CROSS FRAME CF-1

(18-Required)



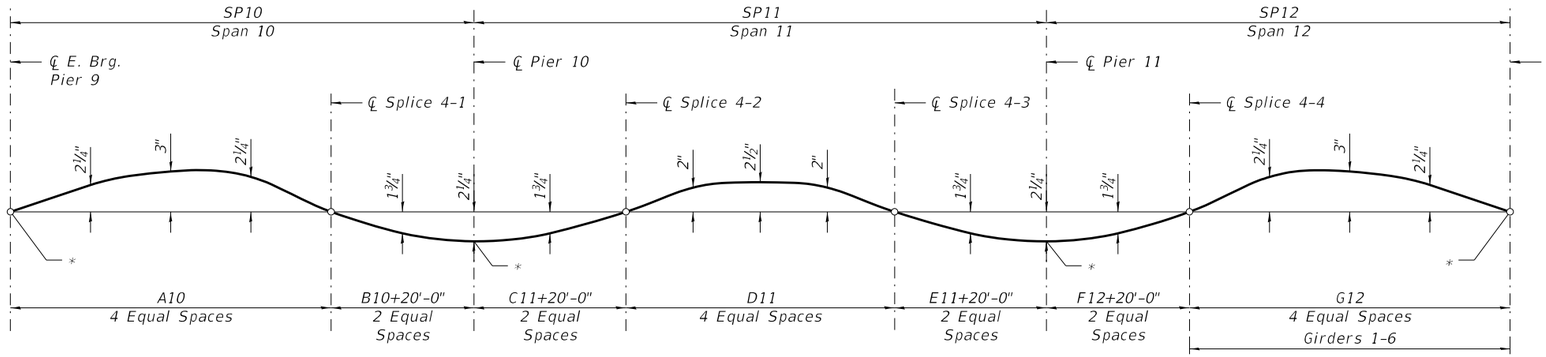
FIELD SPLICE 4-1 & 4-4 DETAIL



FIELD SPLICE 4-2 & 4-3 DETAIL

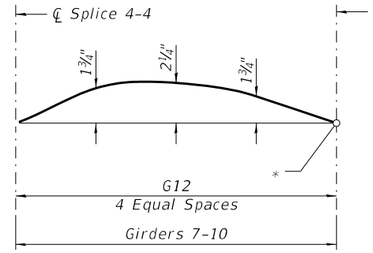
Notes:

1. Use 7/8" Ø H.S. Bolts with 15/16" Ø holes for all splice connections.
2. "CVN" denotes Charpy-V-Notch impact energy requirements, zone 2.
3. For bearing stiffener and connecting plate details, see sheet S-213 of 445.



CAMBER DIAGRAM UNIT 4

* See Table for Final Top of Web Elevations at abutments and piers.



***TOP OF WEB ELEVATIONS

		Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7	Girder 8	Girder 9	Girder 10
UNIT 4	℄ E. Brg. Pier 9	499.63	499.80	499.97	500.11	500.19	500.06	499.90	499.73	499.56	499.40
	℄ Splice 4-1	502.24	502.41	502.58	502.72	502.79	502.67	502.52	502.36	502.20	502.04
	℄ Pier 10	503.03	503.20	503.36	503.51	503.58	503.45	503.30	503.15	502.99	502.83
	℄ Splice 4-2	504.27	504.44	504.60	504.75	504.82	504.69	504.54	504.39	504.24	504.06
	℄ Splice 4-3	506.55	506.72	506.89	507.03	507.11	506.98	506.85	506.70	506.56	506.40
	℄ Pier 11	507.49	507.65	507.82	507.96	508.04	507.91	507.76	507.63	507.49	507.34
	℄ Splice 4-4	508.72	508.89	509.06	509.20	509.27	509.15	508.99	508.85	508.72	508.58
	℄ W. Brg. Pier 12	511.12	511.29	511.46	511.60	511.67	511.55	511.43	511.30	511.18	511.05

*** For Fabrication Only

INTERIOR GIRDER MOMENT TABLE						
		0.4 Sp. 10	Pier 10	0.5 Sp. 11	Pier 11	0.6 Sp. 12
Is	(in^4)	74,840	183,092	58,208	183,092	74,840
Ic(n)	(in^4)	178,780	-	137,094	-	178,780
Ic(3n)	(in^4)	130,089	-	101,861	-	130,089
Ic(cr)	(in^4)	-	200,484	-	200,484	-
Ss	(in^3)	2,135	4,390	1,502	4,390	2,135
Sc(n)	(in^3)	2,911	-	2,130	-	2,911
Sc(3n)	(in^3)	2,650	-	1,923	-	2,650
S(cr)	(in^3)	-	5,113	-	5,113	-
DC1	(k/')	1.195	1.428	1.154	1.428	1.195
MDC1	('k)	2,155	5,540	1,616	5,428	2,074
DC2	(k/')	0.175	0.175	0.175	0.175	0.175
MDC2	('k)	319	784	269	769	306
DW	(k/')	0.421	0.421	0.421	0.421	0.421
MDW	('k)	766	1,886	648	1,851	737
LLDF		0.619	0.631	0.563	0.632	0.617
M_{LL+IM}	('k)	3,107	4,060	2,553	4,029	3,059
Mu (Strength I)	('k)	9,679	17,839	7,796	17,574	9,434
Ø*f* Mn	('k)	14,300	-	10,256	-	14,355
fs DC1	(ksi)	12.11	15.14	12.91	14.84	11.66
fs DC2	(ksi)	1.44	1.84	1.68	1.80	1.39
fs DW	(ksi)	3.47	4.43	4.04	4.34	3.34
fs (LL+IM)	(ksi)	12.81	9.53	14.38	9.46	12.61
fs (Service II)	(ksi)	33.67	33.80	37.33	33.28	32.77
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	-	44.55	-	43.87	-
Ø*f* Fn	(ksi)	-	50.00	-	50.00	-
Vf	(k)	34.90	34.10	34.00	37.10	35.00

INTERIOR GIRDER REACTION TABLE									
		Pier 9		Pier 10		Pier 11		Pier 12	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
LLDF		0.844	0.682	0.844	0.682	0.844	0.682	0.844	0.682
OCF		-	1.0	-	1.0	-	1.0	-	1.0
RDC1	(k)	73.7	71.9	277.5	271.2	274.7	268.5	72.3	70.6
RDC2	(k)	10.7	10.7	38.9	38.9	38.5	38.5	10.4	10.4
RDW	(k)	25.7	23.9	93.6	87.4	92.7	86.5	25.2	23.5
R_{LL}	(k)	99.6	80.5	218.4	176.6	217.1	175.6	99.0	80
R_{IM}	(k)	18.7	15.1	33.7	27.5	33.9	27.4	18.7	15.2
RTotal	(k)	228.4	202.1	662.1	601.6	656.9	596.5	225.6	199.7

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads (in^4 and in^3).

Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in^4 and in^3).

Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in^4 and in^3).

Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in^4 and in^3).

DC1: Un-factored non-composite dead load (kips/ft.).

MDC1: Un-factored moment due to non-composite dead load (kip-ft.).

DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).

MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).

DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).

MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

M_{LL+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).

Mu (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 M_{LL+IM}

Ø*f* Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).

fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ Snc

fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ Sc(3n) or MDC2/ Sc(cr) as applicable.

fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ Sc(3n) or MDW/ Sc(cr) as applicable.

fs (LL+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
M_{LL+IM} / Sc(n) or M_{LL+IM} / Sc(cr) as applicable.

fs (Service II): Sum of stresses as computed below (ksi).
fsDC1 + fsDC2 + fsDW + 1.3 fs($_{LL+IM}$)

0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

fs (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 (fsDC1 + fsDC2) + 1.5 fsDW + 1.75 fs($_{LL+IM}$)

Ø*f* Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

Vf: Maximum factored shear range in span computed according to Article 6.10.10.

LLDF: Live Load Distribution factor

OCF: obtuse Correction Factor

Note:
M_{LL} and R_{LL} include the effects of centrifugal force and superelevation.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 4, 2 OF 2
STRUCTURE NO. 090-0180
SHEET S-215 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1121
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1)BR]BR	PEORIA/TAZEWELL	1361	1122
	ILLINOIS	CONTRACT NO. 68B46		

VOLUME 5 OF 5

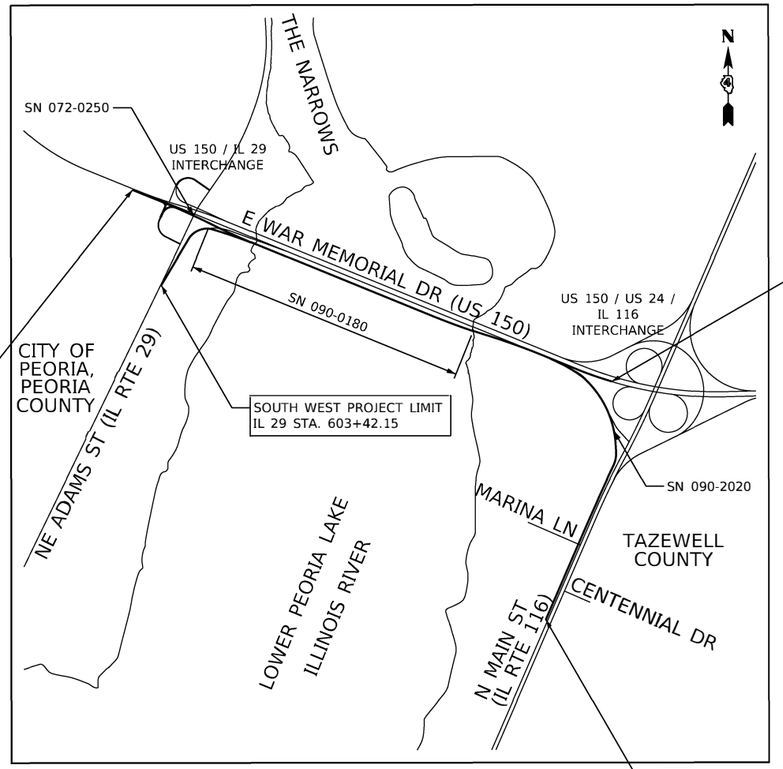
STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

PROPOSED HIGHWAY PLANS

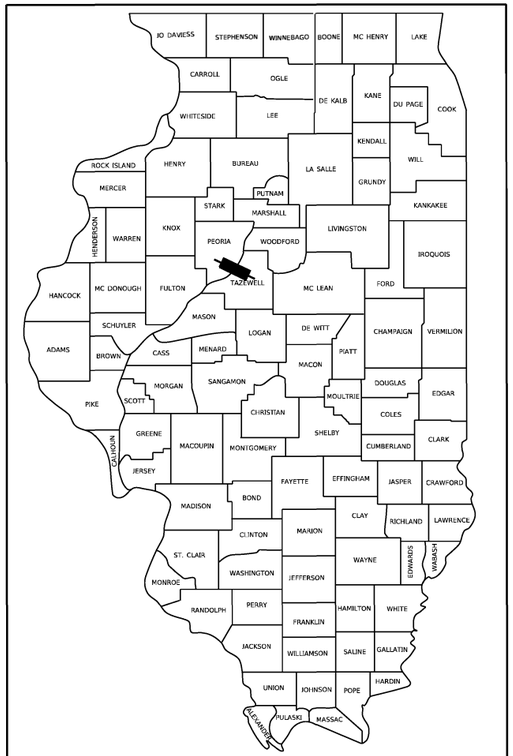
FAP ROUTE 317 AND FAP ROUTE 673 (EASTBOUND US 150 AND SOUTHBOUND IL 116)
SECTION (15B;[(102–1),(14HB)]BR)BR
PROJECT NHPP–YRP3(905)
BRIDGE REPLACEMENT OVER ILLINOIS RIVER AND INTERCHANGE IMPROVEMENTS
PEORIA & TAZEWELL COUNTY

C–94–052–13



GROSS / NET LENGTH = 12,146.79 FT. = 2.301 MILE

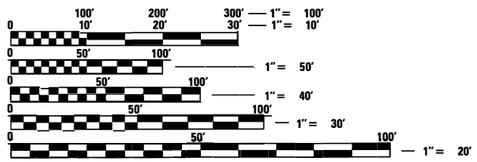
D–94–028–13



LOCATION OF SECTION INDICATED THUS: –

WORK ON THIS PROJECT WILL CONSIST OF: ROADWAY WIDENING, RECONSTRUCTION AND RESURFACING, BRIDGE REPLACEMENT, SAFETY IMPROVEMENTS, DRAINAGE IMPROVEMENTS, BICYCLE AND PEDESTRIAN FACILITY IMPROVEMENTS, ROADWAY SIGNING, PAVEMENT MARKING, AND LANDSCAPING.

	US 150 (WEST SIDE)	UUS 150 (EAST SIDE)	IL 29	IL 116	RAMP A	RAMP B	RAMP E	RAMP SW
FUNCTIONAL CLASSIFICATION:	OTHER PRINCIPAL ARTERIAL	FREEWAY	OTHER PRINCIPAL ARTERIAL	OTHER PRINCIPAL ARTERIAL	RAMP	RAMP	RAMP	RAMP
DESIGN SPEED:	50	55	35	55	15	25	35	40
POSTED SPEED:	45	55	35	55	15	25	35	40
ADT:	41,500	41,500	22,800	28,500	3,300	1,600	4,450	5,780
SU:	1.9%	1.9%	2.7%	2.6%	1.8%	3.7%	2.5%	3.9%
MU:	0.7%	0.7%	2.1%	2.3%	2.1%	0.6%	0.8%	2.2%



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1–800–892–0123
OR 811

PROJECT ENGINEER – CHRISTOPHER MAUSHARD
PROJECT MANAGER – CHRISTOPHER MAUSHARD
PHONE: (309)671–3453

CONTRACT NO. 68B46

CATALOG NO. 034923–00D

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBMITTED _____ **20** _____

_____
REGION THREE ENGINEER

_____ **20** _____

_____
ENGINEER OF DESIGN AND ENVIRONMENT

_____ **20** _____

_____
DIRECTOR OF HIGHWAYS PROJECT IMPLEMENTATION

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INDEX OF SHEETS:

FINAL SUBMITTAL

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INDEX-01

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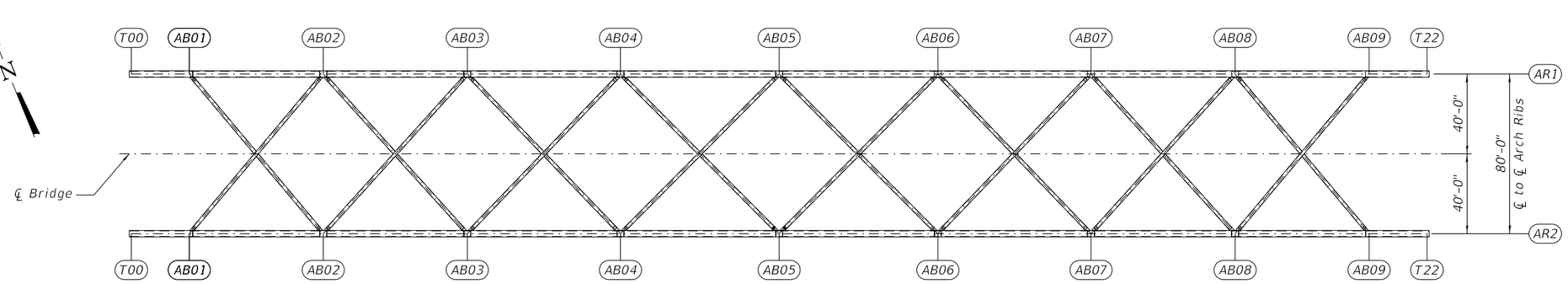
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

US 150 EASTBOUND McCLUGAGE BRIDGE PROJECT
INDEX OF SHEETS

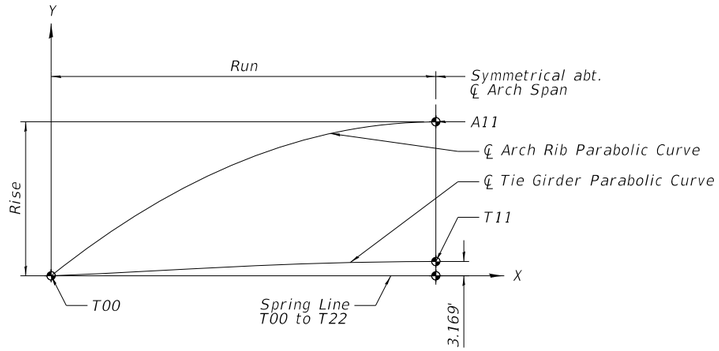
SCALE: NONE | SHEET 1 OF 1 SHEETS | STA. N/A | TO STA. N/A

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B:[(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1123
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

Notes:
1. See Sht. S-217 of 445 for work point geometry tables and hanger work points.
2. See Sht. S-219 of 445 for Half Arch Elevation and Typical Arch Rib and Tie Girder Sections.



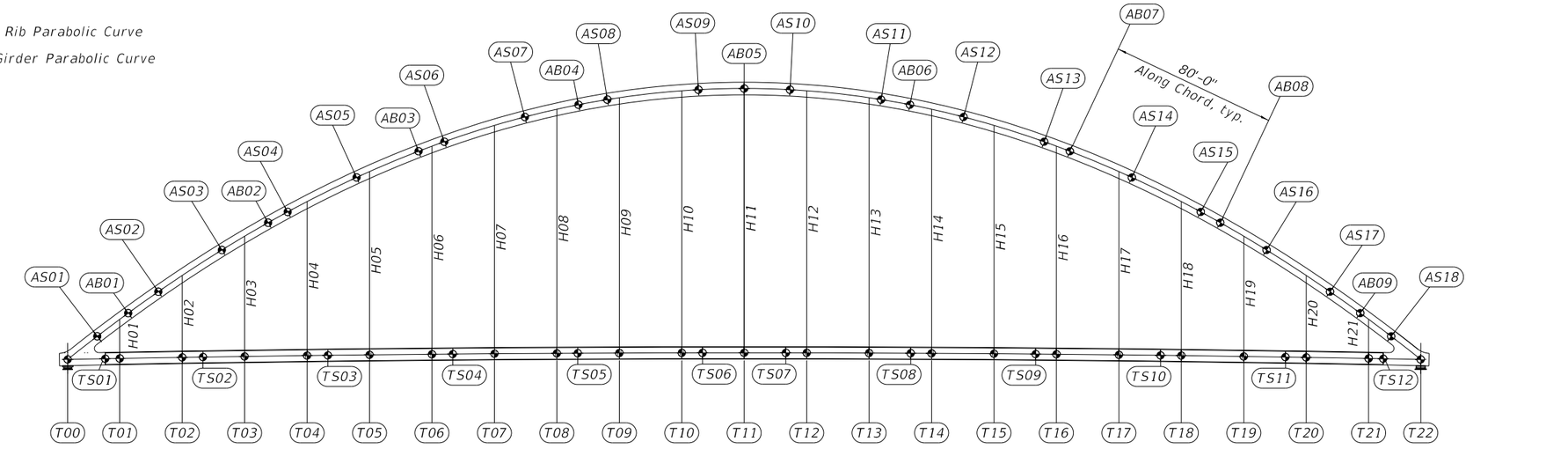
UPPER BRACING PLAN – UNIT 5



℄ ARCH SPAN FINAL GEOMETRY

$$Y = -\frac{Rise}{\left(\frac{Span}{2}\right)^2} X^2 + \frac{Rise}{\left(\frac{Span}{4}\right)} X$$

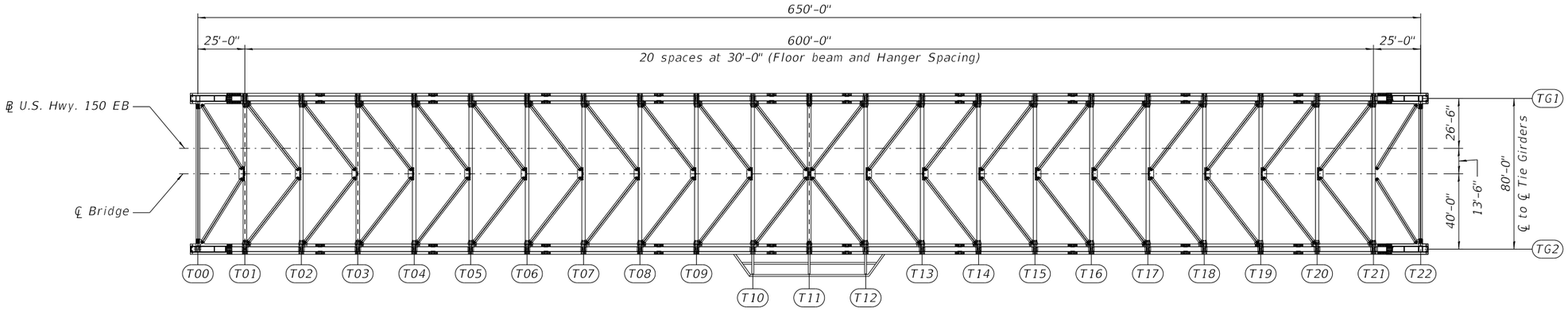
Rise= 130 (Arch Rib)
Span= 650
X & Y in feet



ARCH ELEVATION – UNIT 5

Legend:

A01	Arch Rib Work Point
AB01	Arch Rib Bracing Work Point
AH01	Arch Rib Hanger Work Point
AR1	Arch Rib
AS01	Arch Rib Splice Work Point
H01	Hanger
T01	Tie Girder Work Point
TG1	Tie Girder
TH01	Tie Girder Hanger Work Point
TS01	Tie Girder Splice Work Point



LOWER BRACING PLAN – UNIT 5

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

KEY PLAN - UNIT 5
STRUCTURE NO. 090-0180
SHEET S-216 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1124
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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TIE GIRDER WORK POINTS		
Working Point	X (Feet)	Y (Feet)
T00	0.000	0.000
T01	25.000	0.469
T02	55.000	0.982
T03	85.000	1.441
T04	115.000	1.846
T05	145.000	2.197
T06	175.000	2.494
T07	205.000	2.737
T08	235.000	2.926
T09	265.000	3.061
T10	295.000	3.142
T11	325.000	3.169
T12	355.000	3.142
T13	385.000	3.061
T14	415.000	2.926
T15	445.000	2.737
T16	475.000	2.494
T17	505.000	2.197
T18	535.000	1.846
T19	565.000	1.441
T20	595.000	0.982
T21	625.000	0.469
T22	650.000	0.000

TIE GIRDER SPLICE POINTS		
Working Point	X (Feet)	Y (Feet)
T00	0.000	0.000
TS01	18.000	0.341
TS02	65.000	1.141
TS03	125.000	1.969
TS04	185.000	2.581
TS05	245.000	2.977
TS06	305.000	3.157
TS07	345.000	3.157
TS08	405.000	2.977
TS09	465.000	2.581
TS10	525.000	1.969
TS11	585.000	1.141
TS12	632.000	0.341
T22	650.000	0.000

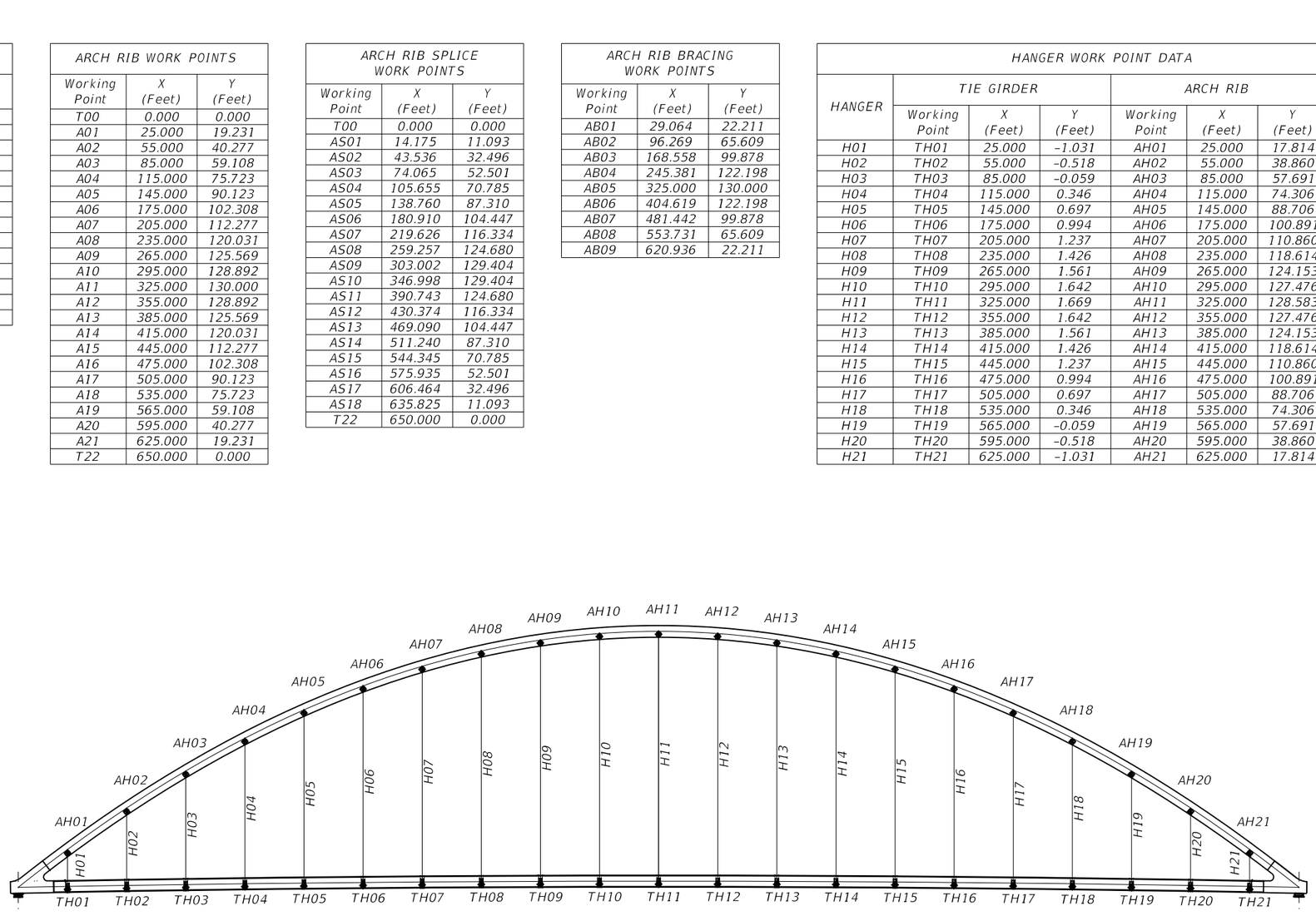
ARCH RIB WORK POINTS		
Working Point	X (Feet)	Y (Feet)
T00	0.000	0.000
A01	25.000	19.231
A02	55.000	40.277
A03	85.000	59.108
A04	115.000	75.723
A05	145.000	90.123
A06	175.000	102.308
A07	205.000	112.277
A08	235.000	120.031
A09	265.000	125.569
A10	295.000	128.892
A11	325.000	130.000
A12	355.000	128.892
A13	385.000	125.569
A14	415.000	120.031
A15	445.000	112.277
A16	475.000	102.308
A17	505.000	90.123
A18	535.000	75.723
A19	565.000	59.108
A20	595.000	40.277
A21	625.000	19.231
T22	650.000	0.000

ARCH RIB SPLICE WORK POINTS		
Working Point	X (Feet)	Y (Feet)
T00	0.000	0.000
AS01	14.175	11.093
AS02	43.536	32.496
AS03	74.065	52.501
AS04	105.655	70.785
AS05	138.760	87.310
AS06	180.910	104.447
AS07	219.626	116.334
AS08	259.257	124.680
AS09	303.002	129.404
AS10	346.998	129.404
AS11	390.743	124.680
AS12	430.374	116.334
AS13	469.090	104.447
AS14	511.240	87.310
AS15	544.345	70.785
AS16	575.935	52.501
AS17	606.464	32.496
AS18	635.825	11.093
T22	650.000	0.000

ARCH RIB BRACING WORK POINTS		
Working Point	X (Feet)	Y (Feet)
AB01	29.064	22.211
AB02	96.269	65.609
AB03	168.558	99.878
AB04	245.381	122.198
AB05	325.000	130.000
AB06	404.619	122.198
AB07	481.442	99.878
AB08	553.731	65.609
AB09	620.936	22.211

HANGER WORK POINT DATA							
HANGER	TIE GIRDER			ARCH RIB			LENGTH (Feet)
	Working Point	X (Feet)	Y (Feet)	Working Point	X (Feet)	Y (Feet)	
H01	TH01	25.000	-1.031	AH01	25.000	17.814	18.845
H02	TH02	55.000	-0.518	AH02	55.000	38.860	39.379
H03	TH03	85.000	-0.059	AH03	85.000	57.691	57.750
H04	TH04	115.000	0.346	AH04	115.000	74.306	73.961
H05	TH05	145.000	0.697	AH05	145.000	88.706	88.010
H06	TH06	175.000	0.994	AH06	175.000	100.891	99.897
H07	TH07	205.000	1.237	AH07	205.000	110.860	109.624
H08	TH08	235.000	1.426	AH08	235.000	118.614	117.188
H09	TH09	265.000	1.561	AH09	265.000	124.153	122.592
H10	TH10	295.000	1.642	AH10	295.000	127.476	125.834
H11	TH11	325.000	1.669	AH11	325.000	128.583	126.915
H12	TH12	355.000	1.642	AH12	355.000	127.476	125.834
H13	TH13	385.000	1.561	AH13	385.000	124.153	122.592
H14	TH14	415.000	1.426	AH14	415.000	118.614	117.188
H15	TH15	445.000	1.237	AH15	445.000	110.860	109.624
H16	TH16	475.000	0.994	AH16	475.000	100.891	99.897
H17	TH17	505.000	0.697	AH17	505.000	88.706	88.010
H18	TH18	535.000	0.346	AH18	535.000	74.306	73.961
H19	TH19	565.000	-0.059	AH19	565.000	57.691	57.750
H20	TH20	595.000	-0.518	AH20	595.000	38.860	39.379
H21	TH21	625.000	-1.031	AH21	625.000	17.814	18.845

GEOMETRY CONTROL TABLE				
Global Coordinates			Local Coordinates	
Working Point	Station (Feet)	Elev. (Feet)	X (Feet)	Y (Feet)
T00	2130+81.00	508.07	0.000	0.000
T22	2137+31.00	508.07	650.000	0.000



ARCH ELEVATION - UNIT 5

Legend:

- (A01) Arch Rib Work Point
- (AB01) Arch Rib Bracing Work Point
- (AH01) Arch Rib Hanger Work Point
- (AS01) Arch Rib Splice Work Point
- (H01) Hanger
- (T01) Tie Girder Work Point
- (TH01) Tie Girder Hanger Work Point
- (TS01) Tie Girder Splice Work Point

Notes:
1. See Sht. S-216 of 445 for work point Key Plan.
2. See Sht. S-248 of 445 for hanger work point definitions at Arch Rib and Tie Girder.
3. See Sht. S-219 of 445 for Half Arch Elevation and Typical Arch Rib and Tie Girder Sections.
4. Work points provided this sheet are final coordinates at 50° F on the local axis and are applicable to both the north and south planes of the structure. See Sht. S-221 of 445 for work point camber coordinates.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

WORK POINT GEOMETRY - UNIT 5
STRUCTURE NO. 090-0180
SHEET S-217 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	(15B;(102-1),(14HB))BR)BR	PEO/TAZ	1361	1125
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

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ARCH RIB TABLE

Working Point	DC			DW			LL+IM			LL+IM			LL+IM			WS		
							For P min			For Mz max			For Mz min					
	P	My	Mz	P	My	Mz	P	My	Mz	P	My	Mz	P	My	Mz	P	My	Mz
AS01	-4479	279	1280	-991	33	449	-1019	148	-4	-340	75	1931	-718	22	-893	-657	-881	480
A01	-4404	-40	593	-971	-8	315	-1002	-176	-391	-320	-66	2902	-723	-31	-1797	-650	-1399	1038
A02	-4250	-169	-410	-940	-23	136	-954	-109	-1072	-331	-90	5004	-686	6	-3748	-464	1334	1940
A03	-4124	-185	-576	-910	-24	156	-929	20	-1318	-360	-29	6435	-640	29	-5065	-456	-275	2346
A04	-4026	-154	-617	-888	-12	199	-894	30	-452	-372	1	7215	-597	27	-5866	-189	451	2448
A05	-3924	-97	-508	-864	6	234	-872	31	-197	-406	-8	7427	-553	29	-6179	-184	83	2358
A06	-3804	-88	5	-840	16	260	-845	24	-42	-410	-18	7197	-519	31	-6039	-73	-64	2135
A07	-3731	-252	459	-823	0	276	-828	-4	468	-446	-19	6651	-437	6	-5477	-67	286	-1834
A08	-3672	-412	1435	-810	-15	285	-813	-34	1047	-477	-29	5880	-370	10	-4815	-62	-47	1586
A09	-3638	-447	2325	-803	-12	290	-803	-48	1532	-462	-39	5122	-381	17	-4056	-98	174	-1511
A10	-3614	-414	3108	-799	1	293	-795	-53	2238	-480	-41	4623	-377	30	-3325	-97	333	-1695
A11	-3611	-381	3613	-799	14	295	-795	-56	2385	-488	-123	4526	-361	48	-2770	-92	-165	-1859
A12	-3631	-414	3107	-803	1	294	-801	-52	2267	-487	-40	4623	-377	31	-3326	-90	333	-1758
A13	-3669	-446	2323	-812	-12	290	-812	-47	1667	-471	-39	5124	-383	18	-4056	-91	173	-1411
A14	-3716	-412	1434	-823	-15	285	-825	-33	1239	-489	-28	5884	-374	10	-4816	-37	-51	-1572
A15	-3787	-253	457	-839	0	277	-842	-3	632	-466	-19	6653	-439	7	-5477	-43	283	-1778
A16	-3872	-89	3	-860	16	261	-862	26	119	-432	-18	7197	-525	31	-6037	-49	-70	2167
A17	-4003	-100	-510	-888	6	235	-890	32	-98	-431	-7	7424	-559	29	-6177	-167	89	2382
A18	-4117	-155	-620	-915	-12	199	-914	33	-484	-400	2	7203	-608	30	-5864	-173	455	2525
A19	-4220	-189	-580	-939	-24	156	-952	22	-1319	-391	-27	6416	-650	29	-5063	-438	-282	2664
A20	-4346	-174	-414	-968	-23	137	-976	-105	-1057	-358	-86	4974	-697	-5	-3749	-447	1319	2410
A21	-4467	-47	589	-991	-7	315	-1017	-174	-434	-331	-60	2864	-737	-33	-1801	-629	-1381	1670
AS18	-4479	273	1277	-991	33	449	-1017	150	-46	-325	68	1889	-733	26	-898	-629	-871	-1191

TIE GIRDER TABLE

Working Point	DC			DW			LL+IM			LL+IM			LL+IM			WS		
							For P max			For Mz max			For Mz min					
	P	My	Mz	P	My	Mz	P	My	Mz	P	My	Mz	P	My	Mz	P	My	Mz
TS01	1834	-76	478	390	-6	122	351	-96	-160	29	3	1421	257	-64	-692	431	-272	420
T01	1799	-7	-317	385	-6	-74	317	-16	-299	51	-6	1448	238	-13	-1076	326	28	-611
T02	1795	-3	-460	379	-6	54	303	-23	-330	96	-10	2735	216	-16	-1923	345	15	-804
T03	1795	-3	-171	375	-5	92	288	-19	-383	106	-10	3455	196	-12	-2516	361	18	-910
T04	1792	-5	-499	371	-4	92	275	-13	-232	114	-10	3779	179	-8	-2848	379	18	-871
T05	1790	-5	-226	367	-3	91	267	-9	-185	122	-9	3816	164	-4	-2941	396	16	-729
T06	1787	-2	-446	365	-2	94	261	-6	-42	128	-9	3659	151	-1	-2833	411	13	-523
T07	1789	0	69	363	-2	98	257	-4	192	135	-8	3373	140	1	-2555	423	10	-289
T08	1787	-6	103	362	-2	102	254	-3	508	140	-7	3016	113	4	-2177	433	5	-54
T09	1788	10	814	369	24	104	258	17	831	138	6	2672	119	12	-1820	451	41	160
T10	1768	7	1370	345	7	108	239	4	1257	124	0	2449	114	5	-1495	418	8	349
T11	1768	-4	1990	345	-3	100	238	-4	1362	137	-2	2297	114	2	-1201	416	-12	426
T12	1781	37	1445	359	44	108	249	32	1309	128	17	2458	118	12	-1486	433	55	539
T13	1787	4	918	362	2	104	251	1	919	136	3	2710	113	-3	-1821	427	-14	557
T14	1789	-3	192	363	1	102	252	1	530	141	5	3050	110	-4	-2168	415	-20	516
T15	1787	1	144	365	2	98	254	3	189	135	7	3406	140	-1	-2521	401	-23	422
T16	1790	4	-378	368	3	93	259	5	-47	128	8	3687	152	1	-2802	383	-25	288
T17	1792	4	-188	371	3	90	266	9	-164	120	9	3831	166	4	-2917	365	-27	127
T18	1795	1	-483	375	4	92	276	13	-226	111	9	3769	185	9	-2835	346	-27	-37
T19	1795	2	-185	379	5	92	291	19	-390	102	9	3429	205	13	-2519	328	-24	-175
T20	1799	7	-560	385	5	42	304	19	-370	89	7	2695	225	15	-1946	309	-24	-255
T21	1834	56	-589	390	3	-124	341	90	-509	48	4	1351	262	57	-1120	414	216	-418
TS12	1834	-76	479	390	-6	122	341	-95	-150	30	3	1430	252	-63	-697	414	-267	711

Legend:

DC	Indicates structural components and non-structural attachments.
DW	Indicates future wearing surfaces and utilities.
LL+IM	Indicates live load plus impact.
WS	Indicates wind load on structure.
My	Indicates weak axis moment or out-of-plane bending, positive = tension in left (north) web.
Mz	Indicates strong axis moment or in-plane bending, positive = tension in bottom flange.
P	Indicates axial force, positive = tension.

Notes:

1. See Sht. S-217 of 445 for Work Point definition.
2. See Sht. S-219 of 445 for Arch Rib and Tie Girder typical sections and plate sizes.
3. Axial forces (kips) and bending moments (kip*ft) are unfactored and were obtained by three-dimensional analysis. Moment magnification is not included.
4. Concurrent live load (LL+IM) forces effects (P,My,Mz) are provided for each max./min. Mz and max. or min. P.
5. Concurrent live load (LL+IM) forces effects for max./min. My are not provided as these cases do not govern the design.
6. Live load force (LL+IM) effects include multiple presence factor.
7. Maximum wind load on structure (WS) force effects (P,My,Mz) are provided; these force effects are not concurrent.
8. Tie girder force effects are provided for one of the two channels that compose each tie girder.

TYLIN INTERNATIONAL
200 S. WACKER DR.
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CHICAGO, IL 60606
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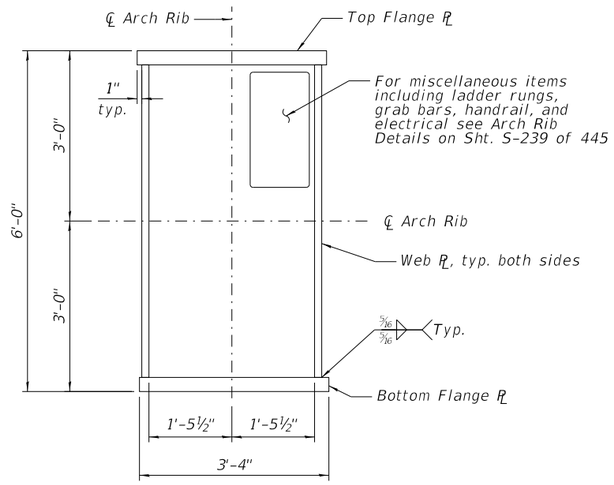
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ARCH FORCES - UNIT 5
STRUCTURE NO. 090-0180
SHEET S-218 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1126
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



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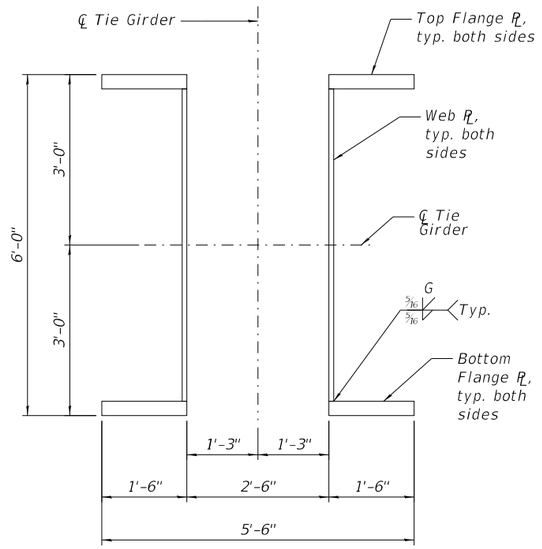
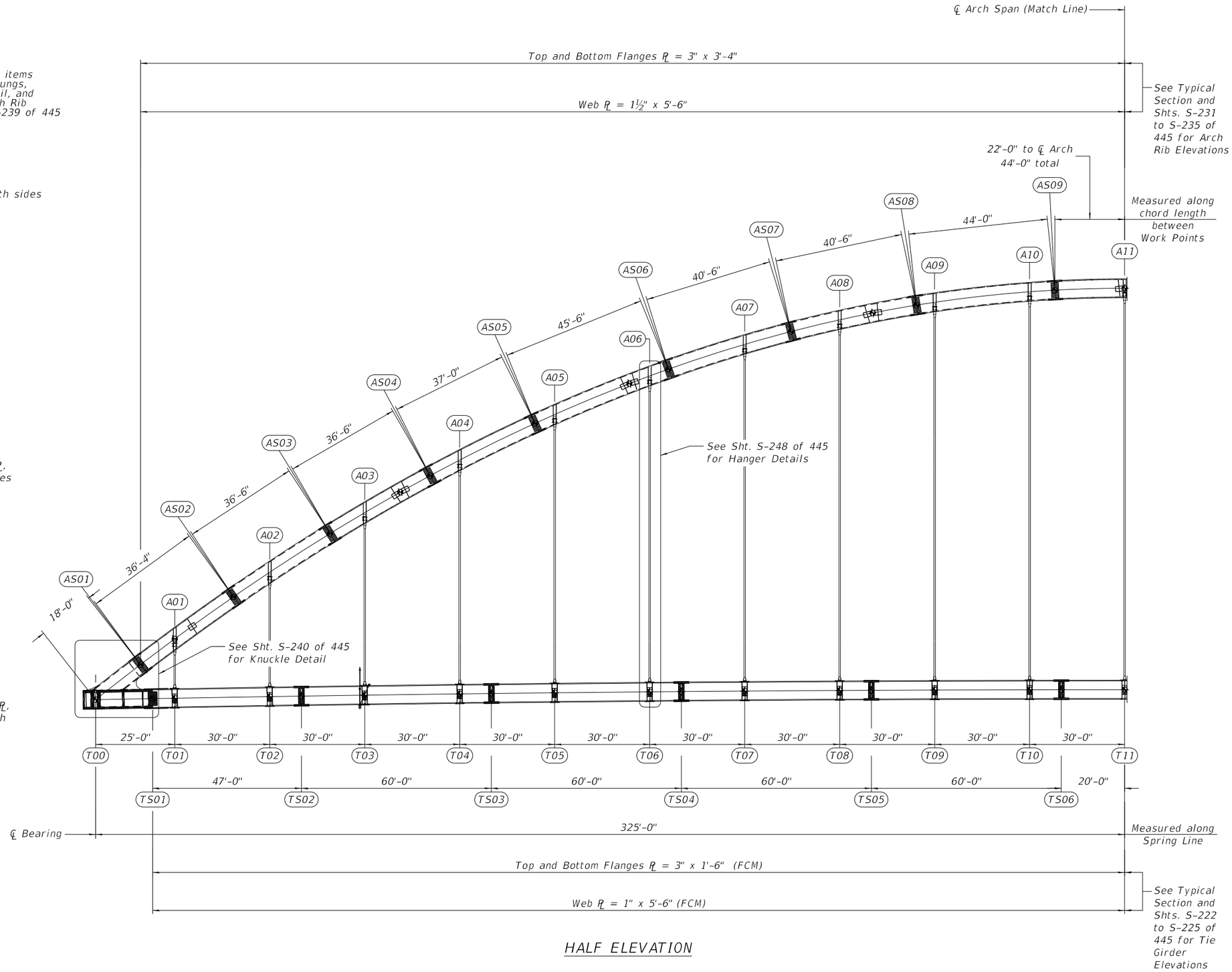


TYPICAL TIE GIRDER SECTION



HALF ELEVATION

Note:
1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELEVATION - UNIT 5
STRUCTURE NO. 090-0180
SHEET S-219 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1127
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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ARCH SPAN CONSTRUCTION SEQUENCE – UNIT 5

Notes:

1. The details provided in these plans and the Engineer's calculations for loads, deflections, and cambers assume the erection sequence described herein.

2. The assumed erection scheme is provided for information only. The actual construction sequence and method of construction is the sole responsibility of the contractor. The contractor shall develop and submit for review a complete erection scheme in advance of starting steel fabrication, including step by step analysis to determine stresses and stability of the structure during all stages of construction. All documents, design computations, plans, methods, and procedures pertaining to the Contractor's construction sequence shall be prepared and sealed by a Structural Engineer licensed in the State of Illinois in accordance with the Special Provisions for Fabrication and Erection of Complex Steel Structures. The work shall not be performed until reviewed by the Engineer.

3. The cost of erecting the superstructure steel, including erection equipment, barges, falsework, jacking equipment and temporary bracing required during erection, shall be included with the pay item for Furnishing and Erecting Structural Steel.

Staging Sequence:

1. Assemble Arch Span (all steel components except belvedere framing) supported by temporary struts/bracing, with splices blocked to match cambered geometry. Fully tighten stringer bolts at fixed connection splices. For the stringer expansion connection plates, all bolts shall be tightened to a snug tight condition only. Any bolts tightened to more than snug tight shall be loosened prior to placing the concrete deck.

2. Install hangers.

3. Load-out and support arch span structure on barge.

4. Install unit 5 bearings on piers 12 and 13, transport structure to site and lift into final position.

5. After supported on final bearings, remove temporary bracing and falsework.

6. Survey Tie Girder and Arch Rib Work Points.

Staging Sequence (cont'd):

7. Place concrete deck per pour sequence described on this sheet.
   - 7.1 – Pour Concrete deck between between stringer expansion plates (1–12). It was assumed that deck pours 1–12 would be completed in three separate stages over three separate days as depicted in the deck pour sequence diagram. When the deck pour is stopped for the day, the next pour shall not be made until both the following are met:
     1) At least 72 hours shall have elapsed from the end of the previous pour.
     2) The concrete strength shall have attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.
   - 7.2 – Install belvedere steel framing.
   - 7.3 – Pour belvedere deck (13).
   - 7.4 – Fully tighten bolts in the stringer expansion connection.
   - 7.4 – Pour closure joints working from the middle of the bridge to the end of deck. A minimum of 14 days is required between initial deck pours (1–12) and the closure pours.

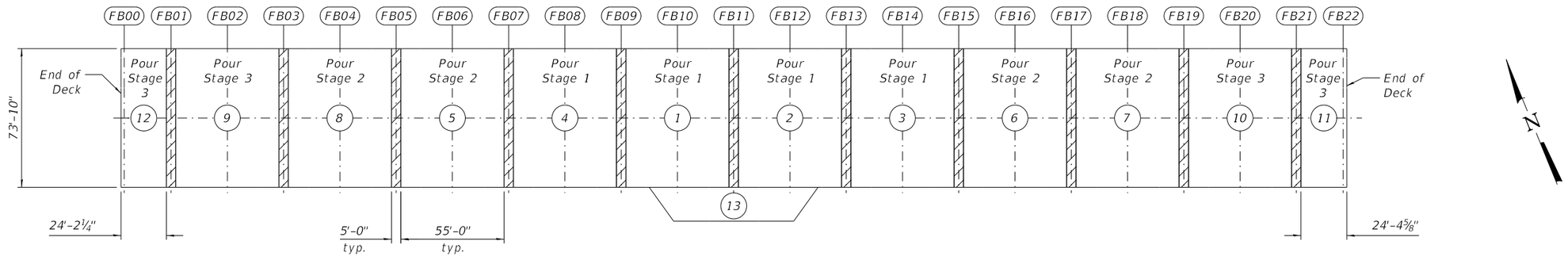
8. Install barriers and railings.

9. Install preformed joint strip seal at Pier 13.

10. Survey Tie Girder and Arch Rib Work Points.

Notes:

The Contractor is alerted that camber and dead load deflection values were developed based on the deck pouring sequence shown. Any deviation from this pouring sequence will result in changes to camber and elevations that affect dead load deflections. If the Contractor wishes to change the sequence, then the proposed plan revisions and design calculations shall be submitted to the Engineer for review and approval. The calculations shall be prepared and sealed by a Licensed Structural Engineer in Illinois.



DECK POUR SEQUENCE

Key:

(1) Placing Sequence

(FB01) Floor Beam

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TYLIN INTERNATIONAL 200 S. WACKER DR. SUITE 1400 CHICAGO, IL 60606 TEL: 312-777-2900	USER NAME = jryding	DESIGNED - KA	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	ARCH SPAN CONSTRUCTION SEQUENCE - UNIT 5 STRUCTURE NO. 090-0180 SHEET S-220 OF 445 SHEETS
		CHECKED - MM	REVISED -		
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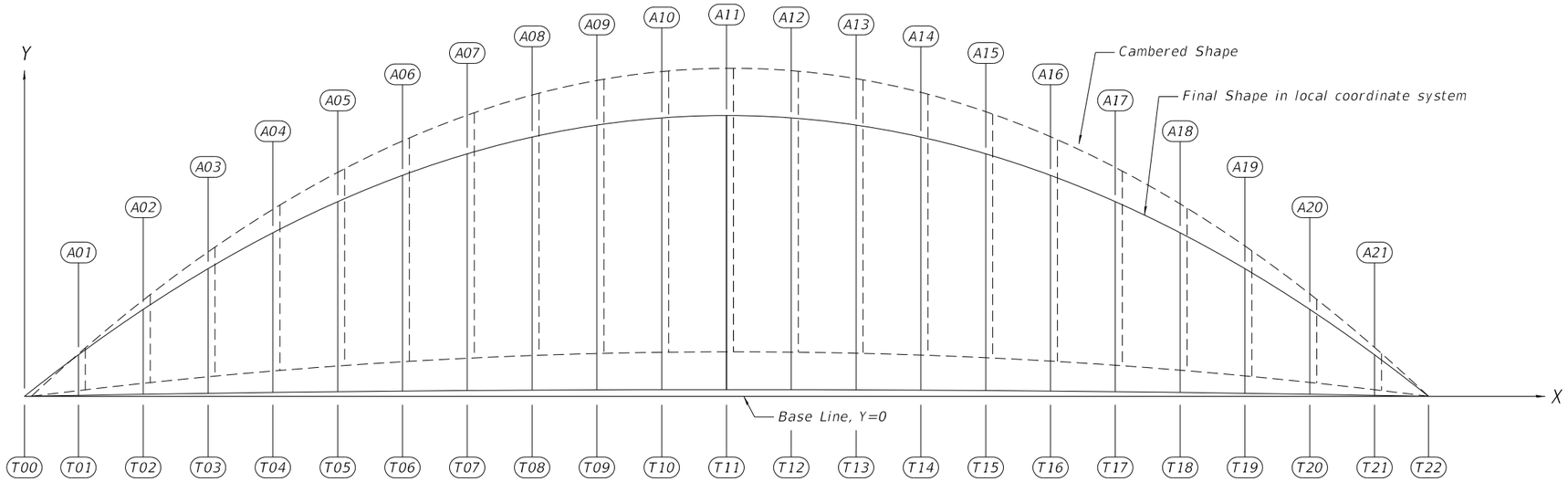
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	(15B;(102-1),(14HB))BR)BR	PEO/TAZ	1361	1128
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	



ARCH CAMBER SCHEMATIC – UNIT 5

South Tie Girder Work Point Camber Coordinates

Working Point	Total Dead Load Camber X (Feet)	Total Dead Load Camber Y (Feet)	Steel Dead Load Coordinates X (Feet)	Steel Dead Load Coordinates Y (Feet)	Final Coordinates X (Feet)	Final Coordinates Y (Feet)
T00	0.282	0.000	0.136	0.000	0.000	0.000
T01	25.273	0.532	25.132	0.519	25.000	0.469
T02	55.260	1.134	55.125	1.091	55.000	0.982
T03	85.246	1.686	85.119	1.602	85.000	1.441
T04	115.233	2.190	115.113	2.049	115.000	1.846
T05	145.220	2.645	145.107	2.432	145.000	2.197
T06	175.207	3.054	175.101	2.753	175.000	2.494
T07	205.194	3.409	205.095	3.013	205.000	2.737
T08	235.182	3.710	235.089	3.213	235.000	2.926
T09	265.169	3.941	265.084	3.355	265.000	3.061
T10	295.157	4.093	295.078	3.439	295.000	3.142
T11	325.146	4.143	325.073	3.467	325.000	3.169
T12	355.135	4.093	355.068	3.439	355.000	3.142
T13	385.123	3.941	385.062	3.355	385.000	3.061
T14	415.111	3.710	415.056	3.213	415.000	2.926
T15	445.098	3.409	445.051	3.013	445.000	2.737
T16	475.085	3.053	475.045	2.753	475.000	2.494
T17	505.072	2.645	505.039	2.432	505.000	2.197
T18	535.059	2.190	535.033	2.049	535.000	1.846
T19	565.046	1.685	565.027	1.602	565.000	1.441
T20	595.032	1.134	595.021	1.091	595.000	0.982
T21	625.019	0.531	625.014	0.519	625.000	0.469
T22	650.010	0.000	650.010	0.000	650.000	0.000

North Tie Girder Work Point Camber Coordinates

Working Point	Total Dead Load Camber X (Feet)	Total Dead Load Camber Y (Feet)	Steel Dead Load Coordinates X (Feet)	Steel Dead Load Coordinates Y (Feet)	Final Coordinates X (Feet)	Final Coordinates Y (Feet)
T00	0.274	0.000	0.136	0.000	0.000	0.000
T01	25.264	0.567	25.132	0.519	25.000	0.469
T02	55.251	1.204	55.125	1.091	55.000	0.982
T03	85.238	1.775	85.119	1.602	85.000	1.441
T04	115.226	2.277	115.113	2.049	115.000	1.846
T05	145.214	2.707	145.107	2.432	145.000	2.197
T06	175.202	3.070	175.101	2.753	175.000	2.494
T07	205.190	3.363	205.095	3.013	205.000	2.737
T08	235.179	3.590	235.089	3.213	235.000	2.926
T09	265.168	3.747	265.084	3.355	265.000	3.061
T10	295.157	3.840	295.078	3.439	295.000	3.142
T11	325.146	3.867	325.073	3.466	325.000	3.169
T12	355.135	3.840	355.068	3.439	355.000	3.142
T13	385.124	3.747	385.062	3.355	385.000	3.061
T14	415.113	3.590	415.056	3.213	415.000	2.926
T15	445.102	3.363	445.051	3.013	445.000	2.737
T16	475.090	3.070	475.045	2.753	475.000	2.494
T17	505.078	2.707	505.039	2.432	505.000	2.197
T18	535.066	2.277	535.033	2.048	535.000	1.846
T19	565.054	1.775	565.027	1.602	565.000	1.441
T20	595.041	1.204	595.021	1.091	595.000	0.982
T21	625.028	0.568	625.014	0.519	625.000	0.469
T22	650.018	0.000	650.010	0.000	650.000	0.000

South Arch Rib Work Point Camber Coordinates

Working Point	Total Dead Load Camber X (Feet)	Total Dead Load Camber Y (Feet)	Steel Dead Load Coordinates X (Feet)	Steel Dead Load Coordinates Y (Feet)	Final Coordinates X (Feet)	Final Coordinates Y (Feet)
A01	25.265	19.274	25.110	19.275	25.000	19.231
A02	55.254	40.361	55.087	40.365	55.000	40.277
A03	85.238	59.243	85.071	59.233	85.000	59.108
A04	115.217	75.922	115.061	75.879	115.000	75.723
A05	145.193	90.399	145.056	90.301	145.000	90.123
A06	175.169	102.671	175.055	102.502	175.000	102.308
A07	205.150	112.732	205.057	112.481	205.000	112.277
A08	235.137	120.576	235.060	120.241	235.000	120.031
A09	265.133	126.190	265.064	125.782	265.000	125.569
A10	295.137	129.564	295.068	129.106	295.000	128.892
A11	325.146	130.690	325.073	130.214	325.000	130.000
A12	355.155	129.564	355.077	129.106	355.000	128.892
A13	385.159	126.189	385.082	125.782	385.000	125.569
A14	415.155	120.576	415.086	120.241	415.000	120.031
A15	445.142	112.732	445.089	112.481	445.000	112.277
A16	475.123	102.671	475.091	102.502	475.000	102.308
A17	505.099	90.399	505.090	90.301	505.000	90.123
A18	535.075	75.922	535.085	75.879	535.000	75.723
A19	565.054	59.242	565.075	59.233	565.000	59.108
A20	595.038	40.361	595.059	40.365	595.000	40.277
A21	625.027	19.273	625.036	19.275	625.000	19.231

North Arch Rib Work Point Camber Coordinates

Working Point	Total Dead Load Camber X (Feet)	Total Dead Load Camber Y (Feet)	Steel Dead Load Coordinates X (Feet)	Steel Dead Load Coordinates Y (Feet)	Final Coordinates X (Feet)	Final Coordinates Y (Feet)
A01	25.227	19.311	25.110	19.275	25.000	19.231
A02	55.189	40.435	55.087	40.365	55.000	40.277
A03	85.159	59.336	85.071	59.233	85.000	59.108
A04	115.138	76.015	115.061	75.879	115.000	75.723
A05	145.124	90.468	145.056	90.301	145.000	90.123
A06	175.118	102.695	175.055	102.502	175.000	102.308
A07	205.118	112.696	205.057	112.481	205.000	112.277
A08	235.122	120.472	235.060	120.241	235.000	120.031
A09	265.129	126.024	265.064	125.782	265.000	125.569
A10	295.137	129.354	295.069	129.106	295.000	128.892
A11	325.146	130.465	325.073	130.214	325.000	130.000
A12	355.155	129.354	355.077	129.106	355.000	128.892
A13	385.163	126.024	385.082	125.782	385.000	125.569
A14	415.170	120.472	415.086	120.241	415.000	120.031
A15	445.174	112.696	445.089	112.481	445.000	112.277
A16	475.174	102.695	475.091	102.502	475.000	102.308
A17	505.168	90.468	505.090	90.301	505.000	90.123
A18	535.155	76.015	535.085	75.879	535.000	75.723
A19	565.133	59.337	565.075	59.233	565.000	59.108
A20	595.103	40.435	595.059	40.365	595.000	40.277
A21	625.065	19.311	625.036	19.275	625.000	19.231

Notes:

1. Total Dead Load Camber Coordinates refers to geometry at fabrication. The tied arch is cambered for dead load, not including Future Wearing Surface (FWS) and not adjusted for the steel assembly during construction (staging sequence 1, Sht. S-220 of 445). Camber does include the deck pour staging (staging sequence 7, Sht. S-220 of 445).
2. Steel Dead Load Camber Coordinates includes self weight of steel components and any locked-in erection stresses (assumed to be zero in the above table).
3. Final Coordinates are based on the local axis and follow the parabolic equation provided on Sht. S-216 of 445.
4. The Contractor shall verify deflections and cambers provided in the plans.
5. Arch span fabrication and erection shall follow the Special Provisions for Fabrication and Erection of Complex Steel Structures.

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ARCH SPAN CAMBER DIAGRAM
STRUCTURE NO. 090-0180
SHEET S-221 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR/BR	PEO/TAZ	1361	1129
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

MODEL: Default
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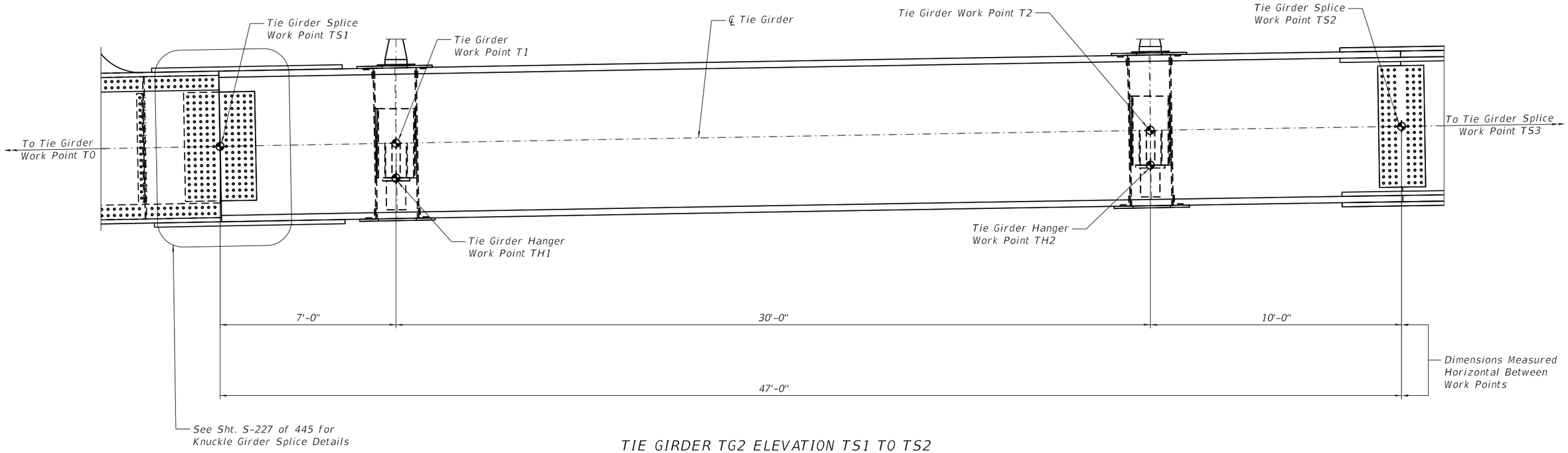
12/12/2018 8:46:34 AM



TIE GIRDER TG2 ELEVATION TS1 TO TS2

(Similar TG1. Simiar TS12-TS11, mirrored about ℄ Arch Span)

Notes:

1. *Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.*
2. *See Sht. S-248 of 445 for Hanger Details.*
3. *See Sht. S-250 of 445 for Floor Beam Details.*

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TIE GIRDER ELEVATION - UNIT 5, 1 OF 4
STRUCTURE NO. 090-0180

SHEET S-222 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1130
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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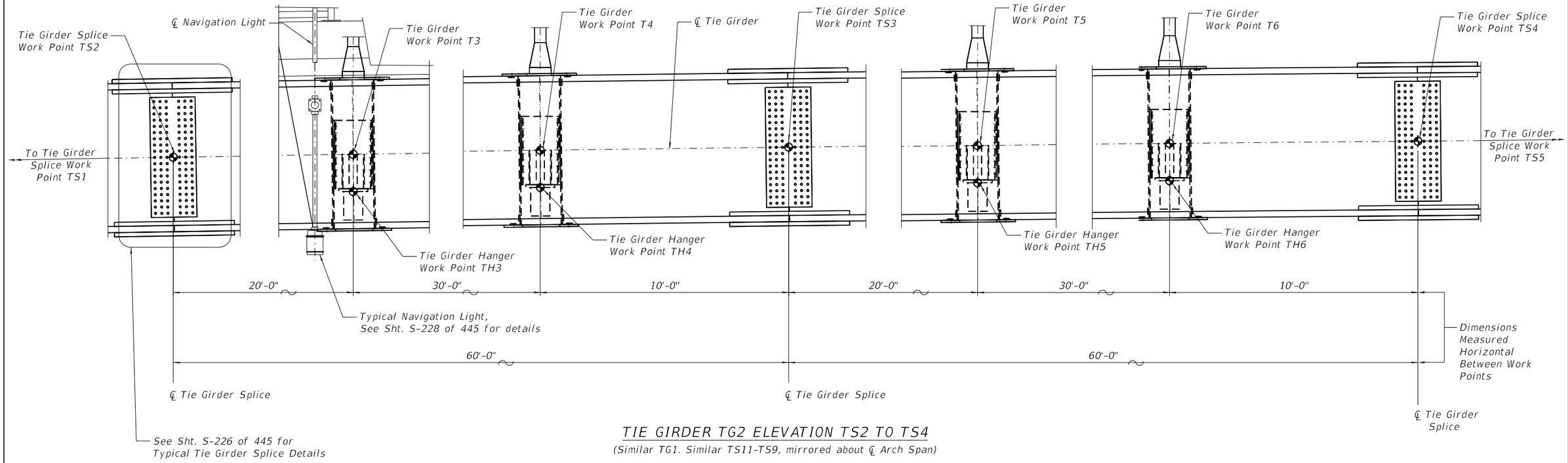

TIE GIRDER TG2 ELEVATION TS2 TO TS4

(Similar TG1. Similar TS11-TS9, mirrored about ℄ Arch Span)

Notes:

1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.
2. See Sht. S-248 of 445 for Hanger Details.
3. See Sht. S-250 of 445 for Floor Beam Details.

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STATE OF ILLINOIS
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TIE GIRDER ELEVATION - UNIT 5, 2 OF 4
STRUCTURE NO. 090-0180

SHEET S-223 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1131
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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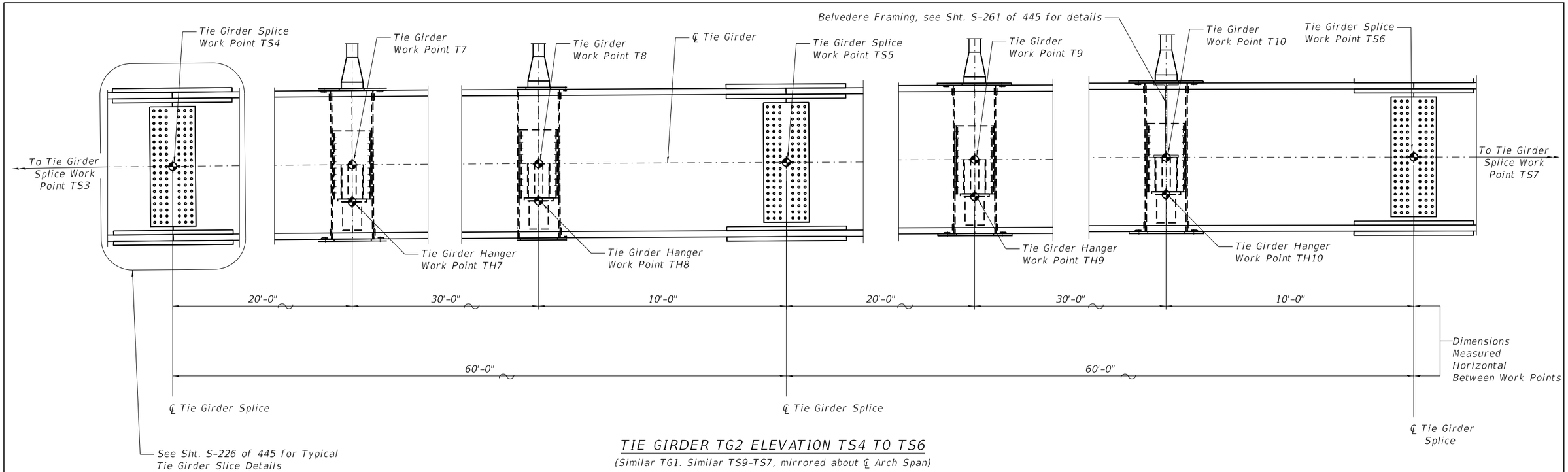

TIE GIRDER TG2 ELEVATION TS4 TO TS6

(Similar TG1. Similar TS9-TS7, mirrored about ℄ Arch Span)

Notes:

1. *Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.*
2. *See Sht. S-248 of 445 for Hanger Details.*
3. *See Sht. S-250 of 445 for Floor Beam Details.*

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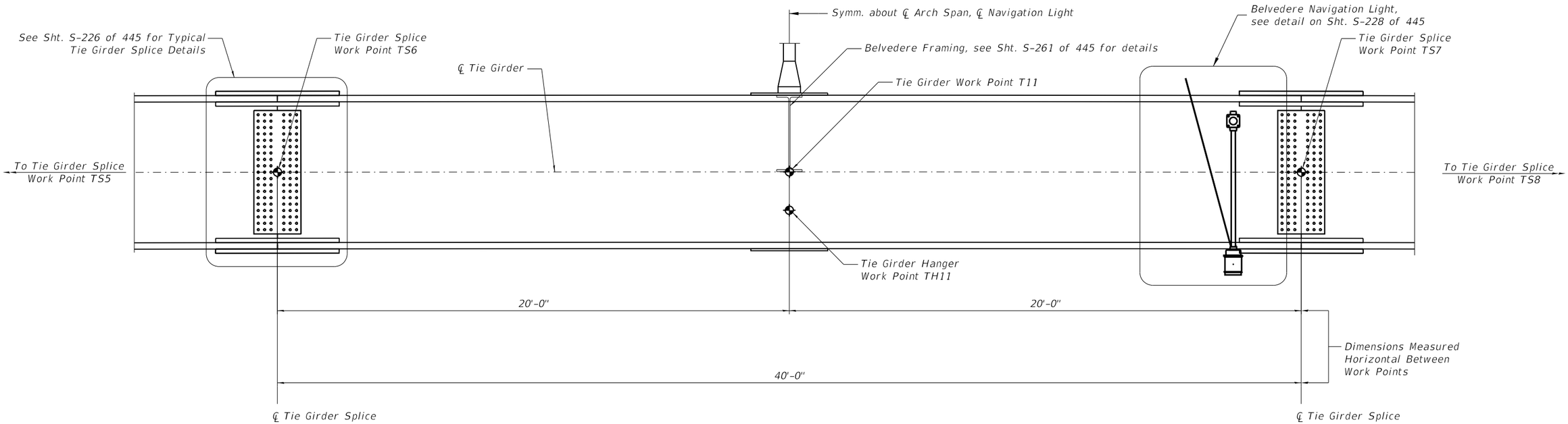
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1132
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



TIE GIRDER TG2 ELEVATION TS6 TO TS7

(Similar TG1 except for Belvedere Framing and Navigation Light)

Notes:

1. *Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.*
2. *See Sht. S-248 of 445 for Hanger Details.*
3. *See Sht. S-250 of 445 for Floor Beam Details.*

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TIE GIRDER ELEVATION - UNIT 5, 4 OF 4
STRUCTURE NO. 090-0180

SHEET S-225 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1133
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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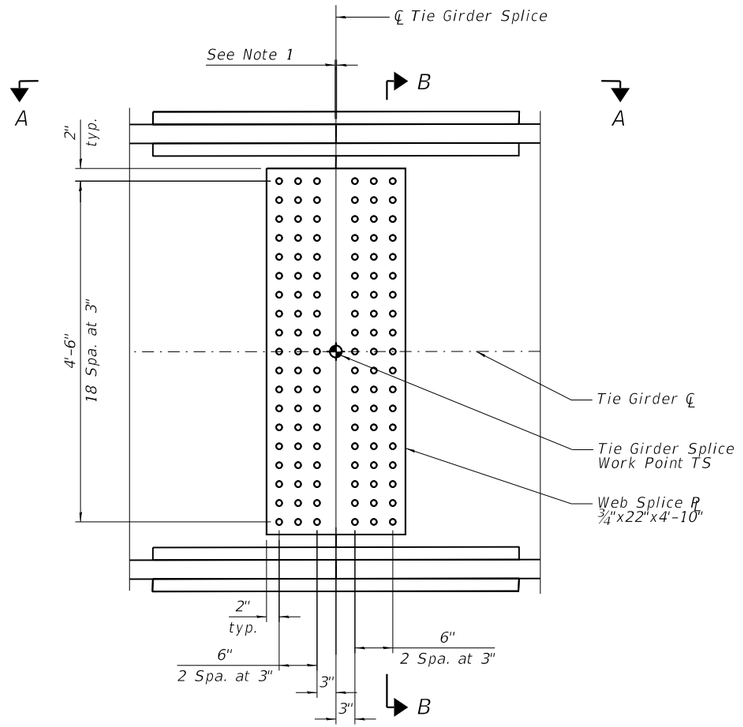
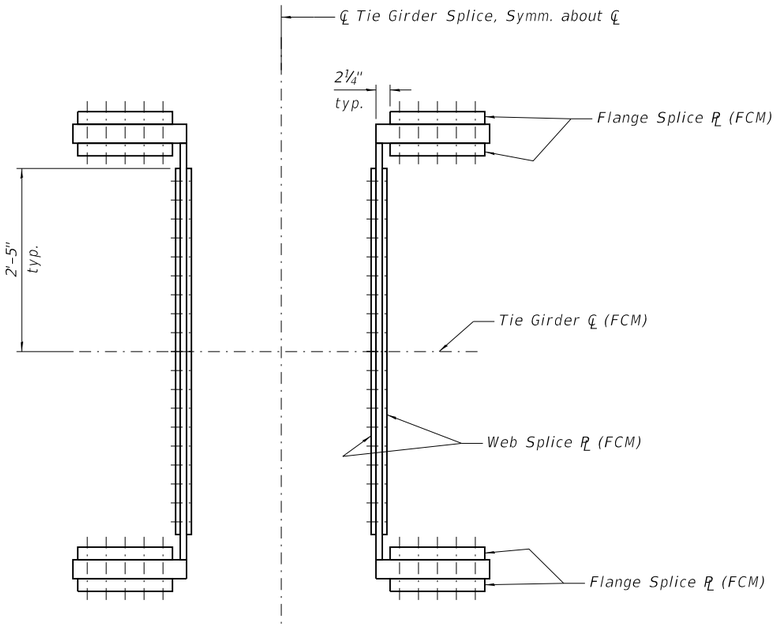
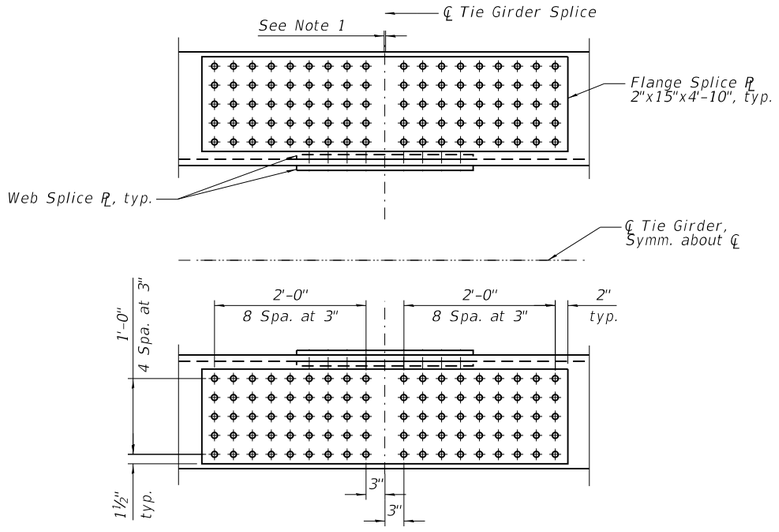


TYPICAL TIE GIRDER SPLICE DETAIL

Provide at TS2 to TS11



SECTION B-B



SECTION A-A

(Top Flange shown, Bottom Flange similar)

Notes:

1. Provide gap between plates not less than 1/32" or greater than 1/8". Fill with clear silicone caulk suitable for structural steel after erection and final coat of paint.

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TIE GIRDER DETAILS - UNIT 5, 1 OF 5
STRUCTURE NO. 090-0180
SHEET S-226 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1134
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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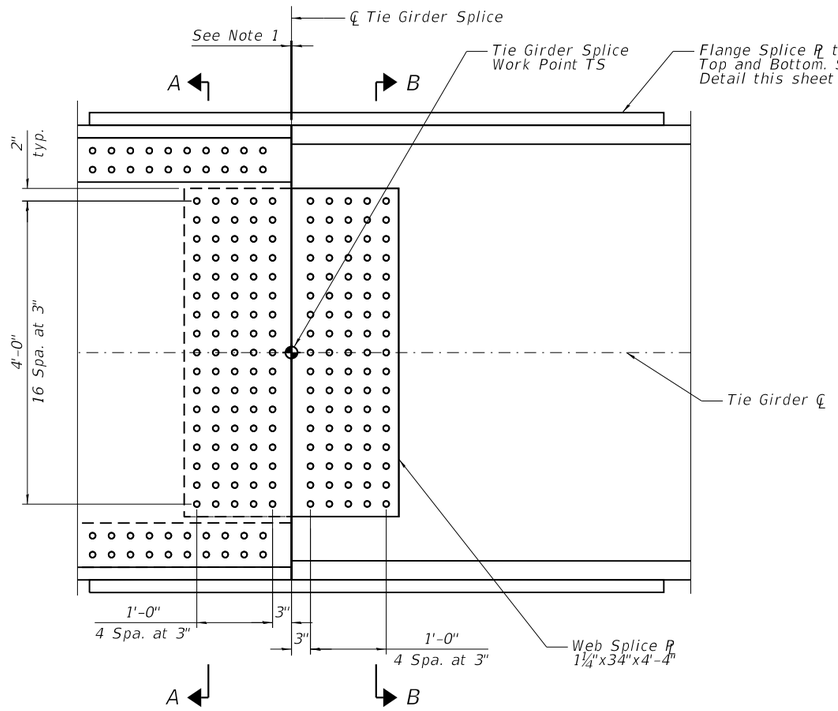
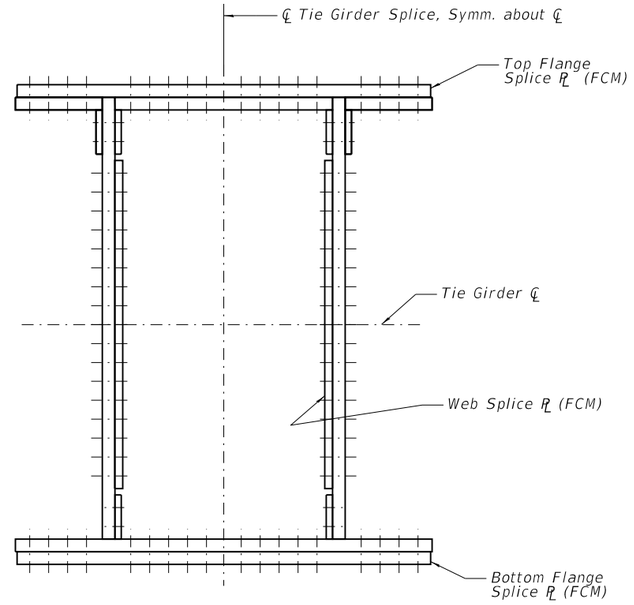


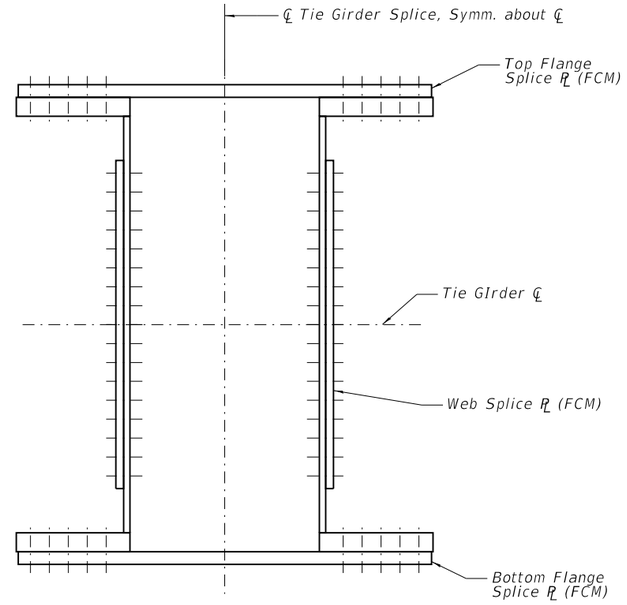
TIE GIRDER AT KNUCKLE SPLICE DETAIL

Provide at TS1 and TS12



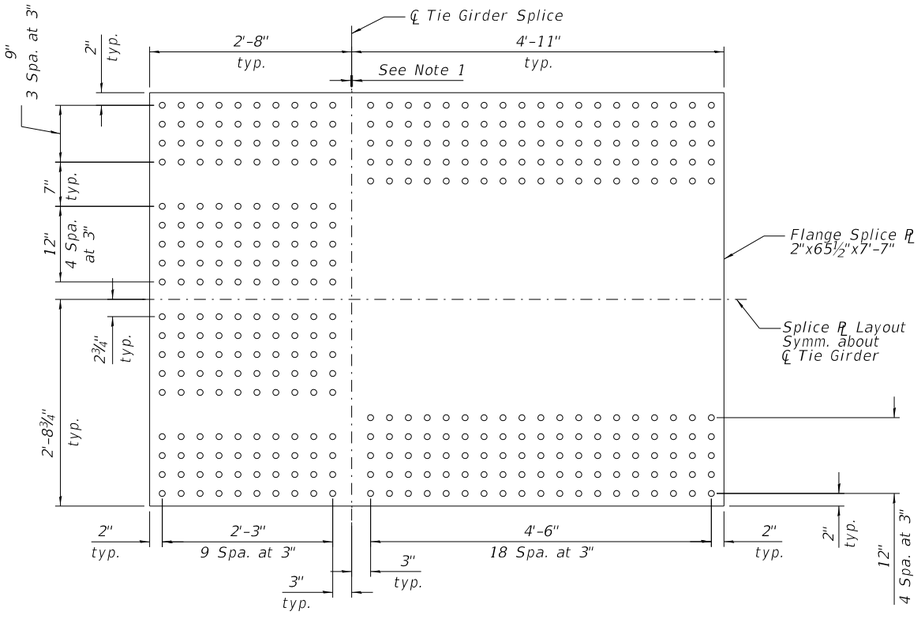
SECTION A–A

(See Knuckle Sheets for typical Details)



SECTION B–B

(See Tie Girder Sheets for typical Details)



FLANGE SPLICE PL DETAIL

(Typical Top and Bottom)

Notes:

1. *Provide gap between plates not less than 1/32" or greater than 1/8". Fill with clear silicone caulk suitable for structural steel after erection and final coat of paint.*

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TIE GIRDER DETAILS - UNIT 5, 2 OF 5
STRUCTURE NO. 090-0180
SHEET S-227 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1135
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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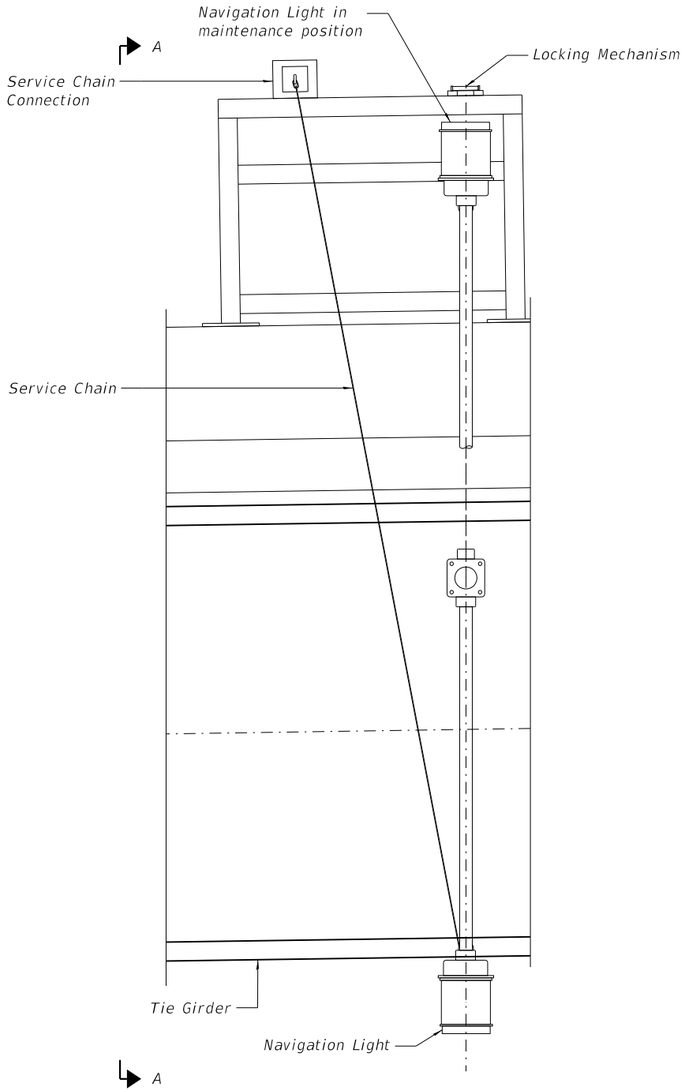
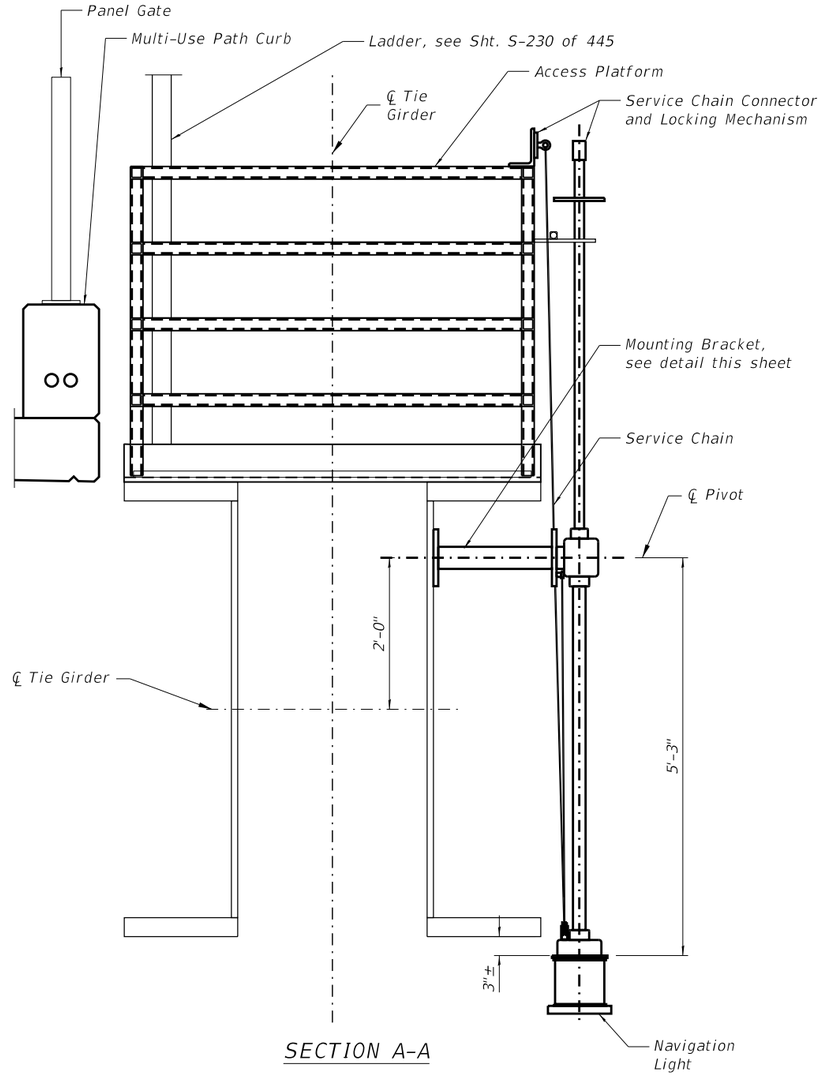


TYPICAL SOUTH NAVIGATION LIGHT DETAIL

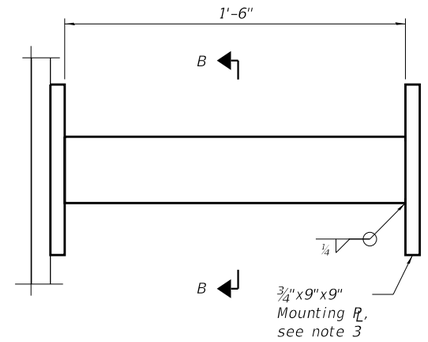
(South side of bridge at 2 locations, bridge rail omitted for clarity)



SECTION A-A

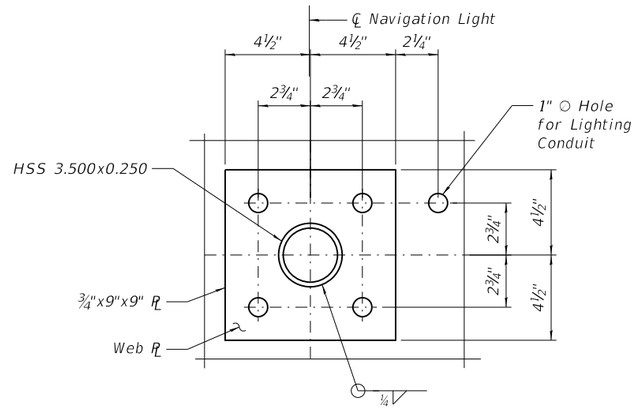
	Color	℄ Navigation Light	Station Offset (See note 8)
North	Red	213+137.50	1.75
	Green	213+392.52	1.75
	Red	213+647.54	1.75
South	Red	213+164.46	-1.75
	Green	213+423.29	NA
	Red	213+674.50	-1.75

NAVIGATION LIGHT LAYOUT



MOUNTING BRACKET DETAIL

(6 Total)



SECTION B-B

NOTES:

1. See Navigation Lighting in Electrical plans for conduit, junction boxes, and other details not shown.
2. The navigation light mounting bracket and service chain connection detail, including bolt and stud attachments to tie girder and parapet, shall be included in the cost of Structural Steel. The cost for all other items, including the navigation light, locking swivel suspension assembly, service chain, and connections to the mounting bracket and service chain connection detail, shall be included in Waterway Obstruction Warning Luminaire, LED.
3. Contractor to coordinate navigation light assembly connection to the mounting bracket and the connection of service chain and locking mechanism to the maintenance platform or bridge rail.
4. Contractor to field verify location of service chain connection details.
5. Provide 7/8" bolts at all locations.
6. All structural steel shall be ASTM A709 or ASTM A1085 and shall be galvanized in accordance with Special Provision, "Hot Dip Galvanizing for Structural Steel".
7. Provide 1" galvanized steel floor grating rated for 100 psf with integral 4" toe board at each end. Connect grating to platform angles per manufacturer's recommendations.
8. Offset is from CL of Navigation Light to CL of Platform.
9. See Sht. S-229 of 445 for Navigation Lights at other locations.
10. See Sht. S-230 of 445 for Acces Platform and Gate details.

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TIE GIRDER DETAILS - UNIT 5, 3 OF 5
STRUCTURE NO. 090-0180

SHEET S-228 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1136
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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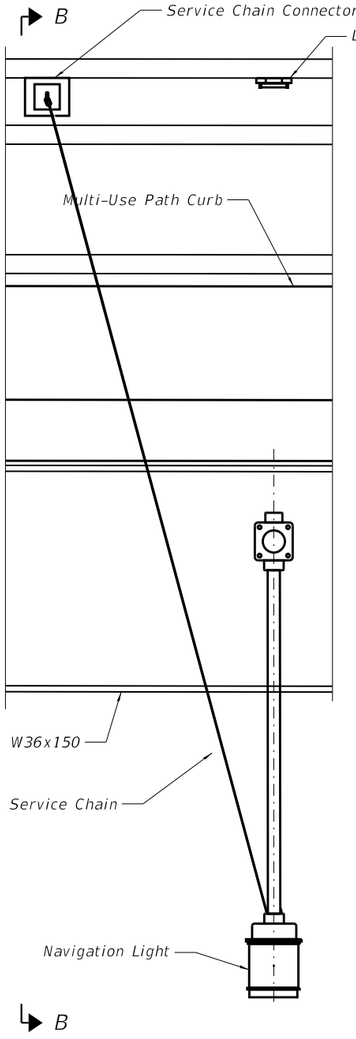
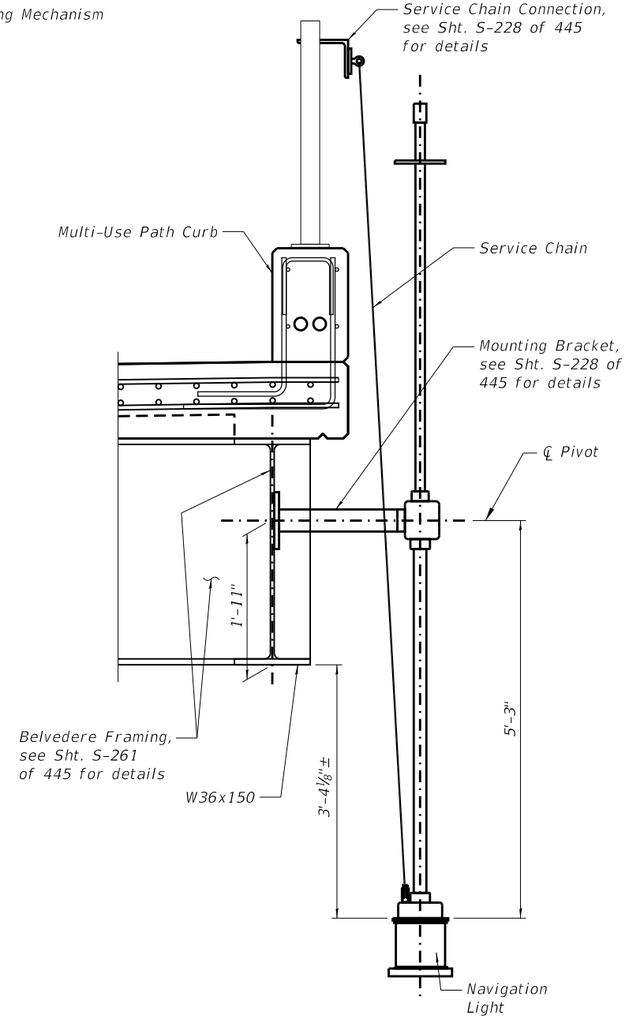
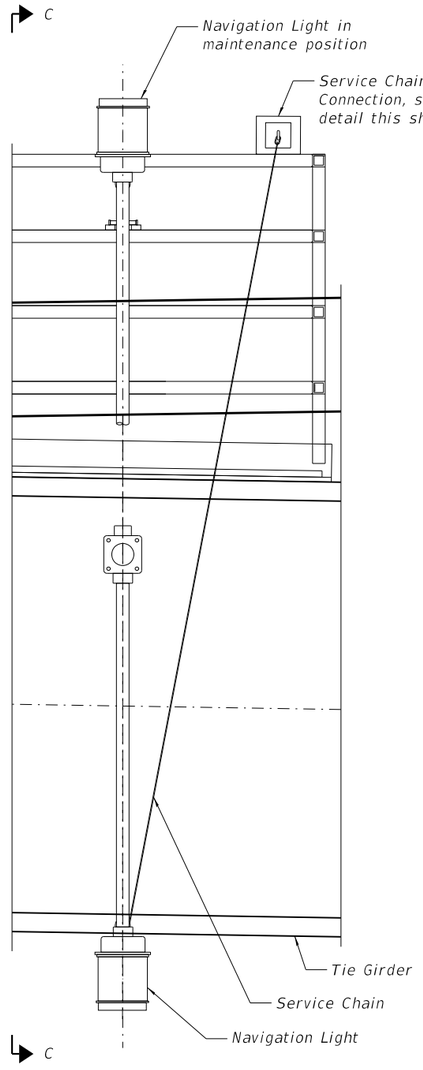


BELVEDERE NAVIGATION LIGHT DETAIL

(South side of bridge, 1 location)

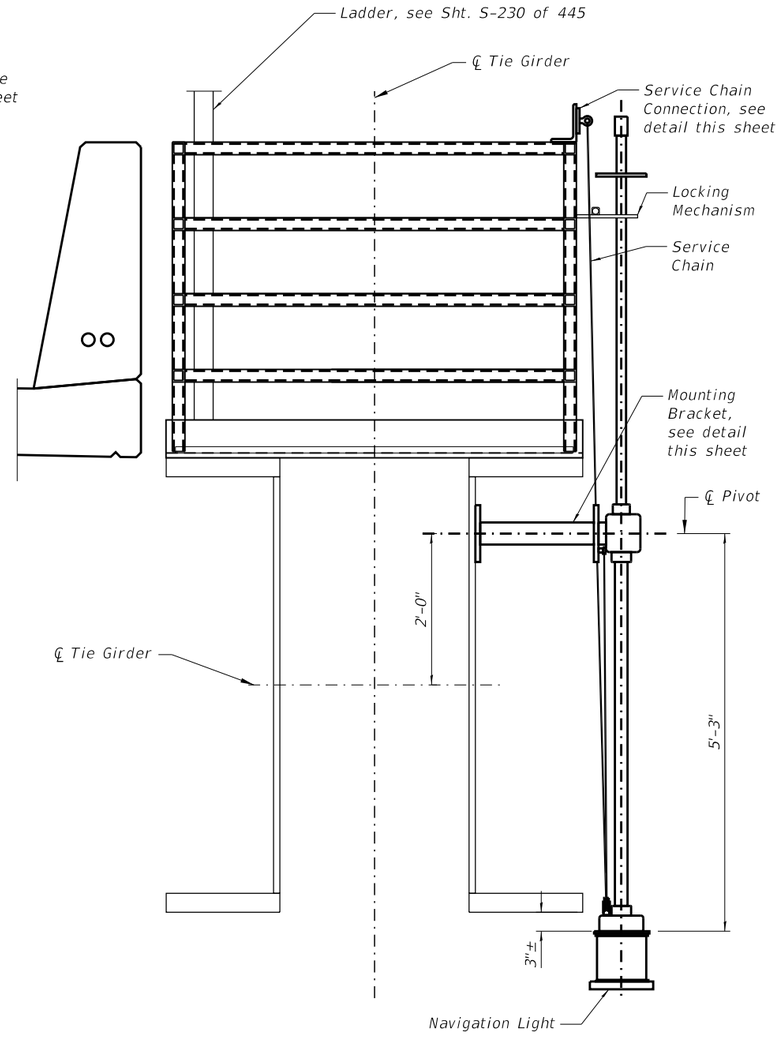


SECTION B-B

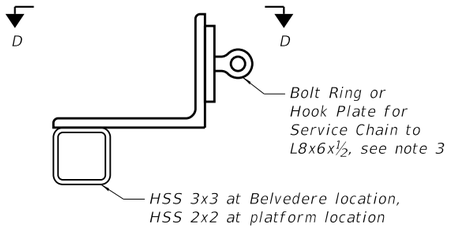


TYPICAL NOTRTH NAVIGATION LIGHT DETAIL

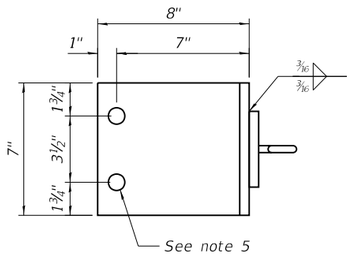
(North side of bridge, 3 locations)



SECTION C-C



SERVICE CHAIN CONNECTION DETAIL



SECTION D-D

See notes on Sht. S-228 of 445

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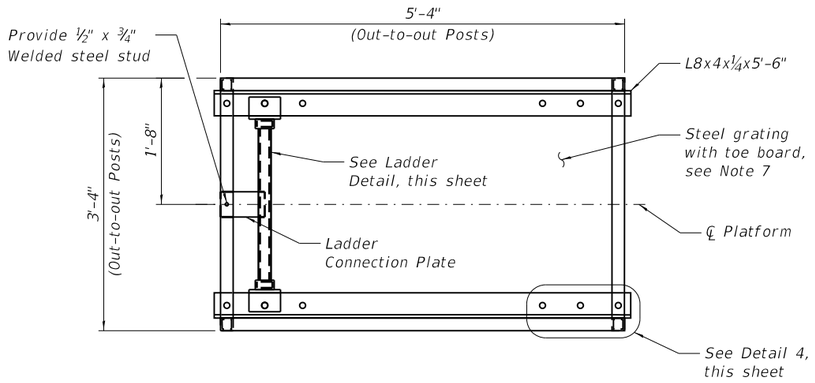
TIE GIRDER DETAILS - UNIT 5, 4 OF 5
STRUCTURE NO. 090-0180

SHEET S-229 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1137
		CONTRACT NO. 68B46		
		ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)



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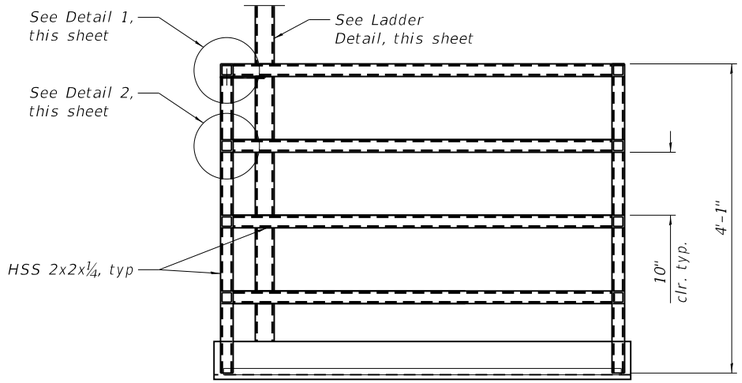
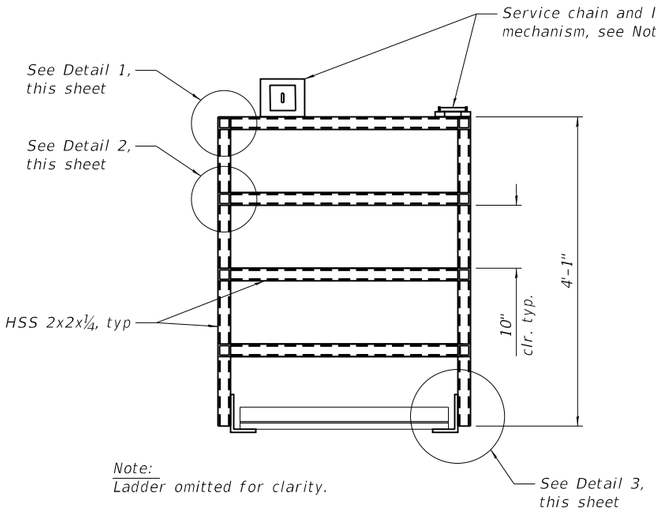
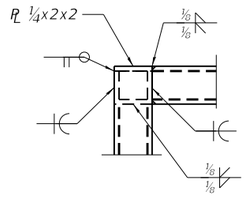


MAINTENANCE ACCESS – FRONT

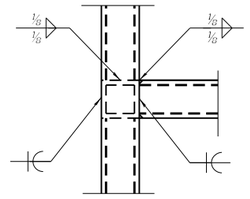


Note:
Ladder omitted for clarity.

MAINTENANCE ACCESS – SIDE



DETAIL 1



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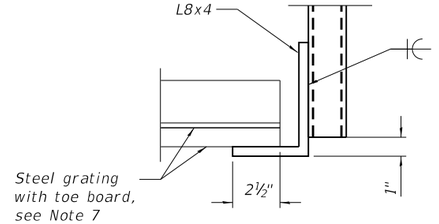

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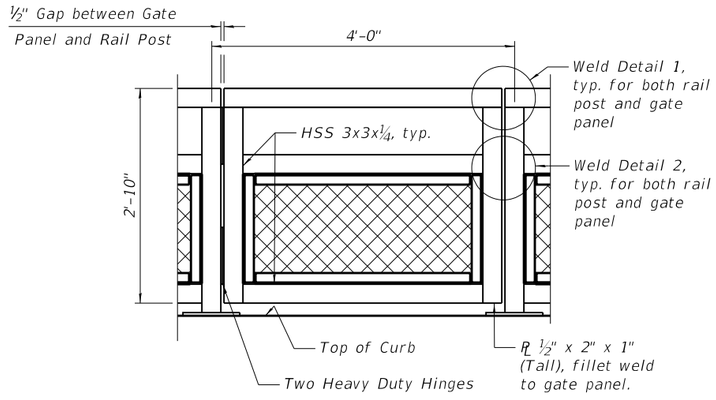
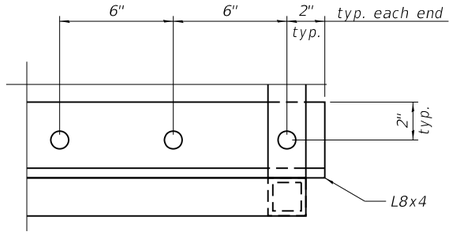


See notes on Sht. S-228 of 445

GATE DETAIL



DETAIL 4

LADDER DETAIL

Gate Notes:
1. See Sht. S-154 of 445 for information not shown, including geometry, chain link fabric and associated details, surface finish, and notes.
2. See Sht. S-154 of 445 for HSS weld details.
3. Contractor to coordinate hinge and lock selection with Engineer. Hinges to be placed to allow gate to open towards the sidewalk.
4. Contractor to coordinate adjustment of gate panel and gaps based on hinge selection.

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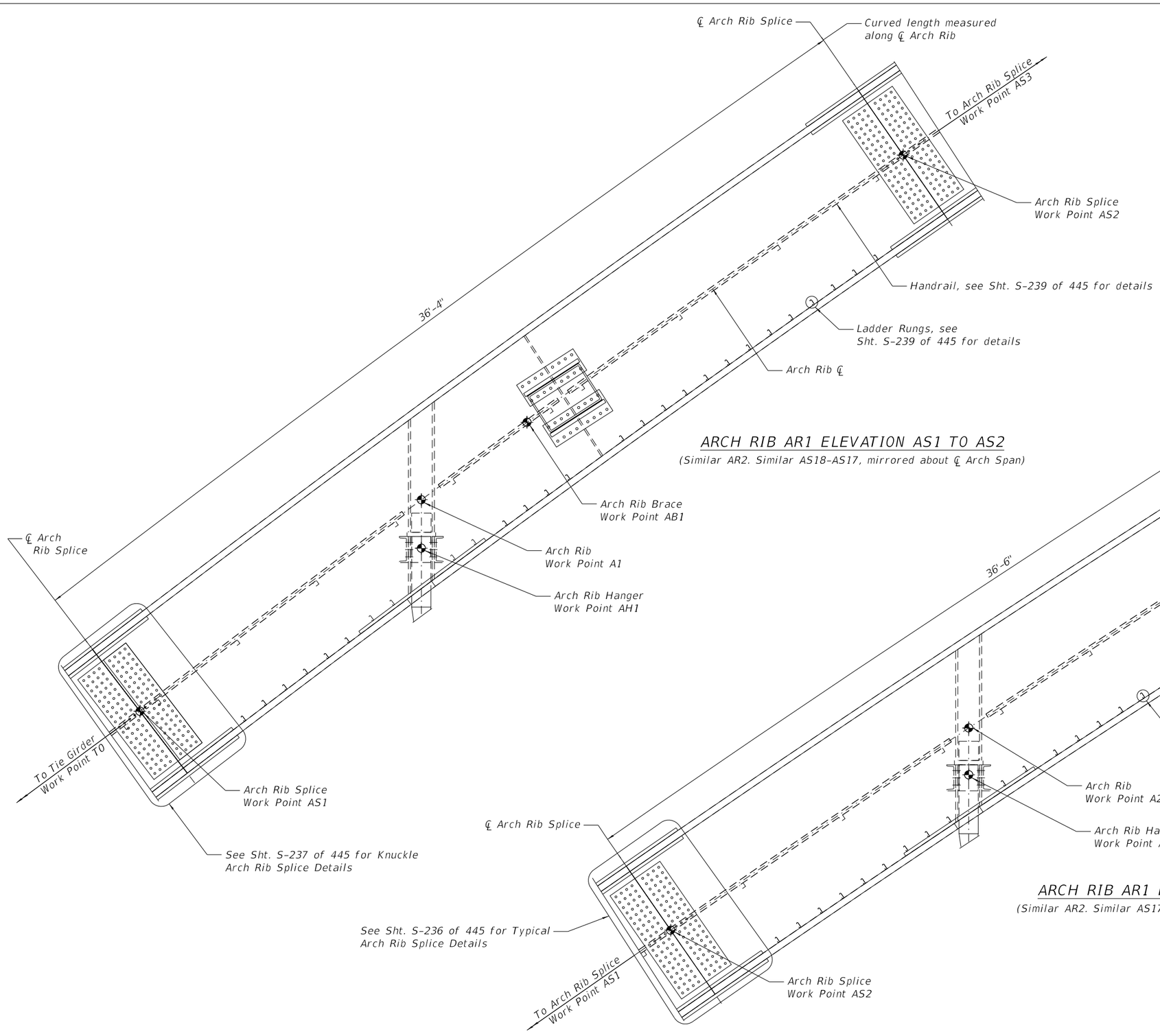
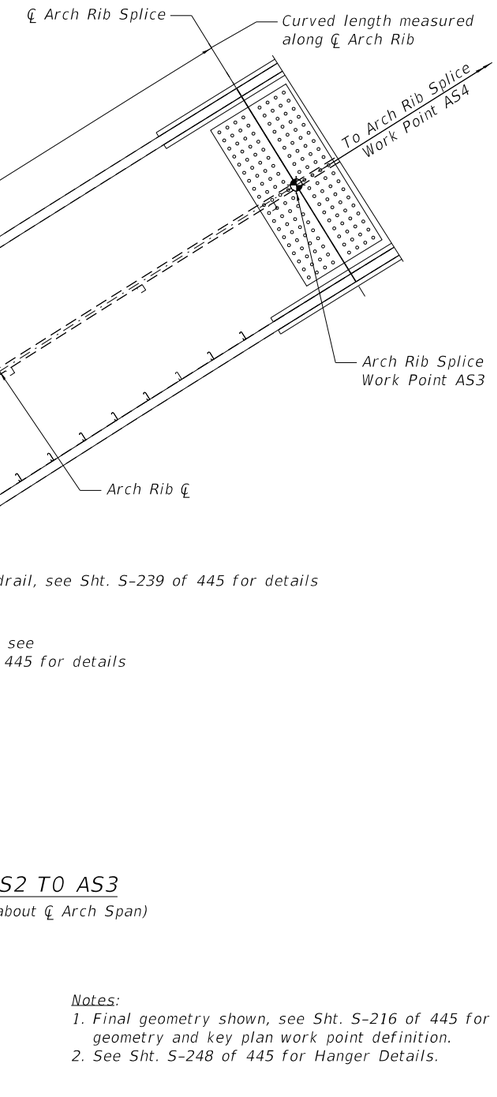
TIE GIRDER DETAILS - UNIT 5, 5 OF 5
STRUCTURE NO. 090-0180
SHEET S-230 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1138
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



ARCH RIB AR1 ELEVATION AS1 TO AS2

(Similar AR2. Similar AS18-AS17, mirrored about ℄ Arch Span)



ARCH RIB AR1 ELEVATION AS2 TO AS3

(Similar AR2. Similar AS17-AS16, mirrored about ℄ Arch Span)

Notes:
1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.
2. See Sht. S-248 of 445 for Hanger Details.

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ARCH RIB ELEVATION - UNIT 5, 1 OF 5
STRUCTURE NO. 090-0180
SHEET S-231 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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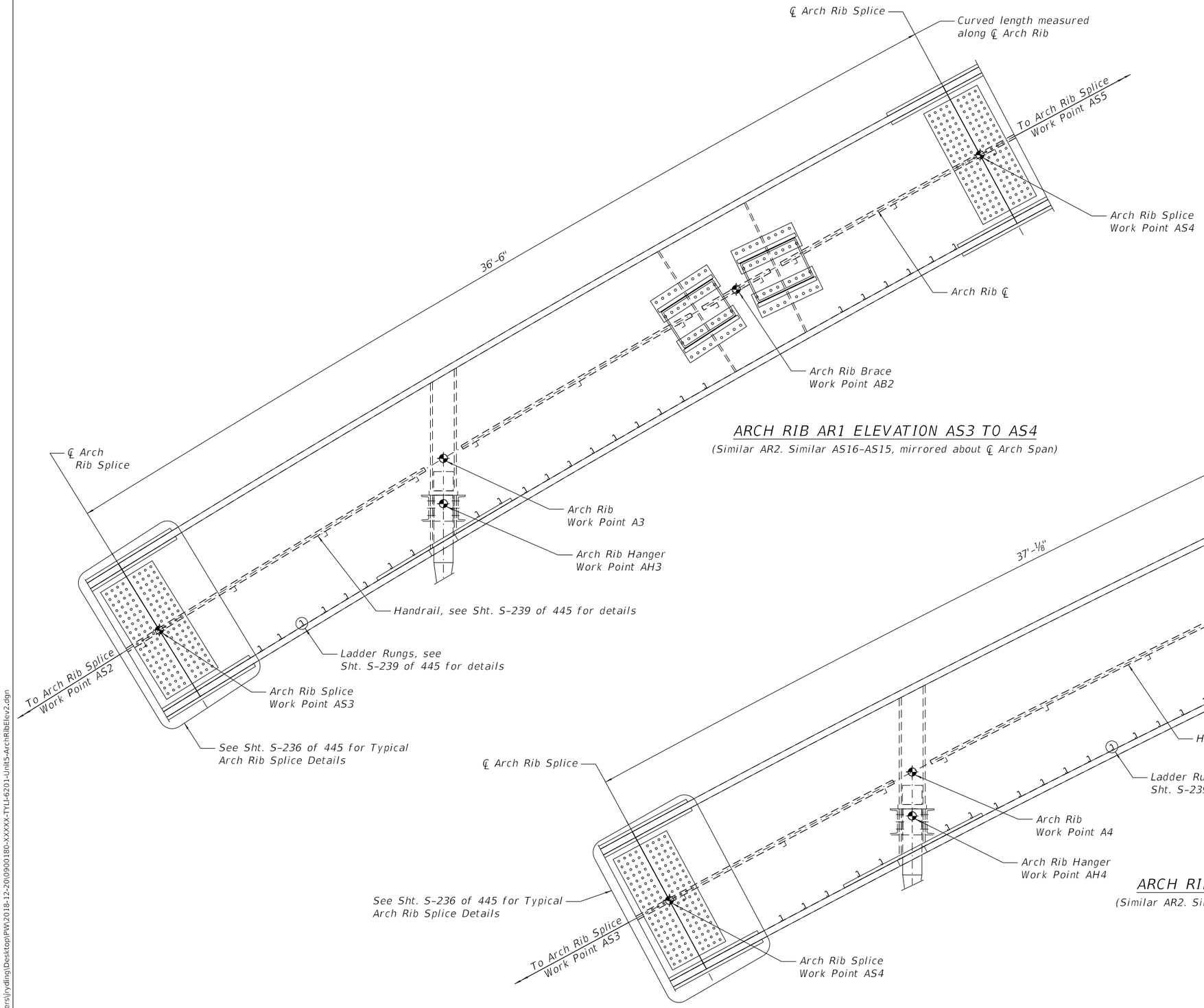

ARCH RIB AR1 ELEVATION AS3 TO AS4

(Similar AR2. Similar AS16-AS15, mirrored about ℄ Arch Span)

ARCH RIB AR1 ELEVATION AS4 TO AS5

(Similar AR2. Similar AS15-AS14, mirrored about ℄ Arch Span)

Notes:
1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.
2. See Sht. S-248 of 445 for Hanger Details.

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ARCH RIB ELEVATION - UNIT 5, 2 OF 5
STRUCTURE NO. 090-0180

SHEET S-232 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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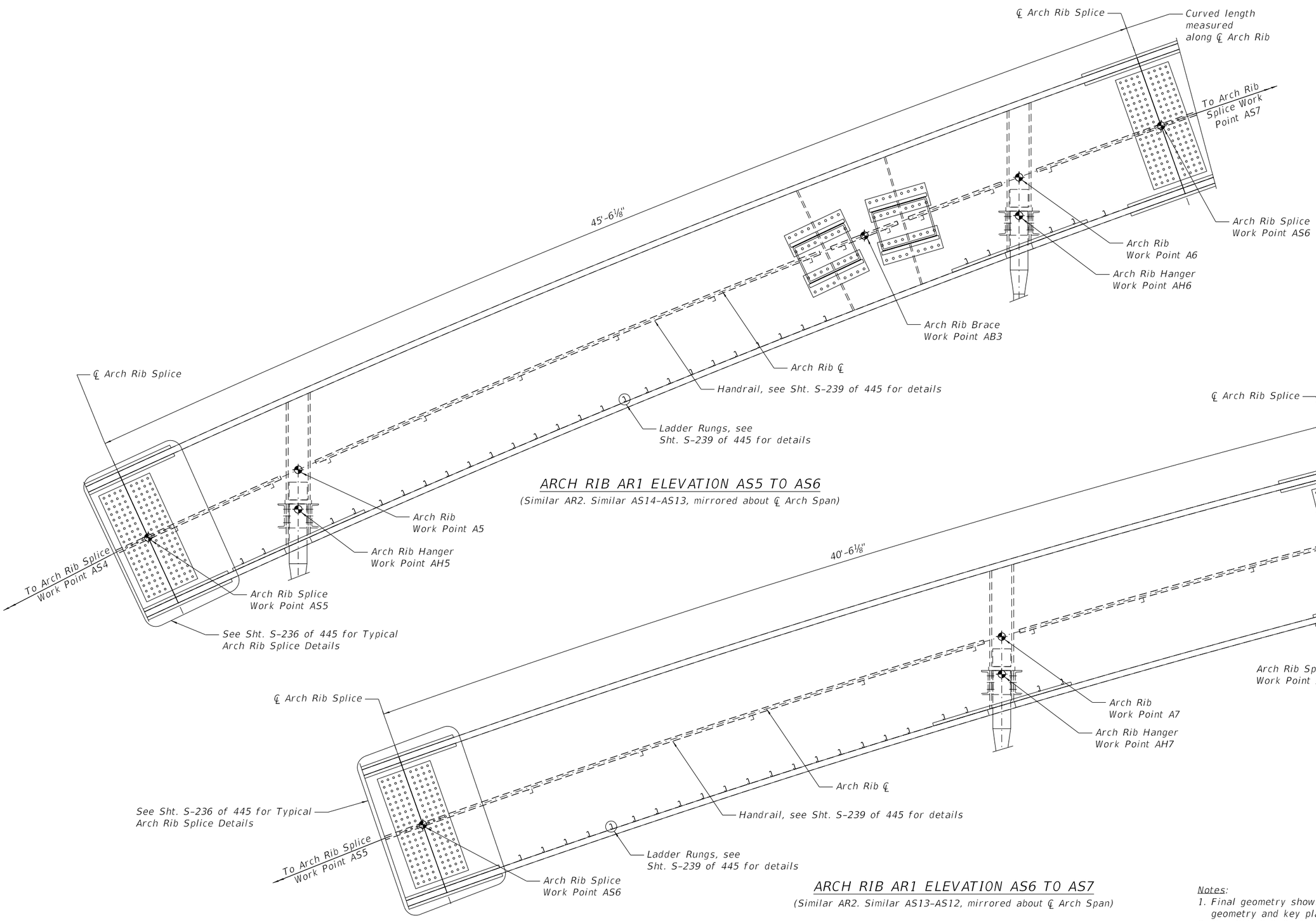

ARCH RIB AR1 ELEVATION AS5 TO AS6

(Similar AR2. Similar AS14-AS13, mirrored about ℄ Arch Span)

ARCH RIB AR1 ELEVATION AS6 TO AS7

(Similar AR2. Similar AS13-AS12, mirrored about ℄ Arch Span)

Notes:
1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.
2. See Sht. S-248 of 445 for Hanger Details.

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F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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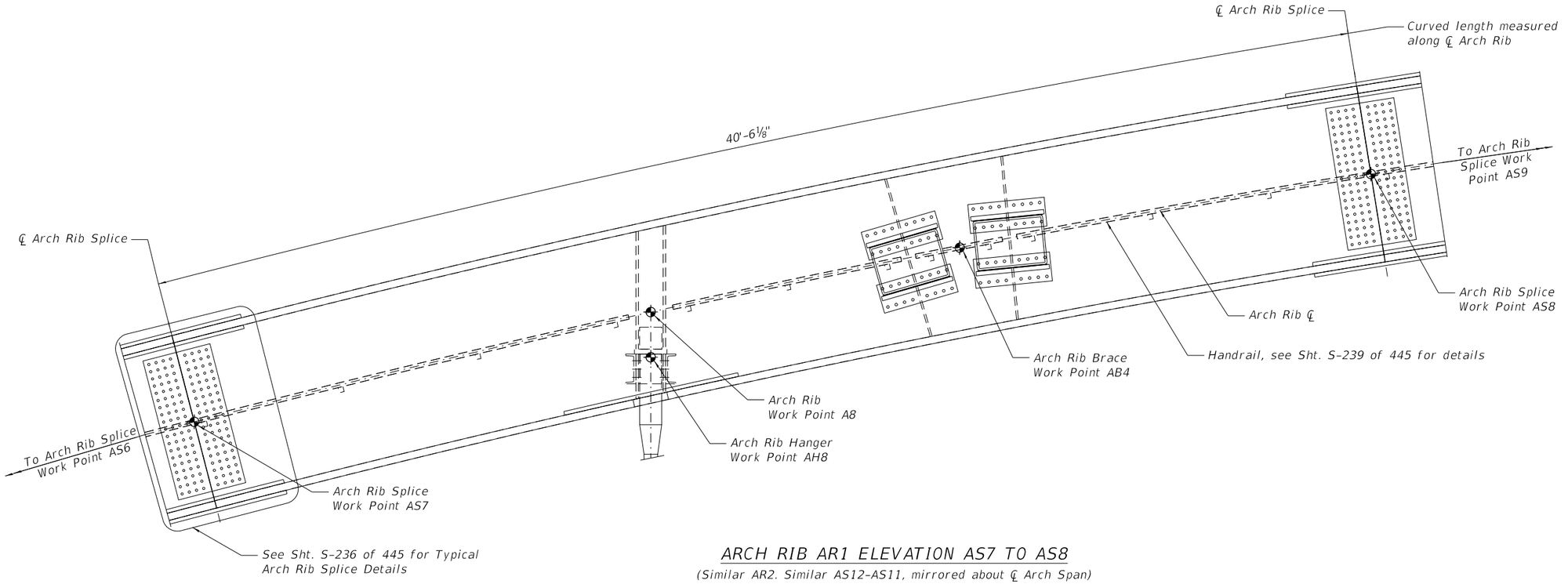
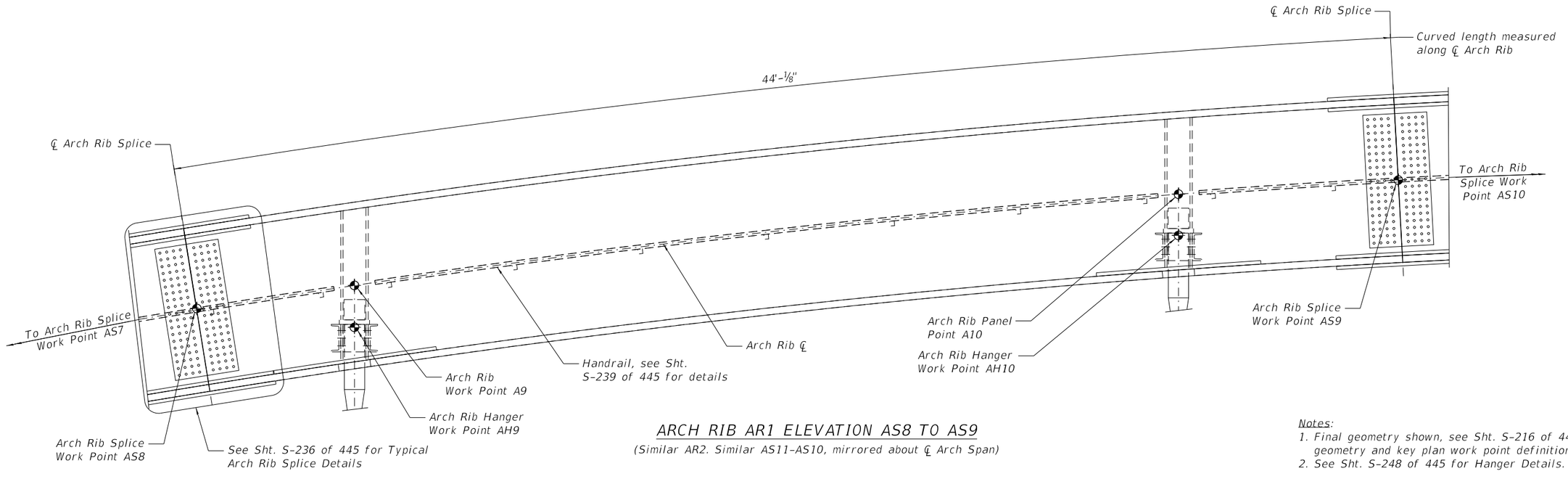


ARCH RIB AR1 ELEVATION AS7 TO AS8

(Similar AR2. Similar AS12-AS11, mirrored about ℄ Arch Span)



ARCH RIB AR1 ELEVATION AS8 TO AS9

(Similar AR2. Similar AS11-AS10, mirrored about ℄ Arch Span)

Notes:
1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.
2. See Sht. S-248 of 445 for Hanger Details.

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ARCH RIB ELEVATION - UNIT 5, 4 OF 5
STRUCTURE NO. 090-0180

SHEET S-234 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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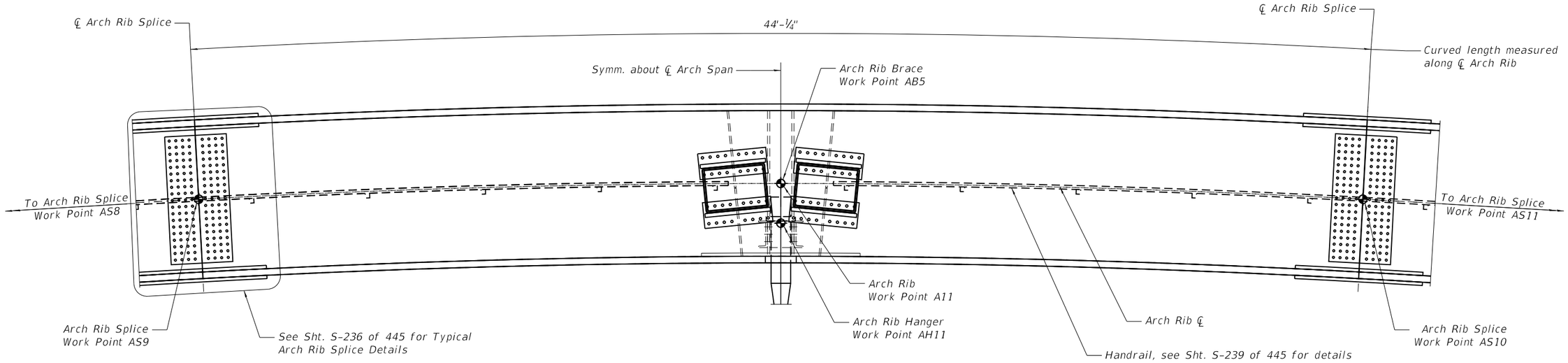

ARCH RIB AR1 ELEVATION AS9 TO AS10

(Similar AR2)

Notes:
1. Final geometry shown, see Sht. S-216 of 445 for geometry and key plan work point definition.
2. See Sht. S-248 of 445 for Hanger Details.

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ARCH RIB ELEVATION - UNIT 5, 5 OF 5
STRUCTURE NO. 090-0180
SHEET S-235 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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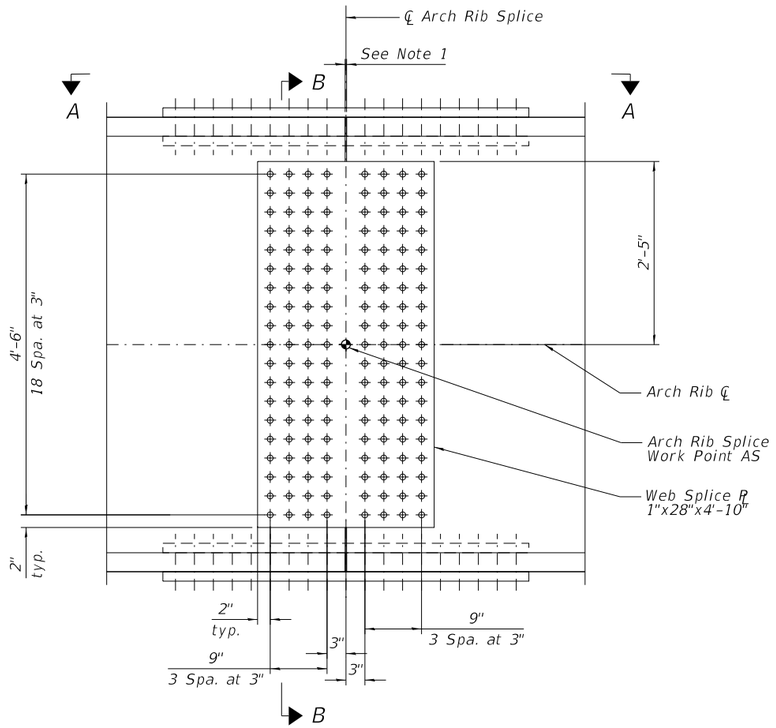
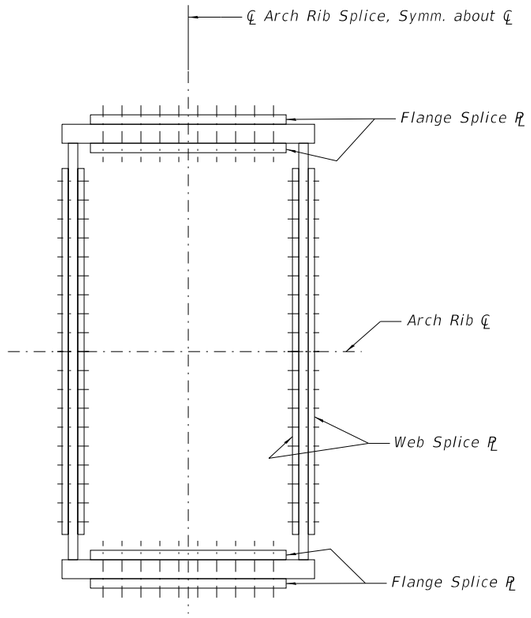
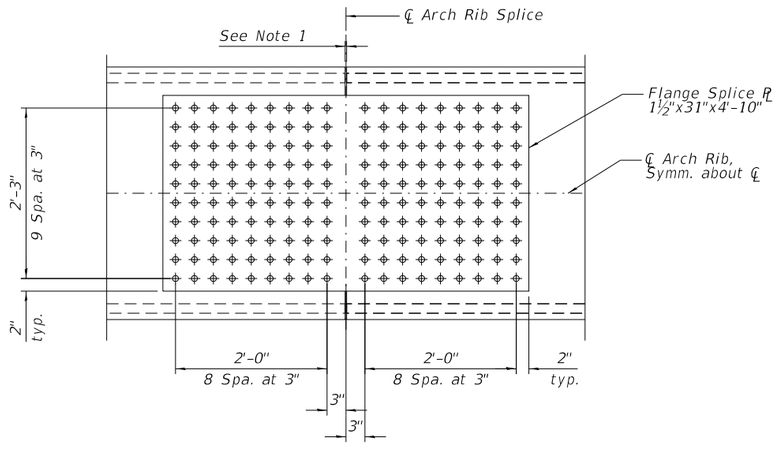


TYPICAL ARCH RIB SPLICE DETAIL

Provide at AS2 to AS17



SECTION B-B



SECTION A-A

(See Note 3)

Notes:

1. *Provide gap between plates not less than 1/32" or greater than 1/8". Fill with clear silicone caulk suitable for structural steel after erection and final coat of paint.*
2. *Bend flange splice plates to match curvature of arch rib.*
3. *Top Flange shown, Bottom Flange similar. Web Splice Plates omitted for clarity.*

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ARCH RIB DETAILS - UNIT 5, 1 OF 4
STRUCTURE NO. 090-0180

SHEET S-236 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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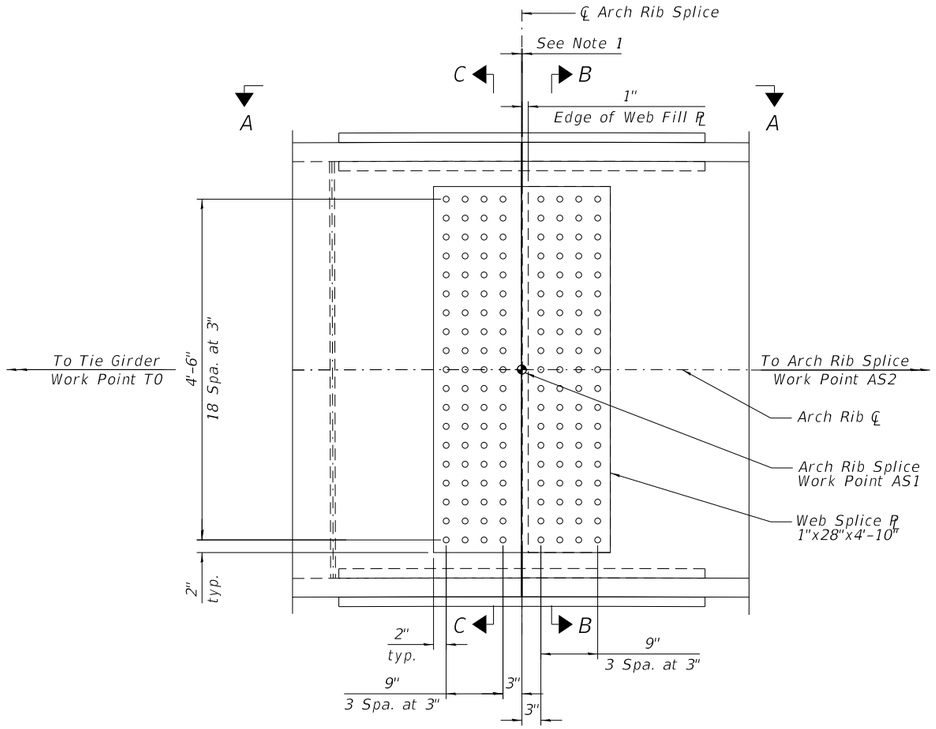
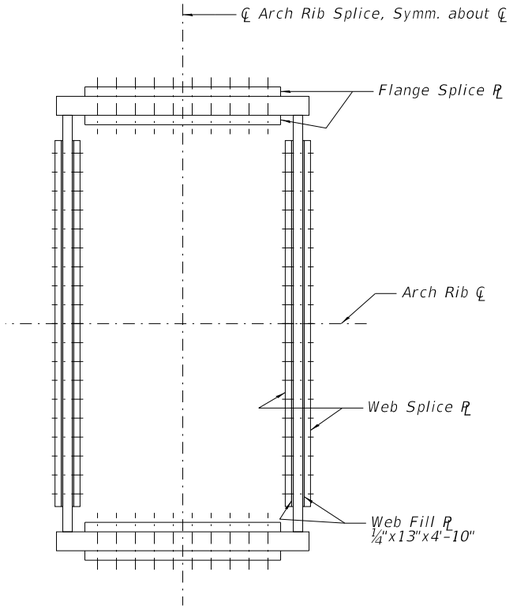
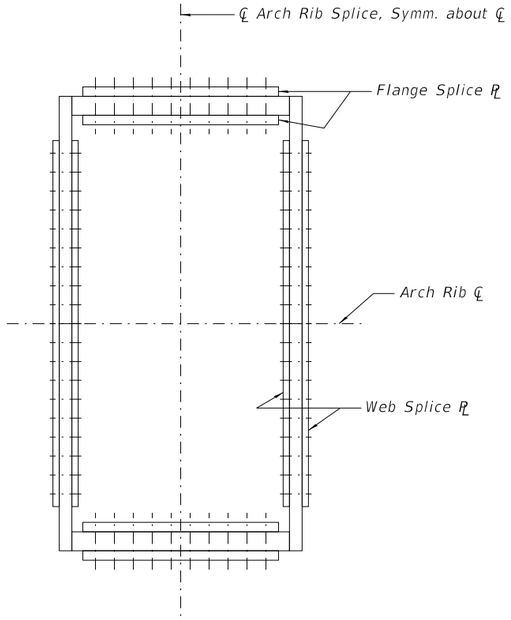


KNUCKLE ARCH RIB DETAIL AS1

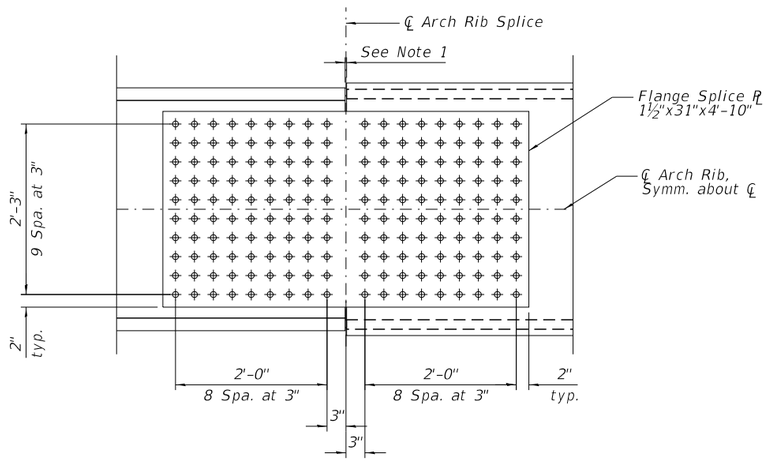
(Similar AS18, mirrored about ℄ Arch Span)



SECTION B-B



SECTION C-C



SECTION A-A

(See Note 3)

Notes:

1. Provide gap between plates not less than 1/32" or greater than 1/8". Fill with clear silicone caulk suitable for structural steel after erection and final coat of paint.
2. Bend flange splice plates to match curvature of arch rib.
3. Top Flange shown, Bottom Flange similar. Web Splice Plates omitted for clarity.

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ARCH RIB DETAILS - UNIT 5, 2 OF 4
STRUCTURE NO. 090-0180
SHEET S-237 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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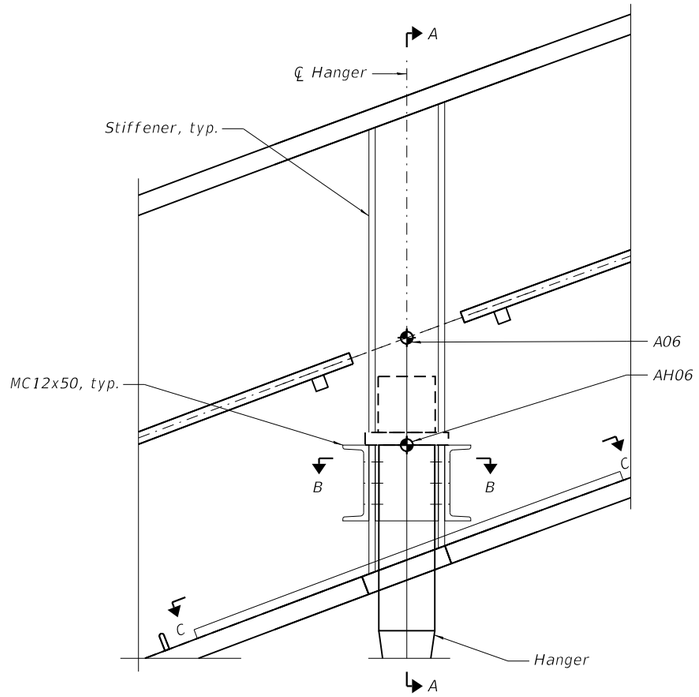
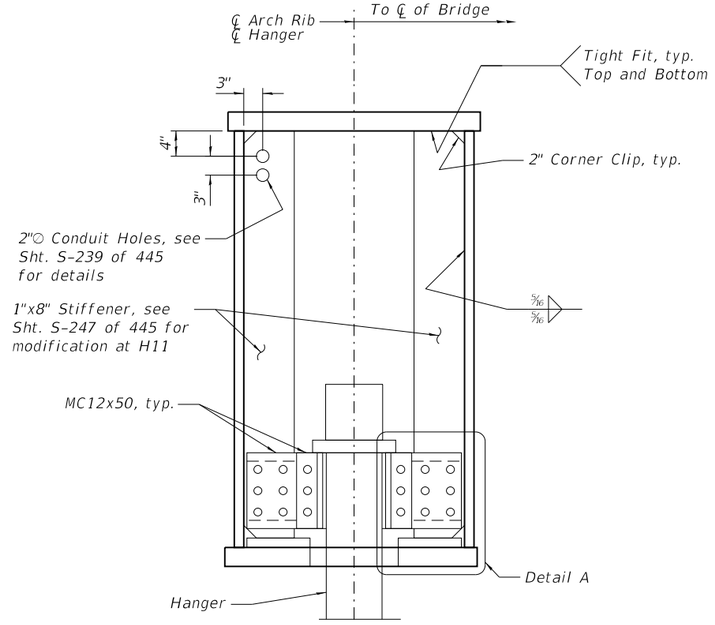
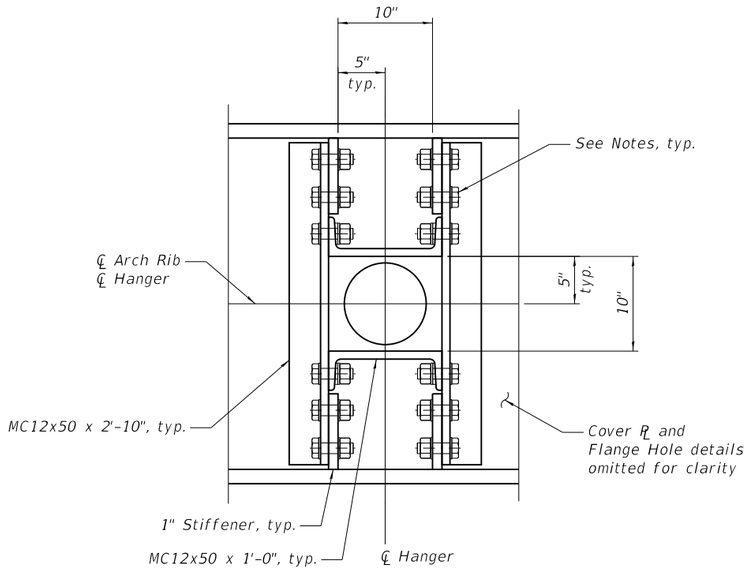


UPPER HANGER CONNECTION DETAIL

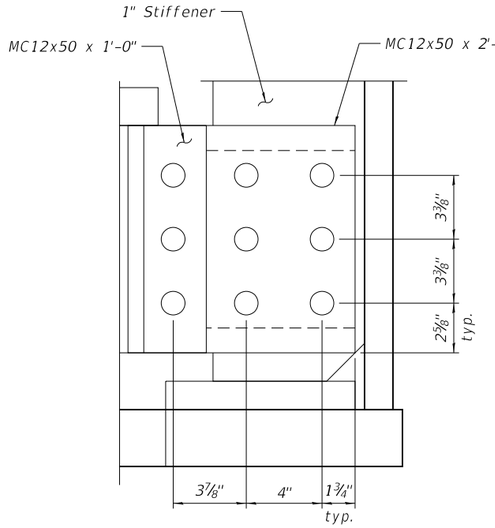
(A06–H06 shown, similar elsewhere)



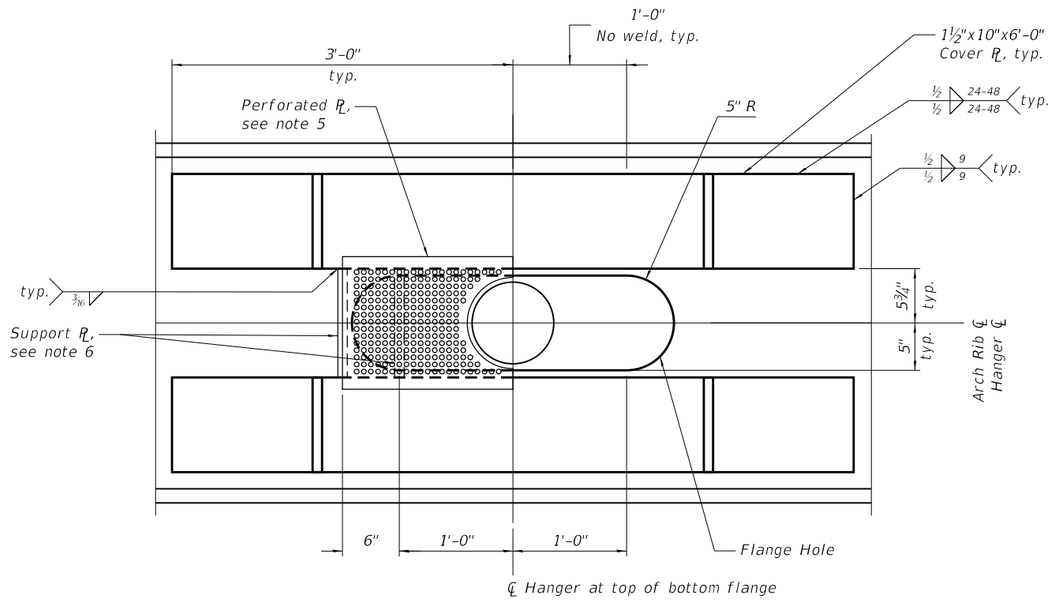
SECTION A–A



SECTION B–B



DETAIL A



SECTION C–C

Notes:

1. Provide 1⅛" diameter ASTM F3125 A325 high–strength structural fasteners in upper hanger connection with threads excluded from the shear plane.
2. Provide short slot holes 1¼" in width x 1½" in length, with length measured perpendicular to web of the arch rib, in the stiffener plate. Provide standard 1¼" diameter holes in all other plies of the connections.
3. Provide ASTM F436 washer under both head and nut of all high–strength fasteners, with a tapered washer for fasteners through flange of channel member.
4. Center hole through arch rib bottom flange at top of flange.
5. Provide 3/16"x14"x1'–6" perforated cover plate each side of CL Hanger. Perforation shall consist of ½" dia. holes at a ¾" spaced grid over the full extents of the plate. Cut plate to accommodate round hanger, adjusted for arch inclination, with permissible gap of ¼". Attach to Cover Plate with ¼"∅x¾" stainless steel cap screws at a maximum spacing of 0'–6".
6. Provide 3/16" x 1" support plates each side of CL Hanger. Orientate support plates with the 3/16" side flush with the top of the Cover PL.

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ARCH RIB DETAILS - UNIT 5, 3 OF 4
STRUCTURE NO. 090-0180
SHEET S-238 OF 445 SHEETS

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	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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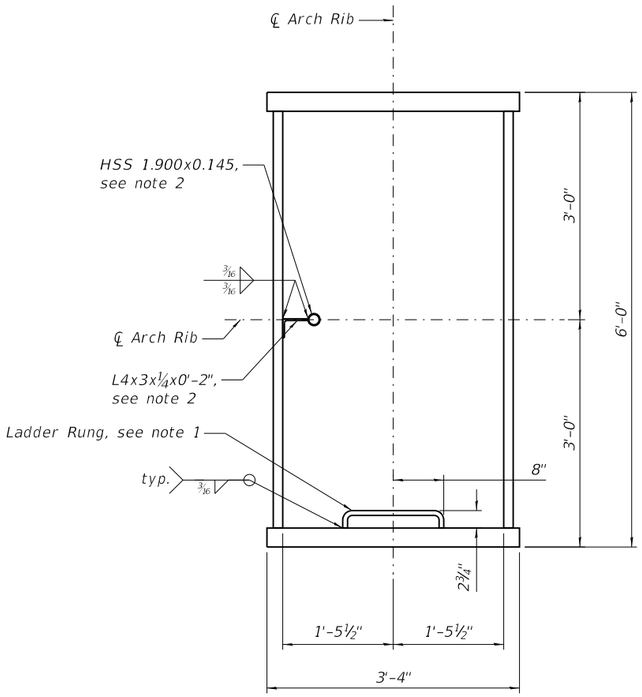

ARCH RIB DETAILS

NOTES:

1. Provide ladder rungs bent from 3/4" diameter rod spaced at a maximum of 1'-0" from knuckle access ladders to arch rib work point A07 and A11. Discontinue ladder rungs across bolted arch rib flange splice plates, between diaphragm plates at arch rib brace connections, and between stiffener plates at arch rib hanger connections with the adjacent rung spaced between 0'-6" and 1'-0" from obstruction.
2. Provide handrail full length of arch rib between knuckle access ladders. Locate handrail on the outside arch web (opposite of arch rib brace) with angle support provided 0'-6" from the end of each segment and spaced at a maximum of 5'-0". Provide handrail between diaphragm plates at arch rib brace connections but discontinue between stiffener plates at arch rib hanger connections. Terminate handrail 0'-2" from each diaphragm or stiffener plate.
3. See Electrical Drawings for conduit, junction box, receptacle and lighting component details. Engineer shall approve the final location and attachment details of all electrical components prior to fabrication. Conduit may be placed in corner clip or supplemental holes shown at each diaphragm or stiffener plate.

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ARCH RIB DETAILS - UNIT 5, 4 OF 4
STRUCTURE NO. 090-0180
SHEET S-239 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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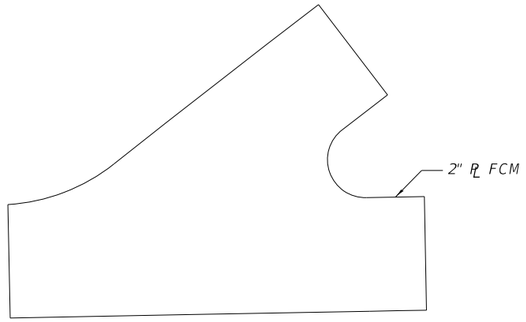
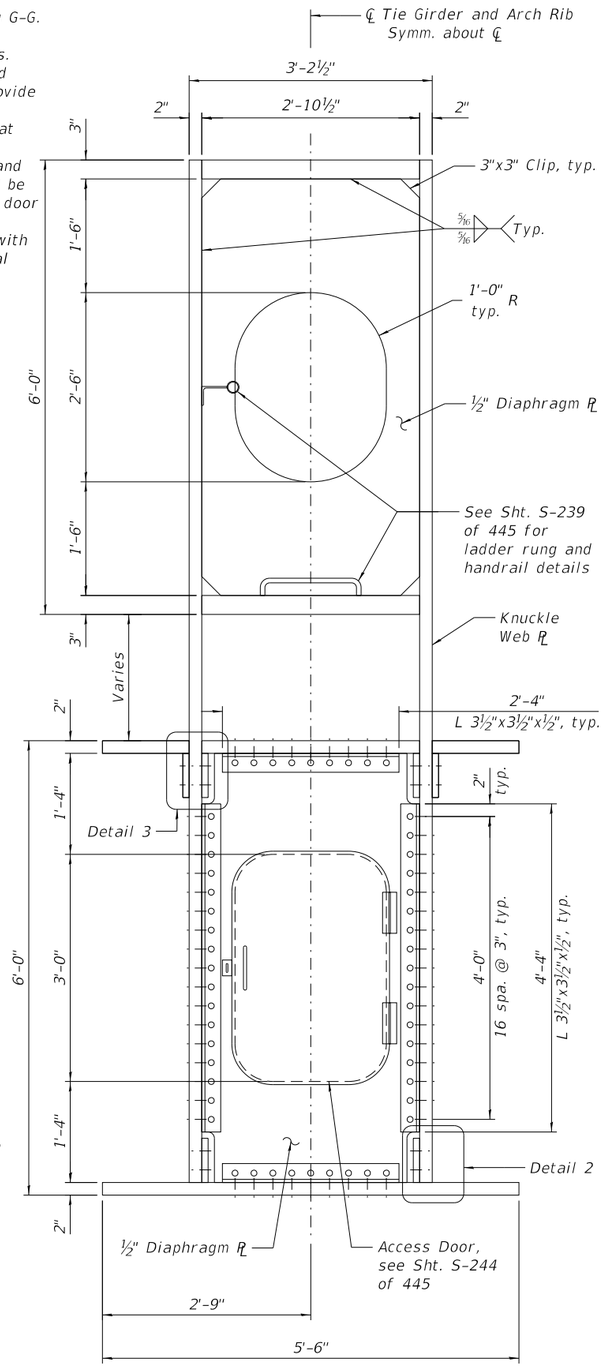


KNUCKLE WEB PLATE DETAIL

Notes:
1. See Shts. S-241 to S-243 of 445 for Sections A-A thru G-G.
2. See Sht. S-242 of 445 for Details 2 and 3.
3. Ground smooth all edges of all circular access openings.
4. Provide mill-to-bear finish between connection plate and bottom flange plate each side of bearing, otherwise provide a tight fit. Refer to Detail 2 on Sht. S-242 of 445.
5. Outside Elevation TG2 at Work Point T0 shown, similar at other locations.
6. The access ladder and connection angles, access door and diaphragm plate, and access door hinges and lock shall be hot dipped galvanized with the exterior surface of the door and diaphragm painted Blue, Munsell No. 10B 3/6. The surfaces shall be prepared and painted in accordance with Special Provision "Hot Dipped Galvanizing for Structural Steel".

KNUCKLE DETAIL
(See note 5)



VIEW H-H

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STATE OF ILLINOIS
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KNUCKLE DETAILS - UNIT 5, 1 OF 5
STRUCTURE NO. 090-0180
SHEET S-240 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1148
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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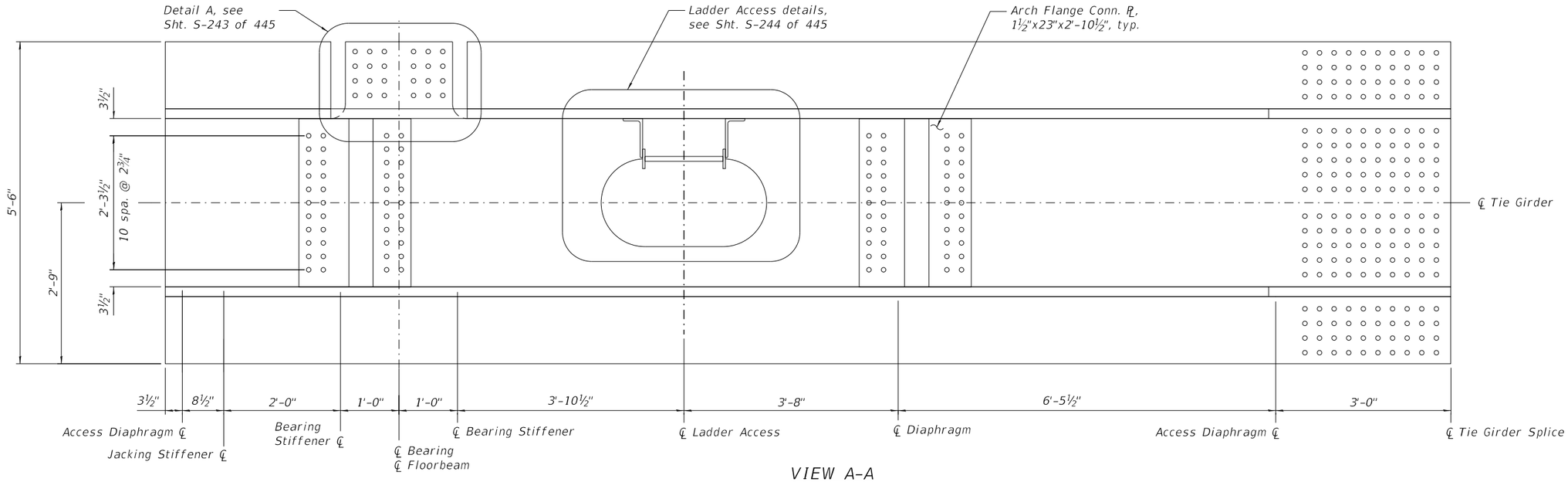
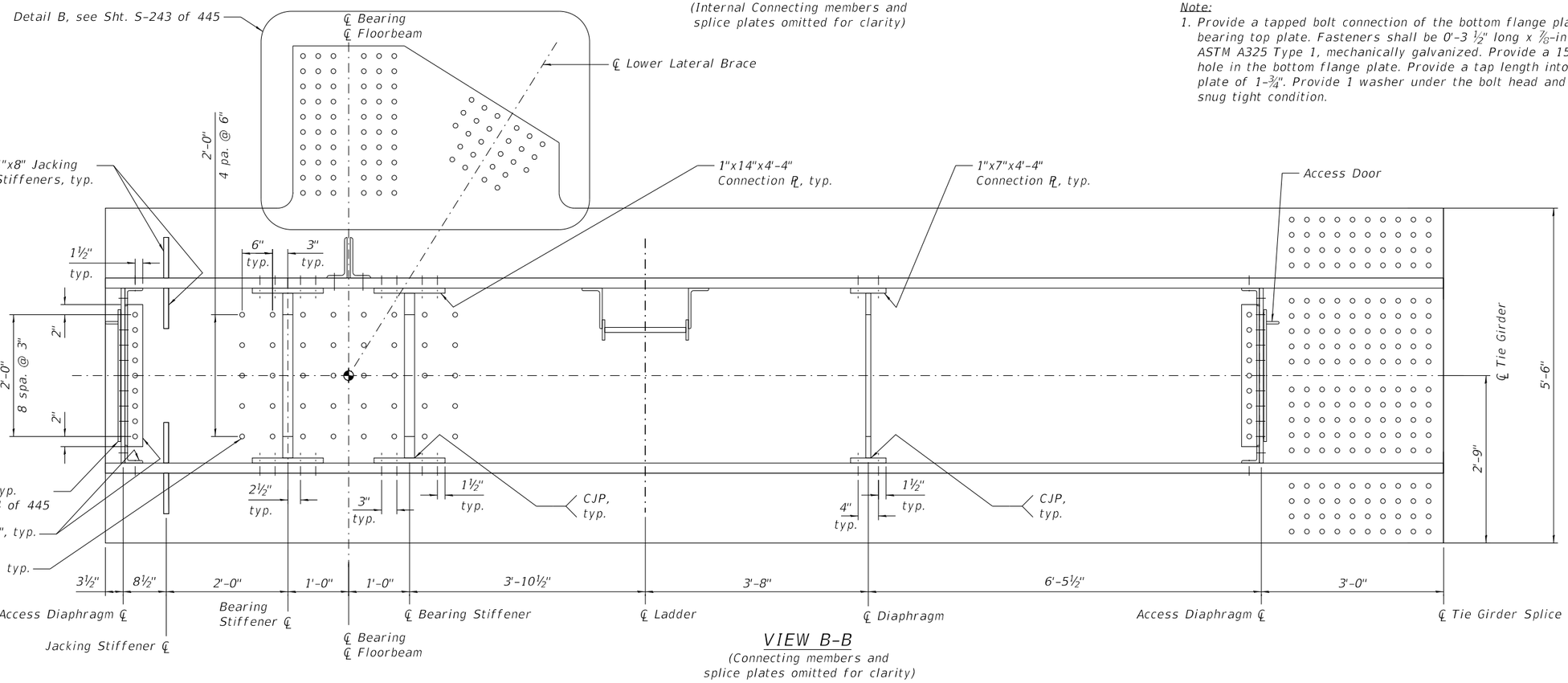


VIEW A-A

(Internal Connecting members and splice plates omitted for clarity)



VIEW B-B

(Connecting members and splice plates omitted for clarity)

Note:

1. *Provide a tapped bolt connection of the bottom flange plate to the bearing top plate. Fasteners shall be 0'-3 ½" long x ⅞-in diameter grade ASTM A325 Type 1, mechanically galvanized. Provide a 15/16-in diameter hole in the bottom flange plate. Provide a tap length into the top bearing plate of 1-¾". Provide 1 washer under the bolt head and install to a snug tight condition.*

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STATE OF ILLINOIS
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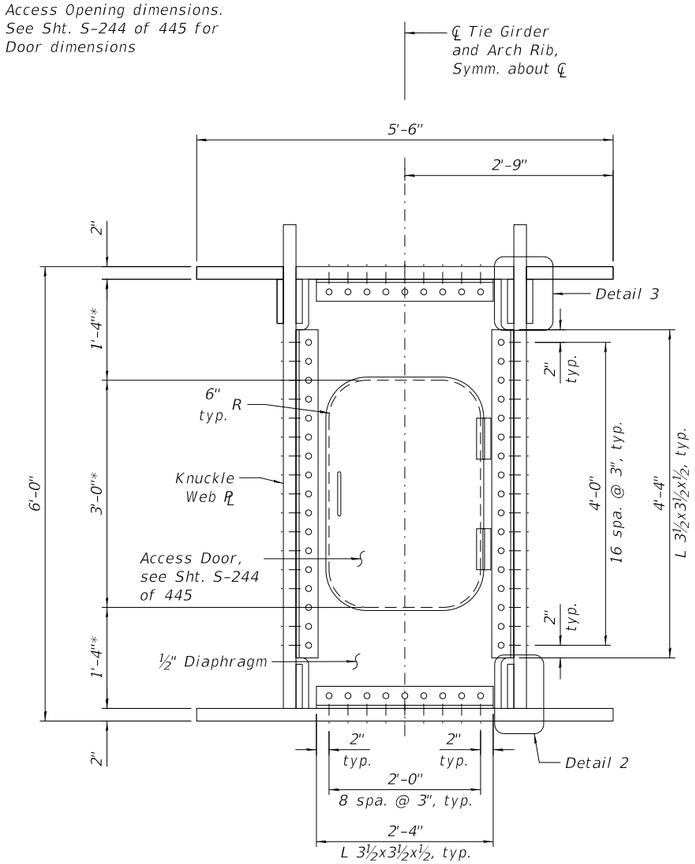
KNUCKLE DETAILS - UNIT 5, 2 OF 5
STRUCTURE NO. 090-0180

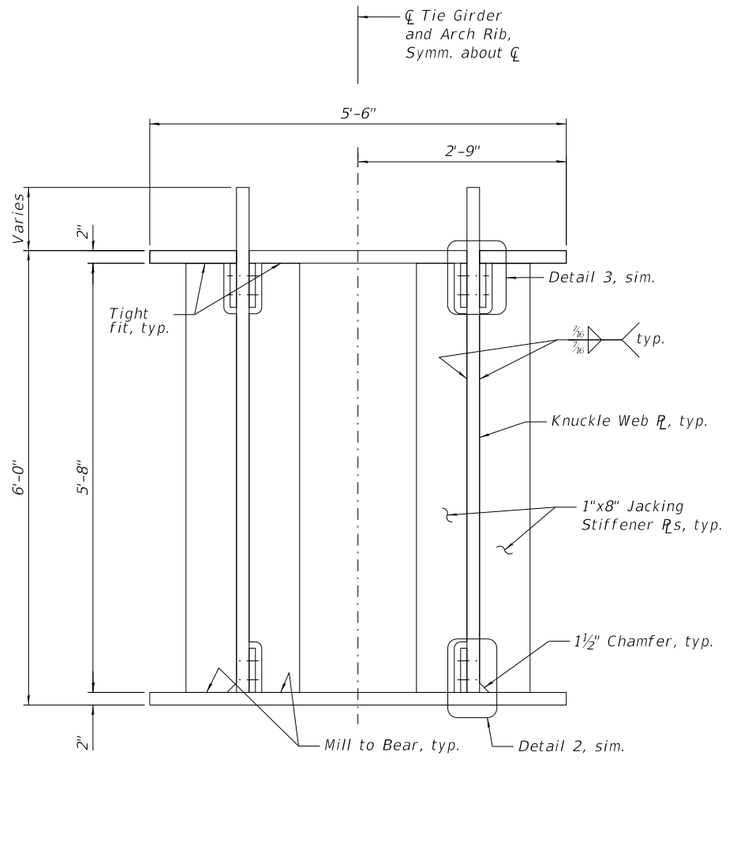
SHEET S-241 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	(15B;(102-1),(14HB))BR)BR	PEO/TAZ	1361	1149
		CONTRACT NO. 68B46		
		ILLINOIS FED. AID PROJECT NHPP-YRP3(905)		

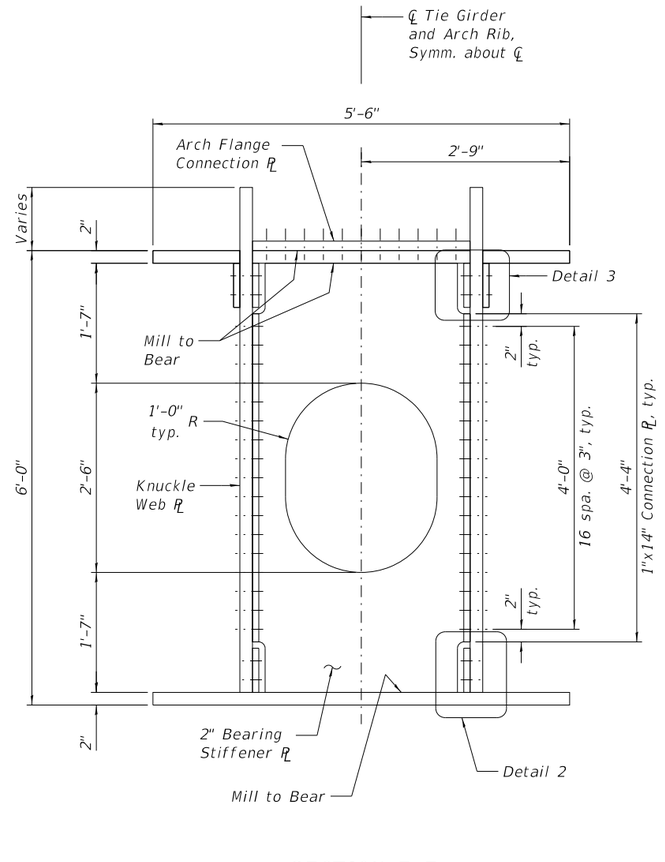
* Access Opening dimensions.
See Sht. S-244 of 445 for
Door dimensions



SECTION C-C



SECTION D-D
(Bearing omitted for clarity)



SECTION E-E
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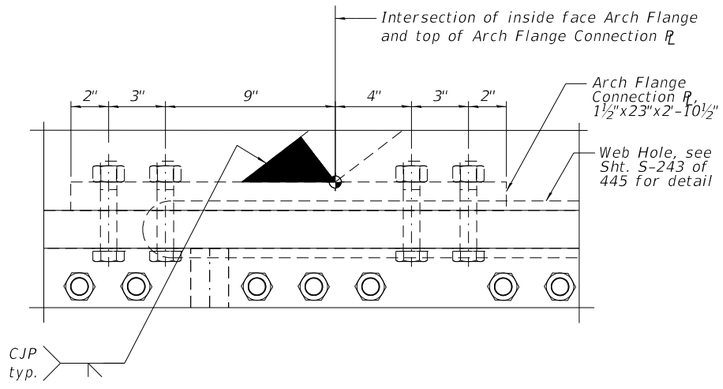
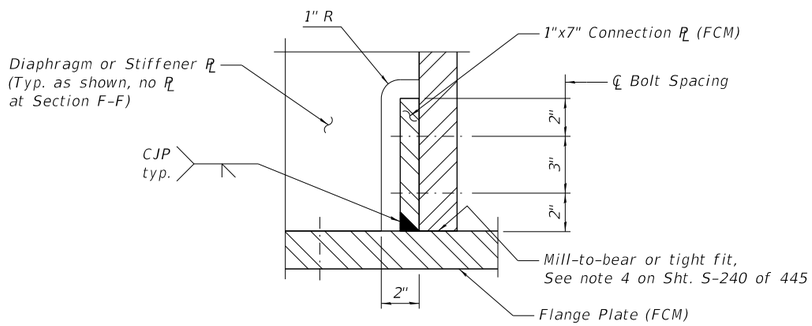
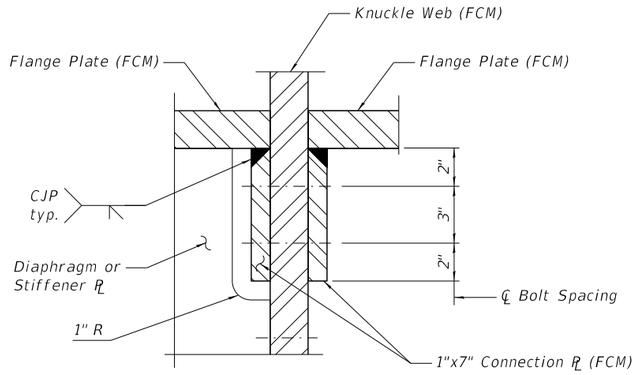


DETAIL 1



DETAIL 2



DETAIL 3

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	PLOT DATE = 12/21/2018	CHECKED - NS	REVISED -		SHEET S-242 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1150
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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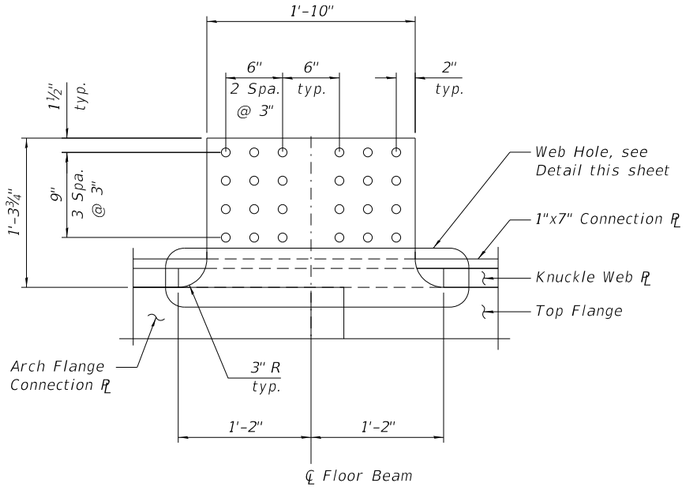
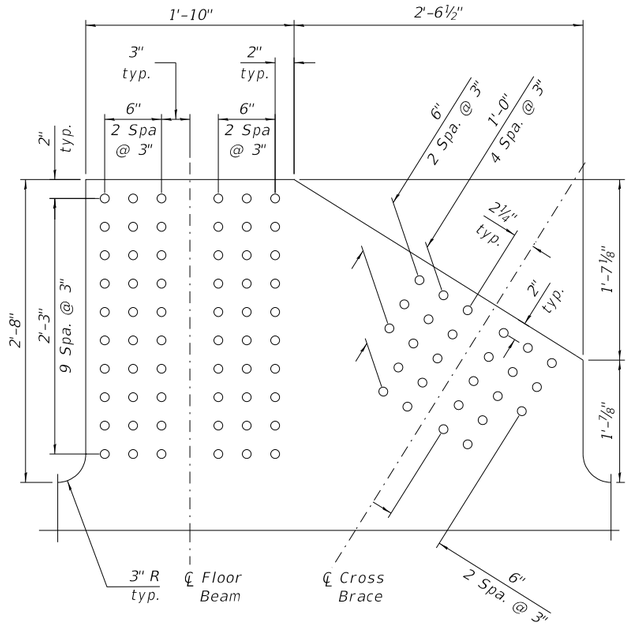
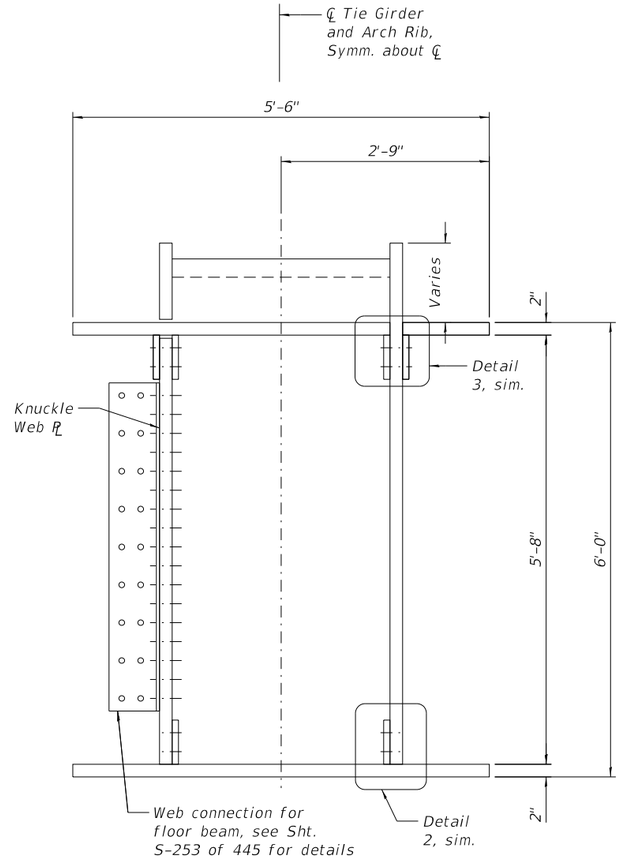


DETAIL A

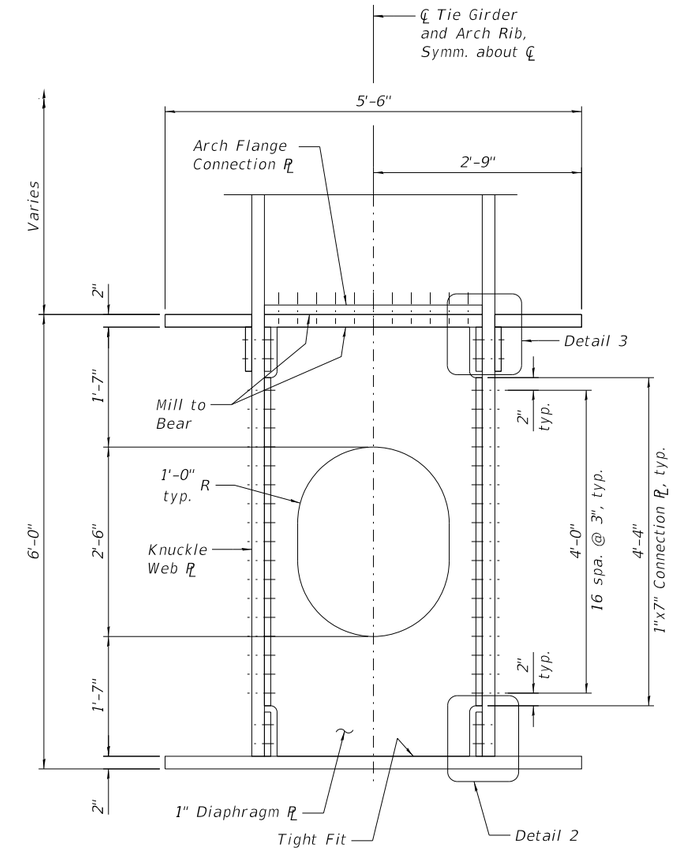


DETAIL B

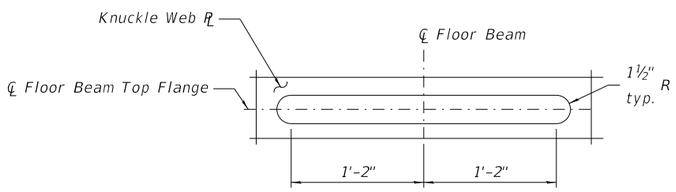


SECTION F-F

(Floor Beam and Bearing omitted for clarity)



SECTION G-G



WEB HOLE DETAIL

(Hole in Knuckle Web at Floor Beam Side Only)

Note:
1. See Sht. S-242 of 445 for Details 2 and 3.

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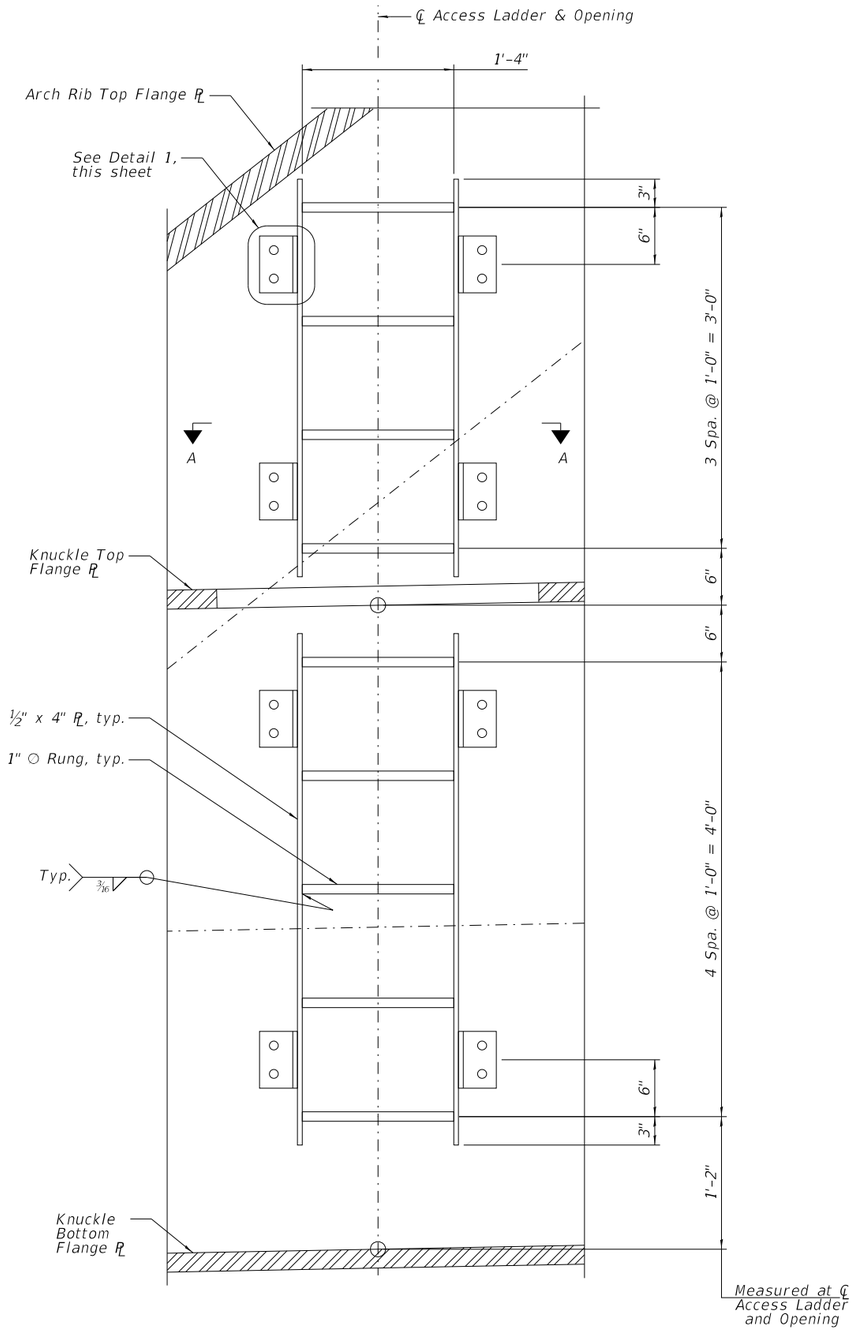
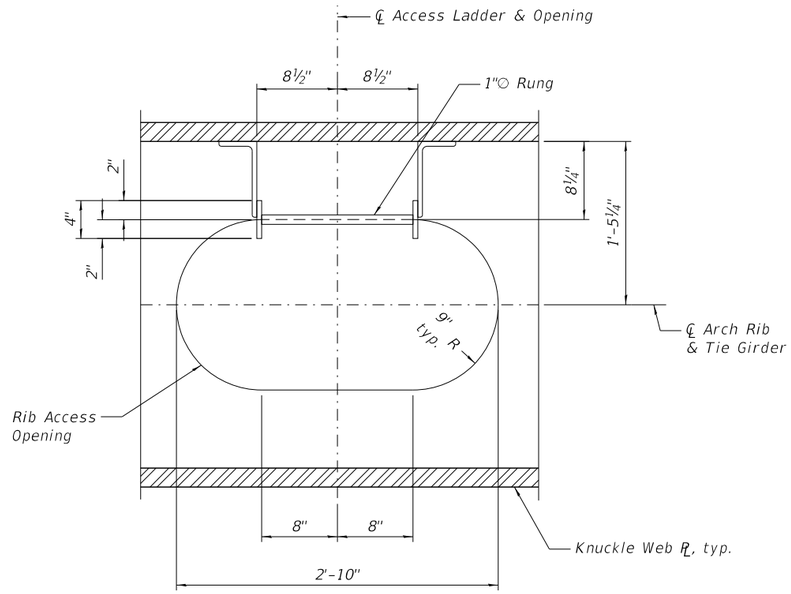
KNUCKLE DETAILS - UNIT 5, 4 OF 5
STRUCTURE NO. 090-0180
SHEET S-243 OF 445 SHEETS

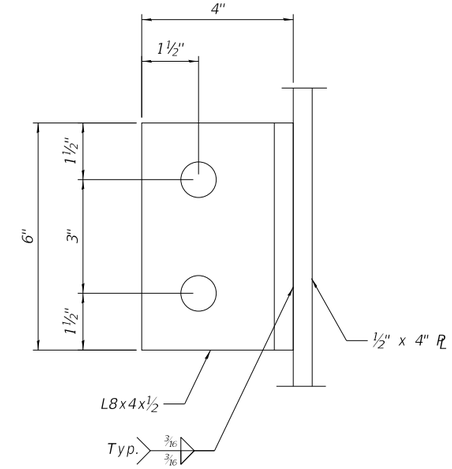
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1151
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



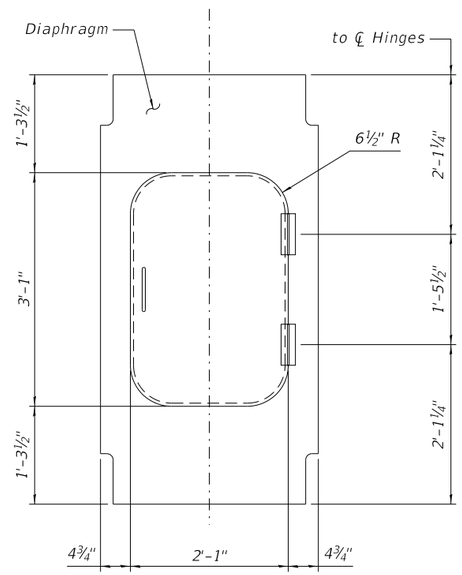
LADDER DETAIL



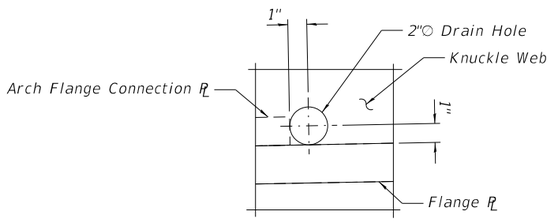
SECTION A-A



DETAIL 1



ACCESS DOOR DETAIL



DRAIN HOLE DETAIL

(Outside web only, 1 location each knuckle)

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F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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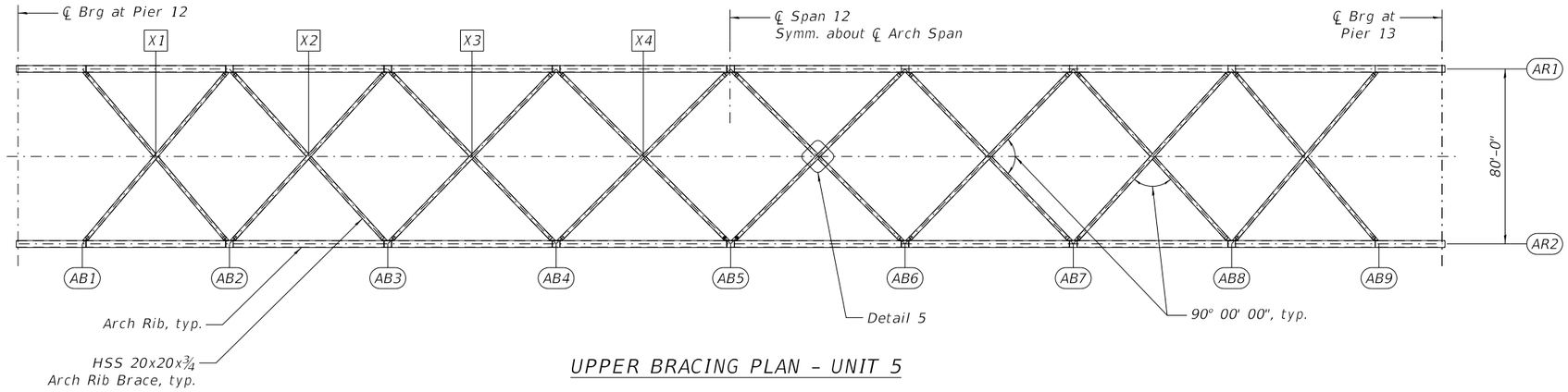
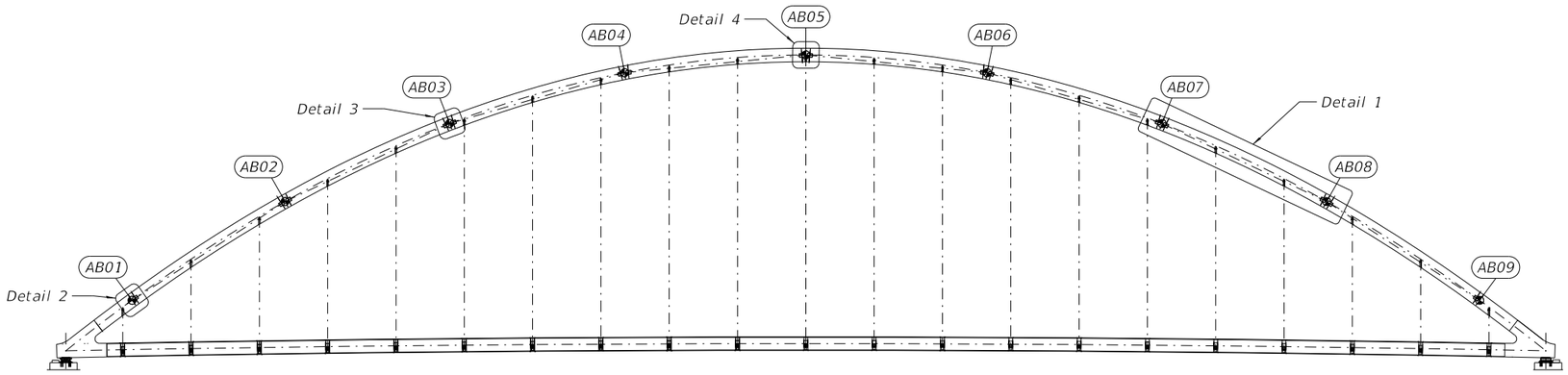
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

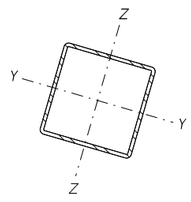


UPPER BRACING PLAN – UNIT 5



UPPER BRACING ELEVATION – UNIT 5

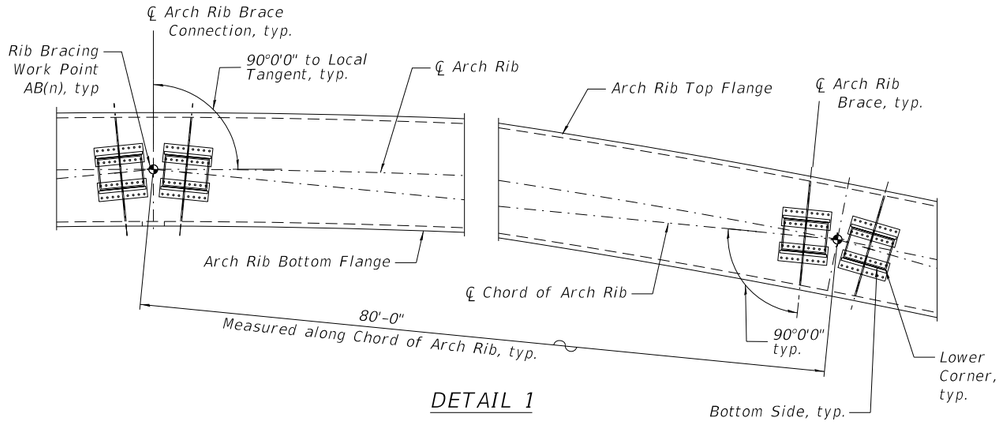
(Connections omitted for clarity. AR1 shown, similar at AR2)



Work Point	Deflection (inches)			Rotation (radians)		
	X(in)	Y(in)	Z(in)	X(rad)	Y(rad)	Z(rad)
AB1–AR	-0.09	-0.01	-0.04	-0.001	0.000	-0.001
AB2–AF	-0.05	0.00	-0.13	-0.003	0.000	-0.002
AB3–AF	-0.04	0.00	-0.17	-0.005	0.000	-0.002
AB4–AF	-0.05	0.00	-0.18	-0.006	0.000	-0.001
AB5–AF	-0.06	0.00	-0.17	-0.006	0.000	0.000
AB1–AR	-0.09	0.01	-0.04	0.001	0.000	0.001
AB2–AF	-0.05	0.00	-0.13	0.003	0.000	0.002
AB3–AF	-0.04	0.00	-0.17	0.005	0.000	0.002
AB4–AF	-0.05	0.00	-0.18	0.006	0.000	0.001
AB5–AF	-0.06	0.00	-0.17	0.006	0.000	0.000
X1	1.01	0.00	-1.76	0.000	0.001	0.000
X2	1.04	0.00	-2.45	0.000	0.000	0.000
X3	0.77	0.00	-2.96	0.000	0.000	0.000
X4	0.25	0.00	-3.26	0.000	0.000	0.000

Notes:
1. The X Work Point represents the intersection of CL Arch Rib Braces.
2. Camber values are symmetric about CL of Arch Span
3. See Sht. S-221 of 445 for additional camber information.
4. See Sht. S-246 of 445 for Details 2, 3, and 4.
5. See Sht. S-247 of 445 for Detail 5.

STEEL DEAD LOAD CAMBER



DETAIL 1

General Notes:
1. The Arch Rib Brace members, end cap plates, and access plates shall be hot dipped galvanized with the exterior surface painted Blue, Munsell No. 10B 3/6. The surface shall be prepared for painting in accordance with the Special Provision "Hot Dipped Galvanizing for Structural Steel". See General Notes for additional details.
2. All connection plates of the arch rib brace system shall be painted in accordance with the General Notes. These connection plates include Brace Connection Bracket, Shim Plate, Access Rod, and the Splice Plate.
3. All bolted connections to the Arch Rib Brace members are slip critical with threads excluded from the shear plane. Provide a Class D faying surface on the Arch Rib Brace member and a Class B faying surface on the connection plates. Fasteners shall be ASTM A325 Type 1, mechanically galvanized. Bolts are 7/8-in diameter in 15/16-in holes which shall be reamed or drilled to after galvanizing.
4. An optional welded shop splice for the Arch Rib Brace member is shown from Contractor convenience. Weld backing plate or backing bar may remain in place. Splice brace member after galvanizing. Remove galvanizing and prepare surface for welding in accordance with AWS D-19.0. Following weld inspection and acceptance, repair galvanized surface in accordance with ASTM A 780. Additional welded shop splices and other details required by the by the Contractor to facilitate galvanizing, including ports and vents, are to be submitted and approved by the Engineer and shall be indicated on the shop drawings.
5. Provide a 3/4" diameter drain hole that is located 2'-0" from each end of each brace member, continuous or discontinuous. Place hole on the bottom side of the brace member at a distance of 4" from the low corner as defined in Detail 1.

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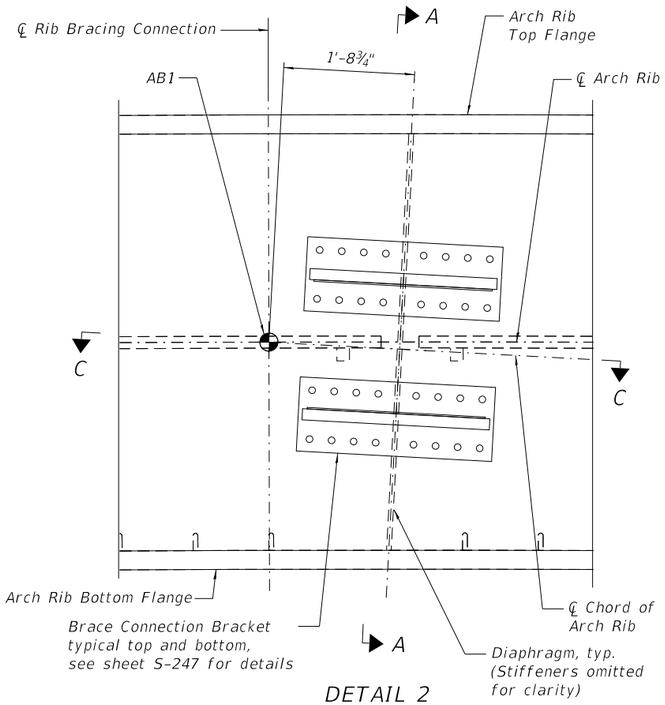
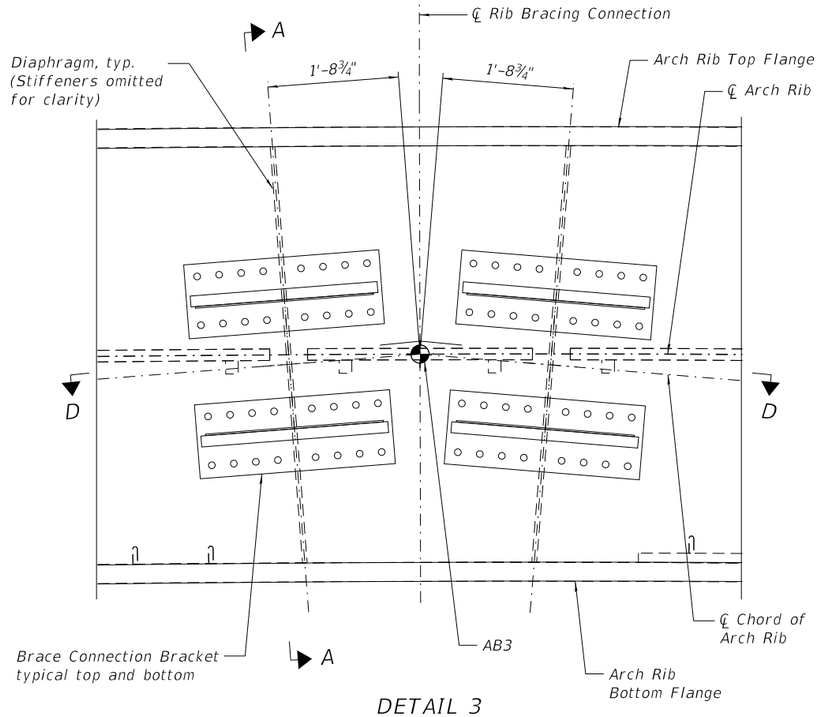
ARCH RIB BRACING DETAILS - UNIT 5, 1 OF 3
STRUCTURE NO. 090-0180
SHEET S-245 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1153
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



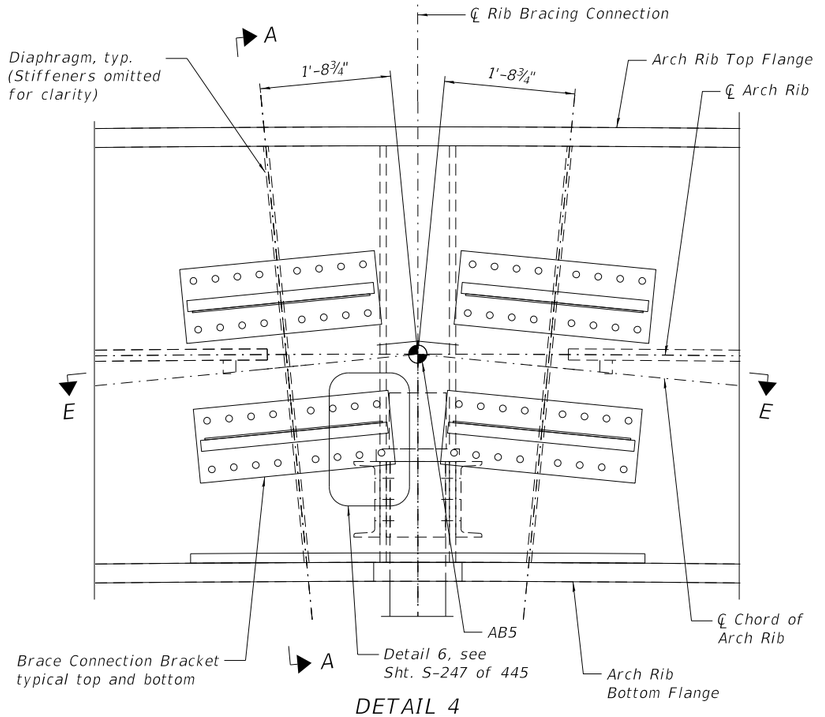
DETAIL 2

(Similar at AB09)

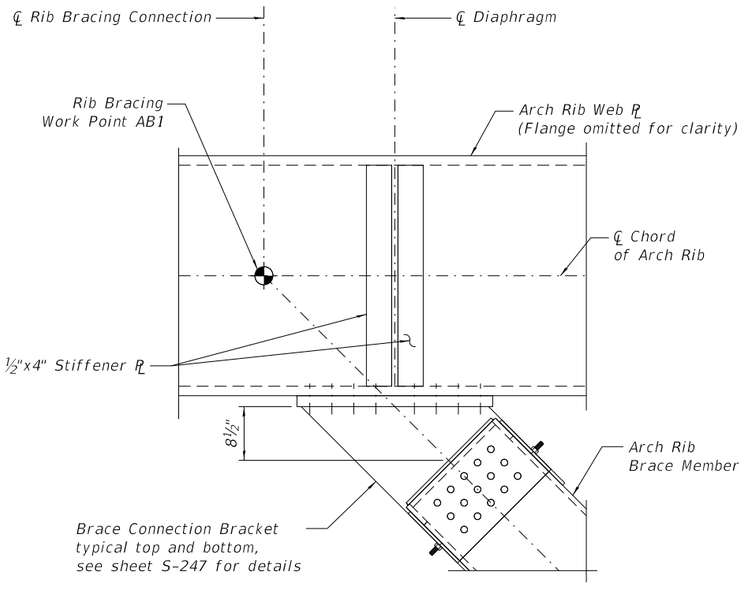


DETAIL 3

(Similar at AB02 to AB04 and AB06 to AB08)

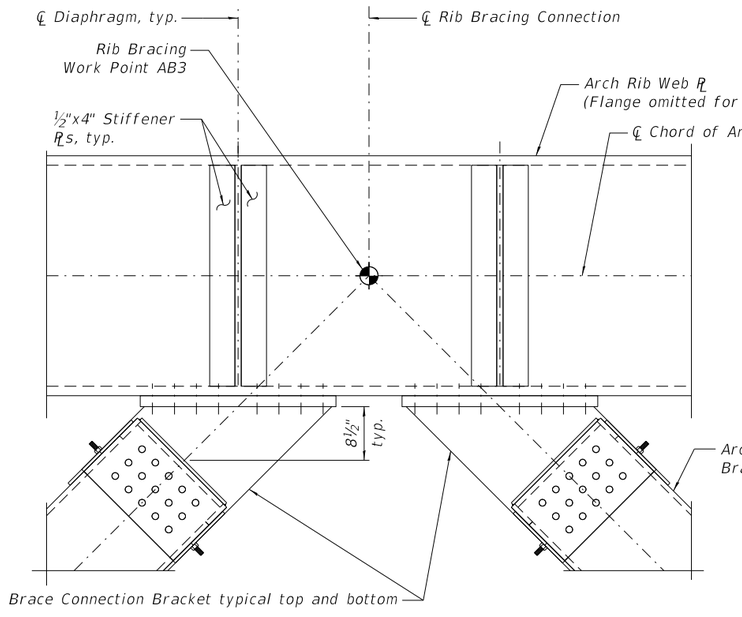


DETAIL 4



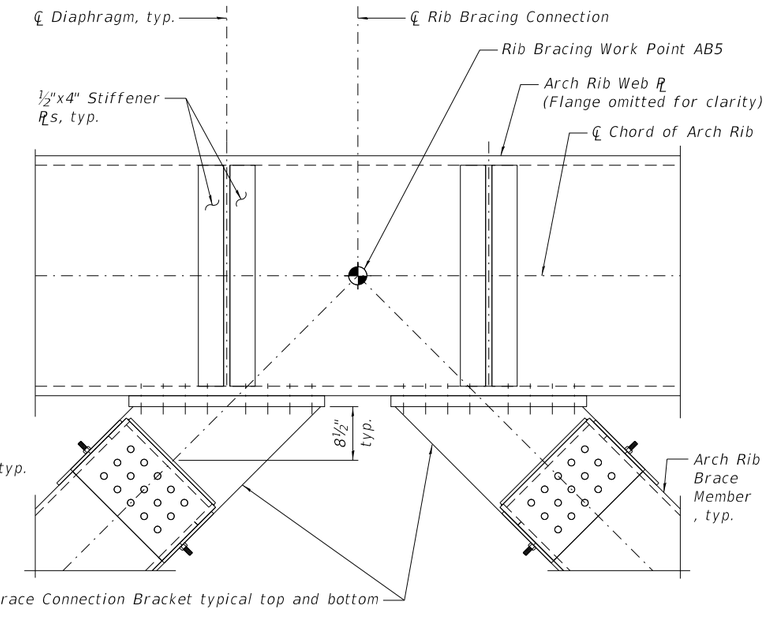
SECTION C-C

(Shown along ℄ Arch Rib Chord)



SECTION D-D

(Shown along ℄ Arch Rib Chord)



SECTION E-E

(Shown along ℄ Arch Rib Chord)

Note:
1. See Sht. S-247 of 445 for Section A-A

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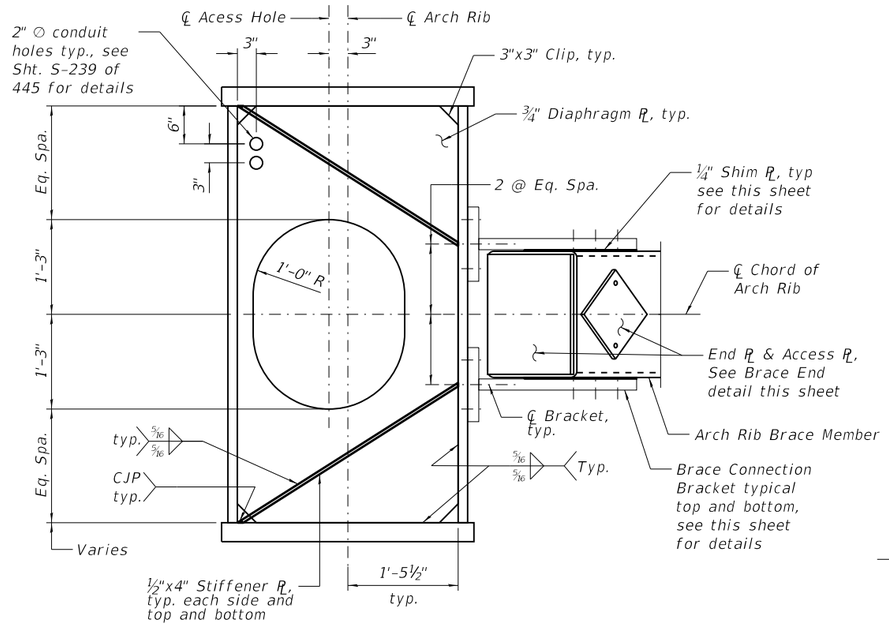
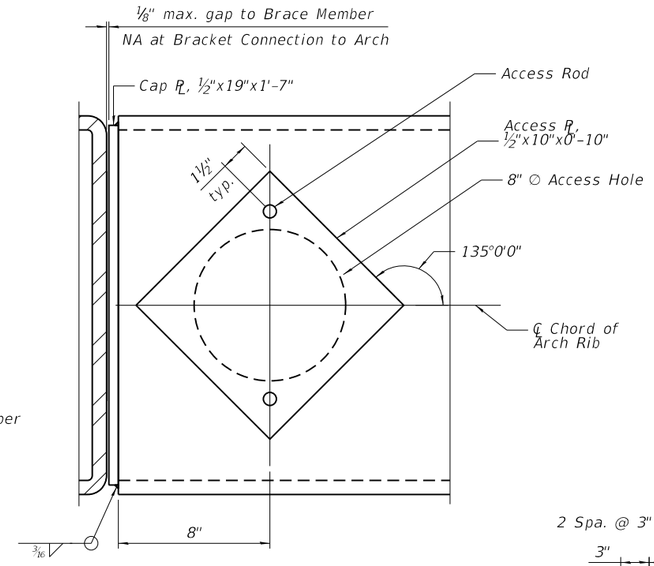
ARCH RIB BRACING DETAILS - UNIT 5, 2 OF 3
STRUCTURE NO. 090-0180
SHEET S-246 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	(15B;(102-1),(14HB))BR)BR	PEO/TAZ	1361	1154
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

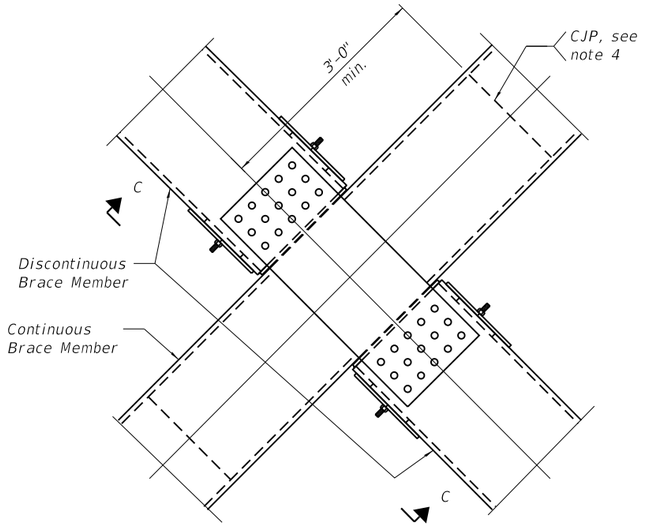


SECTION A-A

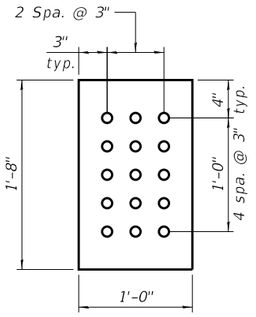


BRACE END DETAIL

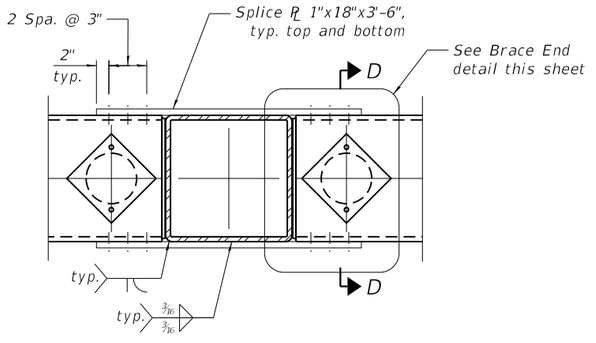
(Splice plates omitted for clarity)



DETAIL 5



SHIM PL DETAIL



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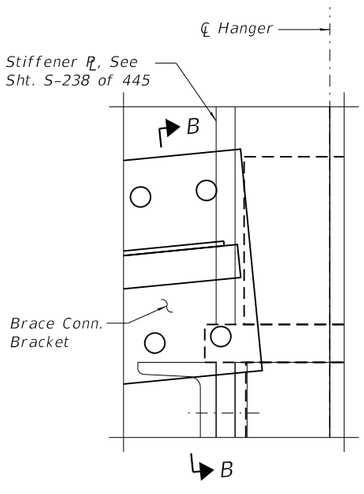
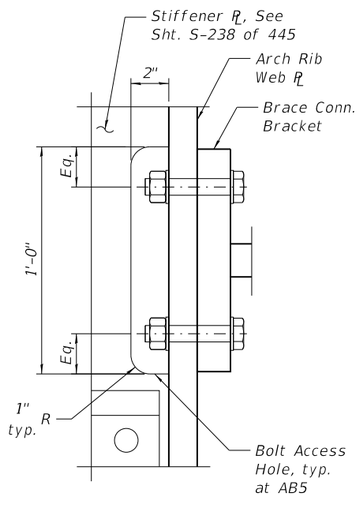
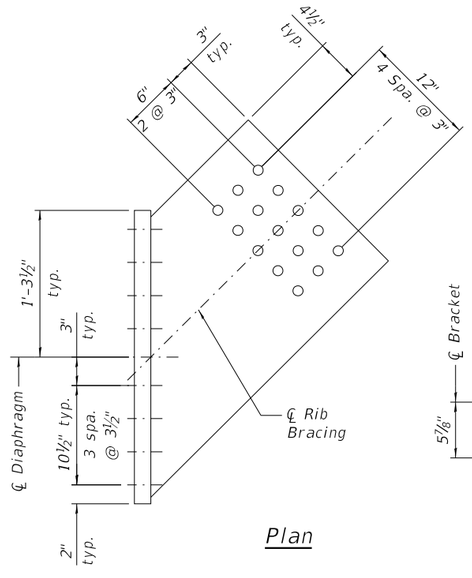


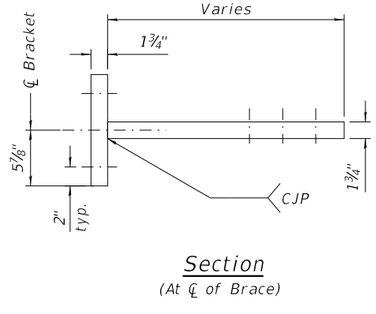
DETAIL 6



SECTION B-B



Plan



Section

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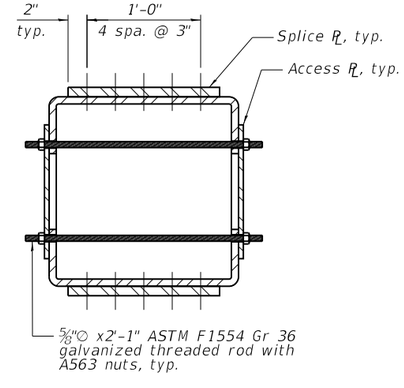
BRACE CONNECTION BRACKET



SECTION D-D

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ARCH RIB BRACING DETAILS - UNIT 5, 3 OF 3
STRUCTURE NO. 090-0180

SHEET S-247 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1155
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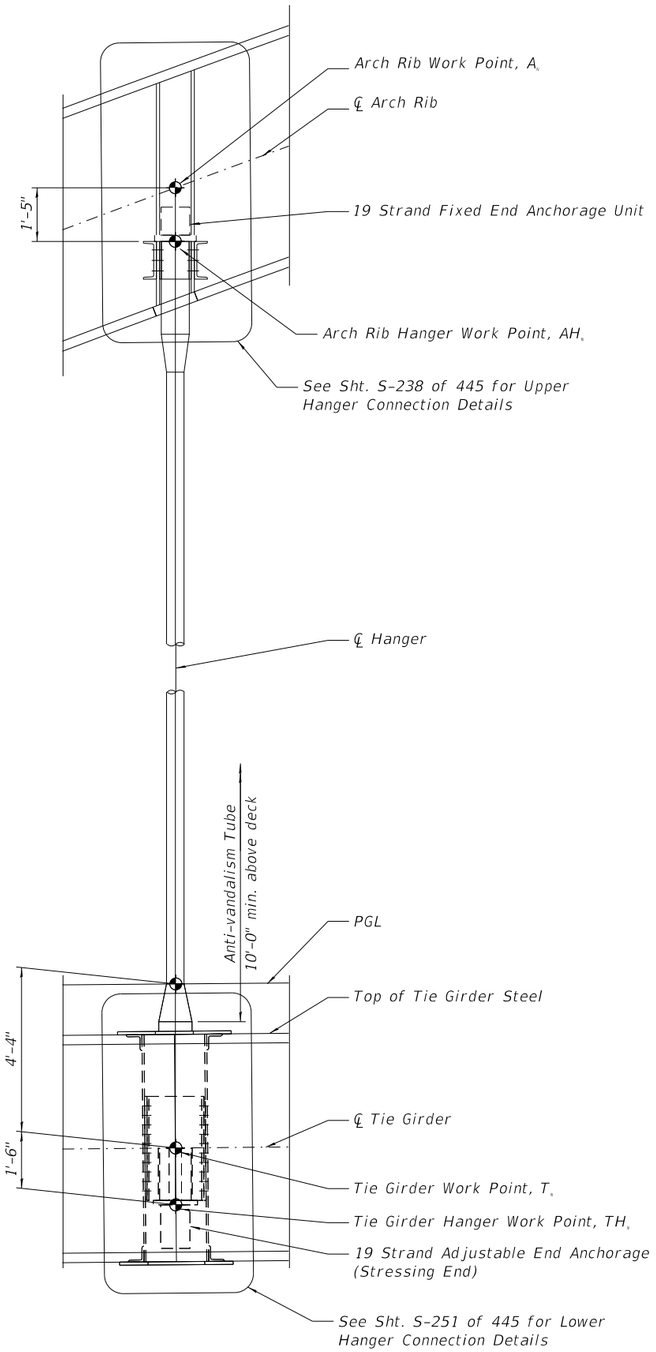
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



HANGER ELEVATION

SIDE	HANGER	STEEL AREA (in2)	HANGER FORCES (kip) DC	DW	LL+IM	WS	STR. I	HANGER LOSS
SOUTH	HS 01	4.185	123	34	51	12	293	550
	HS 02	4.185	200	52	72	15	454	728
	HS 03	4.185	220	58	76	12	496	738
	HS 04	4.185	228	59	77	9	509	724
	HS 05	4.185	227	59	77	7	507	706
	HS 06	4.185	227	59	77	5	507	695
	HS 07	4.185	229	59	76	3	508	693
	HS 08	4.185	236	59	76	3	517	701
	HS 09	4.185	245	59	76	3	528	719
	HS 10	4.185	258	59	78	3	548	734
	HS 11	4.185	262	59	80	3	556	734
	HS 12	4.185	258	59	78	3	548	734
	HS 13	4.185	245	59	76	2	528	719
	HS 14	4.185	236	59	76	2	516	701
	HS 15	4.185	229	59	76	2	508	693
	HS 16	4.185	227	59	76	3	507	695
	HS 17	4.185	227	59	77	5	507	706
	HS 18	4.185	228	59	77	8	508	723
	HS 19	4.185	220	58	76	11	496	737
	HS 20	4.185	200	52	71	14	453	728
	HS 21	4.185	123	34	51	11	293	549
NORTH	HN 01	4.185	116	34	51	12	285	533
	HN 02	4.185	191	52	72	15	442	708
	HN 03	4.185	211	58	76	12	484	719
	HN 04	4.185	219	59	77	9	497	706
	HN 05	4.185	219	59	77	7	497	690
	HN 06	4.185	219	59	77	4	497	678
	HN 07	4.185	219	59	76	3	496	670
	HN 08	4.185	220	59	76	3	497	662
	HN 09	4.185	218	59	76	3	494	656
	HN 10	4.185	218	59	76	3	494	651
	HN 11	4.185	216	59	76	3	492	649
	HN 12	4.185	218	59	76	2	494	651
	HN 13	4.185	218	59	76	2	494	656
	HN 14	4.185	220	59	76	2	497	662
	HN 15	4.185	219	59	76	2	496	669
	HN 16	4.185	219	59	76	3	497	678
	HN 17	4.185	219	59	77	5	497	690
	HN 18	4.185	219	59	77	8	497	706
	HN 19	4.185	211	58	76	11	484	718
	HN 20	4.185	191	52	71	14	442	707
	HN 21	4.185	116	34	51	11	285	533

Notes

1. Hangers shall be supplied, tested, fabricated, and assembled in accordance with the sixth edition of the PTI Recommendations for Stay Cable Design, Testing, and Installation.
2. Hangers shall be composed of individual seven-wire steel strands conforming to ASTM A416 with a steel area = 0.2325 in^2. Each hanger assembly shall consist of 18 strands for a total steel area = 4.185 in^2.
3. See Special Provision Hanger Assemblies for Tied Arch Span for detailed materials, testing, fabrication and installation of hangers.

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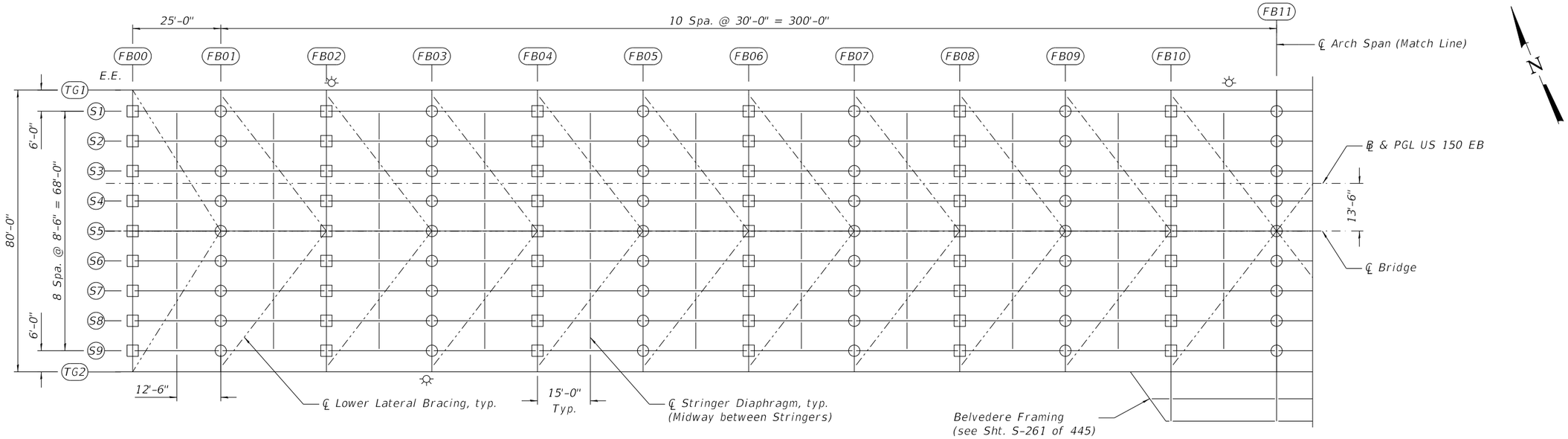
PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -	

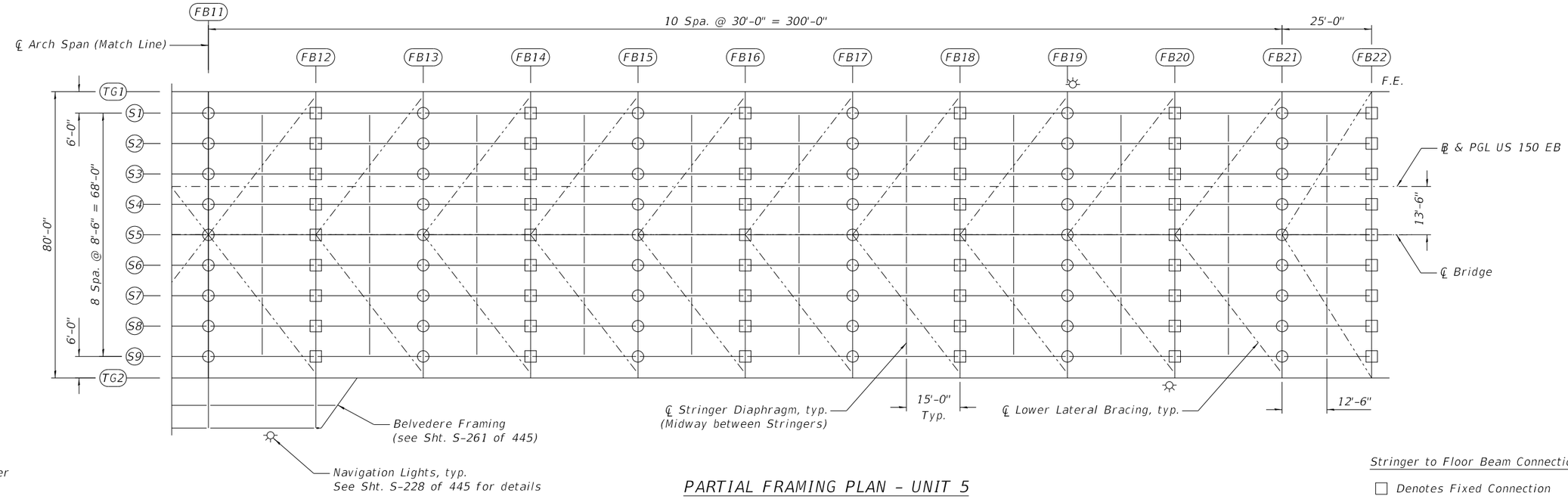
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HANGER DETAILS - UNIT 5
STRUCTURE NO. 090-0180
SHEET S-248 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1156
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



PARTIAL FRAMING PLAN - UNIT 5



PARTIAL FRAMING PLAN - UNIT 5

Key:

(S1) Stringer

(TG1) Tie Girder

(FB01) Floor Beam

Stringer to Floor Beam Connection Legend:

☐ Denotes Fixed Connection

○ Denotes Slotted Connection

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		CHECKED - MM	REVISED -		
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F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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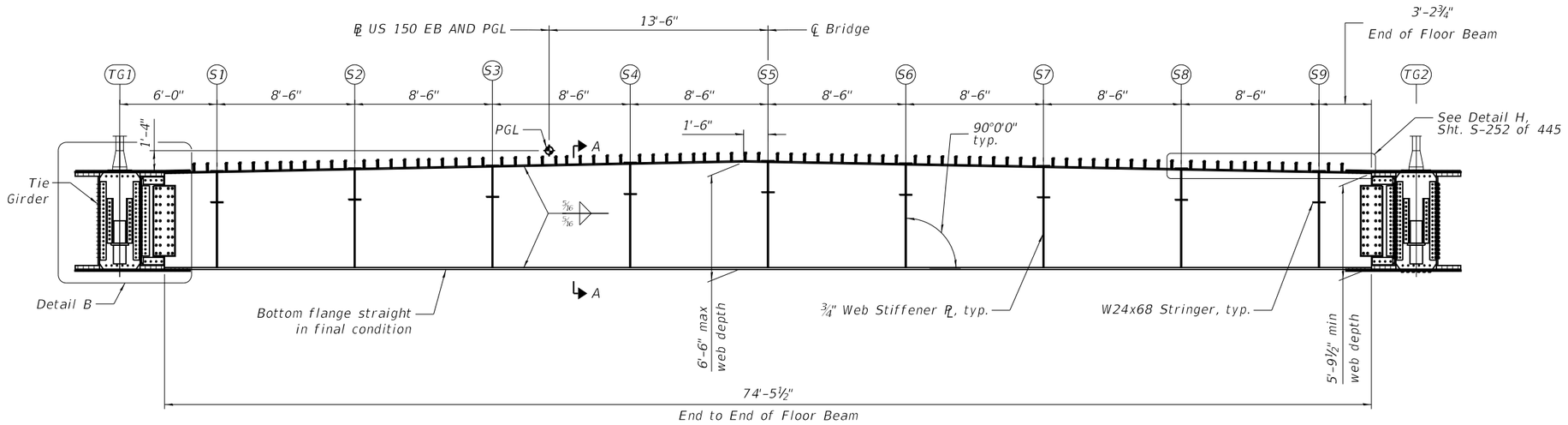
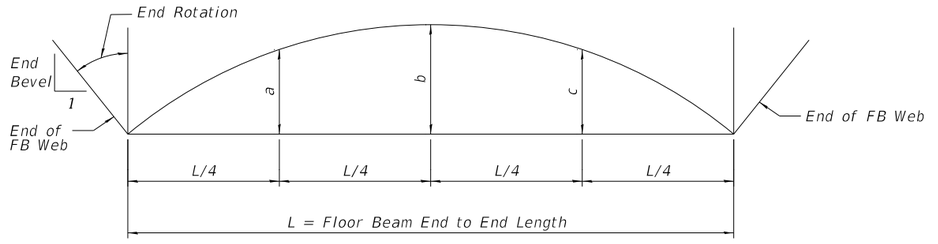


INTERIOR FLOOR BEAM ELEVATION - UNIT 5

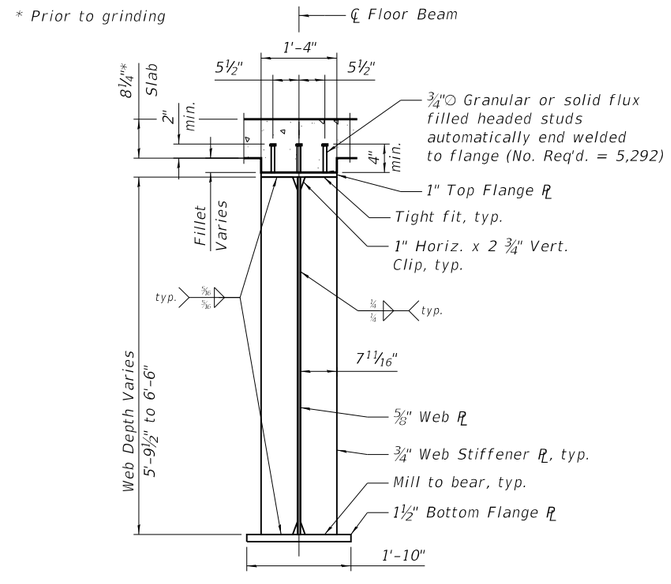


INTERIOR FLOOR BEAM CAMBER DIAGRAM

Floor Beam camber shown is for Floor Beams in unloaded position and provides for all dead load deflections except future wearing surface. Floor Beams shall be detailed and fabricated such that the bottom of web is level and the ends are vertical after dead load deflections have occurred.

FLOOR BEAM	CAMBER (in.)			END BEVEL	
	a	b	c	North	South
FB01	¾"	1 1/16"	¾"	1:333	1:250
FB02, FB04	1 7/16"	1 15/16"	1 7/16"	1:200	1:143
FB03, FB05	1⅛"	1½"	1⅛"	1:250	1:167
FB06	1 7/16"	1 15/16"	1 7/16"	1:167	1:167
FB07	1⅛"	1½"	1⅛"	1:200	1:250
FB08	1 7/16"	1 15/16"	1 7/16"	1:125	1:200
FB09	1"	1⅜"	1"	1:143	1:500
FB10	1 3/16"	1⅜"	1 3/16"	1:125	1:500
FB11	15/16"	1¼"	15/16"	1:125	Vert.

Notes:
1. Floor Beams are orientated perpendicular to the Tie Girder ℄.



SECTION A-A

*Terminate weld 1/4" (+/-1/8") from plate edge/clip.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FLOOR BEAM DETAILS - UNIT 5, 1 OF 3
STRUCTURE NO. 090-0180
SHEET S-250 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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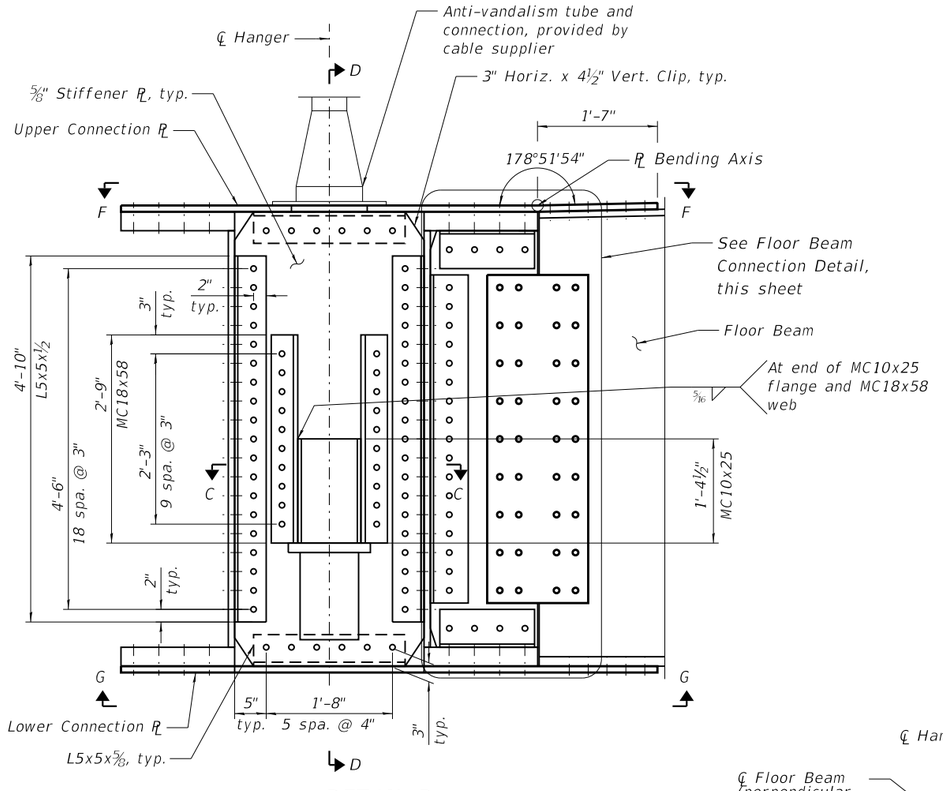
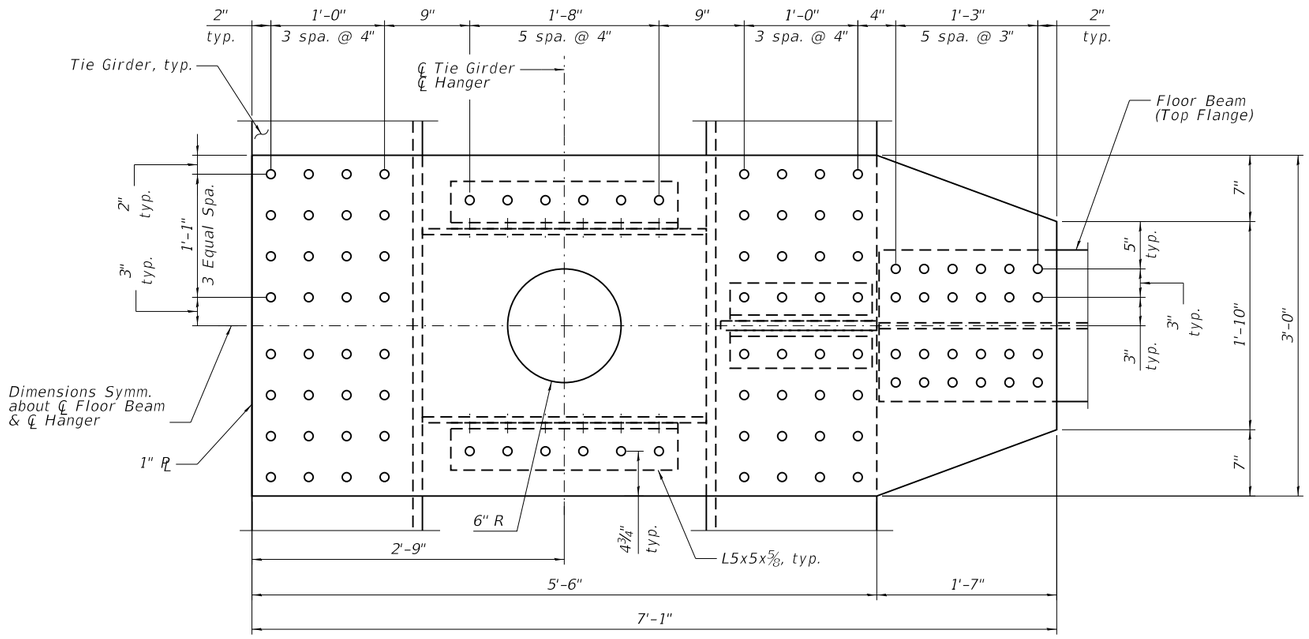
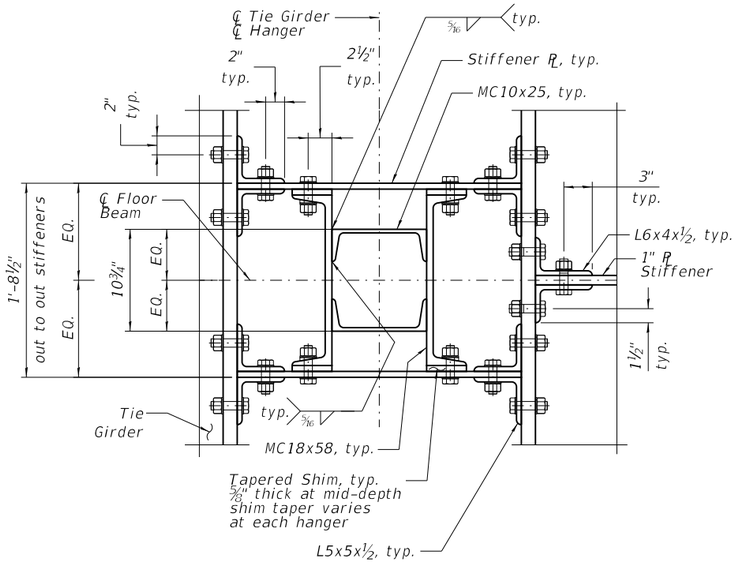


DETAIL B

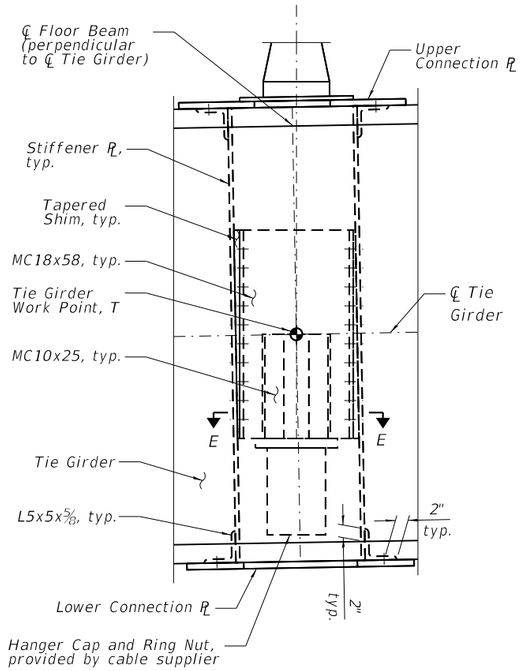


SECTION F-F

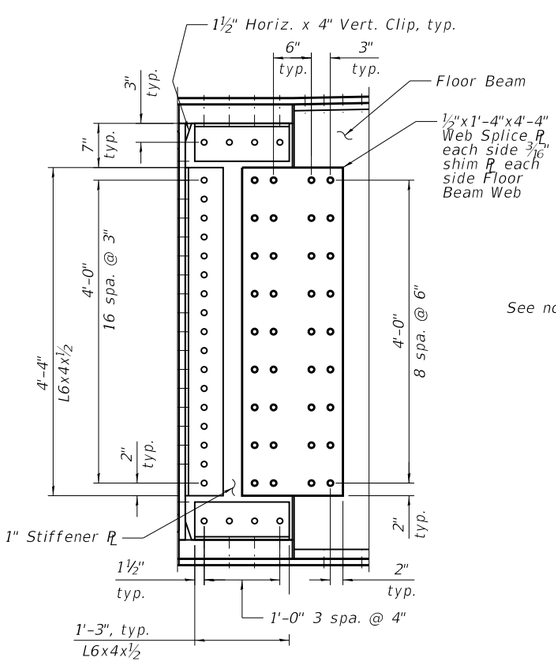
Typ. Upper Connection PL
(see Sht. S-252 of 445 for Upper Connection PL detail at Belvedere)



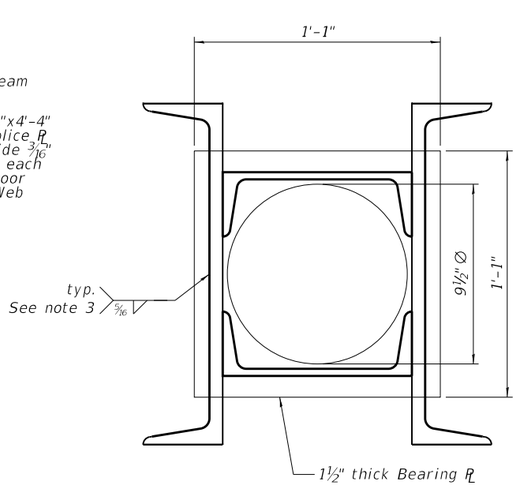
SECTION C-C



SECTION D-D



FLOOR BEAM CONNECTION DETAIL



SECTION E-E

Notes:
1. Provide ASTM F436 washer under both head and nut of all high-strength fasteners, with a tapered washer for fasteners through flange of channel member.
2. Bearing plate surface flatness over bearing area shall be 1/500 of ring nut outside diameter or as specified by cable supplier.
3. Contact surfaces between bearing plate and MC channels shall be milled to bear.

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FLOOR BEAM DETAILS - UNIT 5, 2 OF 3
STRUCTURE NO. 090-0180
SHEET S-251 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR,BR	PEO/TAZ	1361	1159
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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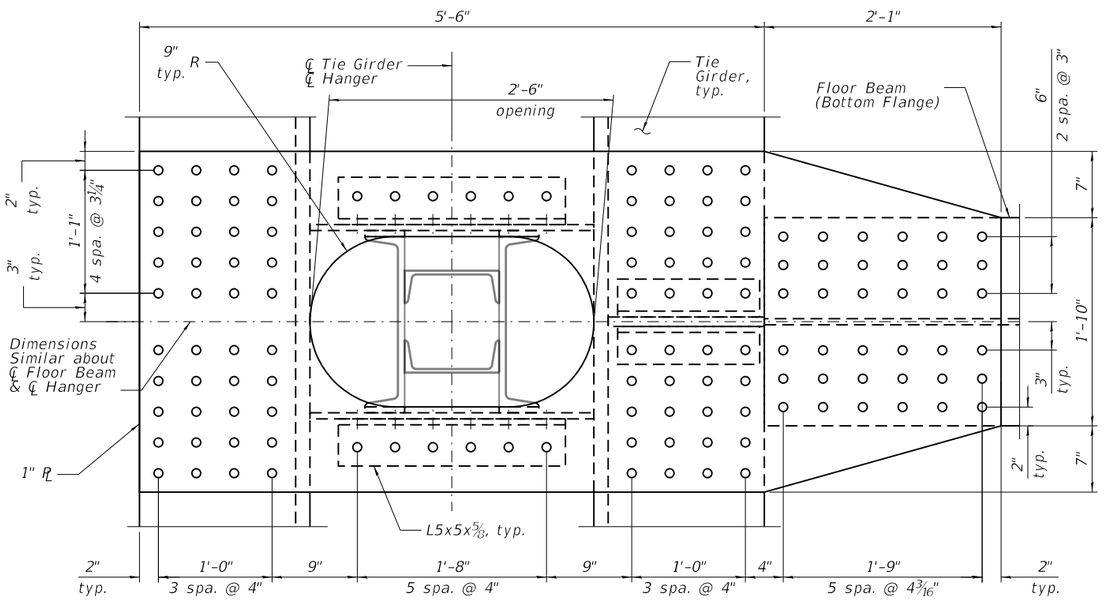
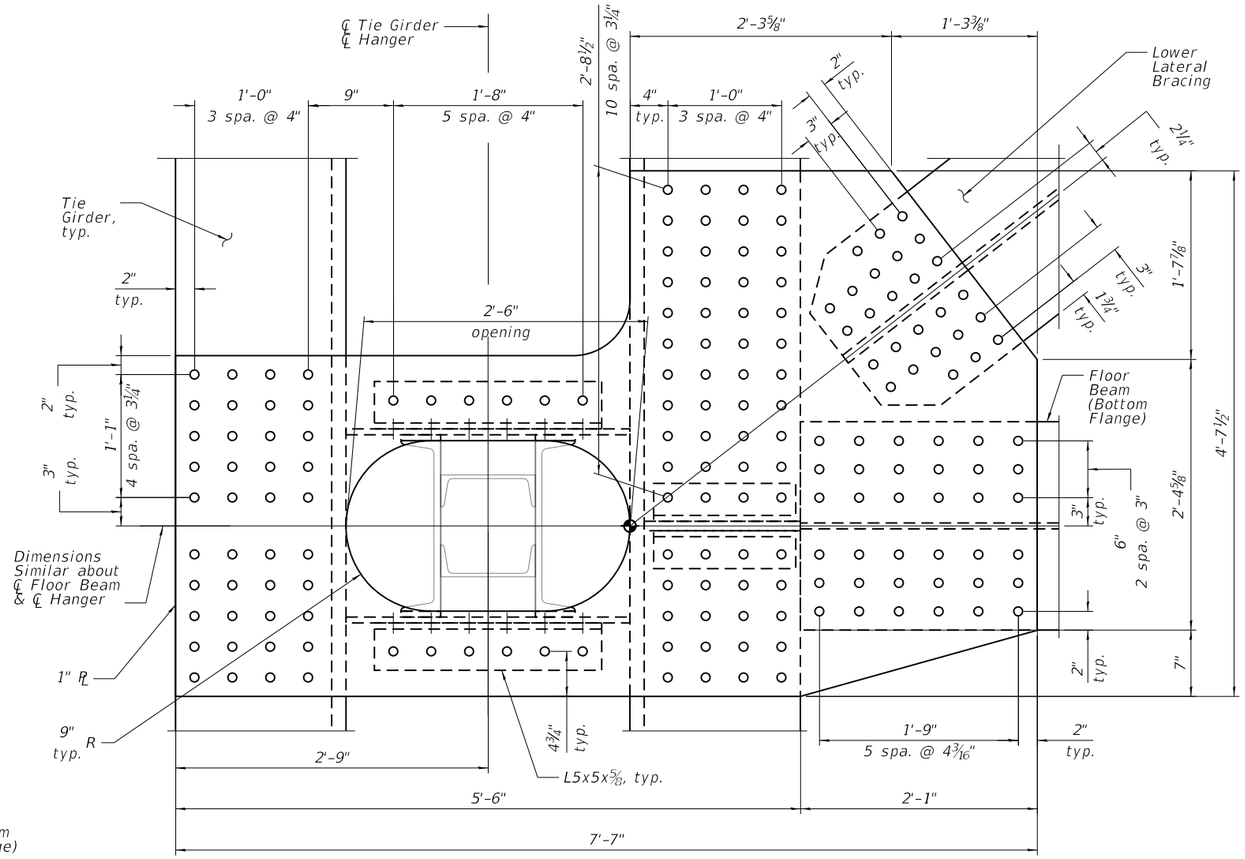


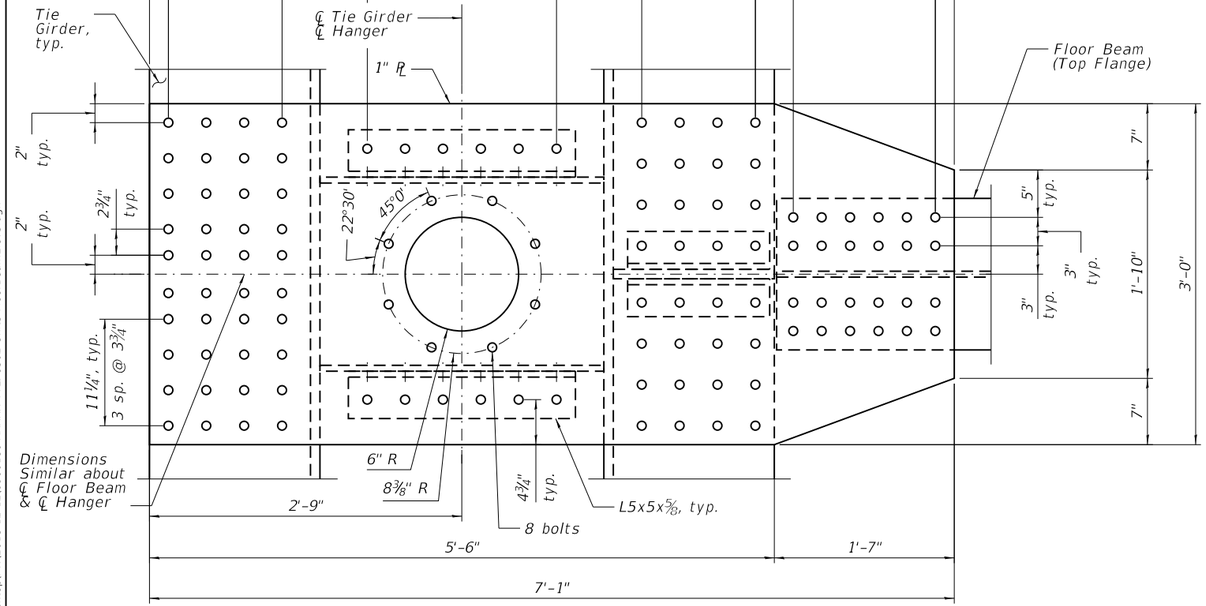
SECTION G-G

Floor Beam 11 Lower Connection PL



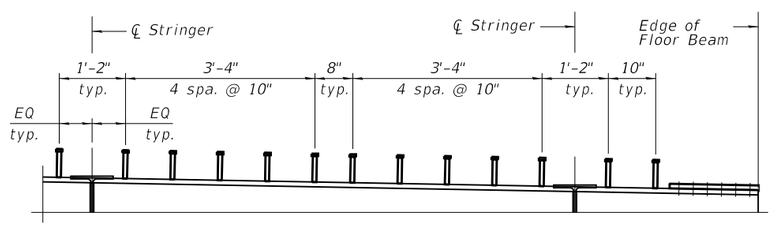
SECTION G-G

Typ. Lower Connection PL



SECTION F-F

Floor Beams 10, 11, & 12 Upper Connection PL



DETAIL H

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FLOOR BEAM DETAILS - UNIT 5, 3 OF 3
STRUCTURE NO. 090-0180
SHEET S-252 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1160
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

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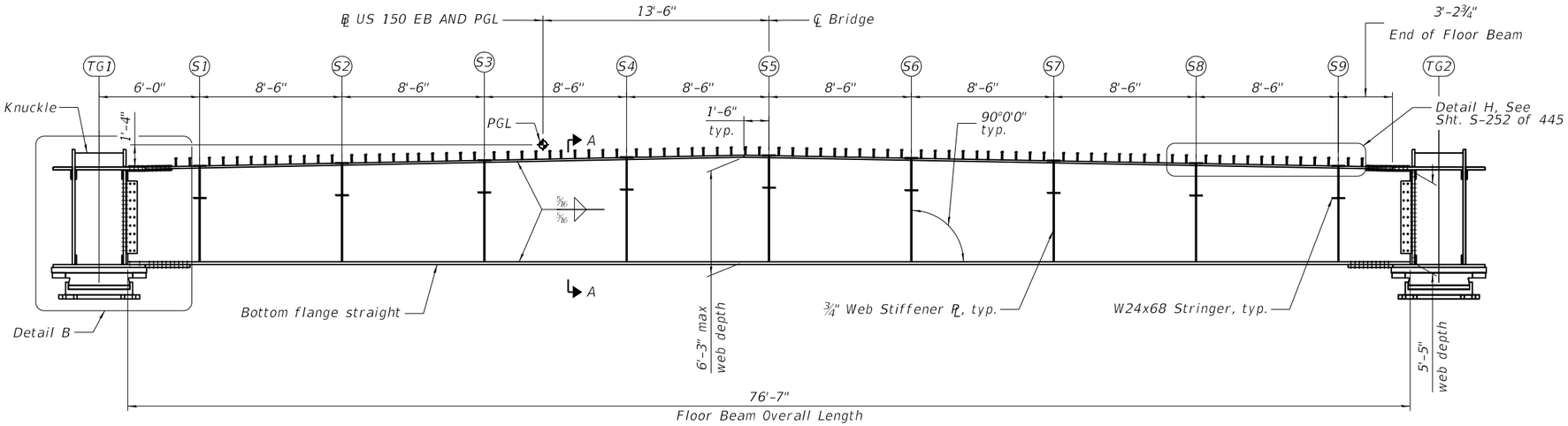
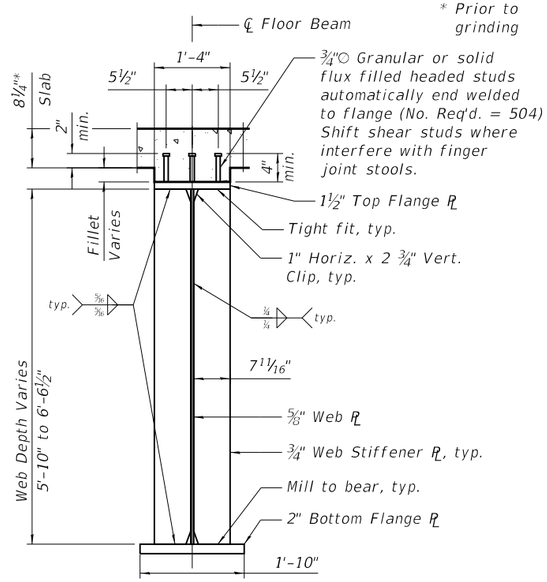
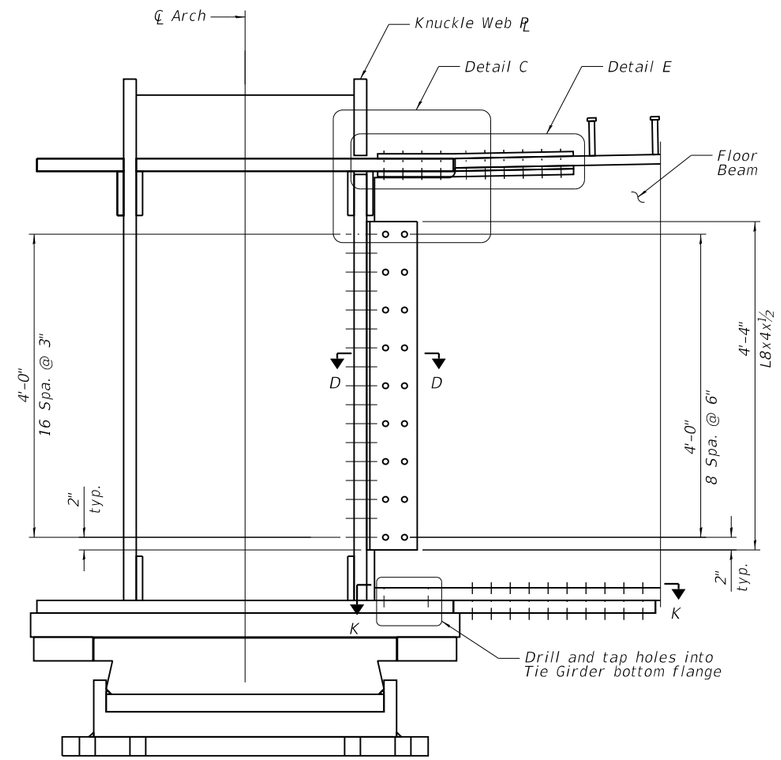


END FLOOR BEAM ELEVATION - UNIT 5



SECTION A-A



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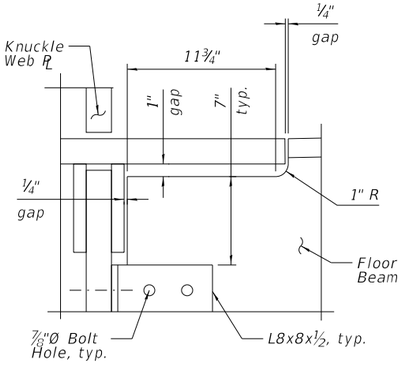

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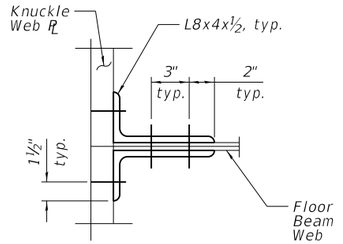
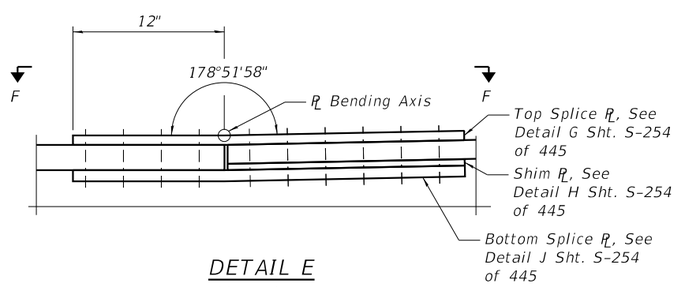


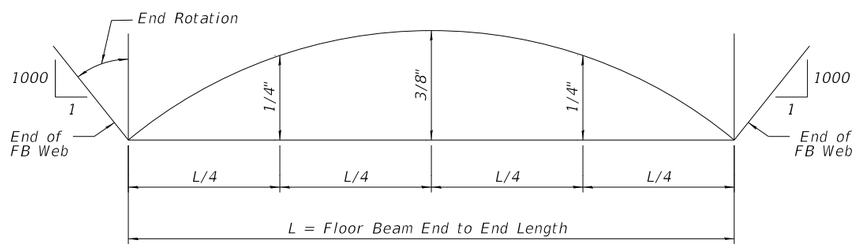
SECTION D-D



DETAIL E

Knuckle - Floor Beam Top ℄ Connection

Notes:
1. Floor Beams are orientated perpendicular to the Tie Girder center line.



END FLOOR BEAM CAMBER DIAGRAM

Floor Beam camber shown is for Floor Beams in unloaded position and provides for all dead load deflections except future wearing surface. Floor Beams shall be detailed and fabricated such that the bottom of web is level and the ends are vertical after dead load deflections have occurred.

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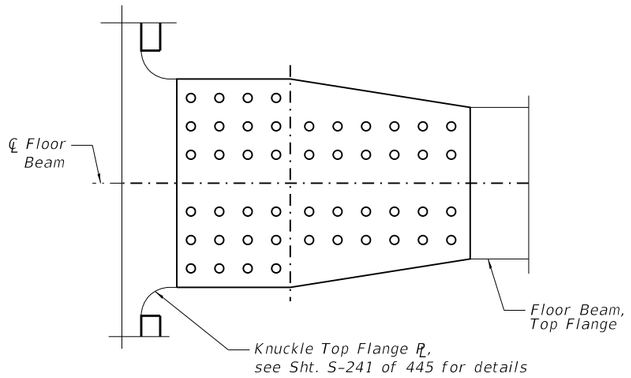
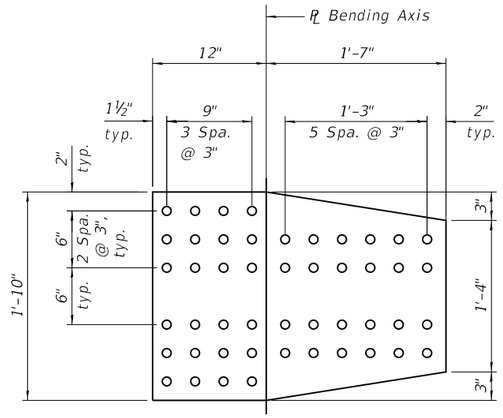
END FLOOR BEAM DETAILS - UNIT 5, 1 OF 2
STRUCTURE NO. 090-0180
SHEET S-253 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1161
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



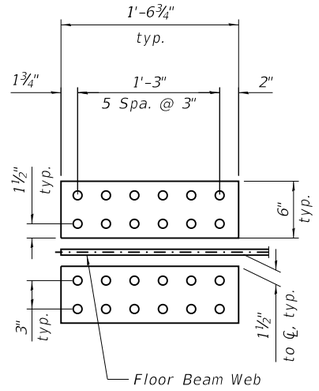
DETAIL F

Knuckle – Floor Beam Top Flange Connection



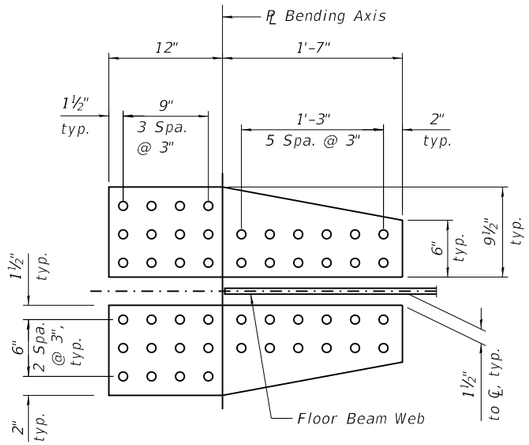
DETAIL G

¾" Top Splice PL



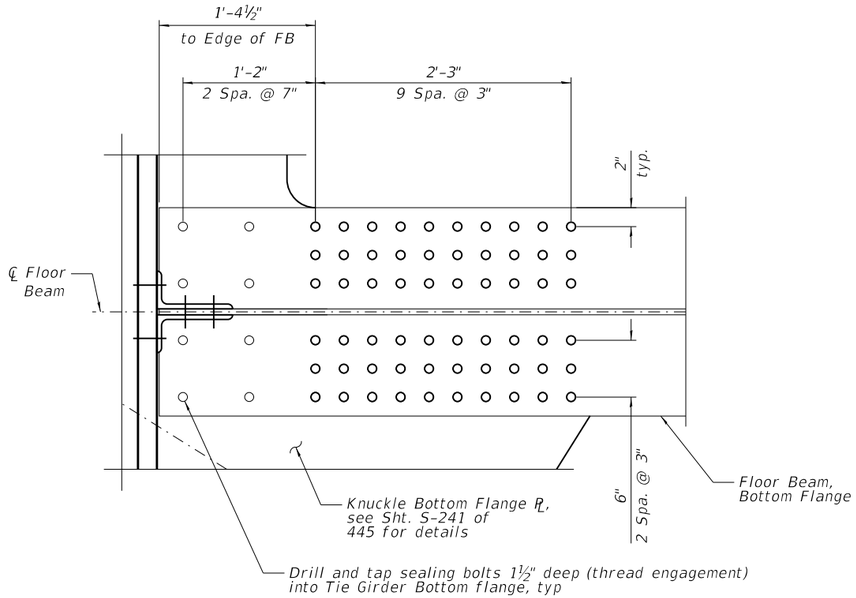
DETAIL H

½" Shim PLs



DETAIL J

⅞" Bottom Splice PLs



DETAIL K

Floor Beam – Lower Flange Connection at Knuckle

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END FLOOR BEAM DETAILS - UNIT 5, 2 OF 2
STRUCTURE NO. 090-0180

SHEET S-254 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1162
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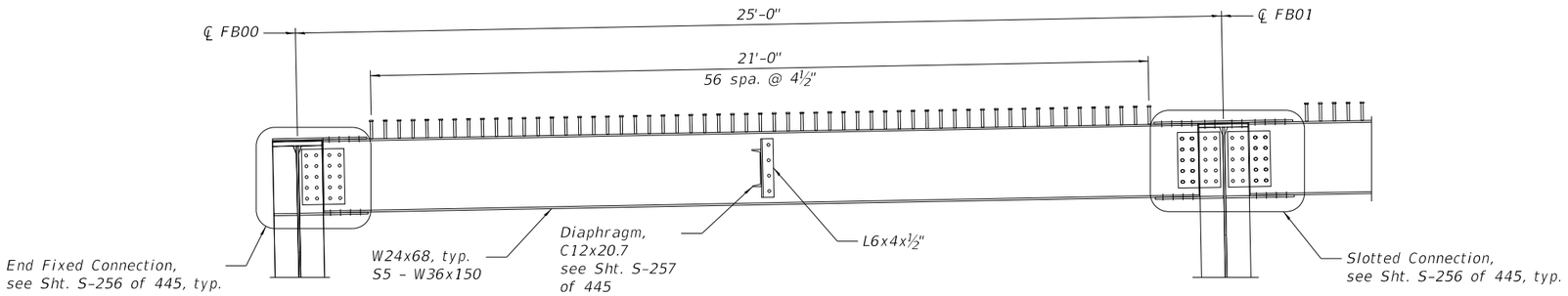
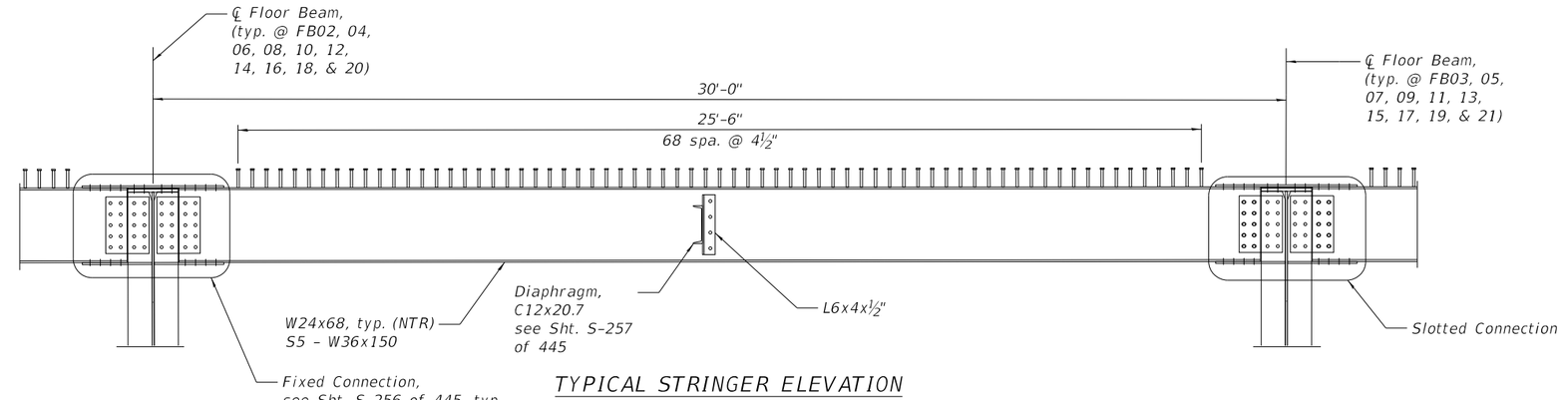
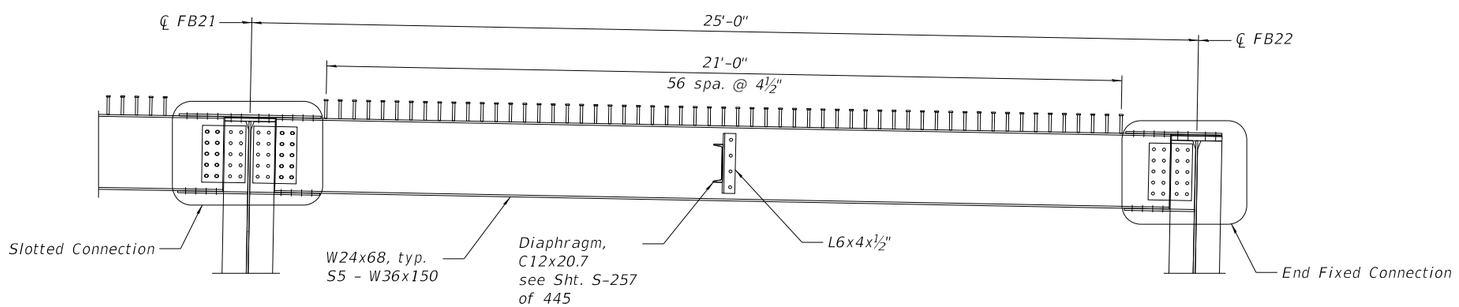
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



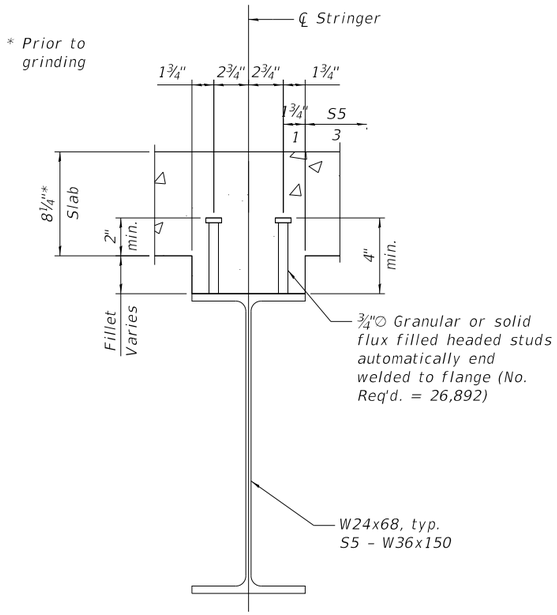
TYPICAL STRINGER ELEVATION
(Stringer S1 through S9)



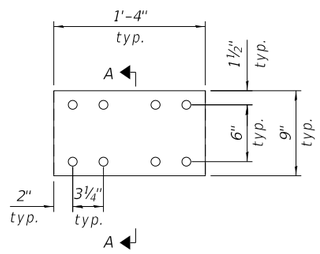
TYPICAL STRINGER ELEVATION
(Stringer S1 through S9)



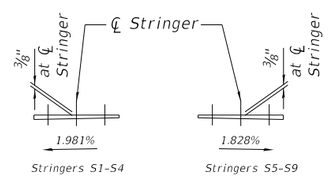
TYPICAL STRINGER ELEVATION
(Stringer S1 through S9)



TYPICAL STRINGER SECTION



BEVEL SHIM ℄ DETAIL



SECTION A-A

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		CHECKED - MM	REVISED -		
	PLOT SCALE = 0:2.0000 ':' / in.	DRAWN - JR	REVISED -		
	PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -		SHEET S-255 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1163
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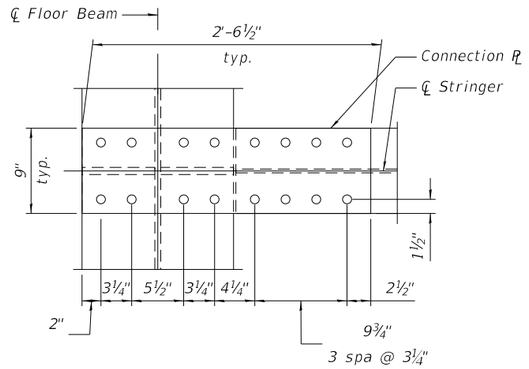
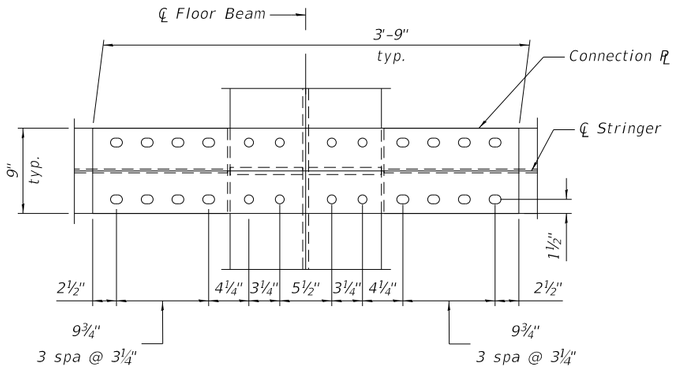
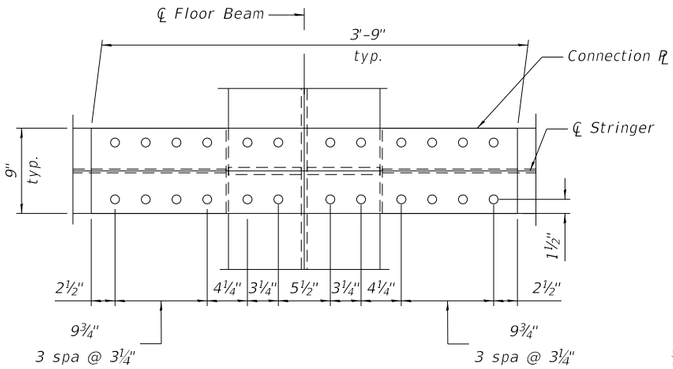
		ILLINOIS FED. AID PROJECT NHPP-YRP3(905)		



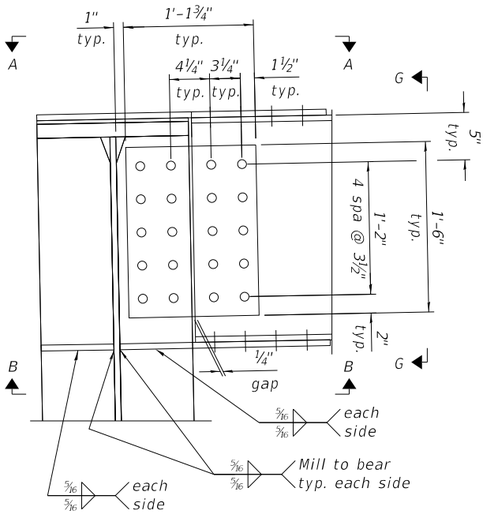
VIEW A-A



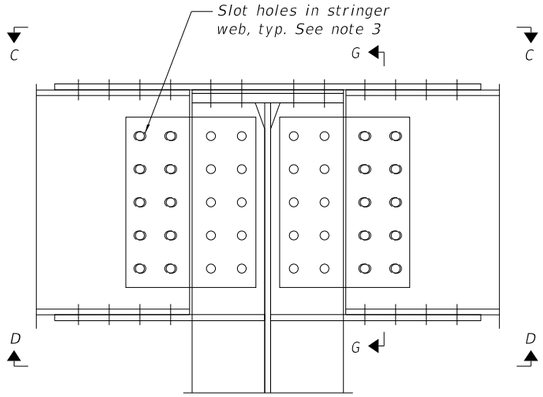
VIEW C-C



VIEW E-E

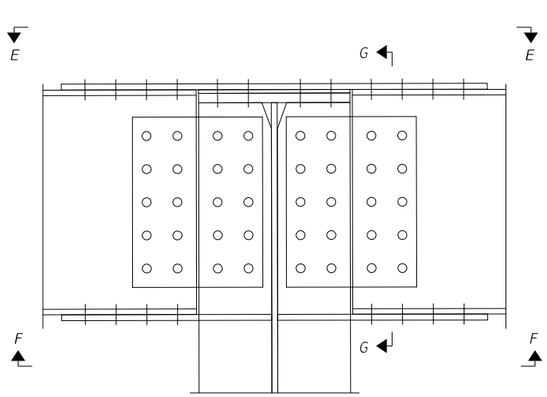


END FIXED CONNECTION



SLOTTED CONNECTION

(See "End Fixed Connection" for details not shown)



FIXED CONNECTION

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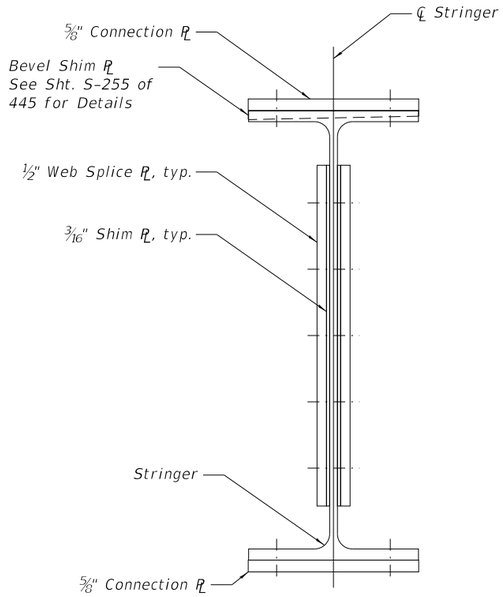
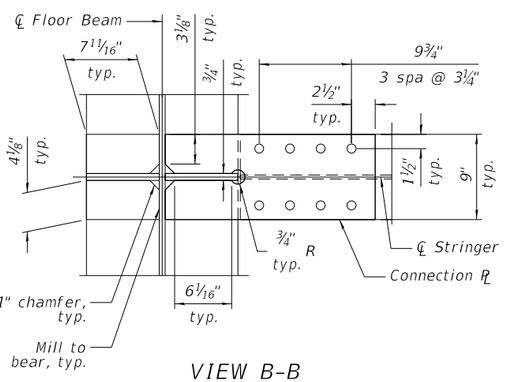
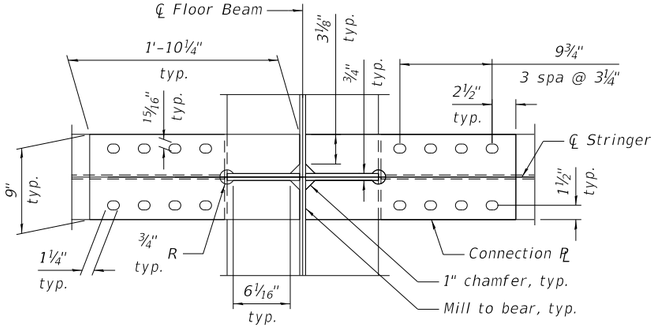


SECTION G-G

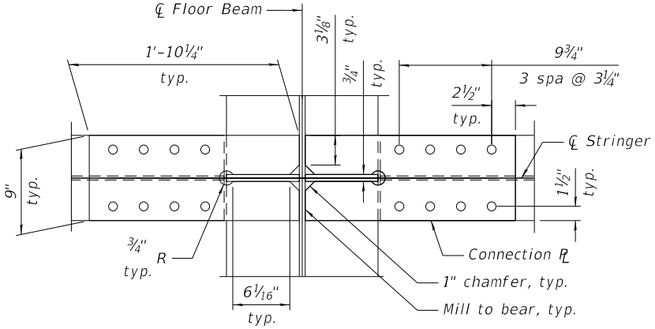
(See "End Fixed Connection" for details not shown)



VIEW B-B



VIEW D-D



VIEW F-F

Notes:

1. Use standard 15/16" diameter holes on stringer flanges, floorbeam flanges, and web connection plates.
2. Use standard 15/16" diameter holes on all flange connection plates denoted as "Fixed".
3. Use slotted 15/16" x 1 1/4" holes on flange connection plates where indicated and stringer webs denoted as "Slotted". A 2" x 2" x 5/16" structural plate washer is required for each slotted hole in the top and bottom connection plates.
4. Bolts in slotted connection shall be installed snug tight until slab is poured between stringer expansion plates. Bolts shall be fully tightened after belvedere slab has been poured and prior to the closure pours over the expansion plates, see Sht. S-220 of 445 for details.

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F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1164
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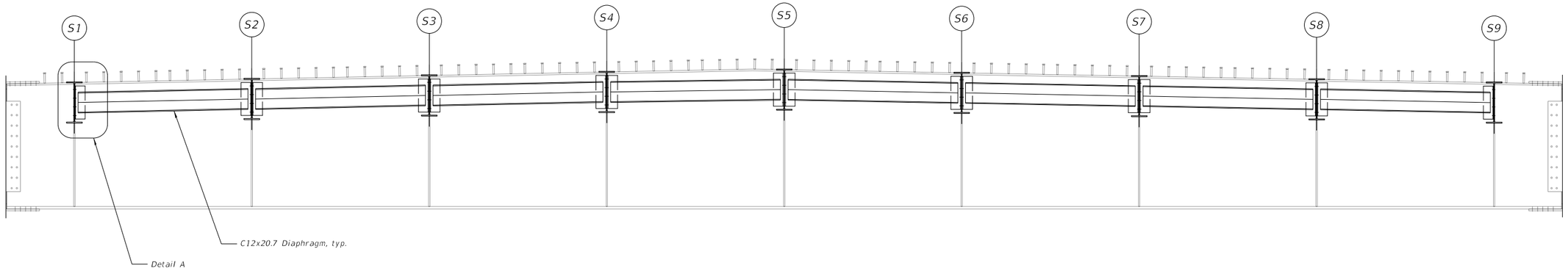
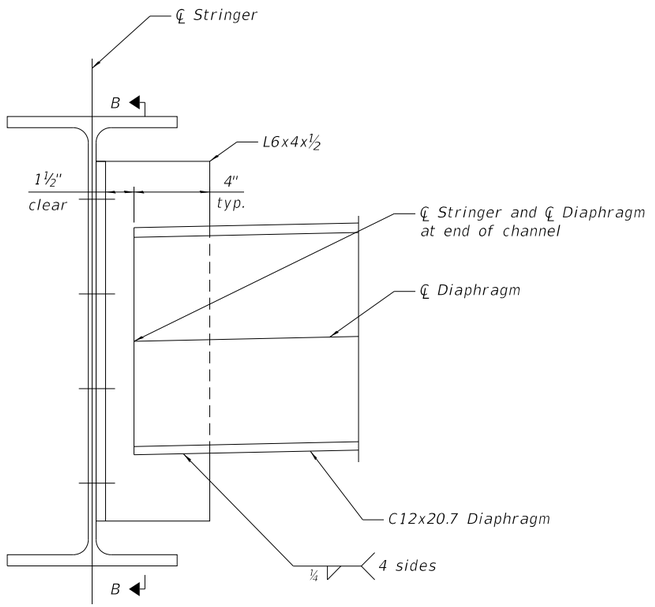
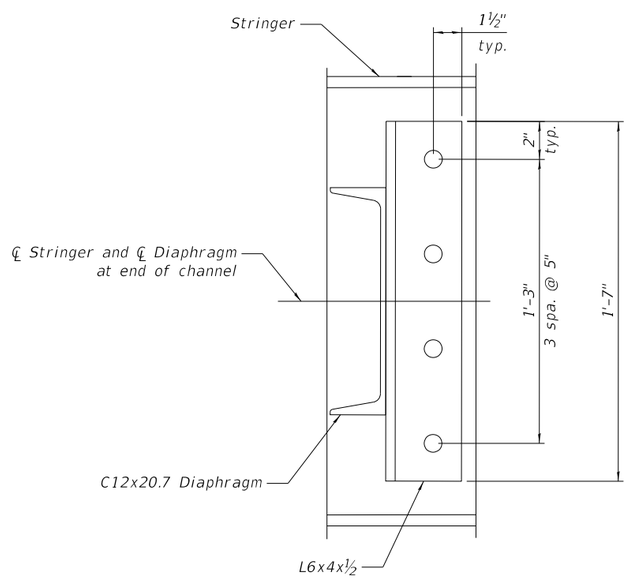


TYPICAL STRINGER SECTION



Detail A



Section B-B

FLOOR BEAM MOMENT TABLE					FLOOR BEAM SHEAR TABLE			
Floor Beam	DC1 (kip-ft)	DC2 (kip-ft)	DW (kip-ft)	LL+IM (kip-ft)	DC1 (kip)	DC2 (kip)	DW (kip)	LL+IM (kip)
FB00/FB22	983	104	260	2,007	80	11	19	157
FB01/FB21	2,069	231	976	2,872	124	22	59	156
FB02/FB20	3,425	572	1,221	3,184	166	35	57	157
FB03/FB19	2,765	283	1,233	3,201	121	21	58	158
FB04/FB18	3,461	743	1,220	3,205	169	38	58	158
FB05/FB17	2,740	281	1,218	3,205	120	21	58	158
FB06/FB16	3,519	536	1,218	3,205	169	34	58	158
FB07/FB15	2,664	282	1,218	3,205	113	21	58	158
FB08/FB14	3,350	1,013	1,219	3,205	161	54	58	158
FB09/FB13	2,593	270	1,219	3,203	110	20	58	158
FB10/FB12	3,406	489	1,218	3,205	161	48	58	159
FB11	2,596	179	1,219	3,213	122	17	58	158

INTERIOR STRINGER MOMENT TABLE											
MAX POSITIVE MOMENT				MAX NEGATIVE MOMENT				MAX SHEAR			
DC1 (kip-ft)	DC2 (kip-ft)	DW (kip-ft)	LL+IM (kip-ft)	DC1 (kip-ft)	DC2 (kip-ft)	DW (kip-ft)	LL+IM (kip-ft)	DC1 (kip)	DC2 (kip)	DW (kip)	LL+IM (kip)
113	30	50	363	-113	-30	-50	-236	19	5	8	70

Legend:

DC1 Indicates structural components and non-structural attachments on non-composite section.
DC2 Indicates structural components and non-structural attachments on composite section.
DW Indicates future wearing surfaces and utilities.
LL+IM Indicates live load plus impact.

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FLOOR SYSTEM FORCES - UNIT 5
STRUCTURE NO. 090-0180
SHEET S-258 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1166
		CONTRACT NO. 68B46		
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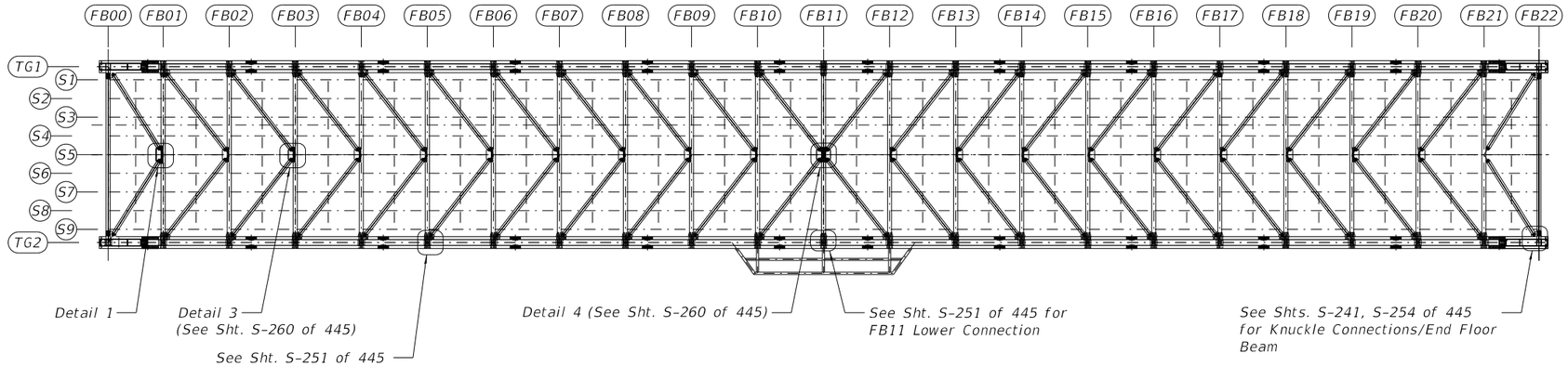
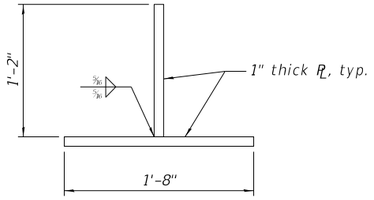
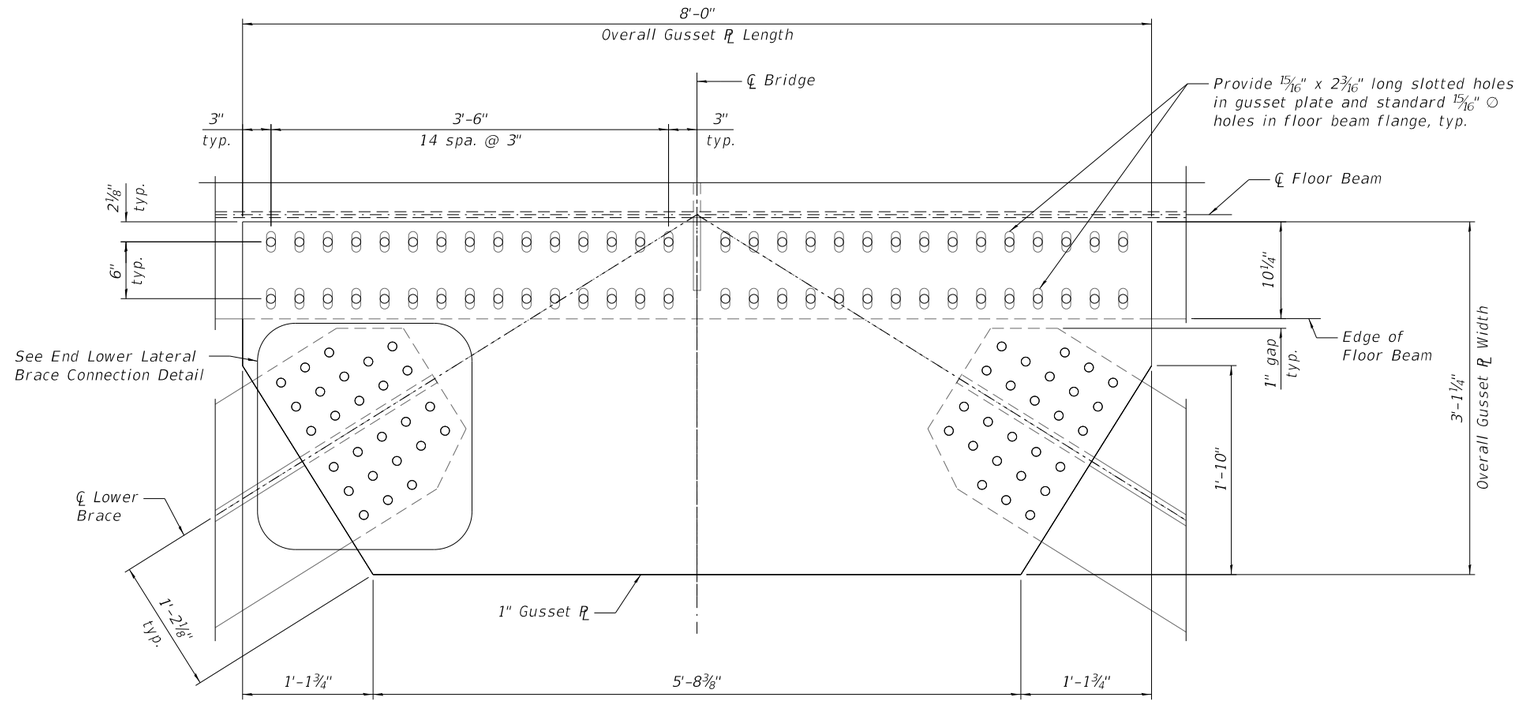


LOWER LATERAL KEY PLAN – UNIT 5



SECTION A-A

(Lower Brace Cross Section)



DETAIL 1

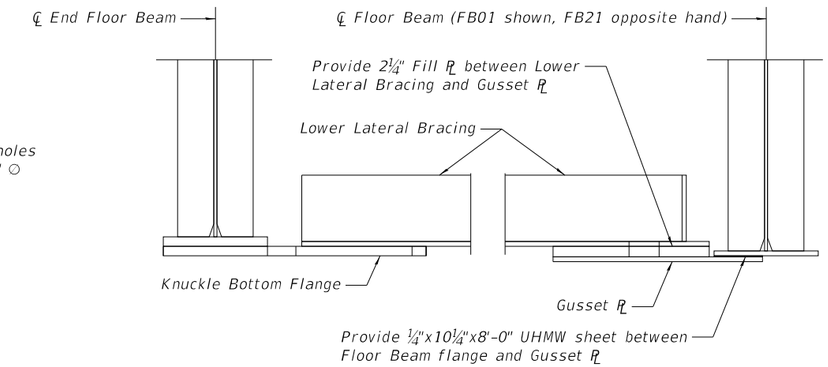
(Gusset PL at FB01 shown,
Gusset PL at FB21 similar)
(Detail view from under bridge looking up)

Key:

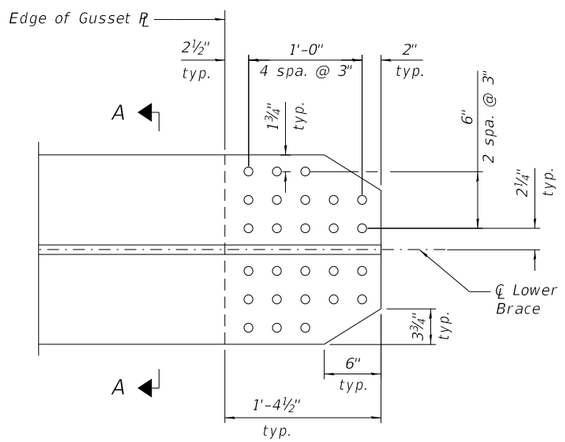
- (S1) Stringer
- (TG1) Tie Girder
- (FB01) Floor Beam

Notes:

1. Bolts installed in slotted holes between the Floor Beam flange and Gusset PL shall be installed snug tight. An additional second nut shall be installed at each bolt location of the snug tight joint. An ASTM F436 washer or 5/16" thick common plate washer shall be used as required to completely cover the slotted hole. All remaining lateral bracing bolted connections shall conform to General Note 1, see Sht. S-7 of 445.
2. Provide UHMW sheet in accordance with ASTM D6712.



ELEVATION VIEW END LATERAL BRACE



END BAY LOWER LATERAL BRACE CONNECTION DETAIL

(Dimensions symmetric about ℄ Lower Brace)

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LOWER LATERAL BRACING DETAILS - UNIT 5, 1 OF 2
STRUCTURE NO. 090-0180
SHEET S-259 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB))BR)BR	PEO/TAZ	1361	1167
		CONTRACT NO. 68B46		
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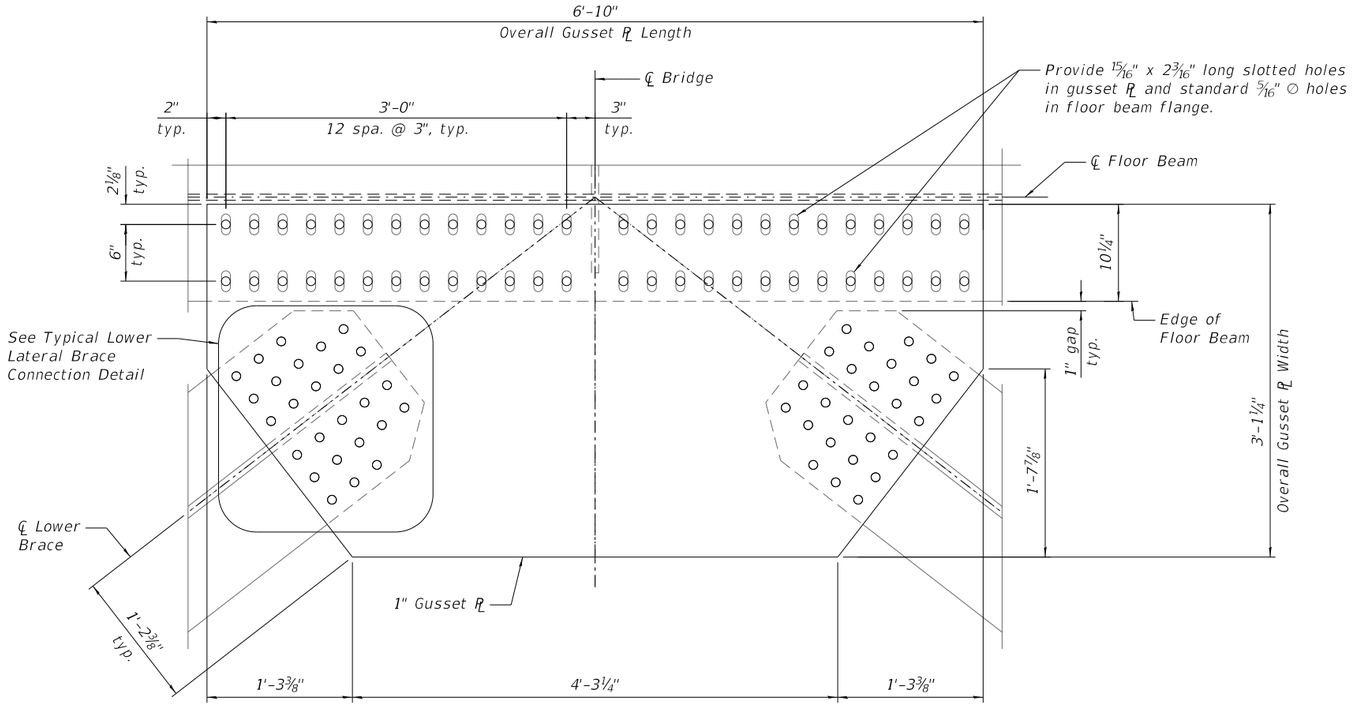
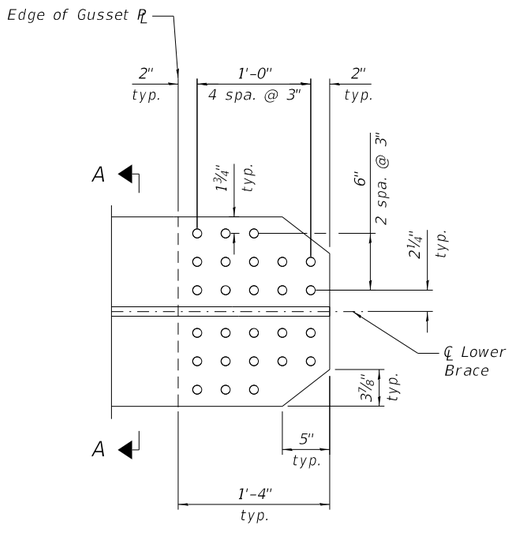


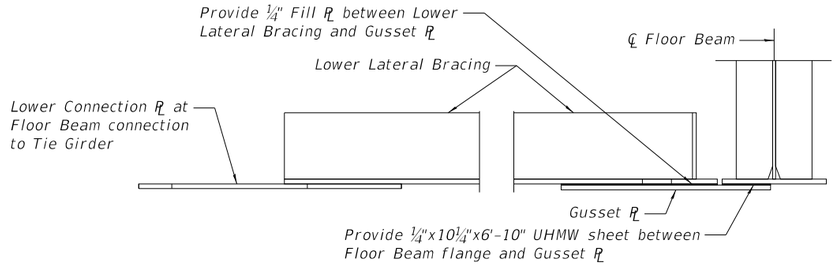
DETAIL 3

(View from under bridge looking up. Gusset PL at FB03 shown, Gusset PLs at FB02-FB10 & FB12-FB20 similar)

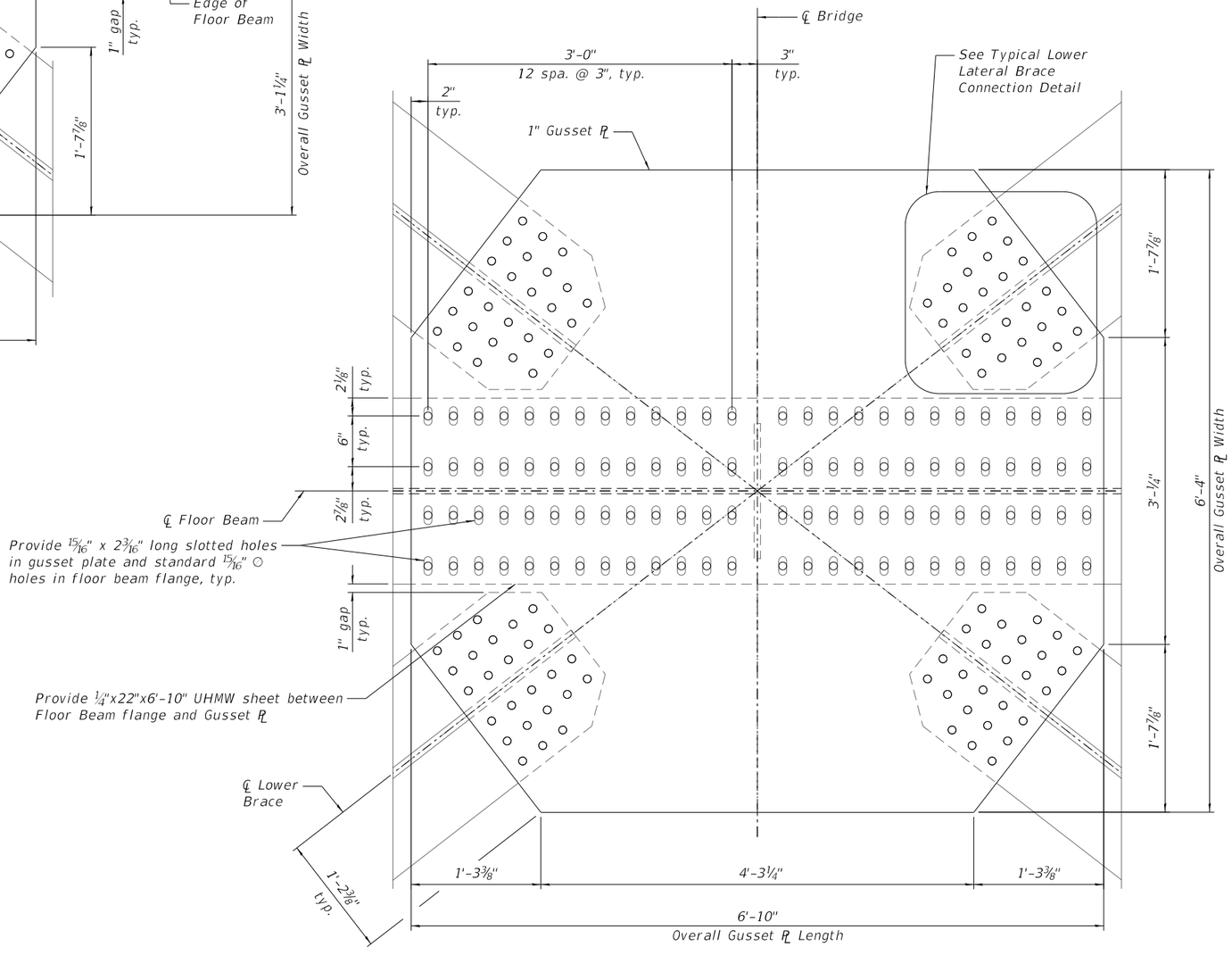


TYPICAL LOWER LATERAL BRACE CONNECTION DETAIL

(Dimensions symmetric about ℄ Lower Brace)



ELEVATION VIEW TYPICAL LATERAL BRACE



DETAIL 4

(Gusset PL at FB11; view from under bridge looking up)

Notes:
1. See Sht. S-259 of 445 for section A-A.
2. See Sht. S-259 of 445 for lateral bracing notes applicable to this sheet.

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		CHECKED - MM	REVISED -	
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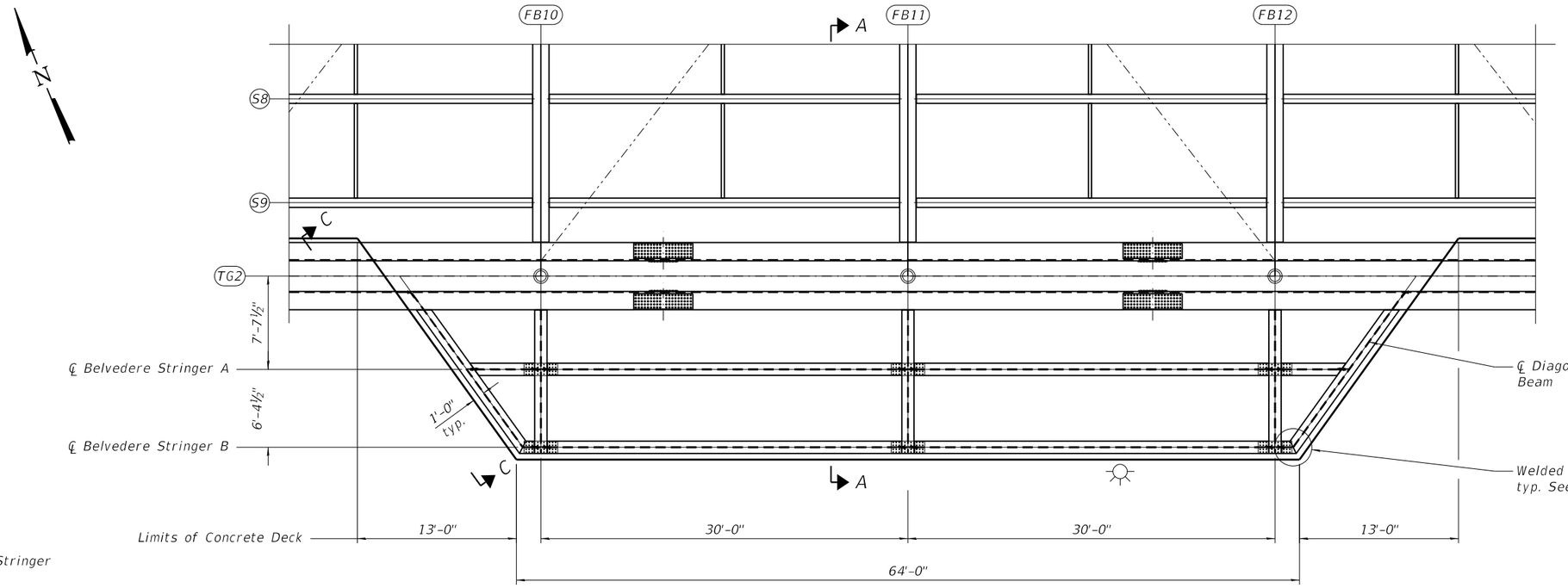
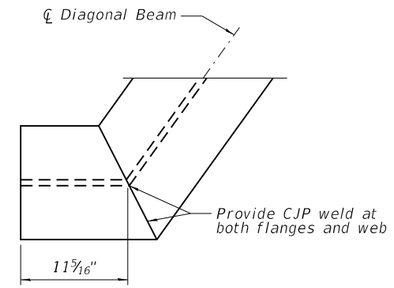
	PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -	

LOWER LATERAL BRACING DETAILS - UNIT 5, 2 OF 2
STRUCTURE NO. 090-0180
SHEET S-260 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	(15B;(102-1),(14HB))BR)BR	PEO/TAZ	1361	1168
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



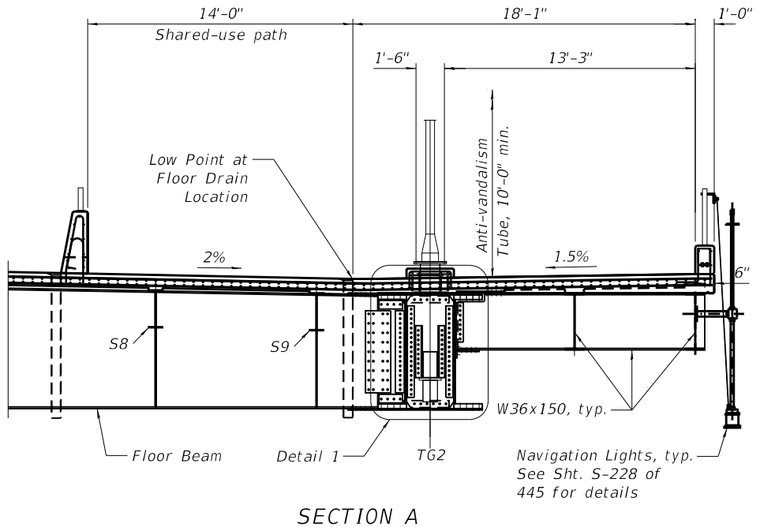


WELDED MOMENT CONNECTION DETAIL

Key:

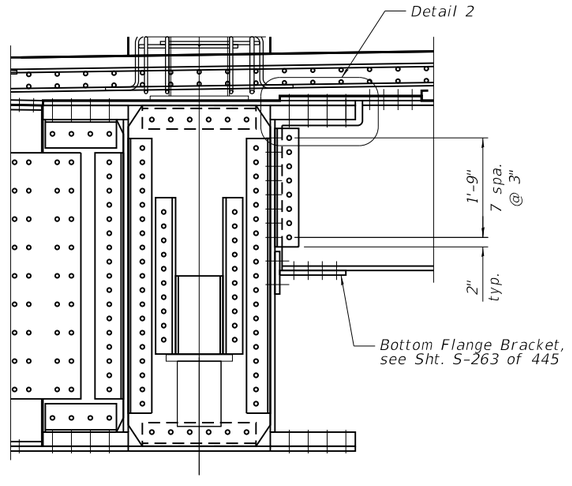
- (S1) Stringer
- (TG1) Tie Girder
- (FB01) Floor Beam

PARTIAL FRAMING PLAN - BELVEDERE



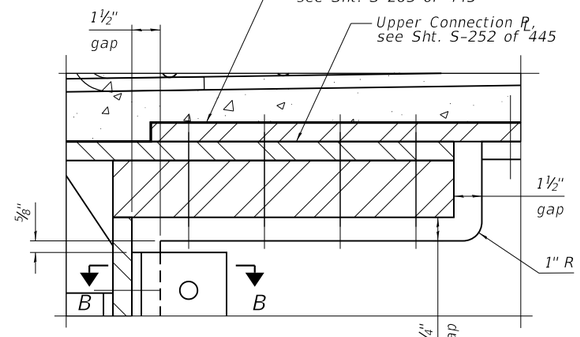
SECTION A

(FB 11 shown, similar FB10 and FB12)

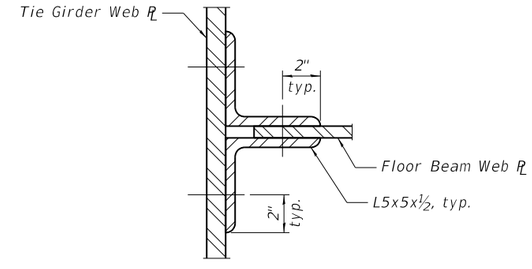


DETAIL 1

(See Sht. S-250 of 445 for information not shown)



DETAIL 2



SECTION B-B

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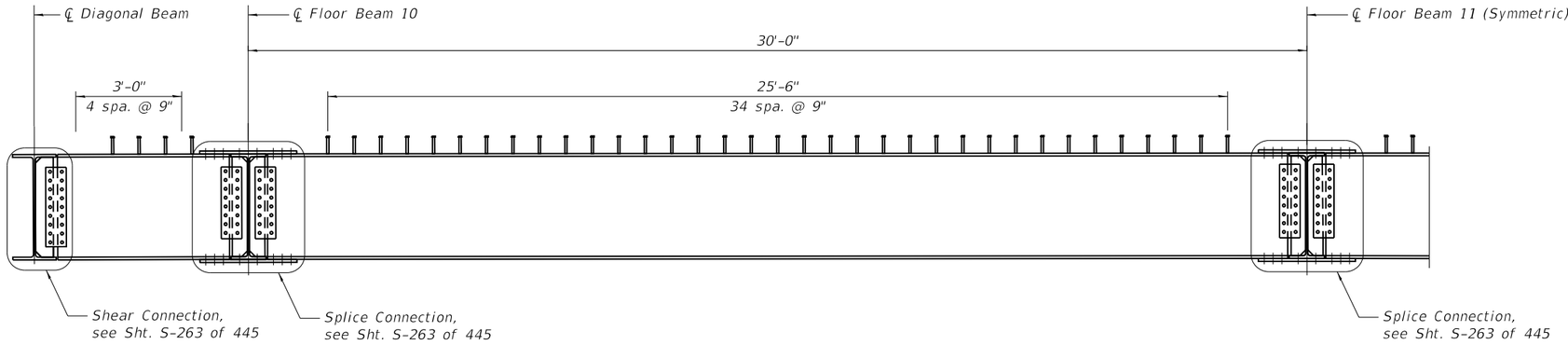
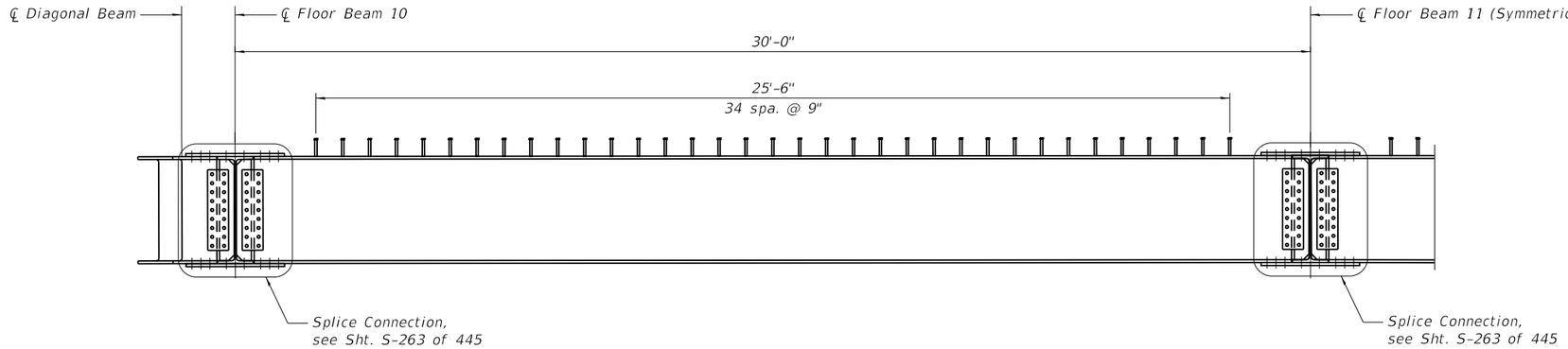
	PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -	

BELVEDERE DETAILS - UNIT 5, 1 of 3
STRUCTURE NO. 090-0180
SHEET S-261 OF 445 SHEETS

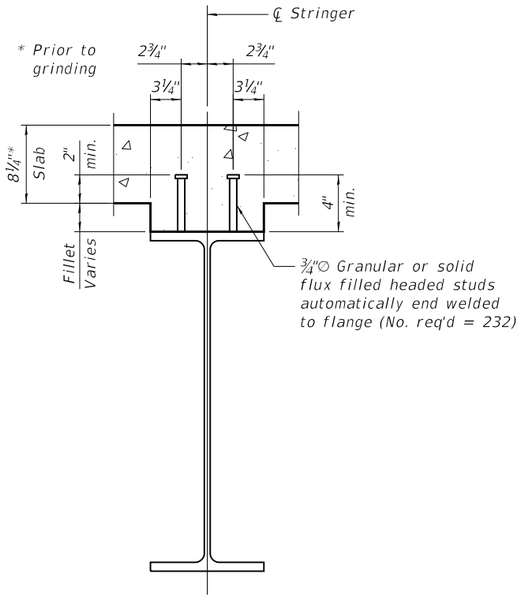
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1169
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



BELVEDERE STRINGER A ELEVATION

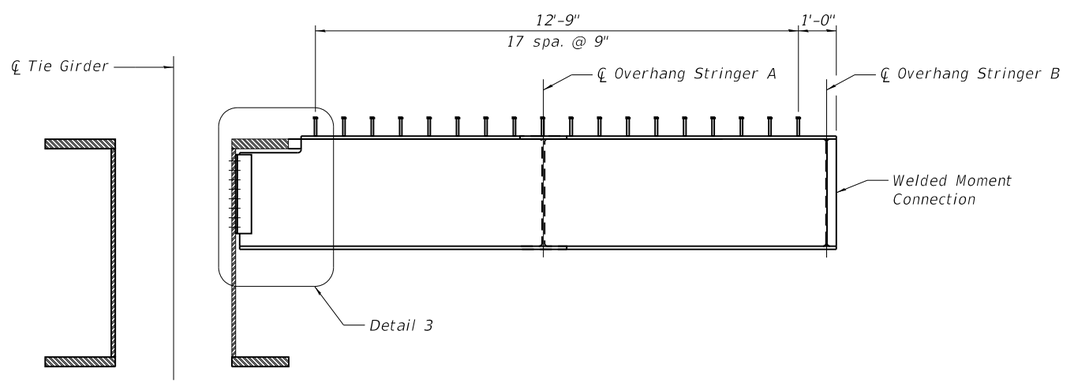


BELVEDERE STRINGER B ELEVATION



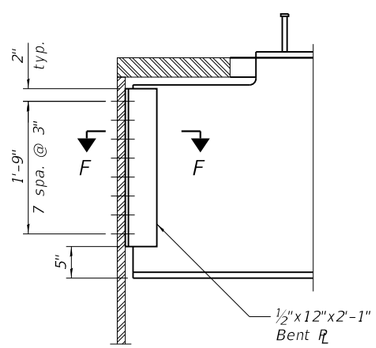
TYPICAL SECTION

(Applicable at Belvedere Stringers, Diagonal Beam, and Overhang Beam)

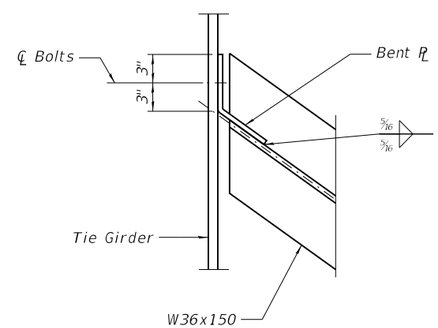


VIEW C

DIAGONAL BEAM ELEVATION



DETAIL 3



SECTION F-F

TYLIN INTERNATIONAL
200 S. WACKER DR.
SUITE 1400
CHICAGO, IL 60606
TEL: 312-777-2900

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	CHECKED - MM	REVISED -	
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PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BELVEDERE DETAILS - UNIT 5, 2 of 3
STRUCTURE NO. 090-0180

SHEET S-262 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1170
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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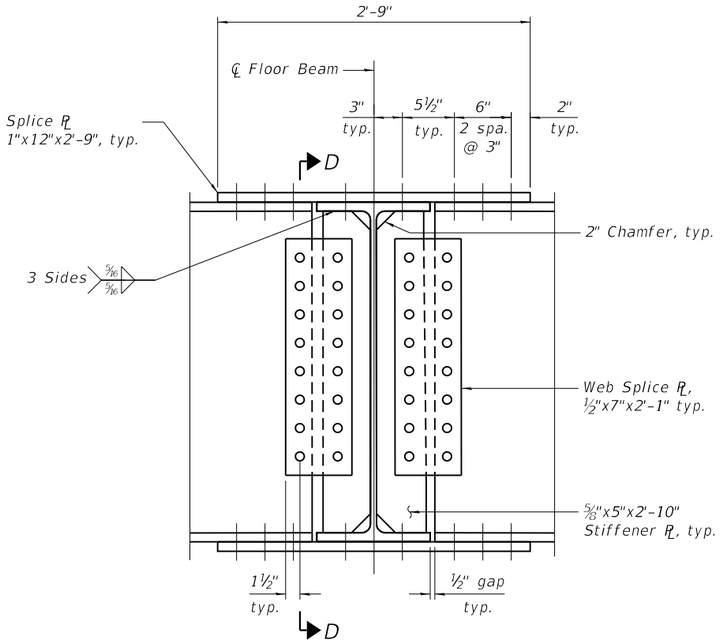
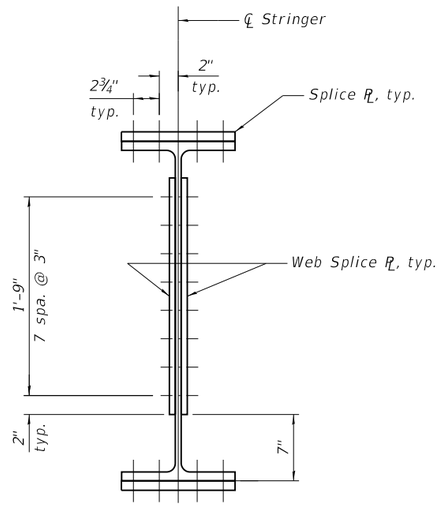
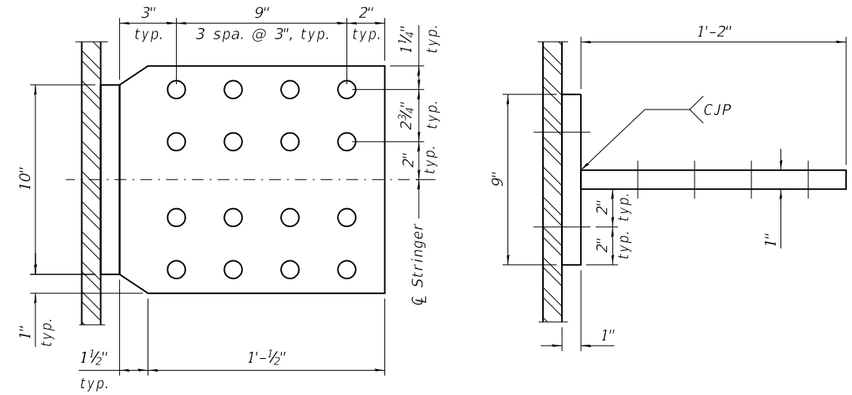


SPLICE CONNECTION

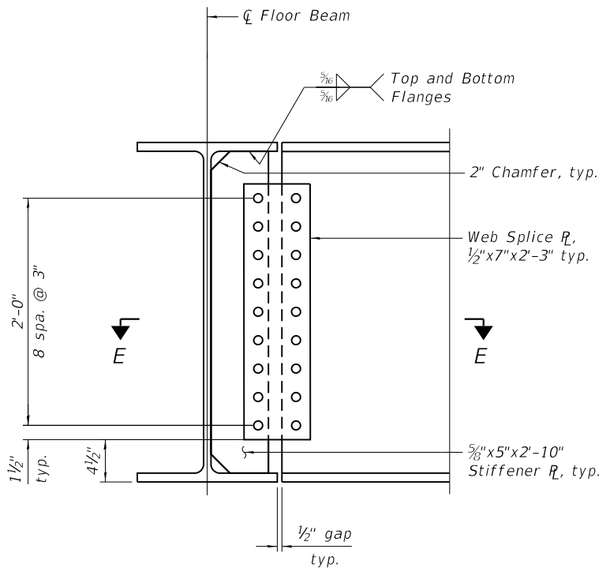


SECTION D-D

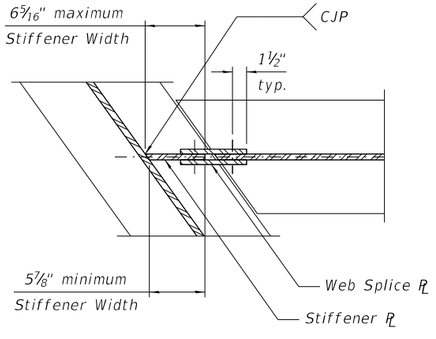


Plan Section

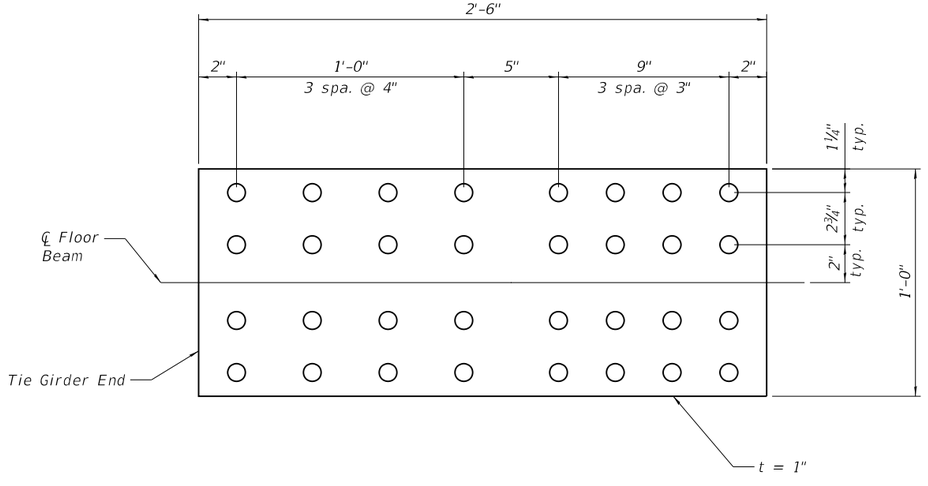
BOTTOM FLANGE BRACKET



SHEAR CONNECTION



SECTION E-E



TOP FLANGE CONNECTION PL

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12/12/2018 8:45:42 AM

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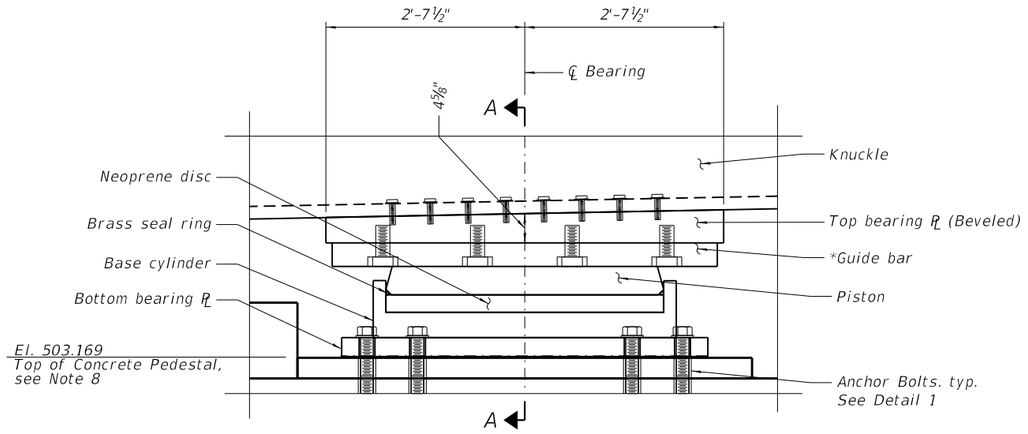
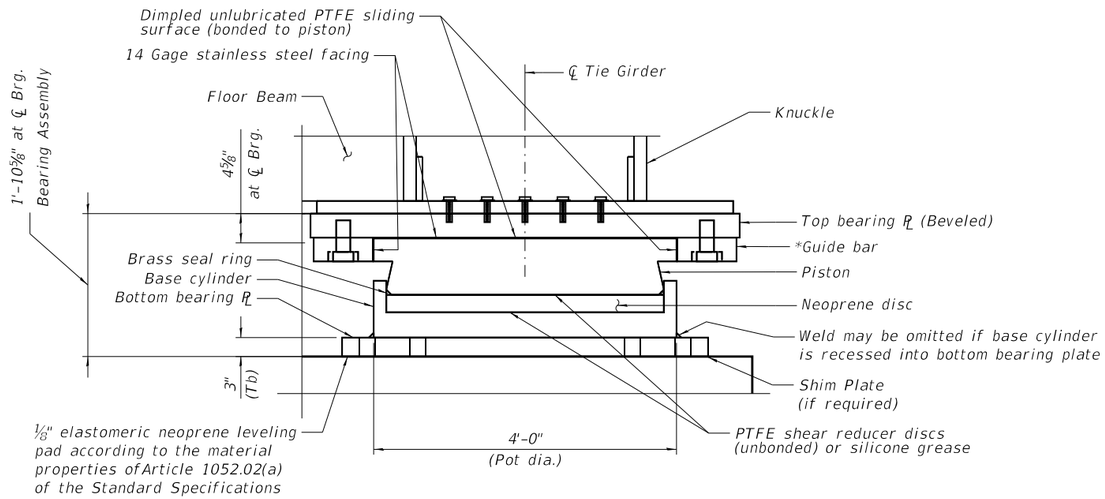
		CHECKED - MM	REVISED -		STRUCTURE NO. 090-0180
	PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - JR	REVISED -		SHEET S-263 OF 445 SHEETS
	PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -		

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1171
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



ELEVATION

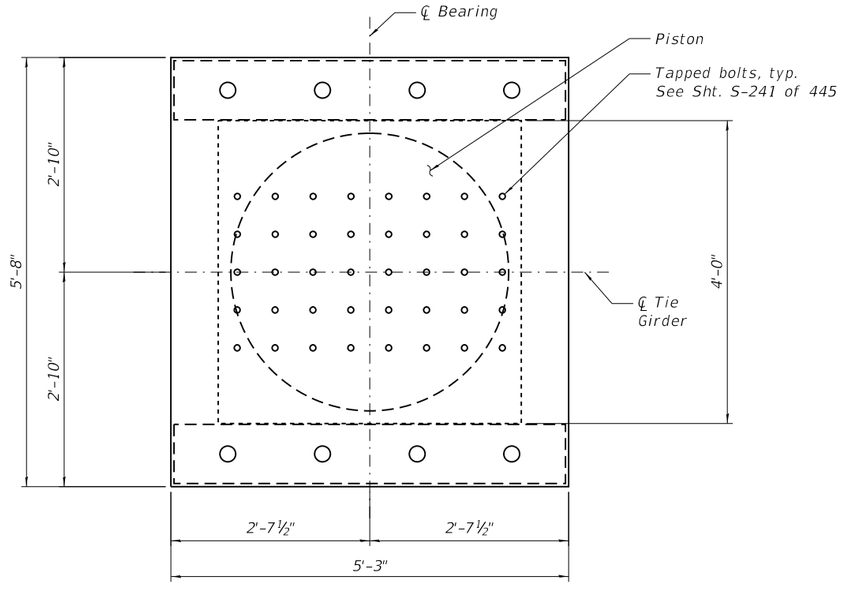


SECTION A-A
(Anchor Bolts omitted for clarity)

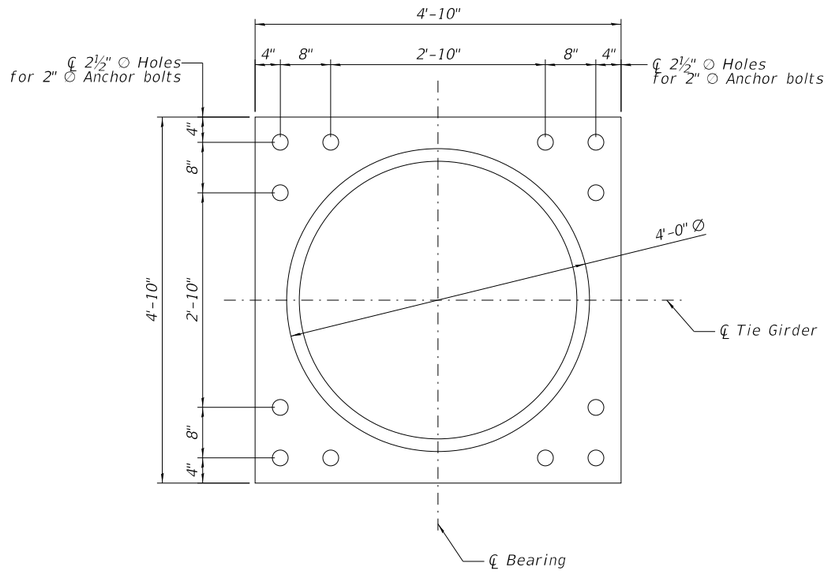
* As alternates to the bolted connection shown, the guide bars may be connected to the top bearing plate by groove welds or the guide bars and top bearing plate may fabricated as a single piece.

GUIDED EXPANSION HLMR BEARING

(At Pier 12)



TOP BEARING PL AND PISTON PLAN



BOTTOM BEARING PL AND BASE CYLINDER PLAN

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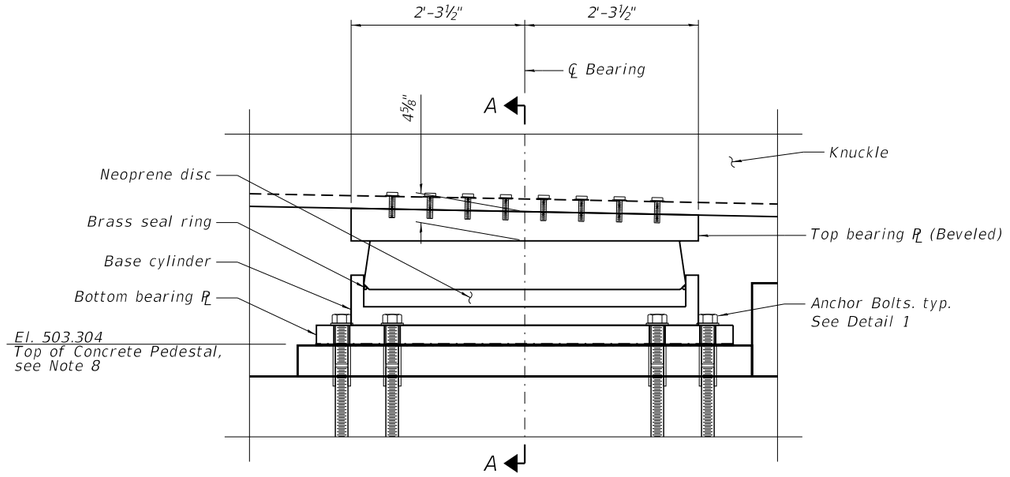
PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -

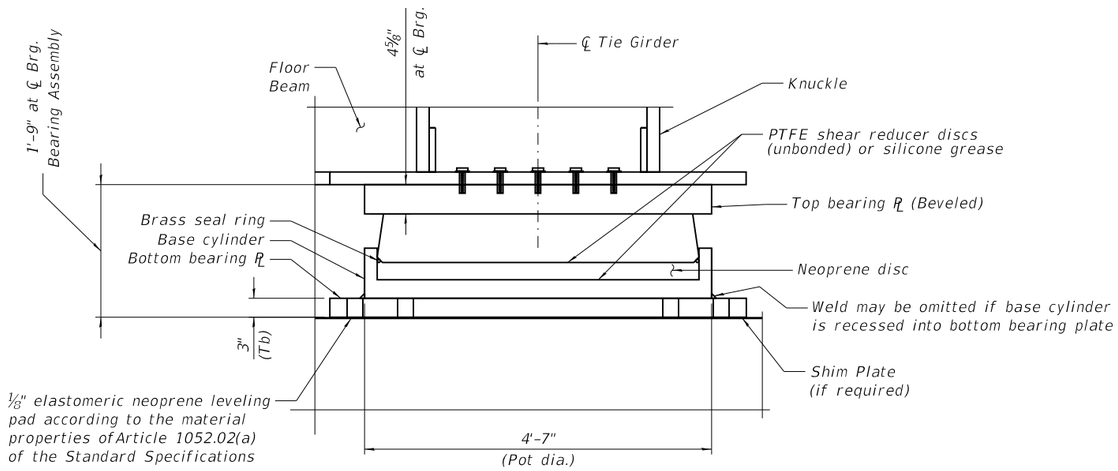
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BEARING DETAILS - UNIT 5, 1 OF 3
STRUCTURE NO. 090-0180
SHEET S-264 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1172
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



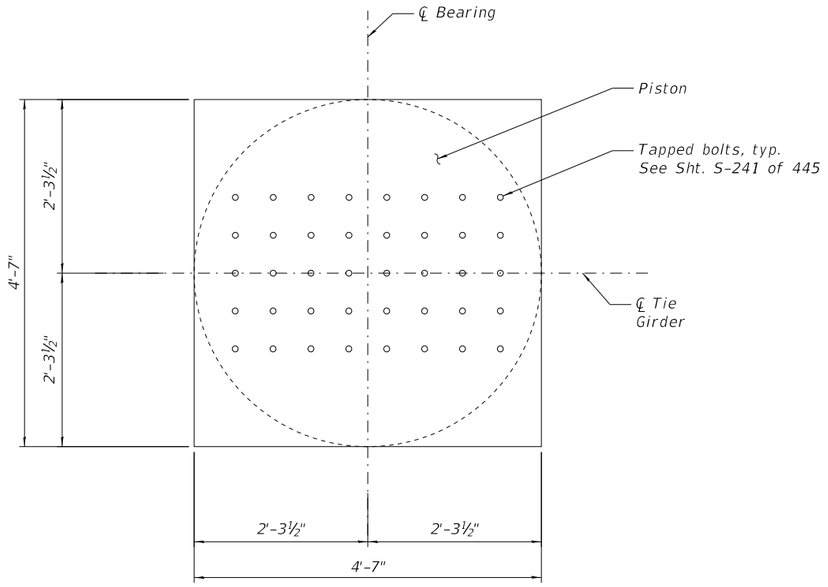
ELEVATION



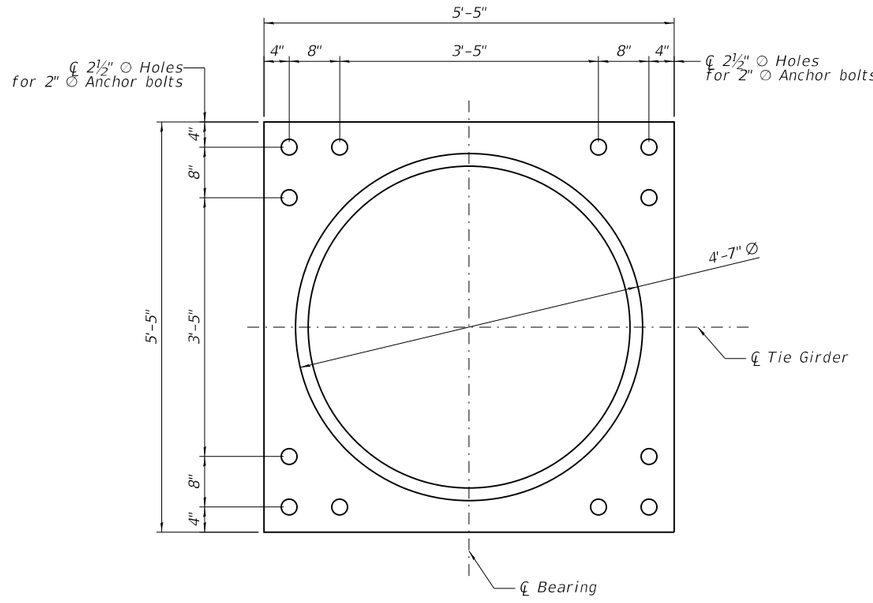
SECTION A-A
(Anchor Bolts
omitted for clarity)

FIXED HLMR BEARING

(At Pier 13)



TOP BEARING PL AND
PISTON PLAN



BOTTOM BEARING PL AND
BASE CYLINDER PLAN

MODEL: Default
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TYLIN INTERNATIONAL 200 S. WACKER DR. SUITE 1400 CHICAGO, IL 60606 TEL: 312-777-2900	USER NAME = jryding	DESIGNED - ER	REVISED -	**STATE OF ILLINOIS** **DEPARTMENT OF TRANSPORTATION**	BEARING DETAILS - UNIT 5, 2 OF 3 STRUCTURE NO. 090-0180 SHEET S-265 OF 445 SHEETS
		CHECKED - MM	REVISED -		
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F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1173
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

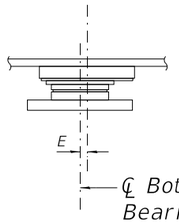
12/12/2018 8:45:39 AM

DESIGN DATA (FIXED BEARING)

Data	Pier 13	Comment
Vertical Design Load, Service (kips)	4650	Service DL + LL without Impact + 0.3WS
Horizontal Design Load, Strength (kips)	1036	Factored Ultimate (Strength) Design Lateral Load
Longitudinal Design Load, Strength (kips)	936	Factored Ultimate (Strength) Design Lateral Load
Resultant Design Load, Strength (kips)	1106	Maximum Concurrent Resultant Lateral Load
Design Rotation, Strength (rad)	0.03	Factored Ultimate Design Rotation
Total Required Movement, Longitudinal (in)	0.00	
Total Required Movement, Transverse (in)	0.00	

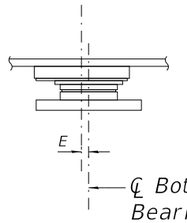
DESIGN DATA (GUIDED EXP. BEARING)

Data	Pier 12	Comment
Vertical Design Load, Service (kips)	4650	Service DL + LL without Impact + 0.3WS
Horizontal Design Load, Strength (kips)	1020	Factored Ultimate (Strength) Design Lateral Load
Design Rotation, Strength (rad)	0.03	Factored Ultimate Design Rotation
Total Required Movement, Longitudinal (in)	12.33	Factored Extreme 1 (Seismic) Movement
Total Required Movement, Transverse (in)	0.00	



BELOW 50° F

(Move bott. brg. ℄ away from fixed bearing)



ABOVE 50° F

(Move bott. brg. ℄ toward fixed bearing)

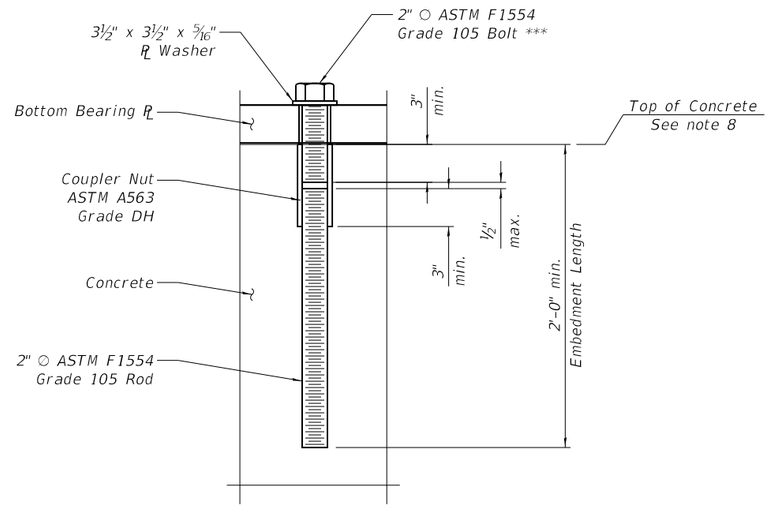
SETTING ANCHOR BOLTS AT EXP. BRG.

E = ¾" for every 15° temp. change from the normal temp. of 50° F.

BILL OF MATERIAL

Item	Unit	Total
Anchor Bolts, 2" ∅	Each	48
High Load Multi-Rotational Bearings, Fixed, 4650 kips	Each	2
High Load Multi-Rotational Bearings, Guided Expansion, 4650 kips	Each	2

*** Contractor shall verify that the length of Anchor Bolt is sufficient for placement with Bearing Manufacturer



DETAIL 1

Cost of threaded rod, bolt, washer and nut shall be included in the cost of the Anchor Bolts, 2"

Notes:

1. The structural steel plates of the bearing assembly shall conform to the requirements of AASHTO M 270 Grade 50.
2. Two ⅛ in. adjusting shims shall be provided for each bearing in addition to all othe plates or shims and placed as shown on bearing details.
3. H.S. fasteners in bearing assembly shall be galvanized according to AASHTO M298 Class 50.
4. If base cylinder is recessed into bottom bearing plate, the thickness of the bottom plate shall be Tb plus the depth of the recess.
5. Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade and diameter specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
6. Anchor bolts may be either cast in place or installed in holes drilled after the supported members is in place. Drilled and set anchor bolts shall be installed according to Article521.06 of the Standard Specification.
7. The cost of the elastomeric neoprene leveling pads, shim plates, and threaded studs shall be included in the cost of High Load Multi-Rotational Bearings.
8. Top of concrete pedestal elevation is based on the bearing dimensions provided and includes the 1/8" elastomeric neoprene leveling pad. This elevation may have to be adjusted to accommodate the actual bearing furnished by the Contractor. It is the responsibility of the Contractor to coordinate any changes in the bearings which may affect this elevation. See Shts. S-355, S-365 of 445 for concrete pedestal and pier substructure details.

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CHICAGO, IL 60606
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PLOT DATE = 12/12/2018	CHECKED - NS	REVISED -	

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BEARING DETAILS - UNIT 5, 3 OF 3
STRUCTURE NO. 090-0180
SHEET S-266 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1174
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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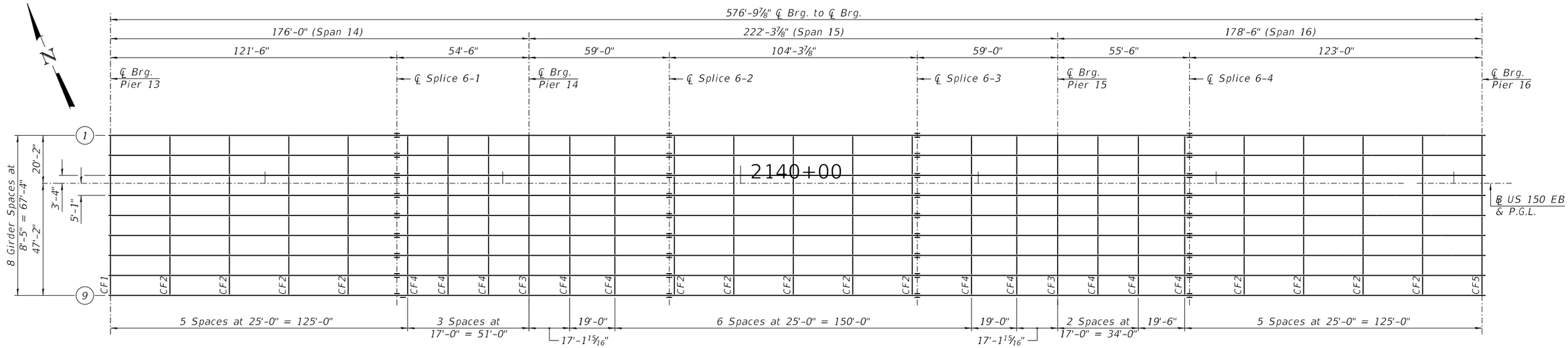
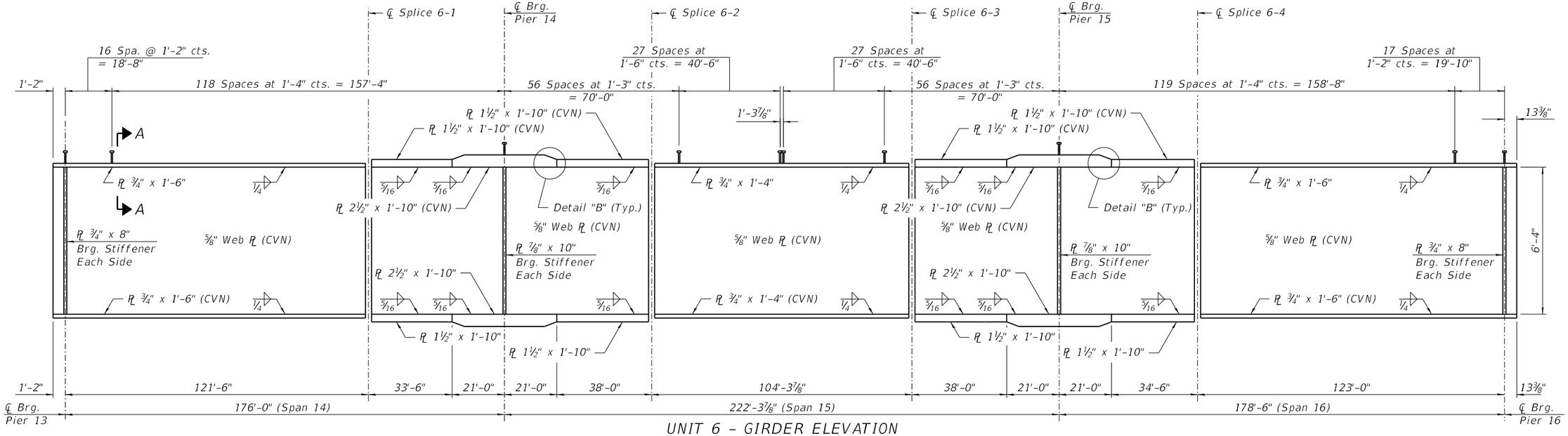


UNIT 6 – FRAMING PLAN



UNIT 6 – GIRDER ELEVATION

Notes:

All Structural Steel shall be AASHTO M270 Grade 50W.

"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.

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

See Sheet S-269 of 445 for Section A-A and Detail B.

HANSON

USER NAME = johns00944	DESIGNED - MNM	REVISED -	
	CHECKED - SEG	REVISED -	
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
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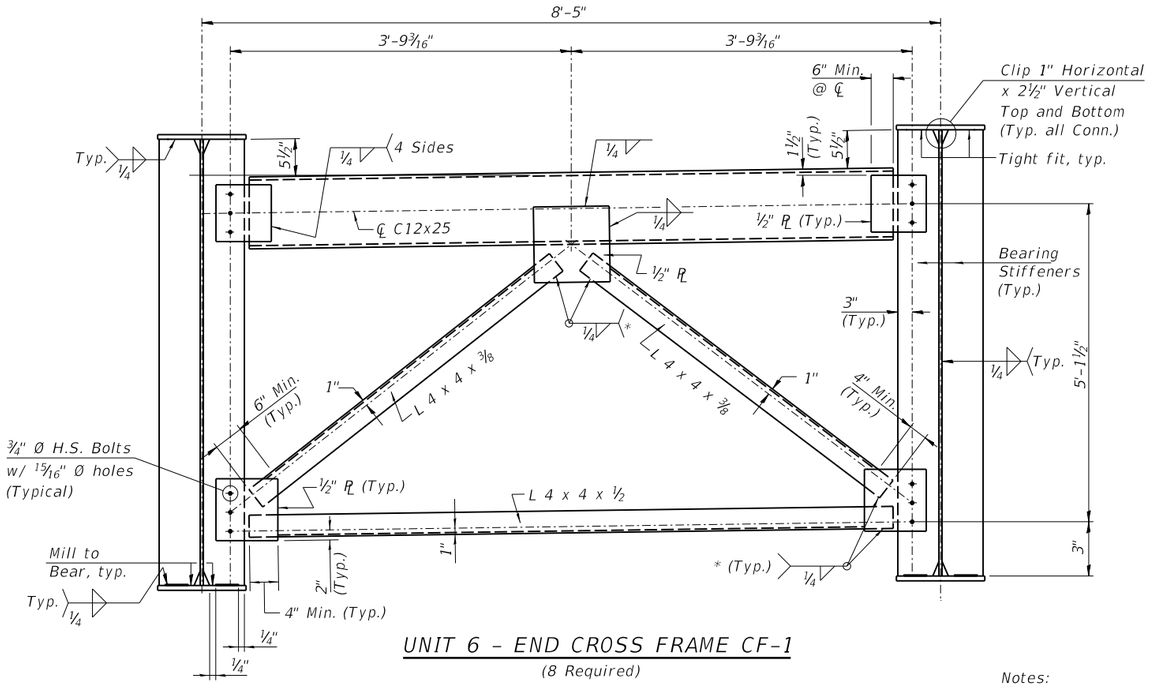
FRAMING PLAN - UNIT 6
STRUCTURE NO. 090-0180

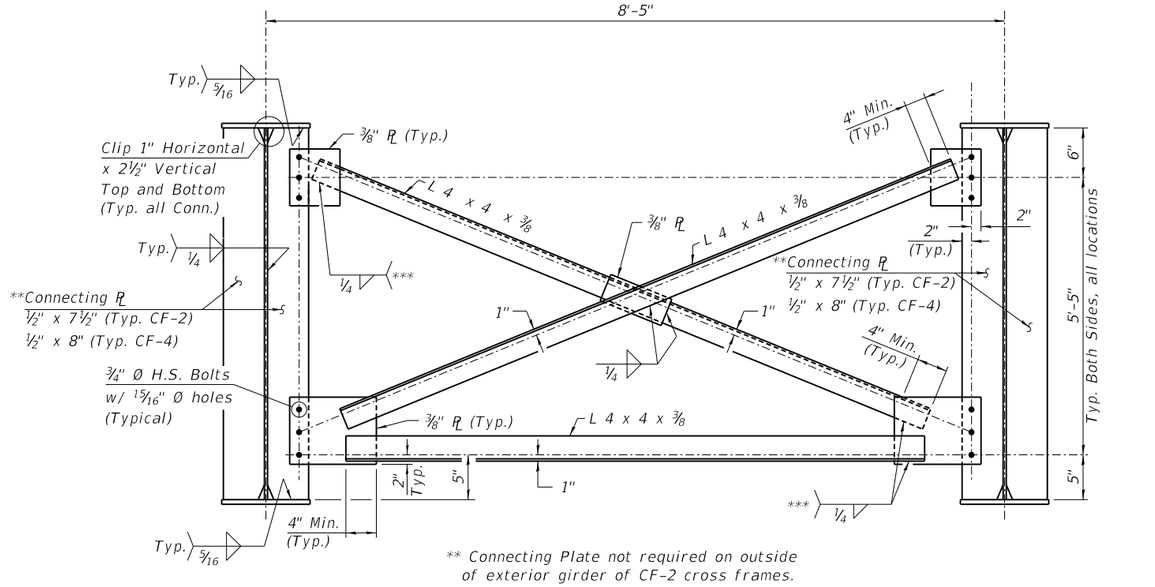
SHEET S-267 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1175
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



UNIT 6 – END CROSS FRAME CF-1

(8 Required)



** Connecting Plate not required on outside of exterior girder of CF-2 cross frames.

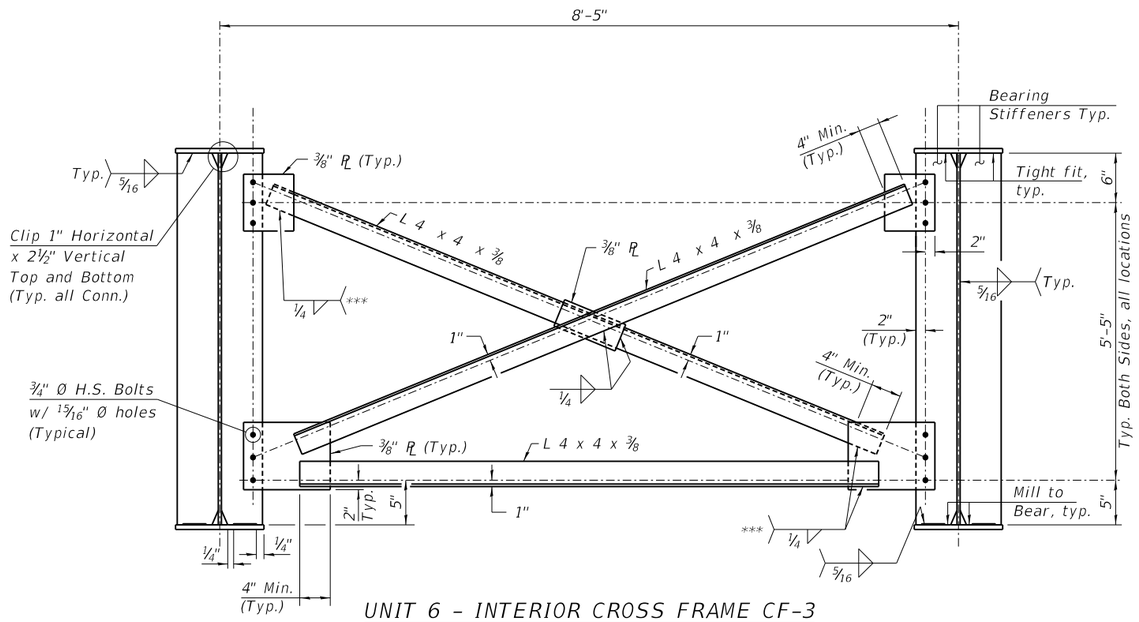
*** Fillet weld angles along 3 sides on one face of gusset plate.

UNIT 6 – INTERIOR CROSS FRAME CF-2 & CF-4

(104 CF-2 Required, 80 CF-4 Required)

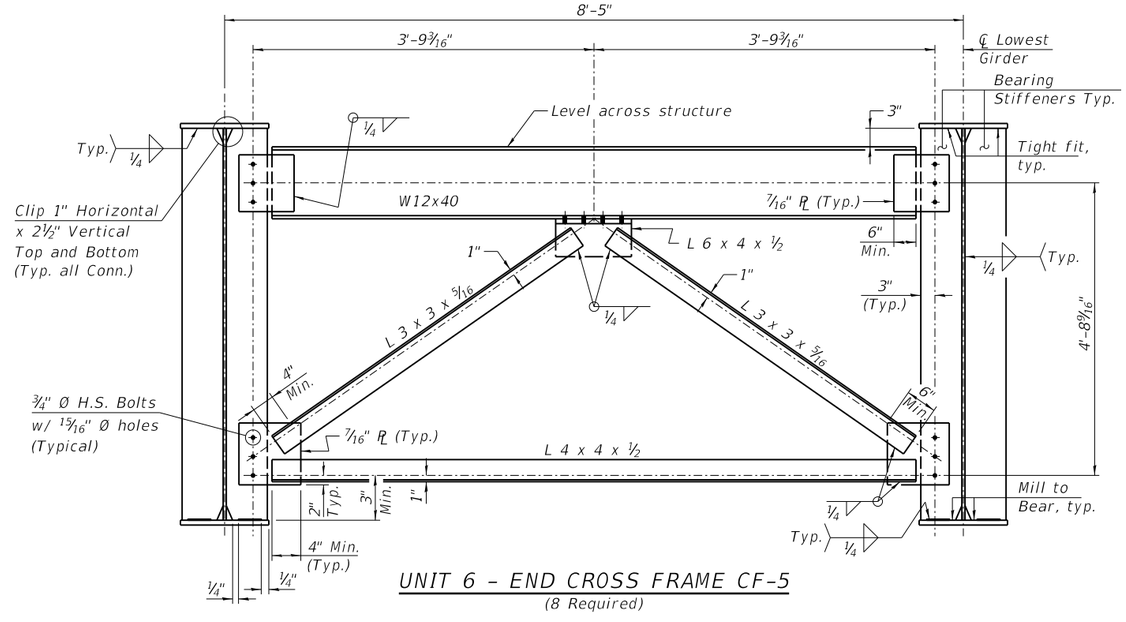
Notes:
Place end cross frame with channel flanges and outstanding angle legs outward from abutment backwall.
All Structural Steel shall be AASHTO M270 Grade 50W.

* Weld on near side of ½" plate.



UNIT 6 – INTERIOR CROSS FRAME CF-3

(16 Required)



UNIT 6 – END CROSS FRAME CF-5

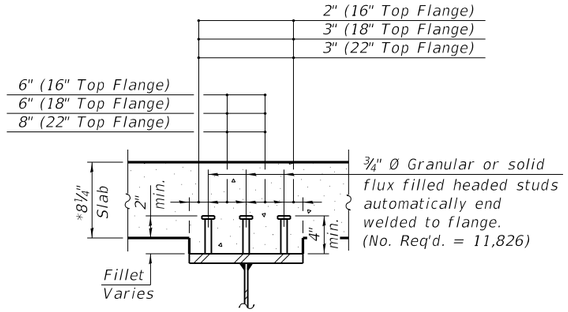
(8 Required)

HANSON	USER NAME = johns00944	DESIGNED - MNM	REVISED -
		CHECKED - SEG	REVISED -
	PLOT SCALE = 0.2.0000 '=' / in.	DRAWN - DAP	REVISED -
	PLOT DATE = 1/25/2019	CHECKED - MNM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

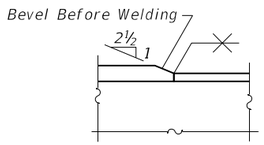
GIRDER DETAILS - UNIT 6, 1 OF 3
STRUCTURE NO. 090-0180
SHEET S-268 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1176
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

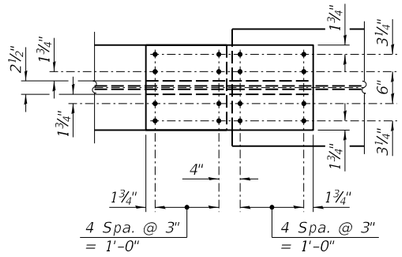


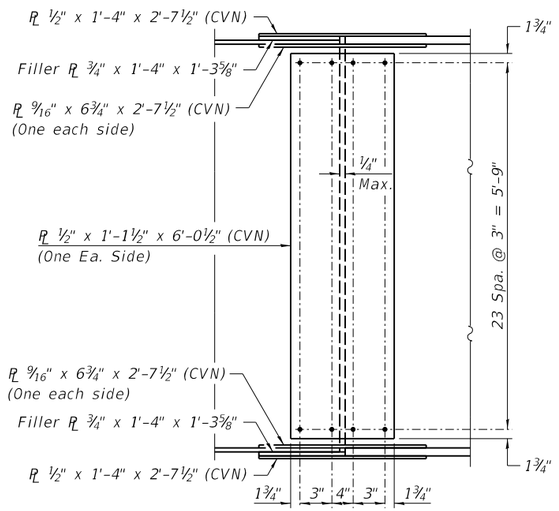
SECTION A-A

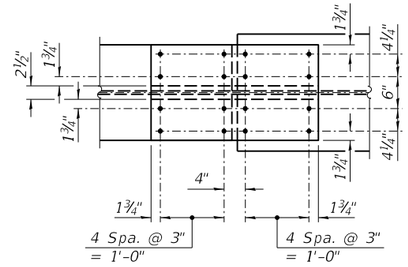
*Prior to grinding.

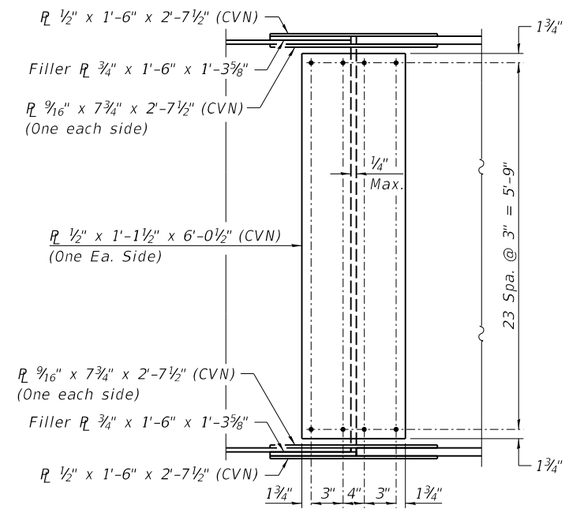


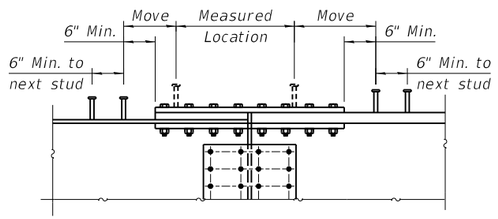
DETAIL "B"





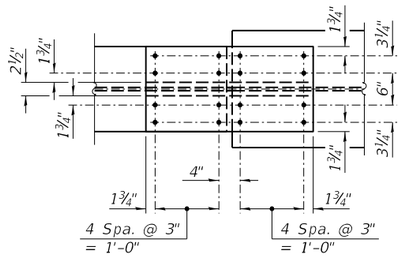




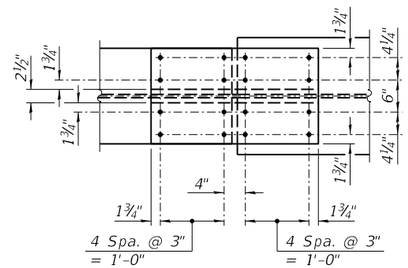


SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. Move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.



DETAIL - FIELD SPLICE 6-2 & 6-3



DETAIL - FIELD SPLICE 6-1 & 6-4

Notes:

Use ⅞" Ø H.S. Bolts with 15/16" Ø holes for all Splice Connections.
"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.
All Structural steel shall be AASHTO M270 Grade 50W.

HANSON

USER NAME = johns00944	DESIGNED - MNM	REVISED -	
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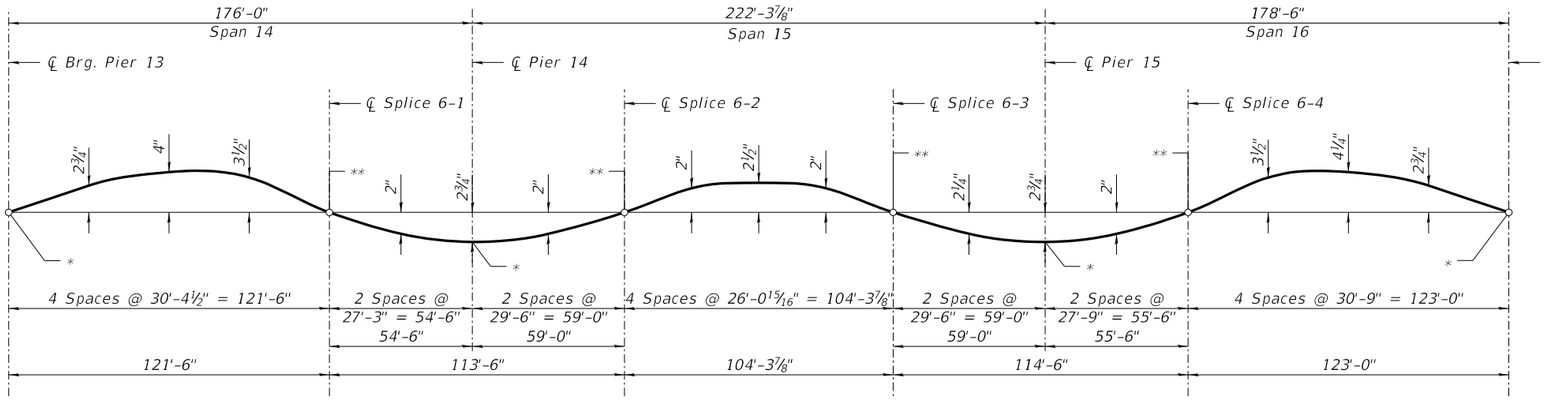
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 6, 2 OF 3
STRUCTURE NO. 090-0180
SHEET S-269 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1177
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		



CAMBER DIAGRAM UNIT 6

* See Table for Final Top of Web Elevations at piers.
** Theoretical Top of Web Elevations before dead load deflection.

***TOP OF WEB ELEVATIONS

		Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7	Girder 8	Girder 9
UNIT 6	℄ Brg. Pier 13	511.11	511.28	511.45	511.60	511.68	511.55	511.39	511.22	511.05
	℄ Splice 6-1	508.79	508.96	509.13	509.27	509.36	509.23	509.07	508.90	508.73
	℄ Pier 14	507.36	507.53	507.70	507.85	507.93	507.80	507.64	507.47	507.30
	℄ Splice 6-2	506.30	506.47	506.63	506.78	506.86	506.74	506.57	506.41	506.24
	℄ Splice 6-3	504.17	504.33	504.50	504.65	504.73	504.60	504.44	504.27	504.11
	℄ Pier 15	502.84	503.00	503.17	503.32	503.40	503.27	503.11	502.94	502.78
	℄ Splice 6-4	502.03	502.20	502.37	502.51	502.59	502.47	502.31	502.14	501.97
	℄ Brg. Pier 16	499.35	499.51	499.68	499.83	499.91	499.79	499.62	499.45	499.29

*** For Fabrication Only

INTERIOR GIRDER MOMENT TABLE						
		0.4 Sp. 14	Pier 14	0.5 Sp. 15	Pier 15	0.6 Sp. 16
Is	(in^4)	62626	192383	58208	192383	62626
Ic(n)	(in^4)	141521	–	135255	–	141521
Ic(3n)	(in^4)	105183	–	100219	–	105183
Ic(cr)	(in^4)	–	207944	–	207944	–
Ss	(in^3)	1616	4750	1502	4750	1616
Sc(n)	(in^3)	2234	–	2121	–	2234
Sc(3n)	(in^3)	2021	–	1911	–	2021
S(cr)	(in^3)	–	4857	–	4857	–
DC1	(k/')	1.266	1.308	1.266	1.308	1.266
MDC1	('k)	2118	6090	1502	6209	2203
DC2	(k/')	0.148	0.148	0.148	0.148	0.148
MDC2	('k)	273	692	216	705	284
DW	(k/')	0.390	0.390	0.390	0.390	0.390
MDW	('k)	718	1819	567	1854	746
LLDF		0.601	0.63	0.563	0.629	0.599
M_{L+IM}	('k)	3012	4289	2709	4313	3049
Mu (Strength I)	('k)	9337	18712	7739	18971	9564
Ø Mn	('k)	10590	–	10322	–	10529
fs DC1	(ksi)	15.73	15.38	12.00	15.69	16.36
fs DC2	(ksi)	1.62	1.71	1.36	1.74	1.69
fs DW	(ksi)	4.26	4.49	3.56	4.58	4.43
fs (L+IM)	(ksi)	16.18	10.60	15.33	10.66	16.38
fs (Service II)	(ksi)	42.65	35.36	36.84	35.86	43.77
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	–	46.65	–	47.30	–
Ø Fn	(ksi)		50.00		50.00	
Vf	(k)	38.1	40.5	32.4	40.4	38.0

INTERIOR GIRDER REACTION TABLE									
		Pier 13		Pier 14		Pier 15		Pier 16	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
LLDF		0.844	0.661	0.844	0.661	0.844	0.661	0.844	0.661
OCF		–	1.0	–	1.0	–	1.0	–	1.0
RDC1	(k)	72.2	69.9	295.5	285.9	298.4	288.7	73.5	71.1
RDC2	(k)	9.1	9.1	33.4	33.4	33.7	33.7	9.3	9.3
RDW	(k)	23.9	23.9	87.7	87.7	88.5	88.5	24.3	24.3
R_{L}	(k)	99.5	77.9	222.2	174.0	223.0	174.6	100.0	78.3
R_{IM}	(k)	18.7	14.6	34.2	26.8	34.3	26.9	18.7	14.6
RTotal	(k)	223.4	195.4	673.0	607.8	677.8	612.4	225.7	197.6

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads ($in.^4$ and $in.^3$).
Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads ($in.^4$ and $in.^3$).
Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).
Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).
DC1: Un-factored non-composite dead load (kips/ft.).
MDC1: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
LLDF: Live load distribution factor.
M_{L+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
Mu (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 M_{L+IM}
Ø Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).
fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ Snc
fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ Sc(3n) or MDC2/ Sc(cr) as applicable.
fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ Sc(3n) or MDW/ Sc(cr) as applicable.
fs (L+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
M_{L+IM} / Sc(n) or M_{L+IM} / Sc(cr) as applicable.
fs (Service II): Sum of stresses as computed below (ksi).
fsDC1 + fsDC2 + fsDW + 1.3 fs(L_{+IM})
0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
fs (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 (fsDC1 + fsDC2) + 1.5 fsDW + 1.75 fs(L_{+IM})
Ø Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
Vf: Maximum factored shear range in span computed according to Article 6.10.10.
OCF: Obtuse correction factor.

Note:
M_{L} and R_{L} include the effects of centrifugal force and superelevation.

USER NAME = johns00944	DESIGNED - MNM	REVISED -	
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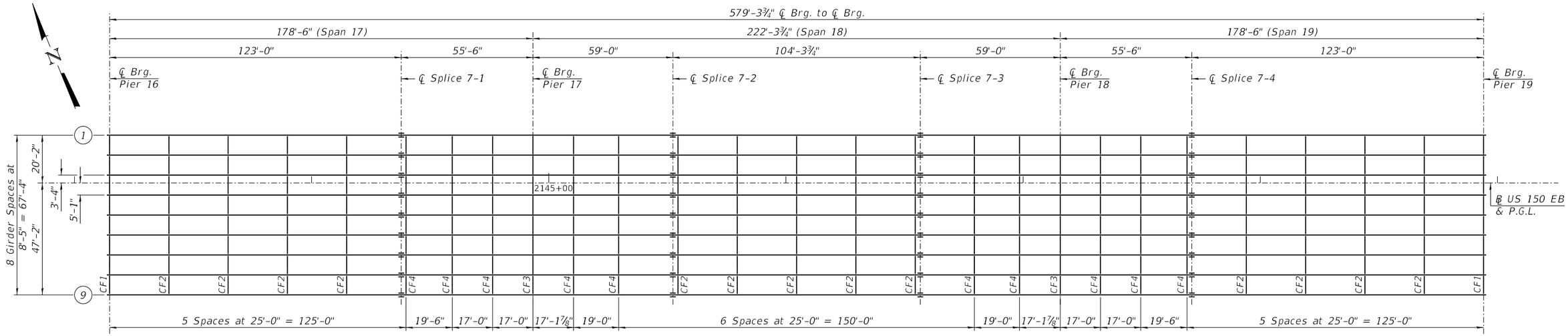
PLOT DATE = 1/25/2019	CHECKED - MNM	REVISED -	

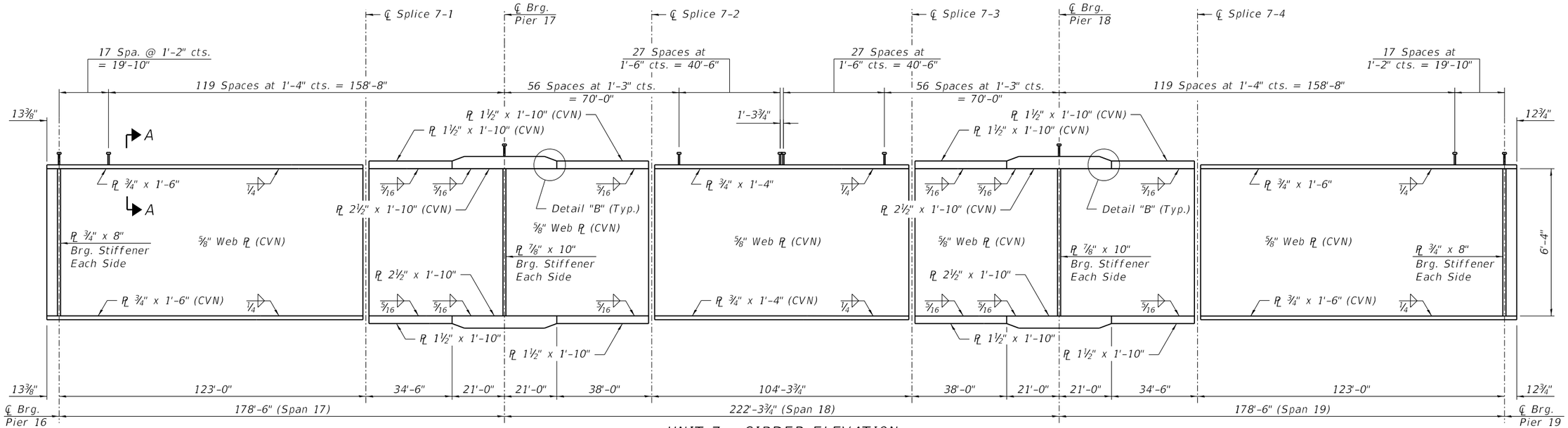
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 6, 3 OF 3
STRUCTURE NO. 090-0180
SHEET S-270 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1178
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	



UNIT 7 – FRAMING PLAN



UNIT 7 – GIRDER ELEVATION

Notes:

All Structural Steel shall be AASHTO M270 Grade 50W.

"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.

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

See Sheet S-273 of 445 for Section A-A and Detail B.

HANSON

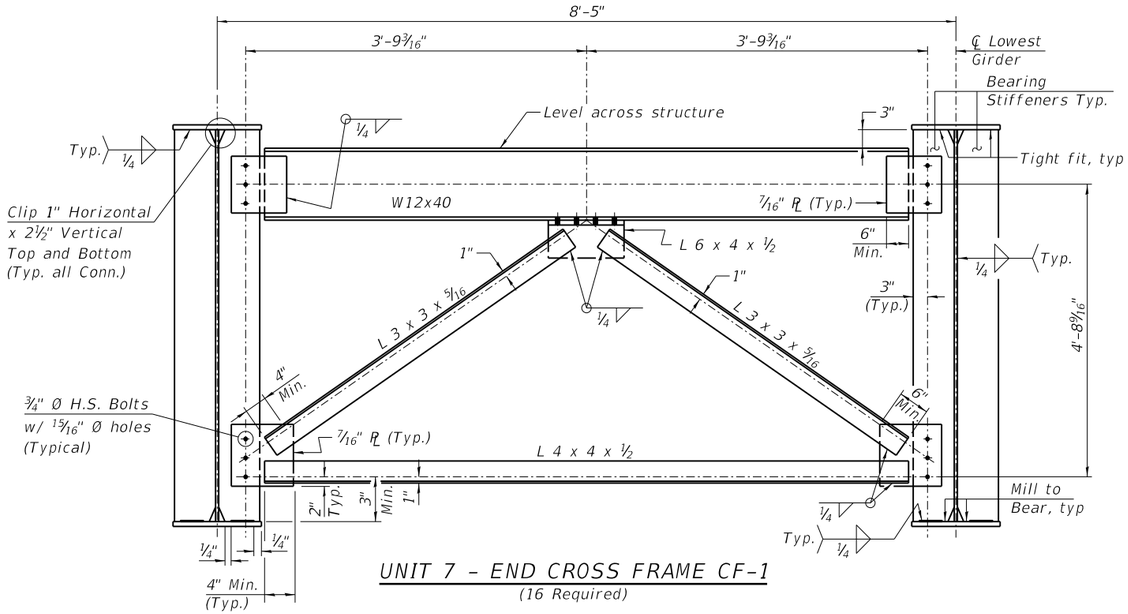
USER NAME = johns00944	DESIGNED - MNM	REVISED -	
	CHECKED - SEG	REVISED -	
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN - UNIT 7
STRUCTURE NO. 090-0180

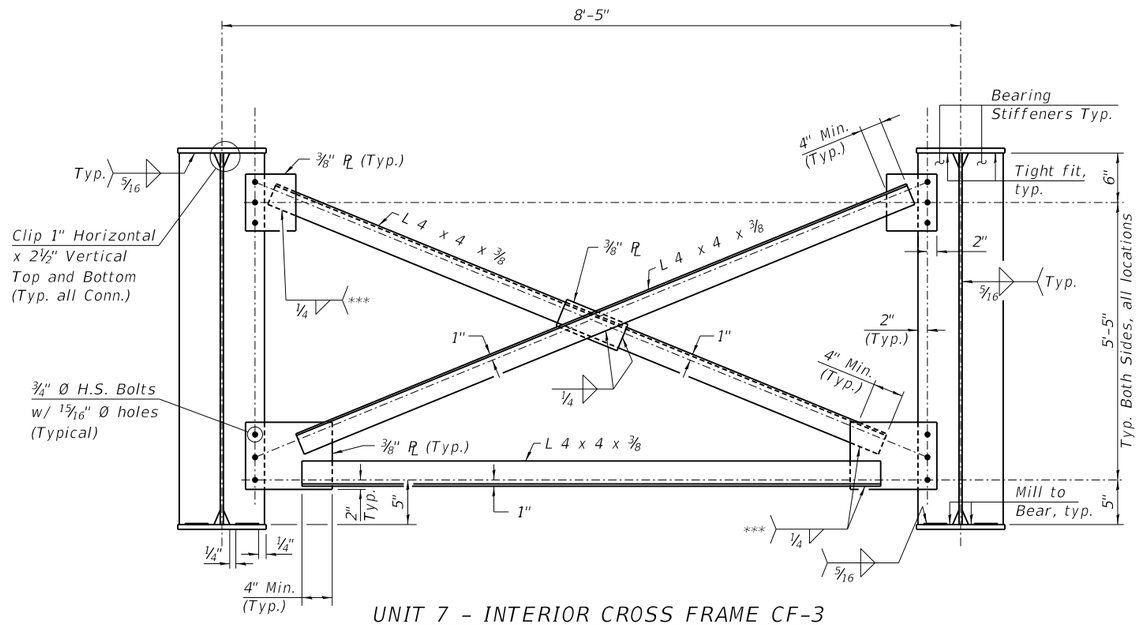
SHEET S-271 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1179
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	



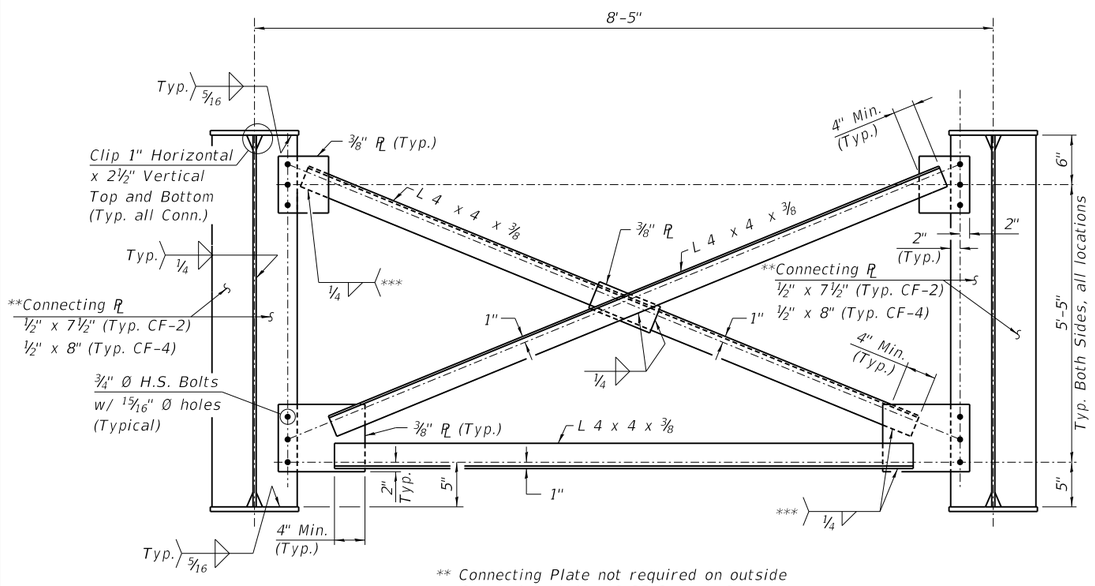
UNIT 7 – END CROSS FRAME CF-1

(16 Required)



UNIT 7 – INTERIOR CROSS FRAME CF-3

(16 Required)



** Connecting Plate not required on outside of exterior girder of CF-2 cross frames.

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

UNIT 7 – INTERIOR CROSS FRAME CF-2 & CF-4

(104 CF-2 Required, 80 CF-4 Required)

Note:
All Structural Steel shall be AASHTO M270 Grade 50W.

HANSON	USER NAME = johns00944	DESIGNED - MNM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
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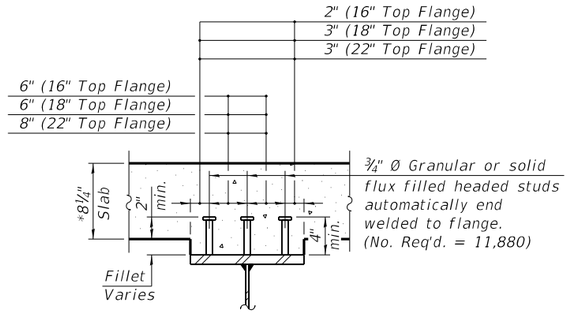
	PLOT DATE = 1/25/2019	CHECKED - MNM	REVISED -	

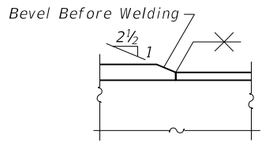
GIRDER DETAILS - UNIT 7, 1 OF 3
STRUCTURE NO. 090-0180
SHEET S-272 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1180
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

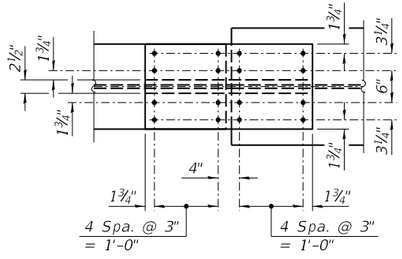


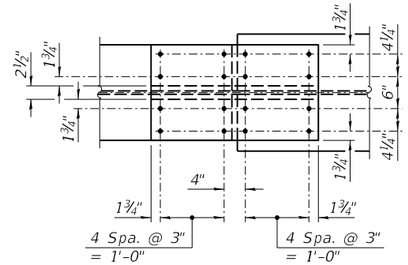
SECTION A-A

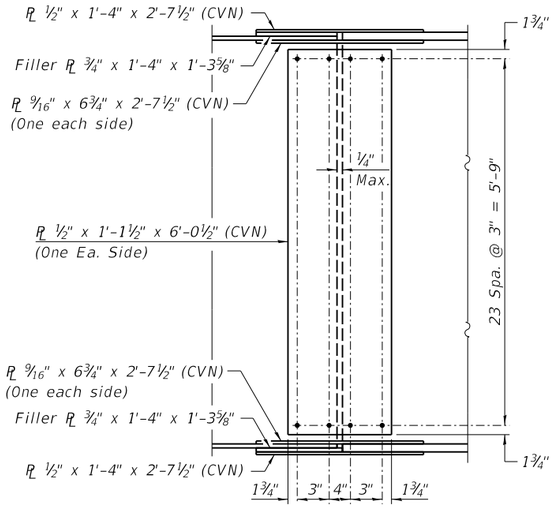
*Prior to grinding

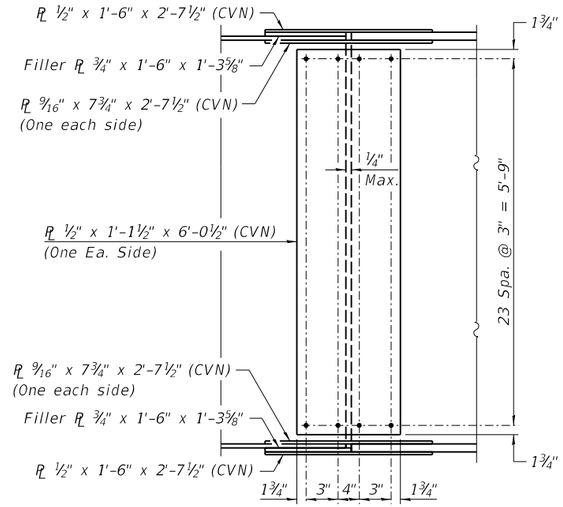


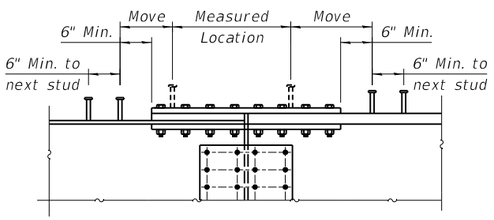
DETAIL "B"





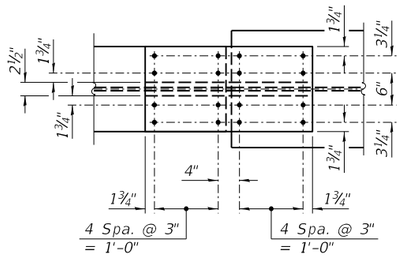




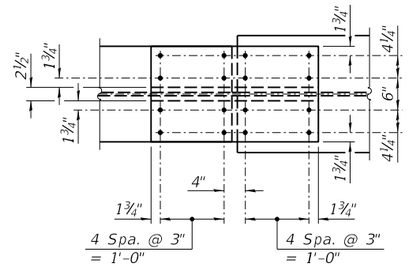


SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. Move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.



DETAIL – FIELD SPLICE 7-2 & 7-3



DETAIL – FIELD SPLICE 7-1 & 7-4

Notes:

Use ⅞" Ø H.S. Bolts with 15/16" Ø holes for all Splice Connections.

"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.

All Structural steel shall be AASHTO M270 Grade 50W.

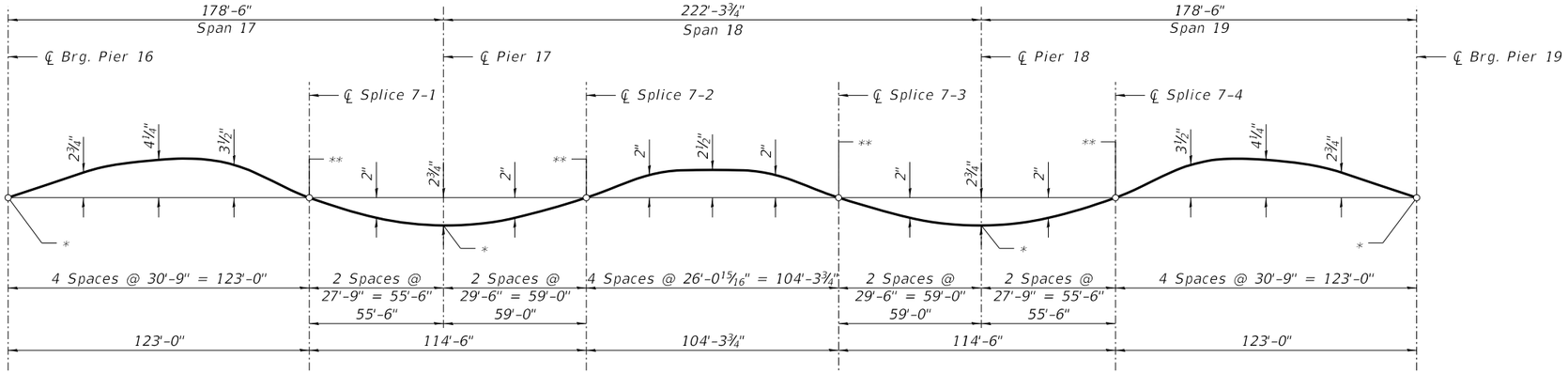
HANSON

USER NAME = johns00944	DESIGNED - MNM	REVISED -	
	CHECKED - SEG	REVISED -	
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 7, 2 OF 3
STRUCTURE NO. 090-0180
SHEET S-273 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B:(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1181
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



CAMBER DIAGRAM UNIT 7

* See Table for Final Top of Web Elevations at piers.
** Theoretical Top of Web Elevations before dead load deflection.

***TOP OF WEB ELEVATIONS

		Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7	Girder 8	Girder 9
UNIT 7	℄ Brg. Pier 16	499.28	499.45	499.62	499.77	499.85	499.72	499.56	499.39	499.22
	℄ Splice 7-1	496.95	497.12	497.29	497.44	497.52	497.39	497.23	497.06	496.89
	℄ Pier 17	495.49	495.66	495.83	495.97	496.05	495.93	495.77	495.60	495.43
	℄ Splice 7-2	494.41	494.57	494.74	494.89	494.97	494.85	494.68	494.51	494.35
	℄ Splice 7-3	492.28	492.45	492.61	492.76	492.84	492.72	492.55	492.39	492.22
	℄ Pier 18	490.95	491.12	491.29	491.44	491.52	491.39	491.23	491.06	490.89
	℄ Splice 7-4	490.15	490.32	490.49	490.64	490.72	490.59	490.43	490.26	490.09
	℄ Brg. Pier 19	487.47	487.63	487.80	487.95	488.03	487.90	487.74	487.57	487.41

*** For Fabrication Only

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 17 or 0.6 Sp. 19	Piers 17 & 18	0.5 Sp. 18
Is	(in^4)	62626	192383	58208
Ic(n)	(in^4)	141521	–	135255
Ic(3n)	(in^4)	105183	–	100219
Ic(cr)	(in^4)	–	207944	–
Ss	(in^3)	1616	4750	1502
Sc(n)	(in^3)	2234	–	2121
Sc(3n)	(in^3)	2021	–	1911
S(cr)	(in^3)	–	4857	–
DC1	(k/')	1.266	1.308	1.266
MDC1	('k)	2214	6178	1474
DC2	(k/')	0.148	0.148	0.148
MDC2	('k)	285	702	212
DW	(k/')	0.390	0.390	0.390
MDW	('k)	750	1845	558
LLDF		0.599	0.629	0.563
M_{L+IM}	('k)	3054	4317	2714
Mu (Strength I)	('k)	9593	18922	7694
Ø Mn	('k)	10522	–	10344
fs DC1	(ksi)	16.44	15.61	11.78
fs DC2	(ksi)	1.69	1.73	1.33
fs DW	(ksi)	4.45	4.56	3.50
fs (L+IM)	(ksi)	16.41	10.67	15.36
fs (Service II)	(ksi)	43.91	35.77	36.57
0.95Rh Fyf	(ksi)	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	–	47.18	–
Ø Fn	(ksi)		50.00	
Vf	(k)	38.0	40.5	32.4

INTERIOR GIRDER REACTION TABLE					
		Piers 16 & 19		Piers 17 & 18	
		Interior	Exterior	Interior	Exterior
LLDF		0.844	0.661	0.844	0.661
OCF		–	1.0	–	1.0
RDC1	(k)	73.7	71.3	297.7	288.0
RDC2	(k)	9.3	9.3	33.6	33.6
RDW	(k)	24.4	24.4	88.3	88.3
R_L	(k)	100.1	78.4	223.0	174.6
R_{IM}	(k)	18.6	14.6	34.3	26.9
RTotal	(k)	226.1	198.0	676.9	611.4

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads ($in.^4$ and $in.^3$).
Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads ($in.^4$ and $in.^3$).
Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).
Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads ($in.^4$ and $in.^3$).
DC1: Un-factored non-composite dead load (kips/ft.).
MDC1: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
LLDF: Live load distribution factor.
M_{L+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
Mu (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 M_{L+IM}
Ø Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).
fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ Snc
fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ Sc(3n) or MDC2/ Sc(cr) as applicable.
fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ Sc(3n) or MDW/ Sc(cr) as applicable.
fs (L+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
M_{L+IM} / Sc(n) or M_{L+IM} / Sc(cr) as applicable.
fs (Service II): Sum of stresses as computed below (ksi).
fsDC1 + fsDC2 + fsDW + 1.3 fs($_{L+IM}$)
0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
fs (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 (fsDC1 + fsDC2) + 1.5 fsDW + 1.75 fs($_{L+IM}$)
Ø Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
Vf: Maximum factored shear range in span computed according to Article 6.10.10.
OCF: Obtuse correction factor.

Note:
M_L and R_L include the effects of centrifugal force and superelevation.

USER NAME = johns00944	DESIGNED - MNM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GIRDER DETAILS - UNIT 7, 3 OF 3 STRUCTURE NO. 090-0180
	CHECKED - SEG	REVISED -		
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -		SHEET S-274 OF 445 SHEETS
PLOT DATE = 1/25/2019	CHECKED - MNM	REVISED -		

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1182
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

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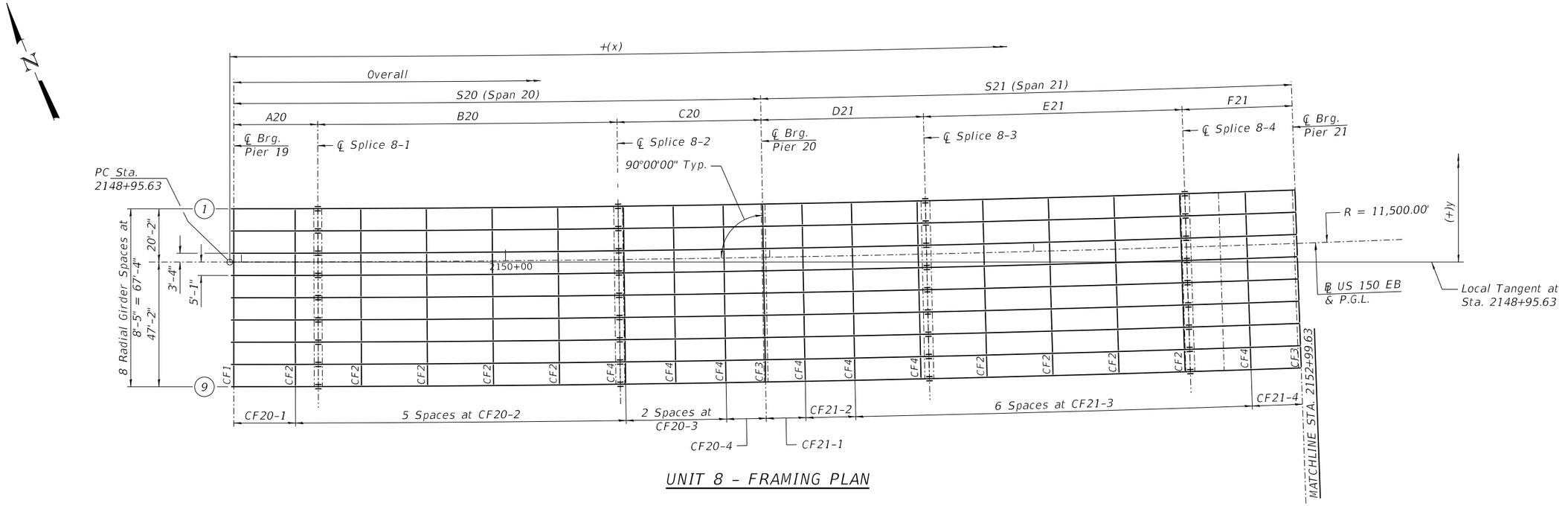
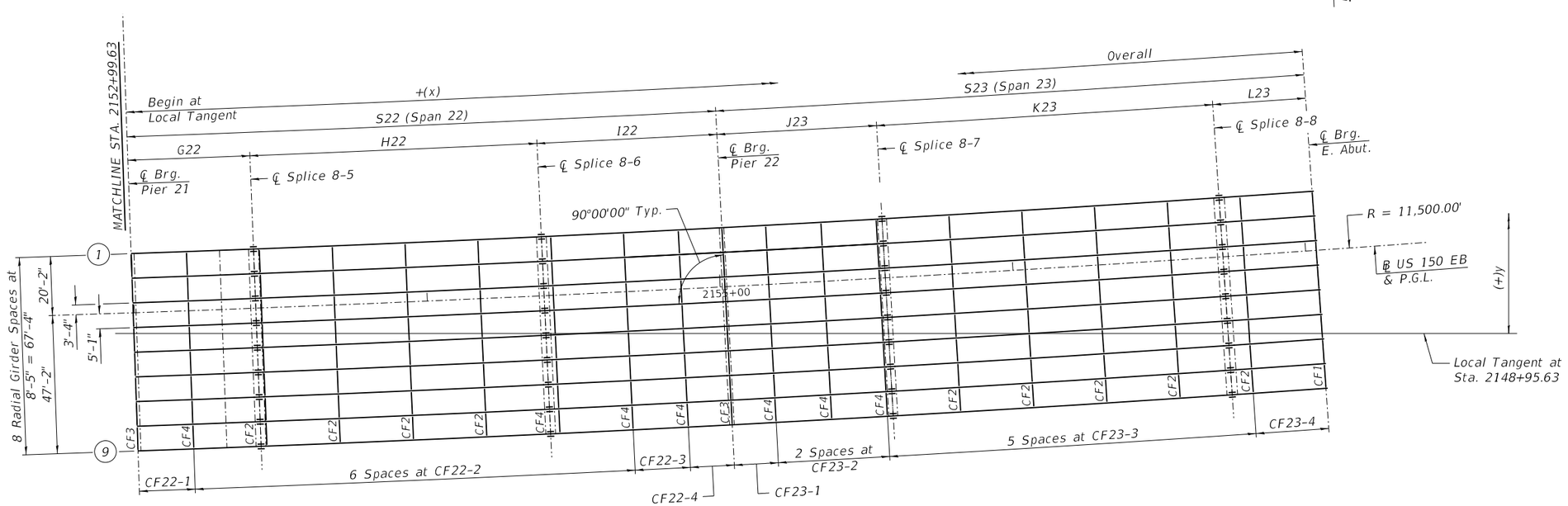


UNIT 8 - FRAMING PLAN



UNIT 8 - FRAMING PLAN

Notes:
See Sheet S-280 of 445 for dimensions.
All Structural Steel shall be AASHTO M270 Grade 50W.

HANSON

USER NAME = johns00944	DESIGNED - MNM	REVISED -	
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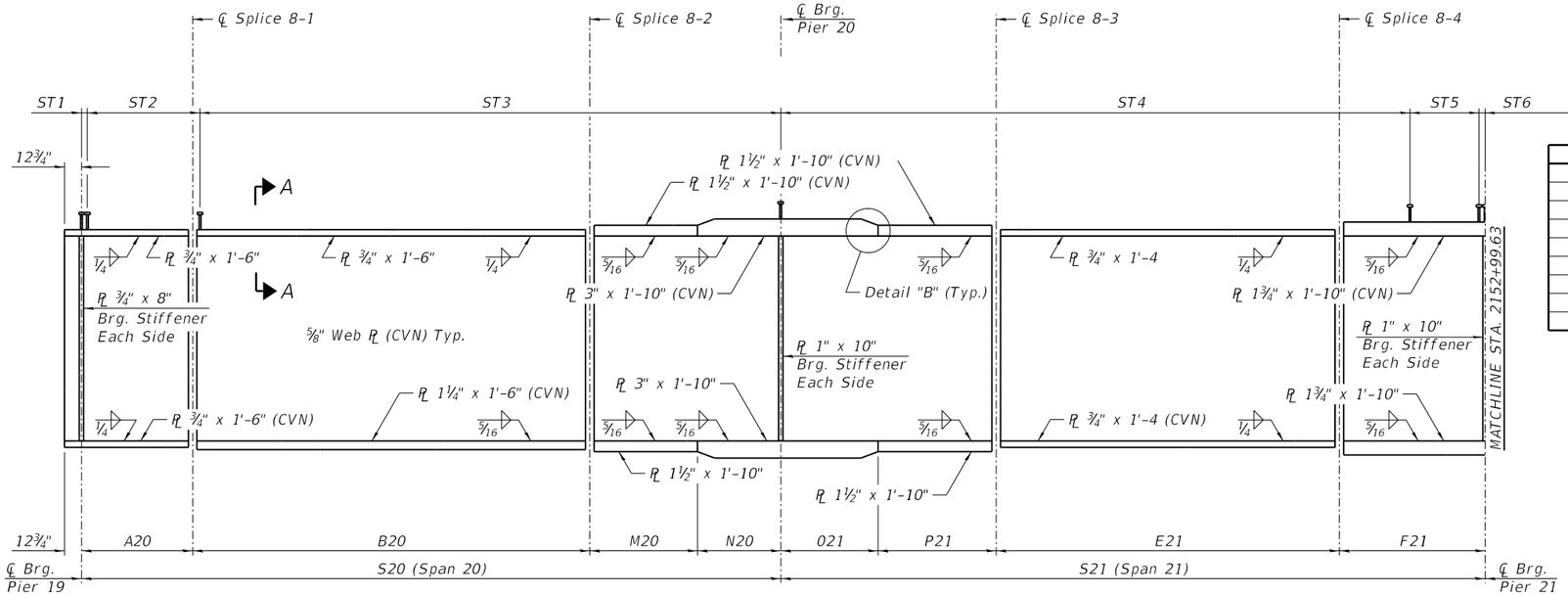
PLOT SCALE = 0:2.0000 ':' / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN - UNIT 8
STRUCTURE NO. 090-0180
SHEET S-275 OF 445 SHEETS

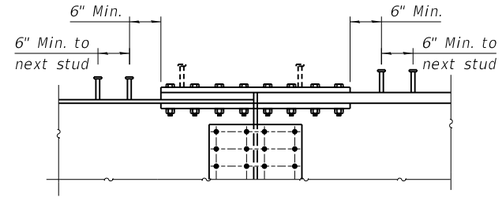
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1183
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	



UNIT 8 - GIRDER ELEVATION

SHEAR STUD SPACING

Girder	ST1	ST2	ST3	ST4
1	1'-1 3/16"	26 at 1'-3" = 32'-6"	111 at 1'-6" = 166'-6"	135 at 1'-4" = 180'-0"
2	9 9/16"	30 at 1'-3" = 37'-6"	108 at 1'-6" = 162'-0"	135 at 1'-4" = 180'-0"
3	11 5/16"	30 at 1'-3" = 37'-6"	108 at 1'-6" = 162'-0"	135 at 1'-4" = 180'-0"
4	1'-1 1/16"	30 at 1'-3" = 37'-6"	108 at 1'-6" = 162'-0"	135 at 1'-4" = 180'-0"
5	1'-2 13/16"	30 at 1'-3" = 37'-6"	108 at 1'-6" = 162'-0"	131 at 1'-4" = 174'-8"
6	10 9/16"	28 at 1'-3" = 35'-0"	110 at 1'-6" = 165'-0"	131 at 1'-4" = 174'-8"
7	1'-0 3/8"	28 at 1'-3" = 35'-0"	110 at 1'-6" = 165'-0"	131 at 1'-4" = 174'-8"
8	1'-2 1/8"	28 at 1'-3" = 35'-0"	110 at 1'-6" = 165'-0"	134 at 1'-4" = 178'-8"
9	9 7/8"	26 at 1'-3" = 32'-6"	112 at 1'-6" = 168'-0"	134 at 1'-4" = 178'-8"

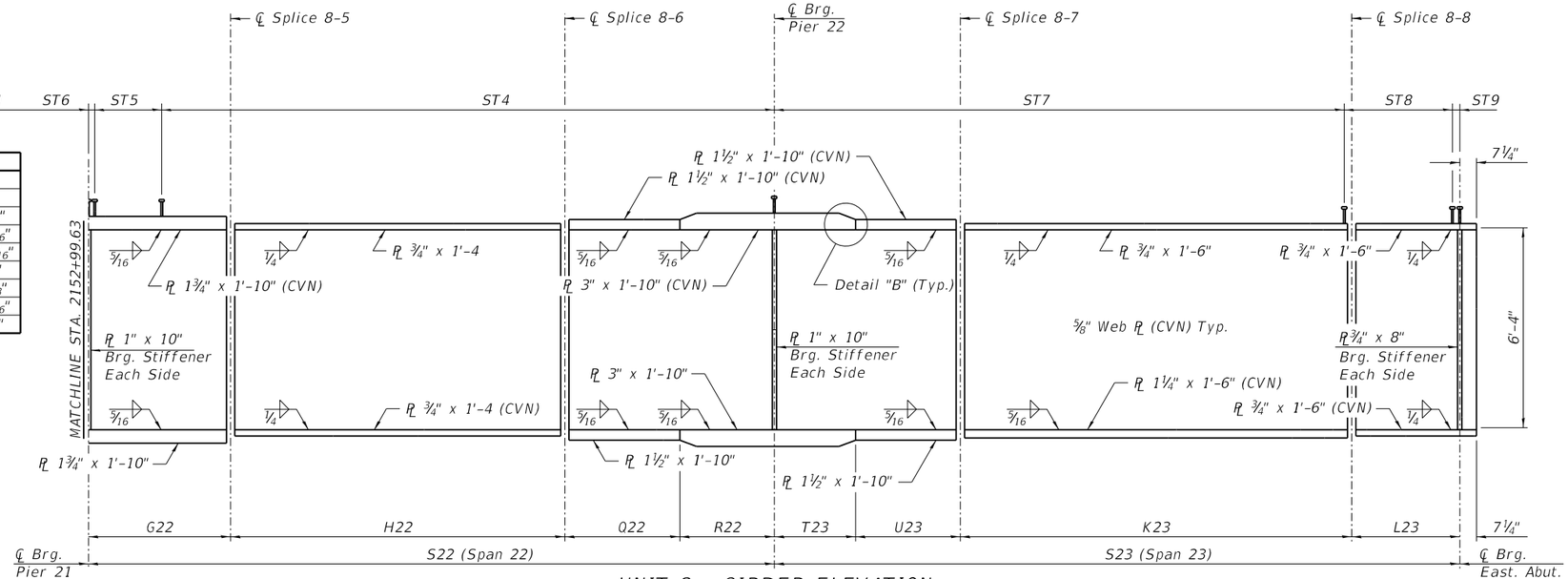


SHEAR STUD DETAIL AT SPLICES AND FLANGE TRANSITIONS

Do not place shear studs on splice plates. move row of studs to 6" beyond nearest edge of splice plate from measured location. Similarly, move studs as required to maintain 6" clear between studs and welded flange transitions.

SHEAR STUD SPACING

Girder	ST5	ST6	ST7	ST8	ST9
1	18 at 1'-2" = 21'-0"	7¾"	109 at 1'-6" = 163'-6"	30 at 1'-3" = 37'-6"	7¾"
2	18 at 1'-2" = 21'-0"	9½"	109 at 1'-6" = 163'-6"	30 at 1'-3" = 37'-6"	9½"
3	18 at 1'-2" = 21'-0"	11 3/16"	109 at 1'-6" = 163'-6"	30 at 1'-3" = 37'-6"	11 3/16"
4	18 at 1'-2" = 21'-0"	1'-1 1/16"	109 at 1'-6" = 163'-6"	30 at 1'-3" = 37'-6"	1'-1 1/16"
5	23 at 1'-2" = 26'-10"	8 13/16"	109 at 1'-6" = 163'-6"	30 at 1'-3" = 37'-6"	1'-2 13/16"
6	23 at 1'-2" = 26'-10"	10⅝"	111 at 1'-6" = 166'-6"	28 at 1'-3" = 35'-0"	10⅝"
7	23 at 1'-2" = 26'-10"	1'-0 3/8"	111 at 1'-6" = 166'-6"	28 at 1'-3" = 35'-0"	1'-0 3/8"
8	20 at 1'-2" = 23'-4"	8 3/16"	111 at 1'-6" = 166'-6"	28 at 1'-3" = 35'-0"	1'-2 3/16"
9	20 at 1'-2" = 23'-4"	9 15/16"	113 at 1'-6" = 169'-6"	26 at 1'-3" = 32'-6"	9 15/16"



UNIT 8 - GIRDER ELEVATION

Notes:
All Structural Steel shall be AASHTO M270 Grade 50W.
"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.
See Sheet S-278 of 445 for Seaction A-A and Detail B.
See Sheet S-280 of 445 for dimensions.

HANSON

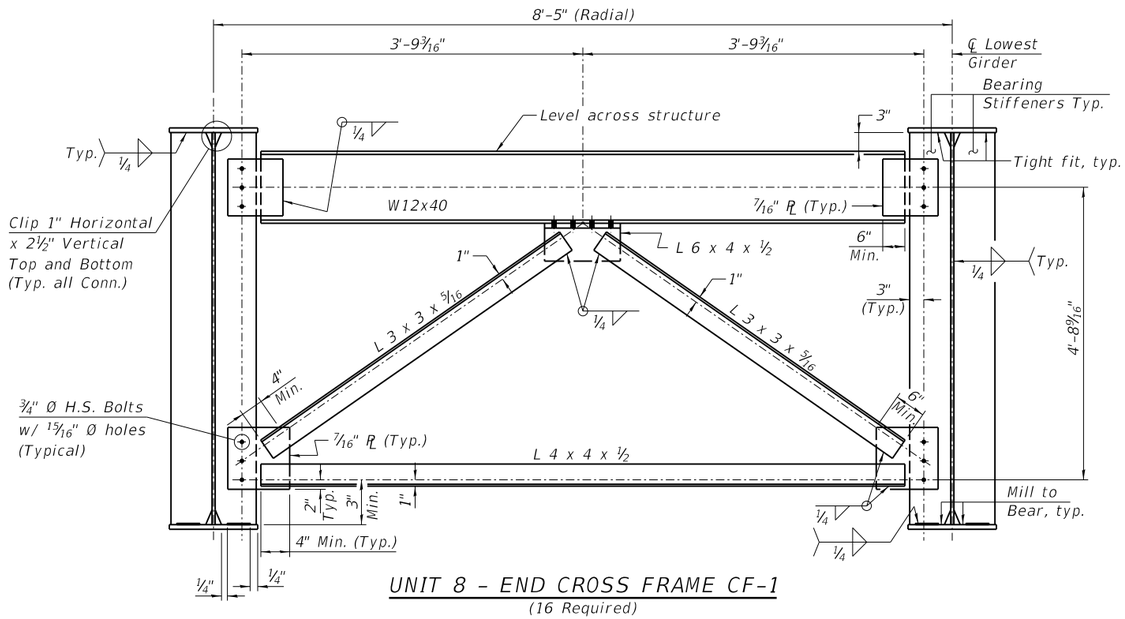
USER NAME = johns00944	DESIGNED - MNM	REVISED -	
	CHECKED - SEG	REVISED -	
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER ELEVATIONS - UNIT 8
STRUCTURE NO. 090-0180

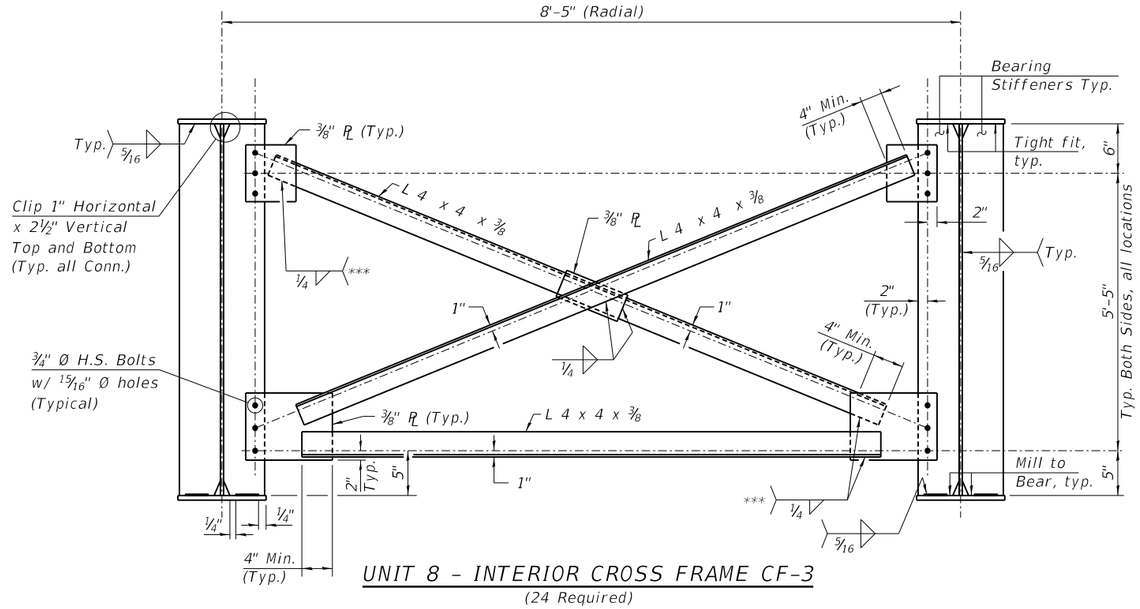
SHEET S-276 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1184
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	



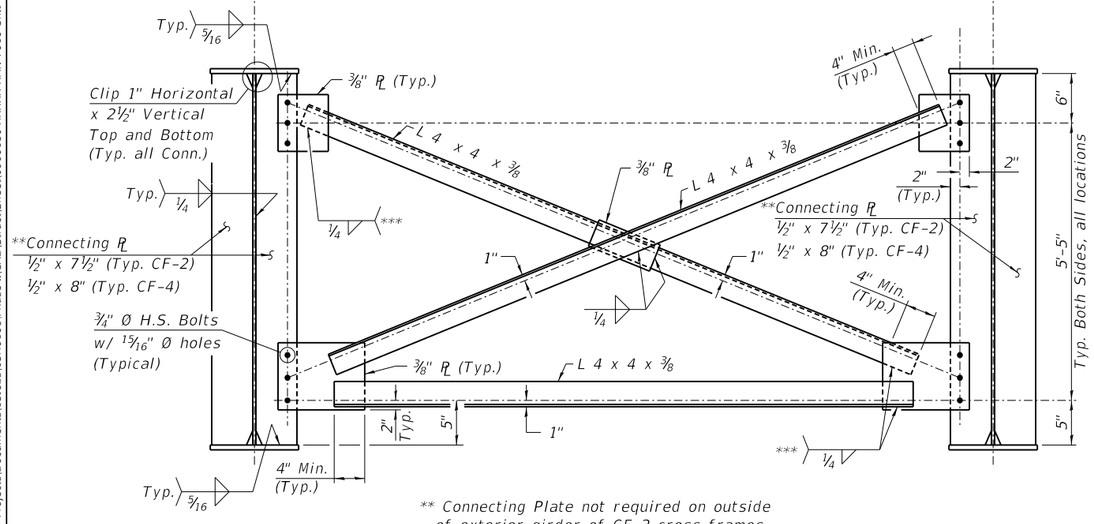
UNIT 8 – END CROSS FRAME CF-1

(16 Required)



UNIT 8 – INTERIOR CROSS FRAME CF-3

(24 Required)



** Connecting Plate not required on outside of exterior girder of CF-2 cross frames.

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

UNIT 8 – INTERIOR CROSS FRAME CF-2 & CF-4

(144 CF-2 Required, 112 CF-4 Required)

Notes:

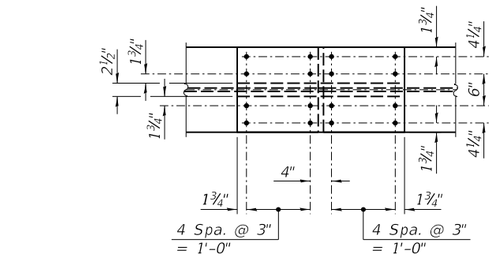
All Structural steel shall be AASHTO M270 Grade 50W.

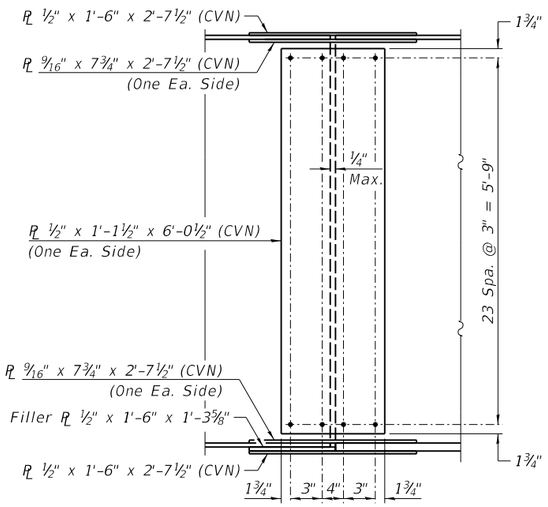
All cross frames shall be installed as steel is erected and secured with erection pins and bolts. Individual cross frames and supports may be temporarily disconnected to install bearing anchor rods.

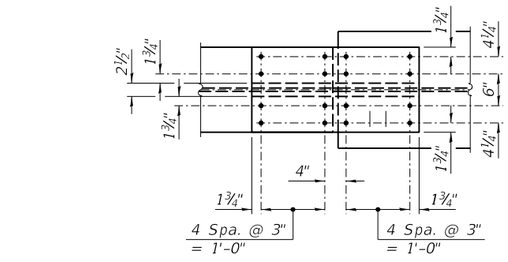
HANSON	USER NAME = johns00944	DESIGNED - MNM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
		CHECKED - SEG	REVISED -	
	PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -	
	PLOT DATE = 1/25/2019	CHECKED - MNM	REVISED -	

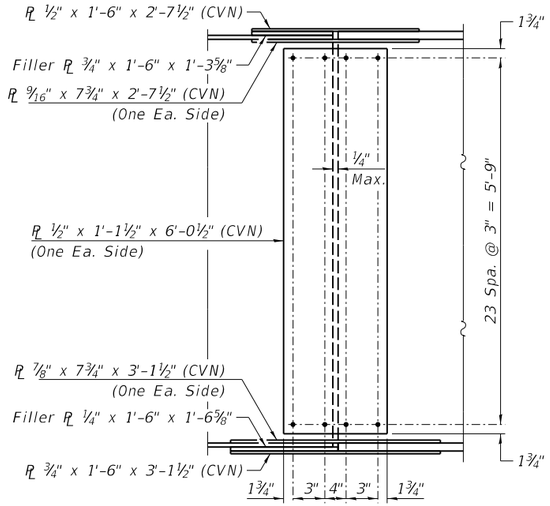
GIRDER DETAILS - UNIT 8, 1 OF 4
STRUCTURE NO. 090-0180
SHEET S-277 OF 445 SHEETS

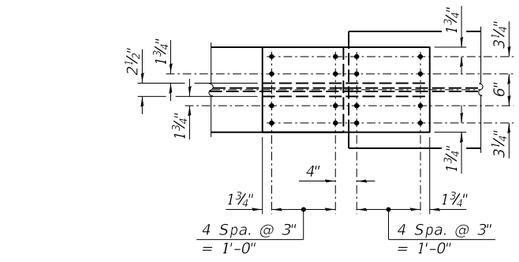
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1185
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT NHPP-YRP3(905)		

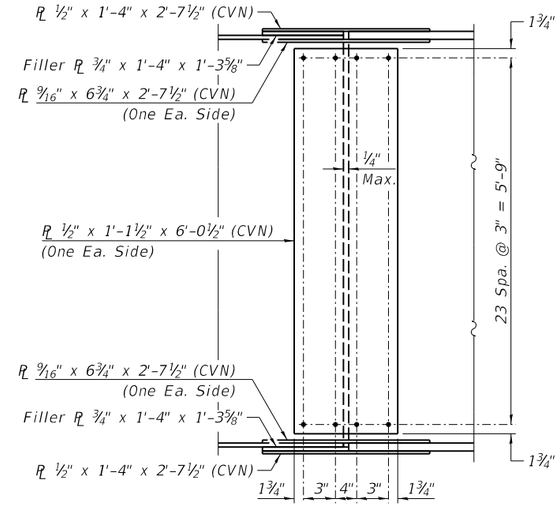


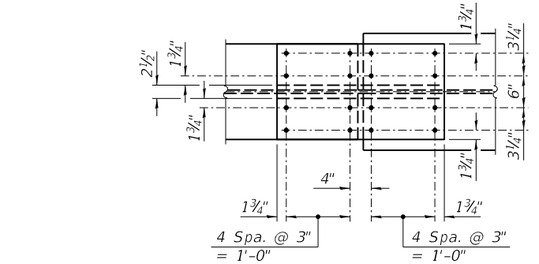


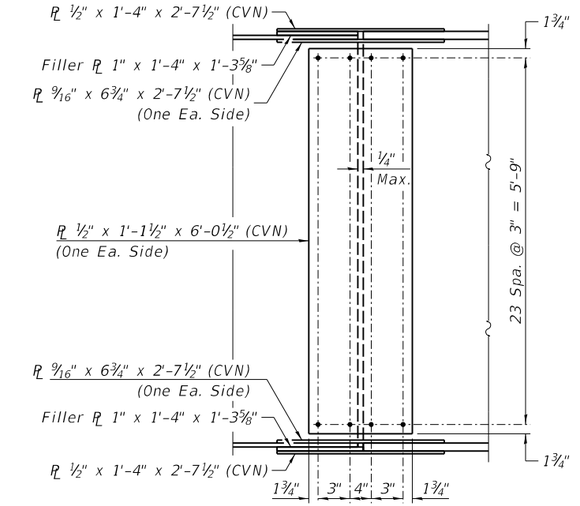


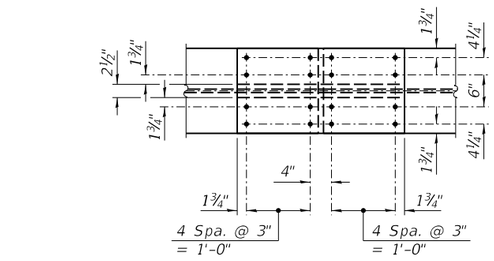




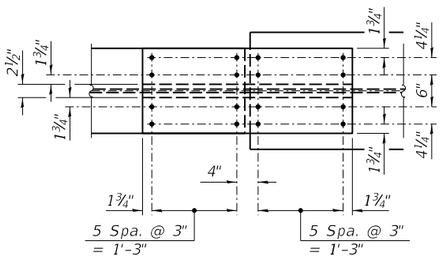




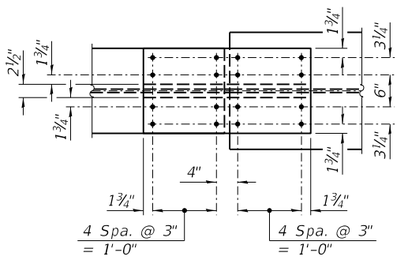




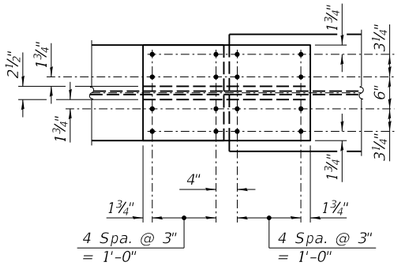
DETAIL – FIELD SPLICE 8-1 & 8-8



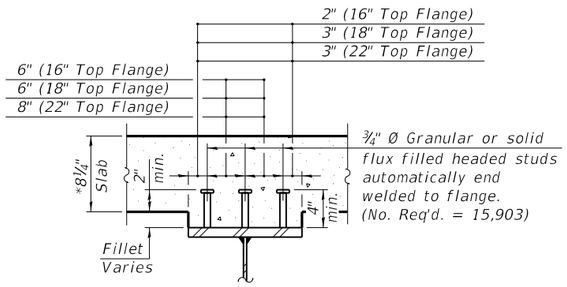
DETAIL – FIELD SPLICE 8-2 & 8-7



DETAIL – FIELD SPLICE 8-3 & 8-6

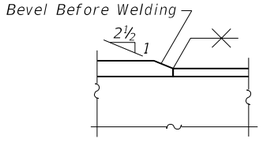


DETAIL – FIELD SPLICE 8-4 & 8-5



SECTION A-A

*Prior to grinding



DETAIL "B"

Notes:

All Structural Steel shall be AASHTO M270 Grade 50W.

Use ⅞" Ø H.S. Bolts with 1 5/16" Ø holes for all Splice Connections.

"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.

USER NAME = johns00944	DESIGNED - MNM	REVISED -	
	CHECKED - SEG	REVISED -	
PLOT SCALE = 0:2.0000 ':" / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 8, 2 OF 4
STRUCTURE NO. 090-0180

SHEET S-278 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1186
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

MODEL: Default
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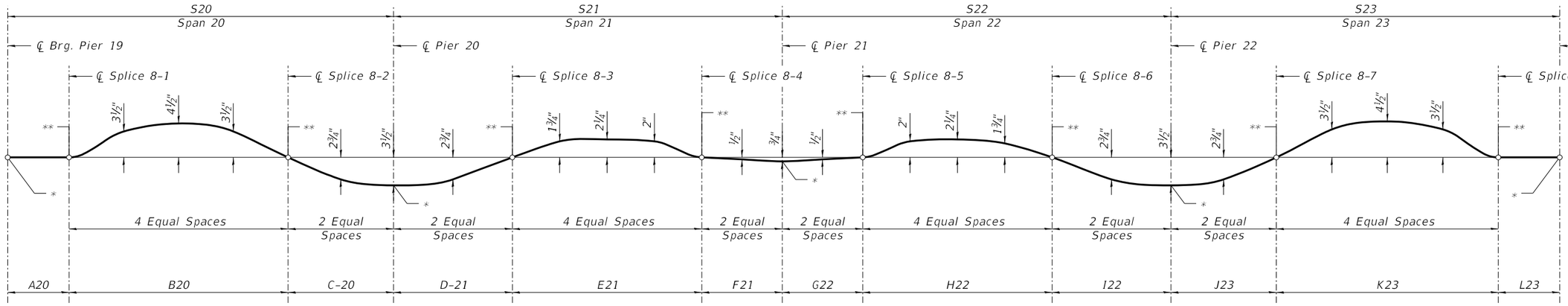
12/11/2018 4:01:05 PM



CAMBER DIAGRAM UNIT 8

Notes:
See Sheet S-280 of 445 for dimensions.

* See Table for Final Top of Web Elevations at abutments and piers.
** Theoretical Top of Web Elevations before dead load deflection.

***TOP OF WEB ELEVATIONS

UNIT 8

	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 6	Girder 7	Girder 8	Girder 9
℄ Brg. Pier 19	487.41	487.57	487.74	487.88	487.97	487.84	487.68	487.51	487.35
℄ Splice 8-1	487.11	487.28	487.45	487.59	487.67	487.54	487.39	487.22	487.05
℄ Splice 8-2	484.68	484.85	485.02	485.16	485.25	485.12	484.96	484.79	484.62
℄ Pier 20	483.11	483.28	483.45	483.59	483.67	483.54	483.39	483.22	483.05
℄ Splice 8-3	481.95	482.12	482.29	482.43	482.51	482.39	482.23	482.06	481.89
℄ Splice 8-4	479.99	480.16	480.32	480.47	480.55	480.42	480.26	480.10	479.93
℄ Pier 21	479.07	479.24	479.41	479.55	479.63	479.50	479.35	479.18	479.01
℄ Splice 8-5	478.28	478.44	478.61	478.76	478.84	478.71	478.55	478.38	478.22
℄ Splice 8-6	476.22	476.39	476.56	476.70	476.78	476.66	476.50	476.33	476.16
℄ Pier 22	474.87	475.04	475.21	475.35	475.43	475.30	475.15	474.98	474.81
℄ Splice 8-7	474.22	474.39	474.56	474.70	474.78	474.65	474.50	474.33	474.16
℄ Splice 8-8	471.97	472.13	472.30	472.45	472.53	472.40	472.24	472.07	471.91
℄ Brg. E. Abut.	470.95	471.12	471.29	471.43	471.51	471.39	471.23	471.06	470.89

*** For Fabrication Only

INTERIOR GIRDER MOMENT TABLE						
		0.4 Sp. 20	Piers 20 & 22	0.55 Sp. 21 or 0.45 Sp. 22	Pier 21	0.6 Sp. 23
Is	(in⁴)	74840	228915	58208	139250	74840
Ic(n)	(in⁴)	176152	–	135255	–	176152
Ic(3n)	(in⁴)	127915	–	100219	–	127915
Ic(cr)	(in⁴)	–	244581	–	154592	–
Ss	(in³)	2135	5583	1502	3503	2135
Sc(n)	(in³)	2900	–	2121	–	2900
Sc(3n)	(in³)	2635	–	1911	–	2635
S(cr)	(in³)	–	5682	–	3626	–
DC1	(k/')	1.292	1.317	1.317	1.317	1.291
MDC1	('k)	3194	7290	1112	3567	3266
DC2	(k/')	0.148	0.148	0.148	0.148	0.148
MDC2	('k)	405	793	159	438	413
DW	(k/')	0.390	0.390	0.390	0.390	0.390
MDW	('k)	1065	2085	418	1150	1086
LLDF		0.594	0.635	0.577	0.611	0.593
M_{L+IM}	('k)	3547	4641	2623	3685	3572
Mu (Strength I)	('k)	12304	21353	6806	13180	12479
Øf Mn	('k)	13437	–	10626	–	13364
fs DC1	(ksi)	17.95	15.67	8.88	12.22	18.35
fs DC2	(ksi)	1.84	1.67	1.00	1.45	1.88
fs DW	(ksi)	4.85	4.40	2.62	3.81	4.95
fs (℄+IM)	(ksi)	14.68	9.80	14.84	12.20	14.78
fs (Service II)	(ksi)	43.72	34.49	31.80	33.33	44.40
0.95Rh Fyf	(ksi)	47.50	47.50	47.50	47.50	47.50
fs (Total)(Strength I)	(ksi)	–	45.44	–	44.14	–
Øf Fn	(ksi)		48.70		50.00	
Vf	(k)	37.5	40.3	31.1	41.5	37.5

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs(Total-Strength I, and Service II) due to non-composite dead loads (in.⁴ and in.³).
Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs(Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in.⁴ and in.³).
Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs(Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in.⁴ and in.³).
Ic(cr), Sc(cr): Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing fs (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in.⁴ and in.³).
DC1: Un-factored non-composite dead load (kips/ft.).
MDC1: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
LLDF: Live load distribution factor.
$_{L}M_{L+IM}$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
Mu (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 M

Øf Mn: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).
fs DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ Snc
fs DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ Sc(3n) or MDC2/ Sc(cr) as applicable.
fs DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ Sc(3n) or MDW/ Sc(cr) as applicable.
fs (℄+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
$M_{℄+IM}$ / Sc(n) or M / Sc(cr) as applicable.
fs (Service II): Sum of stresses as computed below (ksi).
fsDC1 + fsDC2 + fsDW + 1.3 fs( )
0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
fs (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 (fsDC1 + fsDC2) + 1.5 fsDW + 1.75 fs( )
Øf Fn: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
Vf: Maximum factored shear range in span computed according to Article 6.10.10.
OCF: Obtuse correction factor.

Note:
$M_{℄}$ and R include the effects of centrifugal force and superelevation.

INTERIOR GIRDER REACTION TABLE									
		Pier 19		Piers 20 & 22		Pier 21		E. Abut.	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
LLDF		0.844	0.661	0.844	0.661	0.844	0.661	0.844	0.661
OCF		–	1.0	–	1.0	–	1.0	–	1.0
RDC1	(k)	88.3	85.4	328	317.3	224.1	216.8	89.2	86.3
RDC2	(k)	11.0	11.0	35.7	35.7	26.6	26.6	11.1	11.1
RDW	(k)	28.9	28.9	93.8	93.8	69.7	69.7	29.2	29.2
R℄	(k)	105.1	82.3	230.1	180.2	216.5	169.6	105.5	82.6
R_{IM}	(k)	18.8	14.7	34.2	26.8	33.8	26.5	18.8	14.7
RTotal	(k)	252.1	222.3	721.8	653.8	570.7	509.2	253.8	223.9

HANSON

USER NAME = johns00944
PLOT SCALE = 0:2.0000 ':" / in.
PLOT DATE = 1/25/2019

DESIGNED - MNM
CHECKED - SEG
DRAWN - DAP
CHECKED - MNM

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 8, 3 OF 4
STRUCTURE NO. 090-0180
SHEET S-279 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1187
		CONTRACT NO. 68846		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

*GIRDER DIMENSIONS

Girder	Radius	S20	S21	S22	S23	A20	B20	C20	D21	E21	F21	G22	H22	I22	J23	K23	L23	M20	N20	O21	P21
1	11479'-10"	200'-1 3/16"	201'-7 3/4"	201'-7 3/4"	201'-7 3/4"	31'-9 3/4"	113'-7 7/8"	54'-8 1/8"	61'-7 11/16"	98'-3"	41'-9 1/16"	41'-9 1/16"	98'-3"	61'-7 11/16"	54'-8 1/8"	115'-1 13/16"	31'-9 3/4"	30'-9 13/16"	23'-10 5/16"	27'-10 1/16"	33'-9 5/8"
2	11488'-3"	200'-3 9/16"	201'-9 1/2"	201'-9 1/2"	201'-9 1/2"	31'-10 1/16"	113'-8 1/8	54'-8 5/8"	61'-8 3/16"	98'-3 1/8"	41'-9 7/16"	41'-9 7/16"	98'-3 1/8"	61'-8 3/16"	54'-8 5/8"	115'-2 1/8"	31'-10 1/8"	30'-10 1/8"	23'-10 1/2"	27'-10 5/16"	33'-9 15/16"
3	11496'-8"	200' 5 7/16"	201'-11 7/16"	201'-11 7/16"	201'-11 7/16"	31'-10 5/16"	113'-9 7/8"	54'-9 1/8"	61'-8 3/4"	98'-4 3/4"	41'-9 13/16"	41'-9 13/16"	98'-4 3/4"	61'-8 3/4"	54'-9 1/8"	115'-3 7/8"	31'-10 5/16"	30'-10 3/8"	23'-10 3/4"	27'-10 1/2"	33'-10 3/16"
4	11505'-1"	200'-7 1/16"	202'-1 1/16"	202'-1 1/16"	202'-1 1/16"	31'-10 5/8"	113'-10 7/8"	54'-9 5/8"	61'-9 5/16"	98'-5 7/8"	41'-10 3/16"	41'-10 3/16"	98'-5 7/8"	61'-9 5/16"	54'-9 5/8"	115'-4 7/8"	31'-10 5/8"	30'-10 5/8"	23'-10 15/16"	27'-10 3/4"	33'-10 1/2"
5	11513'-6"	200'-8 13/16"	202'-2 13/16"	202'-2 13/16"	202'-2 13/16"	31'-10 7/8"	113'-11 7/8"	54'-10 1/16"	61'-9 13/16"	98'-6 1/2"	41'-10 1/2"	41'-10 1/2"	98'-6 1/2"	61'-9 13/16"	54'-10 1/16"	115'-5 1/8"	31'-10 7/8"	30'-10 15/16"	23'-11 3/16"	27'-11"	33'-10 13/16"
6	11521'-11"	200'-10 9/16"	202'-4 5/8"	202'-4 5/8"	202'-4 5/8"	31'-11 3/16"	114'-0 7/8"	54'-10 9/16"	61'-10 3/8"	98'-7 3/8"	41'-10 7/8"	41'-10 7/8"	98'-7 3/8"	61'-10 3/8"	54'-10 9/16"	115'-6 7/8"	31'-11 3/16"	30'-11 3/16"	23'-11 3/8"	27'-11 1/4"	33'-11 1/8"
7	11530'-4"	201'-0 3/8"	202'-6 3/8"	202'-6 3/8"	202'-6 3/8"	31'-11 7/16"	114'-1 1/8"	54'-11 1/16"	61'-10 13/16"	98'-8 7/16"	41'-11 1/4"	41'-11 1/4"	98'-8 7/16"	61'-10 13/16"	54'-11 1/16"	115'-7 15/16"	31'-11 7/16"	30'-11 7/16"	23'-11 9/16"	27'-11 1/2"	33'-11 3/8"
8	11538'-9"	201'-2 1/8"	202'-8 3/16"	202'-8 3/16"	202'-8 3/16"	31'-11 3/4"	114'-2 1/8"	54'-11 1/2"	61'-11 7/16"	98'-9 1/16"	41'-11 5/8"	41'-11 5/8"	98'-9 1/16"	61'-11 7/16"	54'-11 1/2"	115'-8 15/16"	31'-11 3/4"	30'-11 3/4"	23'-11 13/16"	27'-11 3/4"	33'-11 11/16"
9	11547'-2"	201'-3 3/8"	202'-9 15/16"	202'-9 15/16"	202'-9 15/16"	32'-0"	114'-3 1/8"	55'-0"	62'-0"	98'-9 15/16"	42'-0"	42'-0"	98'-9 15/16"	62'-0"	55'-0"	115'-9 15/16"	32'-0"	31'-0"	24'-0"	28'-0"	34'-0"

*GIRDER DIMENSIONS (CONT.)

Girder	Q22	R22	T23	U23	OVERALL
1	33'-9 5/8"	27'-10 1/16"	23'-10 3/16"	30'-9 13/16"	805'-1"
2	33'-9 15/16"	27'-10 3/16"	23'-10 1/2"	30'-10 1/8"	805'-8 1/8"
3	33'-10 3/16"	27'-10 1/2"	23'-10 3/4"	30'-10 3/8"	806'-3 3/16"
4	33'-10 1/2"	27'-10 3/4"	23'-10 15/16"	30'-10 5/8"	806'-10 1/4"
5	33'-10 13/16"	27'-11"	23'-11 3/16"	30'-10 15/16"	807'-5 3/8"
6	33'-11 1/8"	27'-11 1/4"	23'-11 3/8"	30'-11 3/16"	808'-0 7/16"
7	33'-11 3/8"	27'-11 1/2"	23'-11 9/16"	30'-11 7/16"	808'-7 1/2"
8	33'-11 11/16"	27'-11 3/4"	23'-11 13/16"	30'-11 3/4"	809'-2 5/8"
9	34'-0"	28'-0"	24'-0"	31'-0"	809'-9 11/16"

* Dimensions along centerline of girder

*CROSS FRAME DIMENSIONS

Girder	CF20-1	CF20-2	CF20-3	CF20-4	CF21-1	CF21-2	CF21-3	CF21-4	CF22-1	CF22-2	CF22-3	CF22-4	CF23-1	CF23-2	CF23-3	CF23-4
1	23'-2 1/4"	24'-10 1/4"	18'-10 11/16"	14'-10 5/16"	14'-10 5/16	18'-8 5/8"	24'-10 1/4"	18'-10 11/16"	18'-10 11/16"	24'-10 1/4"	18'-8 5/8"	14'-10 5/16	14'-10 5/16	18'-10 11/16"	24'-10 1/4"	24'-8 3/16"
2	23'-2 7/16"	24'-10 1/2"	18'-10 13/16"	14'-11 1/16"	14'-11 1/16	18'-8 13/16"	24'-10 1/2"	18'-10 13/16"	18'-10 13/16"	24'-10 1/2"	18'-8 13/16"	14'-11 1/16	14'-11 1/16	18'-10 13/16"	24'-10 1/2"	24'-8 7/16"
3	23'-2 5/8"	24'-10 11/16"	18'-11"	14'-11 3/16"	14'-11 3/16"	18'-8 15/16"	24'-10 11/16"	18'-11"	18'-11"	24'-10 11/16"	18'-8 15/16"	14'-11 3/16"	14'-11 3/16"	18'-11"	24'-10 11/16"	24'-8 5/8"
4	23'-2 7/8"	24'-10 15/16"	18'-11 3/16"	14'-11 3/8"	14'-11 3/8"	18'-9 1/8"	24'-10 15/16"	18'-11 3/16"	18'-11 3/16"	24'-10 15/16"	18'-9 1/8"	14'-11 3/8"	14'-11 3/8"	18'-11 3/16"	24'-10 15/16"	24'-8 7/8"
5	23'-3 1/16"	24'-11 1/8"	18'-11 5/16"	14'-11 1/2"	14'-11 1/2"	18'-9 1/4"	24'-11 1/8"	18'-11 5/16"	18'-11 5/16"	24'-11 1/8"	18'-9 1/4"	14'-11 1/2"	14'-11 1/2"	18'-11 5/16"	24'-11 1/8"	24'-9 1/16"
6	23'-3 1/4"	24'-11 3/8"	18'-11 1/2"	14'-11 5/8"	14'-11 5/8"	18'-9 7/16"	24'-11 3/8"	18'-11 1/2"	18'-11 1/2"	24'-11 3/8"	18'-9 7/16"	14'-11 5/8"	14'-11 5/8"	18'-11 1/2"	24'-11 3/8"	24'-9 5/16"
7	23'-3 7/16"	24'-11 9/16"	18'-11 11/16"	14'-11 3/4"	14'-11 3/4"	18'-9 5/8"	24'-11 9/16"	18'-11 11/16"	18'-11 11/16"	24'-11 9/16"	18'-9 5/8"	14'-11 3/4"	14'-11 3/4"	18'-11 11/16"	24'-11 9/16"	24'-9 1/2"
8	23'-3 11/16"	24'-11 13/16"	18'-11 13/16"	14'-11 7/8"	14'-11 7/8"	18'-9 3/4"	24'-11 13/16"	18'-11 13/16"	18'-11 13/16"	24'-11 13/16"	18'-9 3/4"	14'-11 7/8"	14'-11 7/8"	18'-11 13/16"	24'-11 13/16"	24'-9 3/4"
9	23'-3 7/8"	25'-0"	19'-0"	15'-0"	15'-0"	18'-9 15/16"	25'-0"	19'-0"	19'-0"	25'-0"	18'-9 15/16"	15'-0"	15'-0"	19'-0"	25'-0"	24'-9 15/16"

GIRDER LAYOUT DIMENSIONS

Girder	℄ Brg. Pier 19		℄ Splice 8-1		℄ Splice 8-2		℄ Brg. Pier 20		℄ Splice 8-3		℄ Splice 8-4		℄ Brg. Pier 21		℄ Splice 8-5		℄ Splice 8-6		℄ Brg. Pier 22		℄ Splice 8-7	
	x	y	x	y	x	y	x	y	x	y	x	y	x	y	z	y	x	y	x	y	z	y
1	1'-5 15/16"	20'-2"	33'-3 3/4"	20'-2 9/16"	146'-11 9/16"	21'-1 5/16"	201'-7 5/8"	21'-11 1/4"	263'-3 1/8"	23'-2 1/4"	361'-5 3/4"	25'-10 5/16"	403'-2 1/2"	27'-3"	444'-11 1/4"	28'-9 1/2"	543'-1 1/8"	33'-0 1/4"	604'-7 7/8"	36'-1 1/4"	659'-3 1/16"	39'-1 5/16"
2	1'-6"	11'-9"	33'-4"	11'-9 9/16"	147'-0 1/8"	12'-8 5/16"	201'-9 3/8"	13'-6 1/4"	263'-5 7/16"	14'-9 1/4"	361'-8 1/8"	17'-5 3/8"	403'-6 1/16"	18'-10 1/16"	445'-3 1/8"	20'-4 9/16"	543'-5 13/16"	24'-7 3/8"	605'-1 3/16"	27'-8 3/8"	659'-8 13/16"	30'-8 1/2"
3	1'-6"	3'-4"	33'-4 5/16"	3'-4 9/16"	147'-2 1/8"	4'-3 5/16"	201'-11 3/16"	5'-1 5/16"	263'-7 3/4"	6'-4 1/4"	362'-0 1/16"	9'-0 7/16"	403'-9 5/8"	10'-5 1/8"	445'-7 1/16"	11'-11 1/16"	543'-10 1/16"	16'-2 1/2"	605'-6 1/2"	19'-3 1/2"	660'-2 5/8"	22'-3 1/16"
4	1'-6"	-5'-1"	33'-4 5/8"	-5'-0 7/16"	147'-3 7/16"	-4'-1 1/16"	202'-0 5/16"	-3'-3 1/16"	263'-10 1/16"	-2'-0 1/16"	362'-3 1/4"	0'-7 7/16"	404'-1 1/8"	2'-0 3/16"	445'-10 13/16"	3'-6 3/4"	544'-3 1/2"	7'-9 9/16"	605'-11 7/8"	10'-10 5/8"	660'-8 7/16"	13'-10 13/16"
5	1'-6"	-13'-6"	33'-4 1/8"	-13'-5 7/16"	147'-4 3/4"	-12'-6 1/16"	202'-2 1/4"	-11'-8 1/16"	264'-0 3/8"	-10'-5 1/16"	362'-6 7/16"	-7'-9 1/2"	404'-4 1/16"	-6'-4 3/4"	446'-2 7/8"	-4'-10 3/16"	544'-8 1/4"	0'-7 1/16"	606'-5 3/16"	2'-5 13/16"	661'-2 1/4"	5'-6"
6	1'-6 1/16"	-21'-11"	33'-5 3/16"	-21'-10 7/16"	147'-6"	-20'-11 1/16"	202'-4 1/2"	-20'-1 1/16"	264'-2 3/4"	-18'-10 5/8"	362'-9 5/8"	-16'-2 7/16"	404'-8 1/4"	-14'-9 1 1/16"	446'-6 1 3/16"	-13'-3 1/8"	545'-1 1/16"	-9'-0 3/16"	606'-10 1/2"	-5'-11 1/16"	661'-8 1/16"	-2'-10 13/16"
7	1'-6 1/16"	-30'-4"	33'-5 1/2"	-30'-3 7/16"	147'-7 7/16"	-29'-4 1 1/16"	202'-6 1/4"	-28'-6 5/8"	264'-5 1/16"	-27'-3 5/8"	363'-0 1 3/16"	-24'-7 7/8"	404'-11 3/16"	-23'-2 5/8"	446'-10 1 1/16"	-21'-8 1/16"	545'-5 1 3/16"	-17'-5 1/16"	607'-3 1 3/16"	-14'-3 1 5/16"	662'-1 1 7/16"	-11'-3 1 1/16"
8	1'-6 1/16"	-38'-9"	33'-5 3/4"	-38'-8 1/16"	147'-8 5/8"	-37'-9 1/8"	202'-8 1/16"	-36'-11 1/8"	264'-7 3/8"	-35'-8 1/16"	363'-4"	-33'-0 5/16"	405'-3 1/16"	-31'-7 1/16"	447'-2 5/8"	-30'-0 1 5/16"	545'-10 1/8"	-25'-9 1 1/16"	607'-9 1/8"	-22'-8 1 3/16"	662'-7 3/8"	-19'-8 1/2"
9	1'-6 1/16"	-47'-2"	33'-6 1/16"	-47'-1 7/16"	147'-9 7/8"	-46'-2 7/8"	202'-9 1 3/16"	-45'-4 5/8"	264'-9 1 1/16"	-44'-1 9/16"	363'-7 3 1/16"	-41'-5 5/16"	405'-6 7/8"	-40'-0 1/2"	447'-6 9/16"	-38'-5 7/8"	546'-3 3/8"	-34'-2 7/8"	608'-2 7 1/16"	-31'-1 1 1/16"	663'-1 7 1/16"	-28'-1 5/16"

GIRDER LAYOUT DIMENSIONS (CONT.)

Girder	℄ Splice 8-8		℄ Brg. E. Abut.	
	x	y	x	y
1	774'-2 3/16"	46'-3 3/8"	805'-11"	48'-5 7/8"
2	774'-9"	37'-10 1 3/16"	806'-6 1/8"	40'-1 1/8"
3	775'-3 1 3/16"	29'-6 1/16"	807'-1 7/16"	31'-8 3/8"
4	775'-10 5/8"	21'-1 5/16"	807'-8 9/16"	23'-3 5/8"
5	776'-5 7/16"	12'-8 9/16"	808'-3 3/8"	14'-10 7/8"
6	777'-0 1/4"	4'-3 3/4"	808'-10 1/2"	6'-6 1/8"
7	777'-7 1/16"	-4'-1"	809'-5 9/16"	-1'-10 5/8"
8	778'-1 7/8"	-12'-5 3/4"	810'-0 1 1/16"	-10'-3 3/8"
9	778'-8 1 1/16"	-20'-10 9/16"	810'-7 3/4"	-18'-8 1/8"

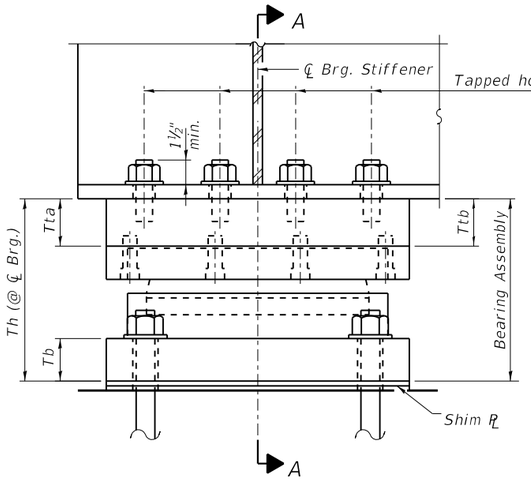
USER NAME = johns00944	DESIGNED - MNM	REVISED -
	CHECKED - SEG	REVISED -
PLOT SCALE = 0:2.0000 ':' / in.	DRAWN - DAP	REVISED -
PLOT DATE = 12/11/2018	CHECKED - MNM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER DETAILS - UNIT 8, 4 OF 4
STRUCTURE NO. 090-0180

SHEET S-280 OF 445 SHEETS

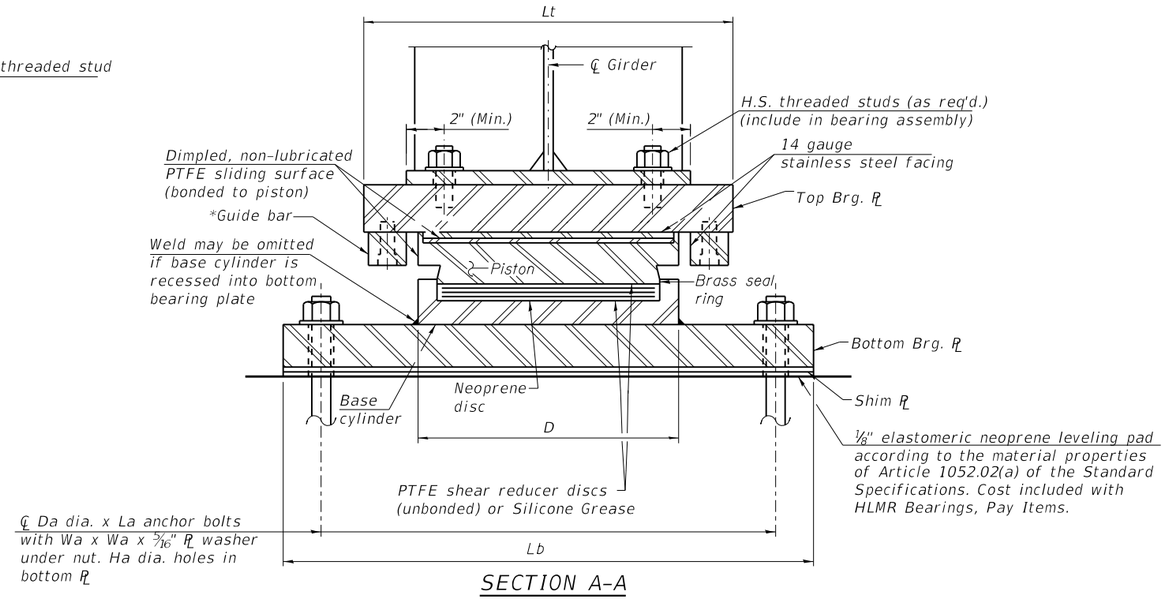
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1188
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	



ELEVATION

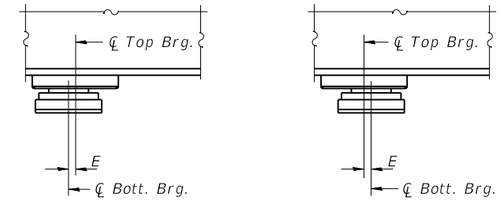
Increasing Station →

* As alternates to the bolted connection shown, the guide bars may be connected to the top bearing plate by groove welds or the guide bars and top bearing plate may be fabricated as a single piece.



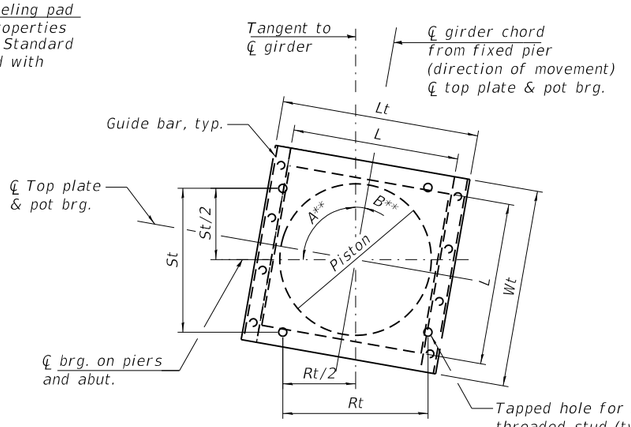
SECTION A–A

⅛" elastomeric neoprene leveling pad according to the material properties of Article 1052.02(a) of the Standard Specifications. Cost included with HLMR Bearings, Pay Items.



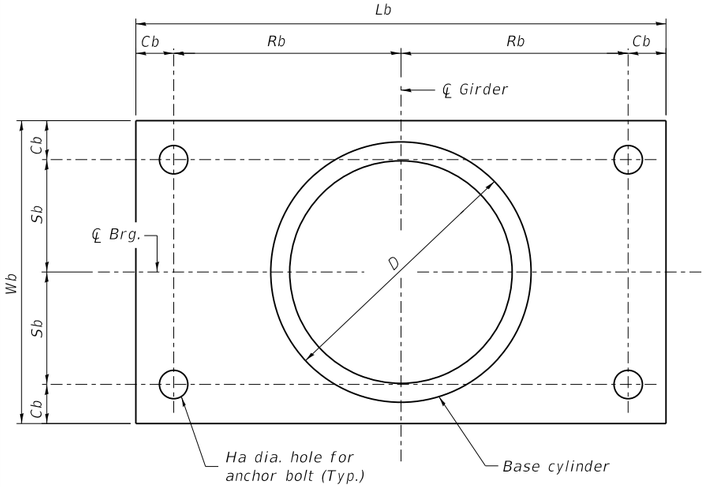
SETTING ANCHOR BOLTS AT EXP. BRG.

E=⅛" per each 100' of expansion for every 15° temp. change from the normal temp. of 50° F.



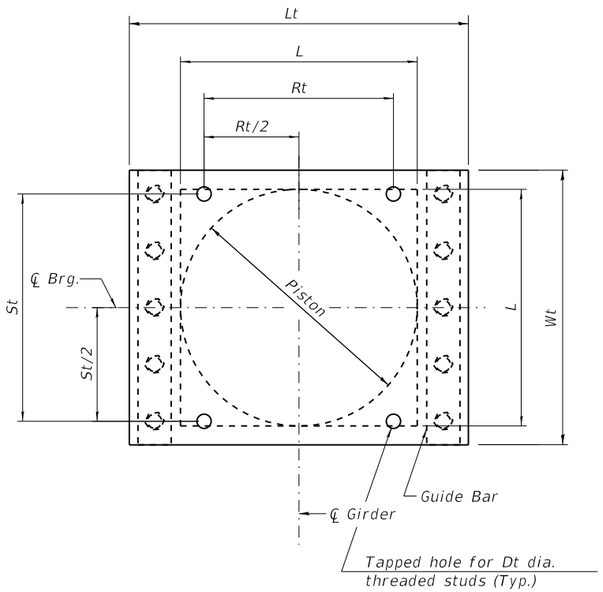
TOP BEARING PL AND PISTON PLAN-RAMP E

** For angles "A" and "B", see bearing orientation details on sheet S-196 of 445.



BOTTOM BEARING PL AND BASE CYLINDER PLAN

(See Sht. S-282 of 445 for bottom Bearing Plate for Ramp E, South Abutment and Ramp E, Pier 2 US 150)



TOP BEARING PL AND PISTON PLAN

(For 4 threaded Studs)

TYLIN INTERNATIONAL
200 S. WACKER DR.
SUITE 1400
CHICAGO, IL 60606
TEL: 312-777-2900

USER NAME = RHoyos	DESIGNED -	REVISED -	
	CHECKED -	REVISED -	
PLOT SCALE = 0:2.0000 ':' / in.	DRAWN -	REVISED -	
PLOT DATE = 1/25/2019	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HLMR EXPANSION BEARINGS, 1 OF 2
STRUCTURE NO. 090-0180
SHEET S-281 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1189
		CONTRACT NO. 68B46		
		ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)

HIGH LOAD MULTI-ROTATIONAL BEARING SCHEDULE

	LOCATION	QUANTITY EACH	REACTION FOR PAY ITEM (KIPS)	SERVICE VERTICAL DESIGN LOAD * (kips)	STRENGTH HORIZONTAL DESIGN LOAD (kips)	TOTAL REQUIRED MOVEMENT (in.)	STRENGTH DESIGN ROTATION (RADIANS)	D (in.)	L (in.)	Th (in.)	TOP PLATE / BEARING ASSEMBLY							MASONRY PLATE						ANCHOR BOLTS				
											Wt (in.)	Lt (in.)	Tt (in.) Tta	Tt (in.) Ttb	Dt (in.)	Rt (in.)	St (in.)	Wb (in.)	Lb (in.)	Tb (in.)	Rb (in.)	Sb (in.)	Cb (in.)	Da (in.)	La (in.)	Wa (in.)	Ha (in.)	Type
	PIER 3	13	650	618	81	2⅛"	0.02	18⅜	18⅜	10⁷⁄₁₆	22½	24¼	2¾	2¾	1	18	18½	20½"	33½"	2¼"	14½"	8"	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
	PIER 5	12	600	591	77	2⅛"	0.02	18⅜	18⅜	10⁷⁄₁₆	22½	24¼	2¾	2¾	1	18	18½	20½"	33½"	2¼"	14½"	8"	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
	PIER 7	11	650	646	86	2⅜"	0.02	18⅜	18⅜	10¹¹⁄₁₆	22¾	24¼	3	3	1	18	18¾"	20½"	33½"	2¼"	14½"	8"	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
	PIER 10	10	650	630	83	2⅜"	0.02	18⅜	18⅜	10¹⁵⁄₁₆	22¾	24¼	3	3½	1	18	18¾"	20½"	33½	2¼"	14½"	8"	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
	PIER 15	9	650	643	129	1¼	0.02	18⅜	18⅜	11⁵⁄₁₆	20¾	24¼	3⅜	3	1	18	16¾"	20½"	33¼"	2¼"	14⅜"	8"	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
	PIER 18	9	650	643	129	1¼	0.02	18⅜	18⅜	11⁵⁄₁₆	20¾	24¼	3⅜	3	1	18	16¾"	20½"	33¼"	2¼"	14⅜"	8"	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
	PIER 20	9	700	688	138	1¼	0.02	19	19	11⁷⁄₁₆	21½	25	3⅜	3	1	18	17½"	21½"	34	2¼"	14¾"	8½"	2¼	1¼	15	2¾	1¾	F1554 Gr. 105
	PIER 22	9	700	688	138	1¼	0.02	19	19	11⁷⁄₁₆	21½	25	3⅜	3	1	18	17½"	21½"	34	2¼"	14¾"	8½"	2¼	1¼	15	2¾	1¾	F1554 Gr. 105
	S. ABUTMENT	7	150	127	10	3	0.02	8⅞	8⅞	6⁵⁄₁₆	14	14	1½	2	1	10	7	11	26	1¾	11¼	5½	1¾	¾	12	2	1¼	F1554 Gr. 55
	PIER E1	7	550	508	69	2	0.02	17	17	10	21	24	2¾	2¾	1	14	14	20	40½	2	18	7¾	2¼	1¼	15	2¾	1¾	F1554 Gr. 55
**	PIER 2,RAMP E	7	150	125	10	1¼	0.02	8⅞	8⅞	6⅛	12½	14	1½	1½	1	10	7	11	26	1¾	11¼	5½	1¾	¾	12	2	1¼	F1554 Gr. 55

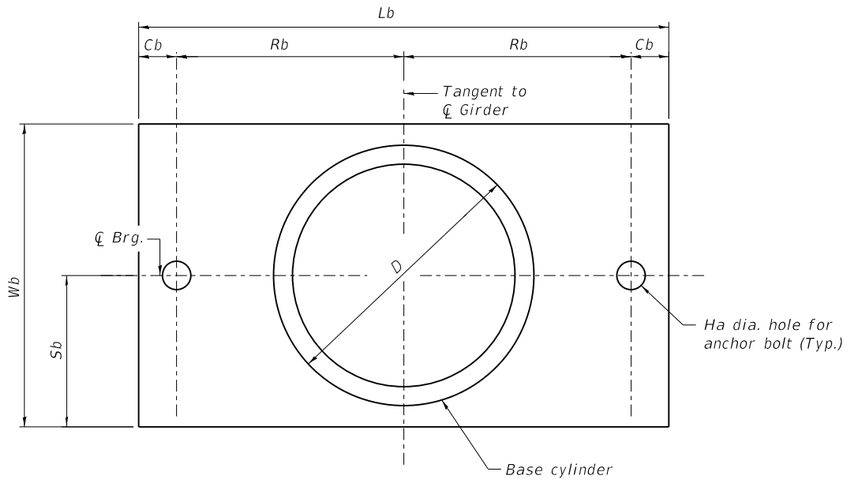
* DOES NOT INCLUDE IMPACT.

** Refers to bearings supporting Ramp E girders supported on Pier 2 (US 150).

FILL PLATES

LOCATION	GIRDER	THICKNESS
PIER 3	5	⅝"
PIER 5	5	⅝"
PIER 7	5	⅝"

The cost of the fill plates is included in the cost of the bearings. Fill plates shall match the dimensions and the material used for the bottom bearing plates.



BOTTOM BEARING ℄ AND BASE CYLINDER PLAN

(South Abutment and Pier 2 Ramp E)

BILL OF MATERIAL

ITEM	UNIT	QUANTITY
HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION - 150K	EACH	14
HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION - 550K	EACH	7
HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION - 600K	EACH	12
HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION - 650K	EACH	52
HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION - 700K	EACH	18
ANCHOR BOLTS, ¾"	EACH	28
ANCHOR BOLTS, 1¼"	EACH	356

NOTES:

1. The structural steel plates of the bearing assembly shall conform to the requirements of AASHTO M 270 Grade 50.
2. The cost of the elastomeric neoprene leveling pad, shim plates and threaded studs shall be included in the cost of High Load Multi-Rotational Bearings.
3. Anchor bolts shall be ASTM F1554 all-thread (or an engineer-approved alternative material) of the grade and diameter specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
4. Anchor bolts may be cast in place or installed in holes drilled after the supporting members are in place. Drilled and set anchor bolts shall be installed according to article 521.06 of the Standard Specificaitons.
5. Two ⅛" adjusting shims shall be provided for each bearing in addition to all other plates of shims and placed as shown on bearing details.
6. If base cylinder is recessed into the bottom bearing plate, the thickness of the bottom bearing plate shall be Tb plus the depth of the recess.

TYLIN INTERNATIONAL
200 S. WACKER DR.
SUITE 1400
CHICAGO, IL 60606
TEL: 312-777-2900

USER NAME = spantazis	DESIGNED -	REVISED -	
	CHECKED -	REVISED -	
PLOT SCALE = 0:2.0000 '-' / in.	DRAWN -	REVISED -	
PLOT DATE = 2/4/2019	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HLMR EXPANSION BEARINGS, 2 OF 2
STRUCTURE NO. 090-0180

SHEET S-282 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1190
		CONTRACT NO. 68B46		
	ILLINOIS	FED. AID PROJECT	NHPP-YRP3(905)	

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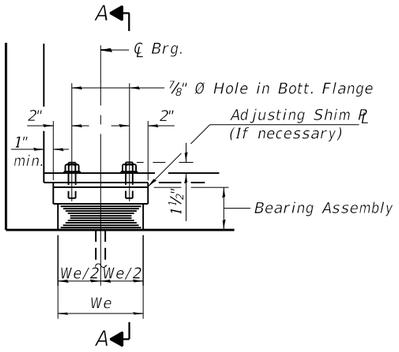
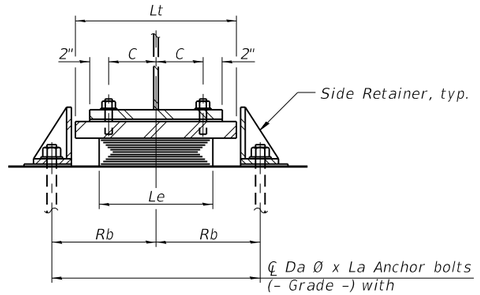
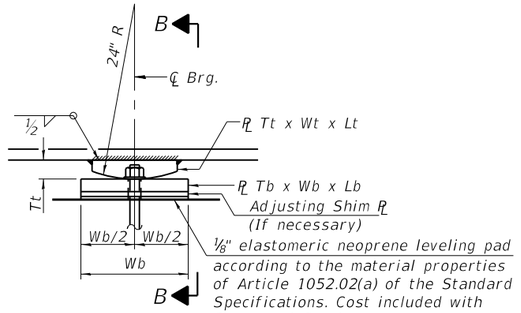
2/4/2019 11:19:37 AM



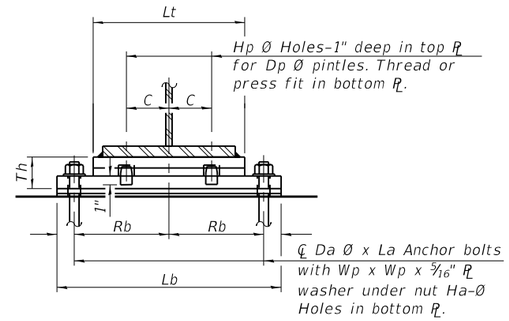
ELEVATION



SECTION A–A



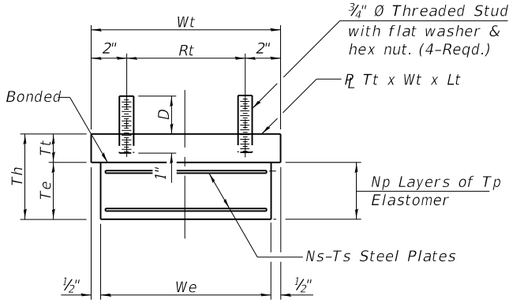
ELEVATION AT PIER



SECTION B–B

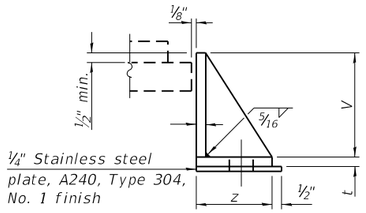
TYPE I ELASTOMERIC EXP. BRG.

FIXED BEARING



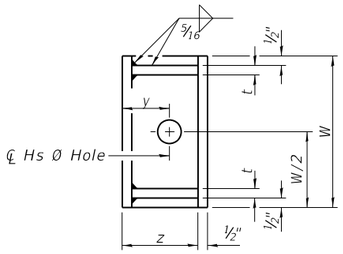
BEARING ASSEMBLY

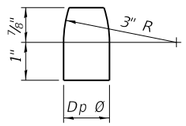
Note:
Shim plates shall not be placed under Bearing Assembly.



SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.





PINTLE

FILL PLATES

LOCATION	GIRDER	THICKNESS
Pier 4	5	¼"
Pier 8	5	½"
E. Brg. Pier 2	5	⅝"
W. Brg. Pier 6	5 & 10	⅞"
W. brg. Pier 9	5	½"

The cost of the fill plates is included in the cost of the bearings. Fill plates shall match the dimensions and the material used for the bottom bearing plates.

FIXED BEARING SCHEDULE

BEARING LOCATION	GIRDERS	NO. REQ'D.	Th IN.	TOP PLATE			BOTTOM PLATE			PINTLES			ANCHOR BOLTS					
				Wt IN.	Lt IN.	Tt IN.	Wb IN.	Lb IN.	Tb IN.	Dp IN.	Hp IN.	C IN.	Rb IN.	Da IN.	La IN.	Ha IN.	Wp IN.	GRADE
PIER 1	1–8	8	3⅞	9	17½	1⅞	9½	26½	2	1¼	1⅜	4	11	1¼	15	1¾	2¾	F1554 Gr.55
PIER 4	1–12, 14	13	5⅛	9	23½	3⅛	9½	32½	2	1¼	1⅜	5½	14	1¼	15	1¾	2¾	F1554 Gr.55
PIER 8	1–11	11	5½	9	23½	3	11½	33½	2½	1⅜	1½	5½	14	1½	18	2	3	F1554 Gr.55
PIER 11	1–10	10	5½	9	23½	3	11	33½	2½	1⅜	1½	5½	14	1½	18	2	3	F1554 Gr.55
PIER 14	1–9	9	5¾	9	24	3¼	12	35	2½	1⅜	1½	5½	14¾	1½	18	2	3	F1554 Gr.55
PIER 17	1–9	9	5¾	9	24	3¼	12	35	2½	1⅜	1½	5½	14¾	1½	18	2	3	F1554 Gr.55
PIER 21	1–9	9	6	9	24	3½	12	35	2½	1⅜	1½	5½	14¾	1½	18	2	3	F1554 Gr.55
PIER E2	1–7	7	4¾	9	21½	2½	10	31½	2¼	1¼	1⅜	5	13	1½	18	2	3	F1554 Gr.55

TYPE I ELASTOMERIC BEARING SCHEDULE

BEARING LOCATION	GIRDERS	NO. REQ'D.	Th IN.	ELASTOMER							TOP PLATE						SIDE RETAINER						ANCHOR BOLTS				
				We IN.	Le IN.	Te IN.	Tp IN.	Np	Ts IN.	Ns	Wt IN.	Lt IN.	Tt IN.	Rt IN.	D IN.	C IN.	V IN.	z IN.	y IN.	W IN.	t IN.	Hs IN.	Rb IN.	Da IN.	La IN.	Wp IN.	Grade
W. ABUTMENT	1–8	8	5 13/16	12	18	3 9/16	9/16	5	3/16	4	13	20	2¼	9	3	5½	5 9/16	7¼	2⅛	10	½	1¼	12¼	1	12	2¼	F1554 Gr.55
PIER 2, W. BRGS.	1–8	8	4⅜	11	16	2⅜	½	4	⅛	3	12	18	2	8	3	5½	4⅛	6¼	2⅛	8	½	1¼	11¼	1	12	2¼	F1554 Gr.55
PIER 2, E. BRGS.	1–14	14	10 1/16	20	24	7 13/16	13/16	8	3/16	7	21	26	2¼	17	3	7	9 3/16	10⅜	2⅛	21	½	1¼	15¼	1	12	2¼	F1554 Gr.55
PIER 6, W. BRGS.	1–10, 12, 14	12	10 1/16	20	24	7 13/16	13/16	8	3/16	7	21	26	2¼	17	3	7	9 3/16	10⅜ *	2⅛	21	½	1¼	15¼	1	12	2¼	F1554 Gr.55
PIER 9, W. BRGS.	1–11	11	6 15/16	14	22	4 3/16	1 1/16	5	3/16	4	15	24	2¾	11	3	7	6 1 1/16	8¾	2⅛	14	½	1¼	14¼	1	12	2¼	F1554 Gr.55
PIER 12, W. BRGS.	1–10	10	6 15/16	14	22	4 3/16	1 1/16	5	3/16	4	15	24	2¾	11	3	7	6 1 1/16	8¾	2⅛	14	½	1¼	14¼	1	12	2¼	F1554 Gr.55
PIER 13	1–9	9	6 7/16	14	22	4 3/16	1 1/16	5	3/16	4	15	24	2¼	11	2½	7	6⅛	8¾	2¾	14	⅝	1¾	14⅞	1½	18	3	F1554 Gr.55
PIER 16, E. BRGS.	1–9	9	6 7/16	14	22	4 3/16	1 1/16	5	3/16	4	15	24	2¼	11	2½	7	6⅛	8¾	2¾	14	⅜	1¾	14⅞	1½	18	3	F1554 Gr.55

* The "z" dimension between Girders 10 and 12 shall be 6¼".

Notes:

Anchor bolts shall be ASTM F1554 all–thread (or an Engineer–approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Side retainers and other steel members required for the elastomeric bearing assembly shall be included in the cost of Elastomeric Bearing Assembly, Type I.

Anchor bolts and side retainers at all supports shall be installed as each member is erected unless an equivalent temporary means of lateral restraint is used.

All Bearing plates and pintles for fixed bearings shall be AASHTO M270, Grade 50W. The bearing plates for the Type 1 bearings shall be AASHTO M270, Grade 50 and shall be galvanized in accordance with the Special Provisions.

Two ⅛" adjusting shims shall be provided for each bearing in addition to all other plates of shims and placed as shown on bearing details.

BILL OF MATERIAL

Item	Unit	Total
Elastomeric Bearing Assembly Type I	Each	81
Anchor Bolts, 1"	Each	126
Anchor Bolts, 1¼"	Each	42
Anchor Bolts, 1½"	Each	146

I-2E-1

8-11-2017

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BEARINGS, TYPE I AND LOW PROFILE FIXED
STRUCTURE NO. 090-0180

SHEET S-283 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1191
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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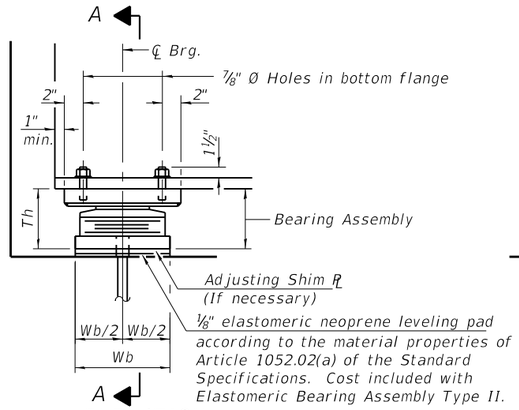

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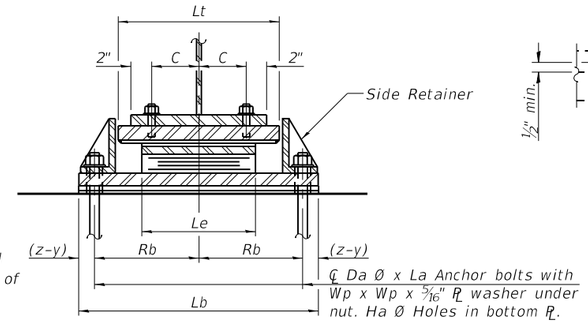
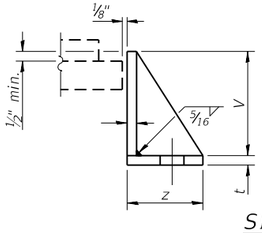


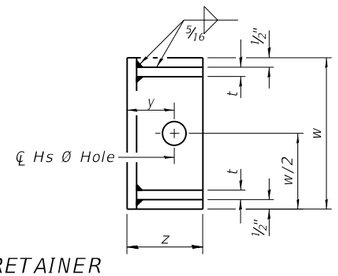
SECTION A-A

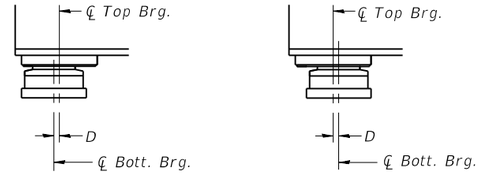
TYPE II ELASTOMERIC EXP. BRG.



SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.



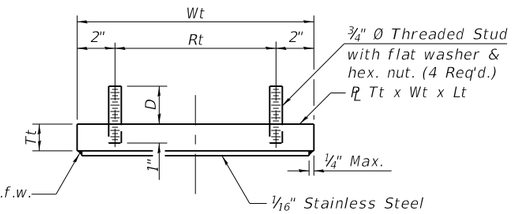


BELOW 50°F. ABOVE 50°F.

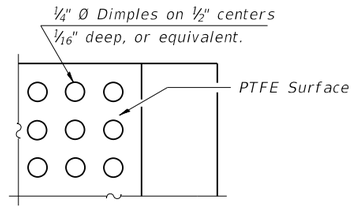
D=⅛" per each 100' of expansion for every 15° temp. change from the normal temp. of 50°F.

EXPANSION BEARING ORIENTATION

The above diagrams are for informational purposes only to show the amount of expected offset "D" for the current temperature in the field.



TOP BEARING ASSEMBLY



PLAN-PTFE SURFACE

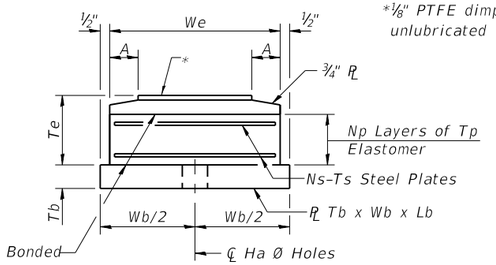
FILL PLATES

LOCATION	GIRDER	THICKNESS
E. Brg. Pier 6	5	⅝"
W. Brg. Pier 19	1-9	1⅛"

The cost of the fill plates is included in the cost of the bearings. Fill plates shall match the dimensions and the material used for the bottom bearing plates.

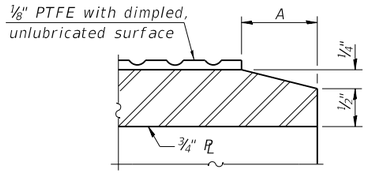
BILL OF MATERIAL

Item	Unit	Total
Elastomeric Bearing Assembly Type II	Each	57
Anchor Bolts, 1"	Each	42
Anchor Bolts, 1¼"	Each	18
Anchor Bolts, 1½"	Each	54



BOTTOM BEARING ASSEMBLY

*⅛" PTFE dimpled, unlubricated



SECTION THRU PTFE

Notes:

Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Side retainers and other steel members required for the elastomeric bearing assembly shall be included in the cost of Elastomeric Bearing Assembly, Type II.

The ⅛" PTFE sheet shall be bonded directly to the top steel plate with a two-component, medium viscosity epoxy resin, conforming to the requirements of the Federal Specification MMM-A-134, Type I. The bond agent shall be applied on the full area of the contact surfaces.

Bonding of ⅛" PTFE sheet during vulcanizing process will be permitted provided the process and method of adjusting assembly height is approved by the Engineer.

Anchor bolts and side retainers at all supports shall be installed as each member is erected unless an equivalent temporary means of lateral restraint is used.

All Bearing plates shall be AASHTO M270, Grade 50 and shall be galvanized in accordance with the Special Provisions.

Two ⅛" adjusting shims shall be provided for each bearing in addition to all other plates of shims and placed as shown on bearing details.

TYPE II ELASTOMERIC BEARING SCHEDULE

BEARING LOCATION	GIRDERS	NO. REQ'D.	Th IN.	ELASTOMER							TOP PLATE						BOTTOM PLATE				SIDE RETAINER						ANCHOR BOLTS					
				We IN.	Le IN.	Te IN.	Tp IN.	Np	Ts IN.	Ns	Wt IN.	Lt IN.	Tt IN.	Rt IN.	D IN.	C IN.	Wb IN.	Lb IN.	Tb IN.	A IN.	V IN.	z IN.	y IN.	t IN.	Hs IN.	W IN.	Rb IN.	Da IN.	La IN.	Ha IN.	Wp IN.	Grade
PIER 6, E. BRGS.	1-11	11	10¼	14	22	5 15/16	1 1/16	6	3/16	5	18	24	2¼	14	2¾	7	15	41¾	2	1½	8¼	8¾	2⅛	½	1¼	14	14¼	1	12	1½	2¼	F1554 Gr.55
PIER 9 E. BRGS.	1-10	10	10¼	14	22	5 15/16	1 1/16	6	3/16	5	18	24	2¼	14	2¾	7	15	41¾	2	1½	8¼	8¾	2⅛	½	1¼	14	14¼	1	12	1½	2¼	F1554 Gr.55
PIER 16, W. BRGS.	1-9	9	10 3/16	14	22	5 15/16	1 1/16	6	3/16	5	18	24	*	14	2¼	7	15	41¾	1¾	1½	8⅜	8¾	2¾	⅝	1¾	14	14⅞	1½	18	2	3	F1554 Gr.55
PIER 19, W. BRGS.	1-9	9	10 3/16	14	22	5 15/16	1 1/16	6	3/16	5	18	24	*	14	2¼	7	15	41¾	1¾	1½	8⅜	8¾	2¾	⅝	1¾	14	14⅞	1½	18	2	3	F1554 Gr.55
PIER 19, E. BRGS.	1-9	9	10 7/16	14	22	5 15/16	1 1/16	6	3/16	5	18	24	*	14	2¼	7	15	41¾	2	1½	8⅜	8¾"	2¾	⅝	1¾	14	14⅞	1½	18	2	3	F1554 Gr.55
E. ABUTMENT	1-9	9	10 7/16	14	22	5 15/16	1 1/16	6	3/16	5	18	24	*	14	2¼	7	15	41¾	2	1½	8½	8¾	2⅜	½	1½	14	14½	1¼	15	1¾	2¾	F1554 Gr.55

* VARIES FROM 2¼" (E. SIDE) TO 2⅝" (W. SIDE)

I-2E-2 8-11-2017

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DEPARTMENT OF TRANSPORTATION

BEARINGS, TYPE II
STRUCTURE NO. 090-0180
SHEET S-284 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1192
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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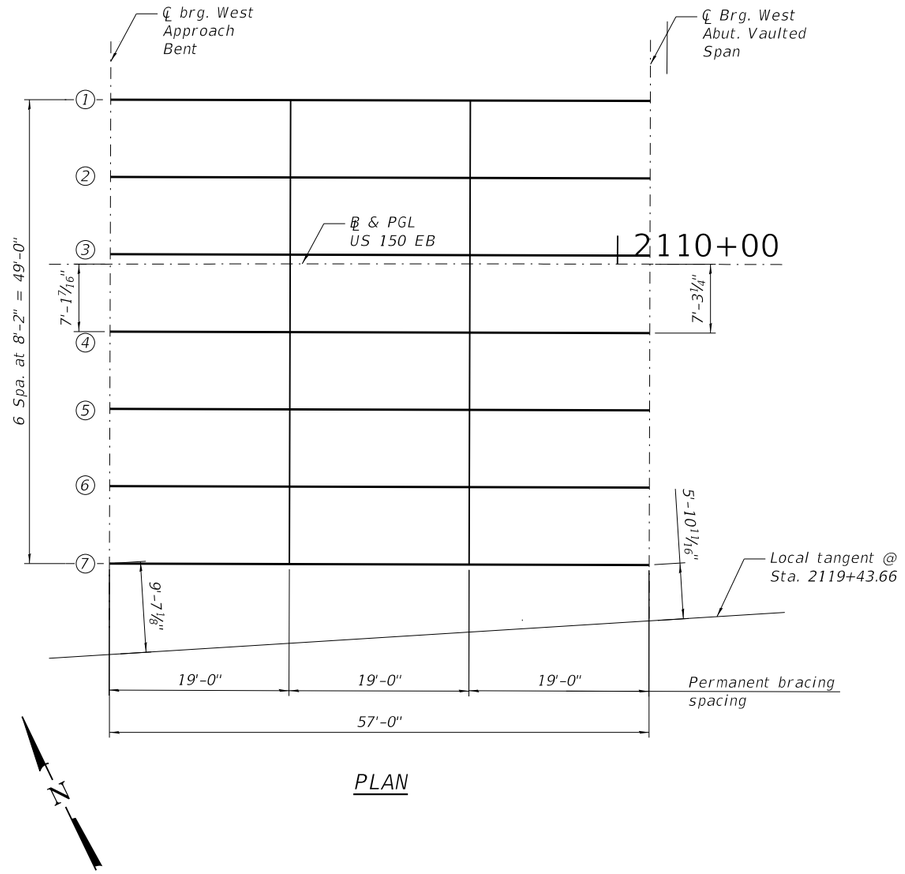
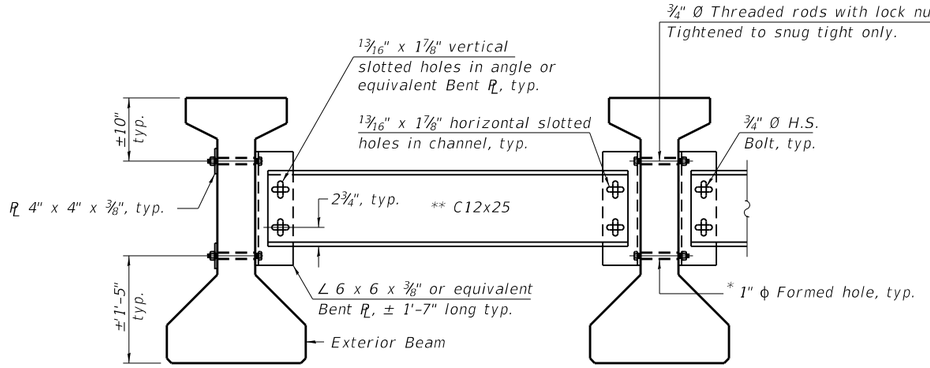


PLAN



Notes:

All material for bracing shall be hot dip galvanized according to AASHTO M111 unless otherwise noted.

Two hardened washers are required for each set of oversized holes.

All holes shall be 15/16" Ø unless otherwise noted.

5/16" x 3" x 3" plate washers are required over all slotted holes.

All bolts, threaded rods, and hardware shall be galvanized according to AASHTO M232.

Threaded rods shall be ASTM F 1554 Grade 55.

Bracing shall be installed as beams are erected and tightened as soon as possible during erection.

Permanent bracing shall not be paid for separately, but shall be included in the cost of Furnishing and Erecting Precast Prestressed Concrete Beams.

* Fabricator shall locate to miss strands within permissible tolerances.

** Alternate C12x30 channels are permitted to facilitate material acquisition.

PERMANENT BRACING DETAILS

INTERIOR BEAM MOMENT TABLE		
		0.5 Sp.
I	(in^4)	90956
I'	(in^4)	317195
Sb	(in^3)	5153
Sb'	(in^3)	9181
St	(in^3)	3736
St'	(in^3)	42576
DC1	(k/')	1.32
MDC1	('k)	536
DC2	(k/')	0.15
MDC2	('k)	61
DW	(k/')	0.408
MDW	('k)	166
LLDF	(k/')	0.725
$M_{℄+IM}$	('k)	908

BEAM REACTION TABLE			
		Abut.	
		Interior	Exterior
LLDF		0.826	0.702
OCF		——	1.0
RDC1	(k)	37.6	33.8
RDC2	(k)	4.3	4.3
RDW	(k)	11.6	9.4
R℄	(k)	64.8	55.1
R_{IM}	(k)	16.4	13.9
RTotal	(k)	134.7	116.5

I: Non-composite moment of inertia of beam section ($in.^4$).
I': Composite moment of inertia of beam section ($in.^4$).
Sb: Non-composite section modulus for the bottom fiber of the prestressed beam ($in.^3$).
Sb': Composite section modulus for the bottom fiber of the prestressed beam ($in.^3$).
St: Non-composite section modulus for the top fiber of the prestressed beam ($in.^3$).
St': Composite section modulus for the top fiber of the prestressed beam ($in.^3$).
DC1: Un-factored non-composite dead load (kips/ft.).
MDC1: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft).
$M_{℄+IM}$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
LLDF: Live Load Distribution Factor
OCF: Obtuse Correction Factor

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN - VAULTED SPAN
STRUCTURE NO. 090-0180

SHEET S-285 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1193
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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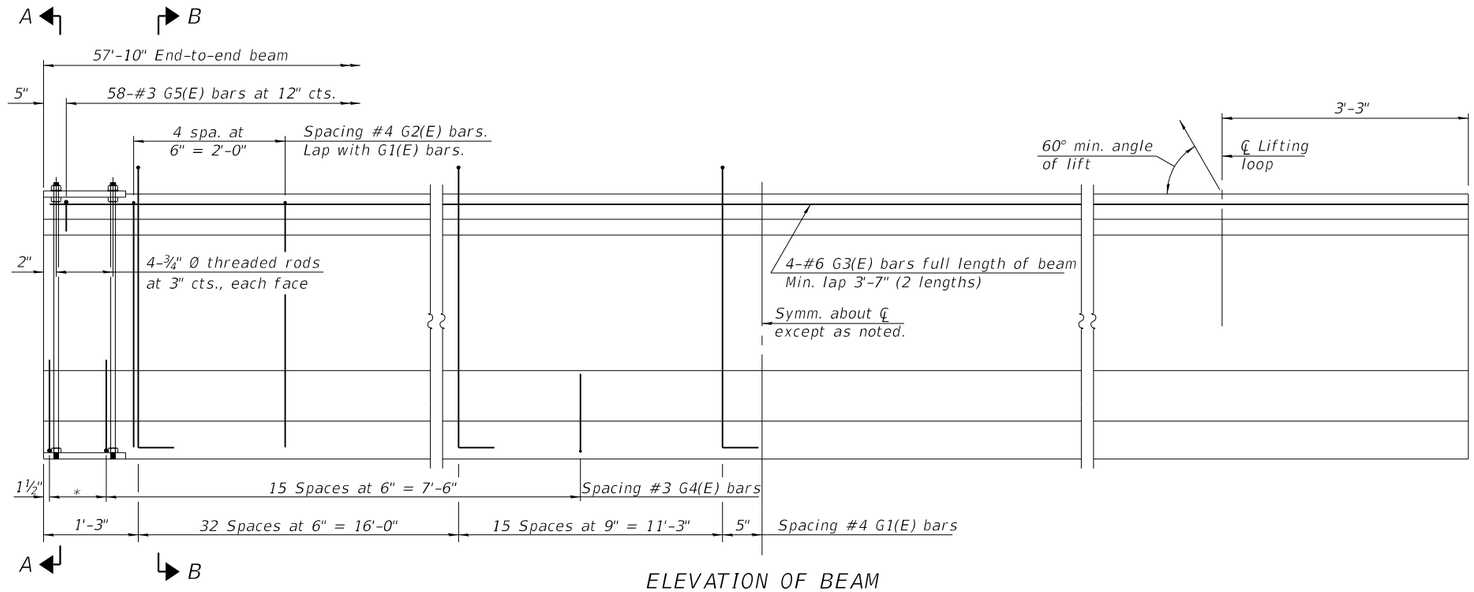
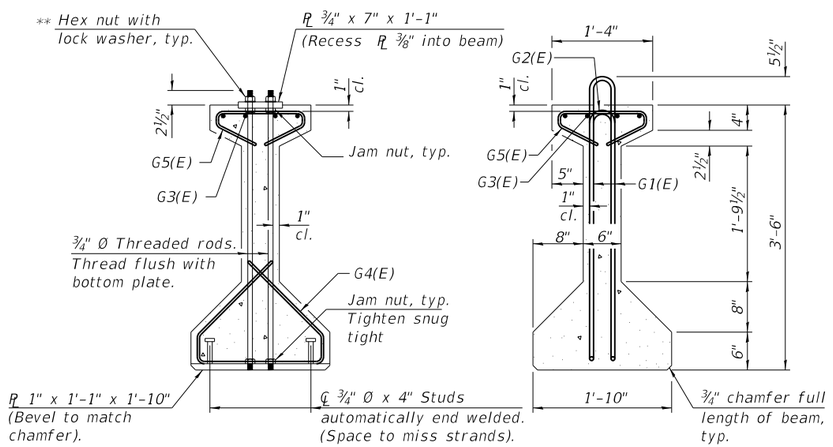


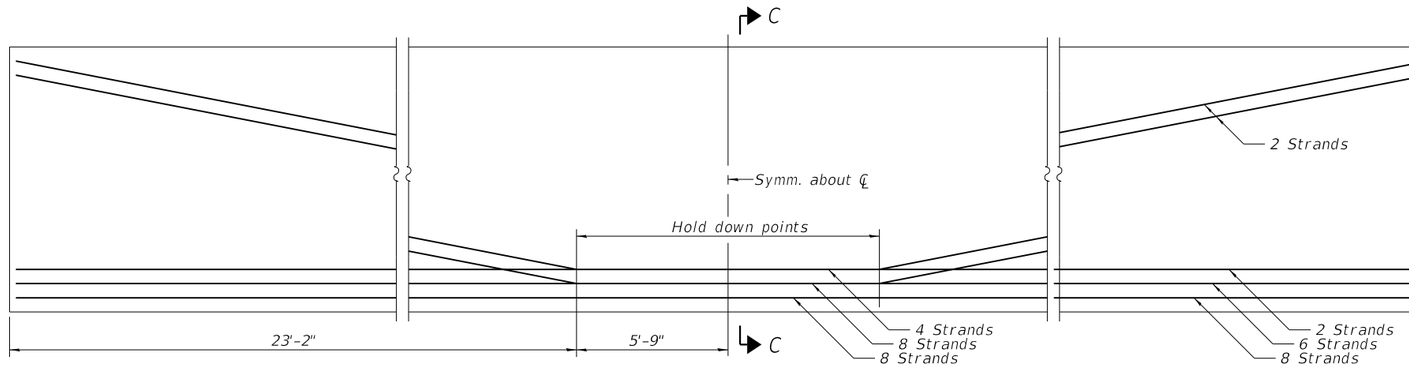
*3 spaces at 3" = 9"

ELEVATION OF BEAM
(Showing reinforcement & dimensions)



SECTION A-A
**Only tighten sufficiently to compress lock washers

SECTION B-B



ELEVATION OF BEAM
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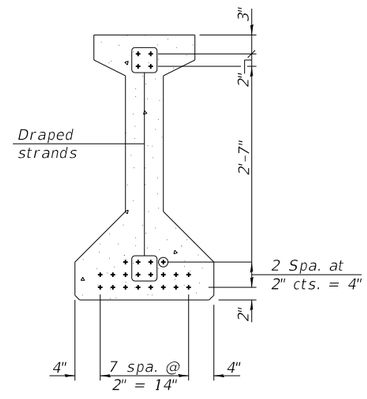

SECTION C-C
(20-½" Ø 270 ksi strands)

BAR LIST
ONE BEAM ONLY
(For information only)

Bar	No.	Size	Length	Shape
G1(E)	96	#4	8'-7"	
G2(E)	10	#4	6'-8"	
G3(E)	8	#6	30'-8"	
G4(E)	38	#3	4'-11"	
G5(E)	58	#3	2'-6"	

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DEPARTMENT OF TRANSPORTATION

42" PPC I-BEAM
STRUCTURE NO. 090-0180
SHEET S-286 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1194
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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NOTES

Inserts for ¾" Ø threaded dowel rods, when specified, are to be two strut, ferrule type for interior beams and single ferrule, flared loop type for exterior beams.

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq. in.

The beams shall have a final concrete compressive strength, f'c, of 6,000 psi and a release concrete compressive strength, f'ci, of 5,000 psi.

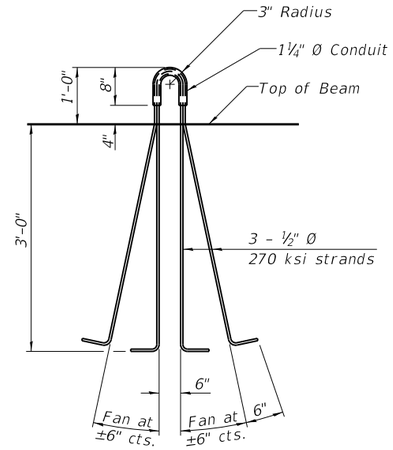
A minimum 2½" Ø lifting pin shall be used to engage the lifting loops during handling.

The top and bottom plates shall be AASHTO M270 Grade 50.

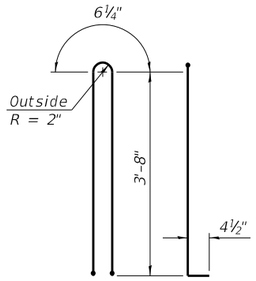
The top and bottom plates shall be galvanized according to AASHTO M111. The threaded rods, nuts and washers shall be galvanized according to AASHTO M232.

Threaded rods shall be ASTM F 1554 Grade 55.

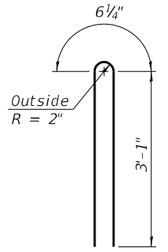
Beams shall not be released from the fabricator until they have attained 45 days of age or older.



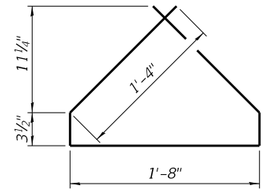
LIFTING LOOP DETAIL



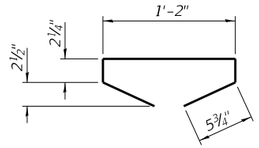
BAR G1(E)



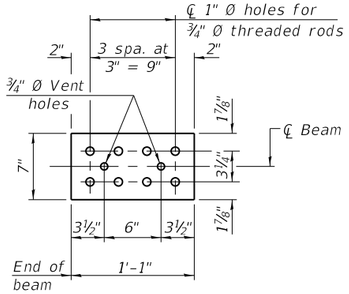
BAR G2(E)



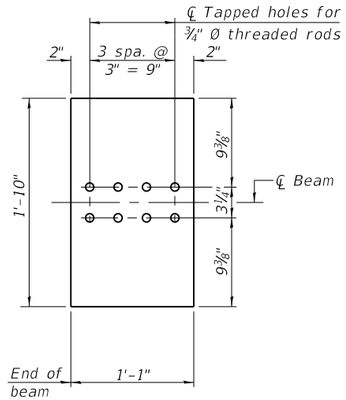
BAR G4(E)



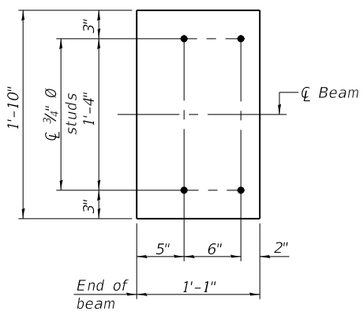
BAR G5(E)



TOP PLATE



BOTTOM PLATE
(Showing threaded rods)



BOTTOM PLATE
(Showing studs)

See bearing details for pintle hole locations when required.

BILL OF MATERIAL

Item	Unit	Total
Furnishing and Erecting Precast Prestressed Concrete I-Beams, 42"	Ft.	405

MODEL: Default
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12/12/2018 10:20:32 AM

TYLIN INTERNATIONAL
200 S. WACKER DR.
SUITE 1400
CHICAGO, IL 60606
TEL: 312-777-2900

USER NAME = CHORBACZ | DESIGNED - CTH | REVISED -
CHECKED - | REVISED -
PLOT SCALE = 0:2.0000 ':' / in. | DRAWN - | REVISED -
PLOT DATE = 12/12/2018 | CHECKED - | REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

42" PPC I-BEAM DETAILS
STRUCTURE NO. 090-0180
SHEET S-287 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1195
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

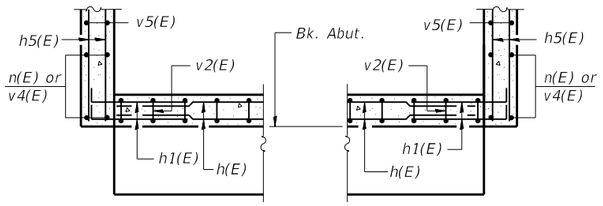
Notes:
Space reinforcement in cap to miss anchor bolts.
Pour steps monolithically with cap.
For details of piles, see sheet S-431 of 445.
For details of reinforcement and Bill of Material, see sheet S-290 of 445.

APPROACH BENT-PILE DATA

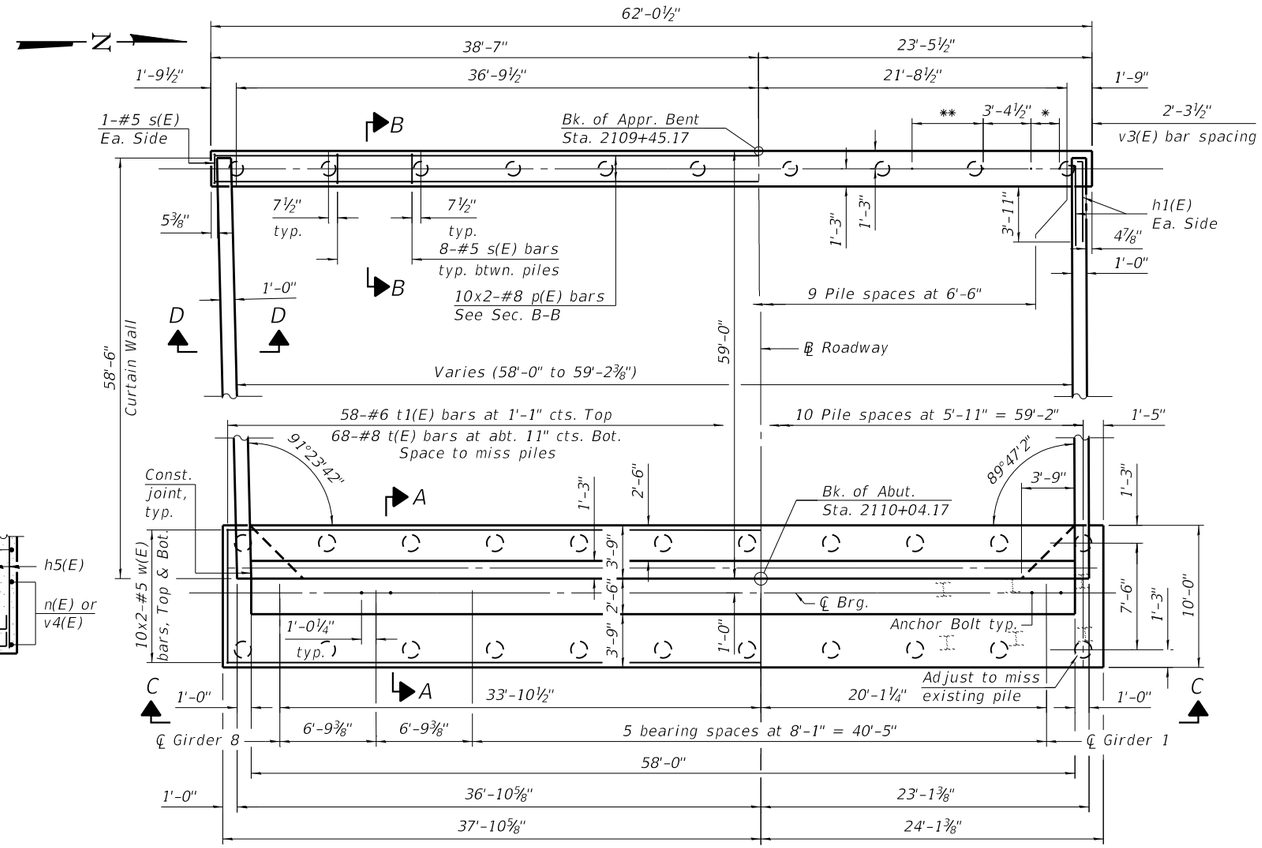
Type: 12" Metal Shell with 0.25" Walls
Nominal Required Bearing: 317 k
Factored Resistance Available: 174 k
Est. Length: 38'-0"
No. Production Piles: 9
No. Test Piles: 1

ABUTMENT- PILE DATA

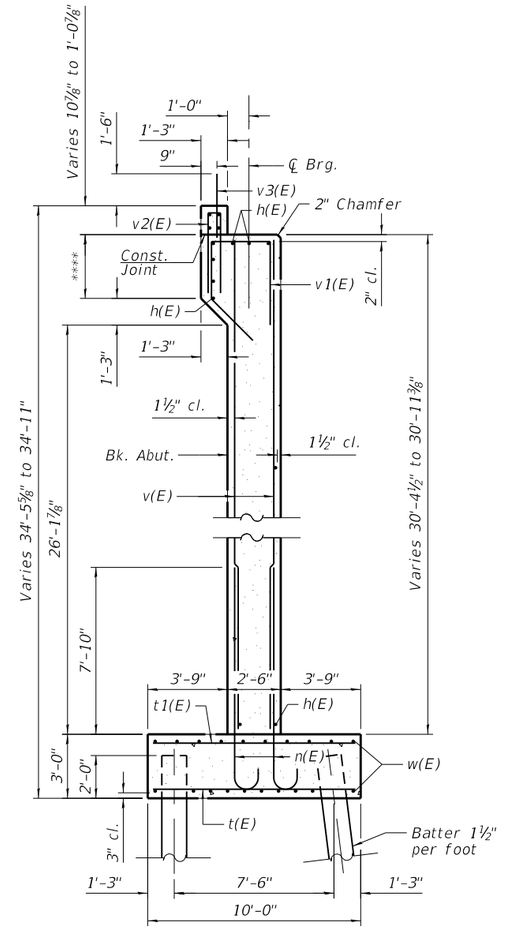
Type: 14" Metal Shell with 0.25" Walls
Nominal Required Bearing: 373 k
Factored Resistance Available: 205 k
Est. Length: 27'-0"
No. Production Piles: 21
No. Test Piles: 1



SECTION E-E

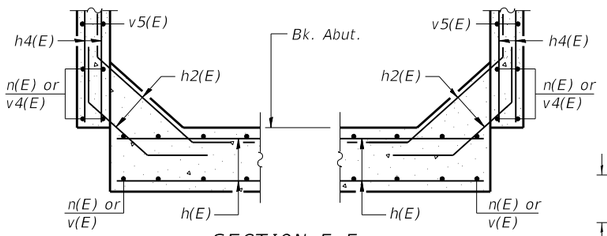


PLAN



SECTION A-A

**** Varies 3'-0" to 3'-7"



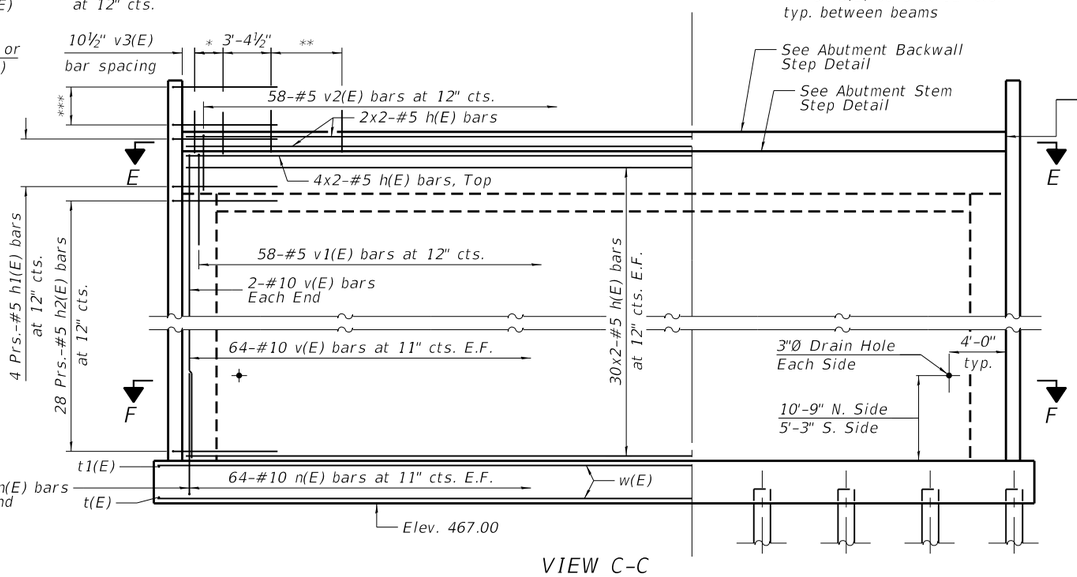
SECTION F-F

MINIMUM BAR LAP

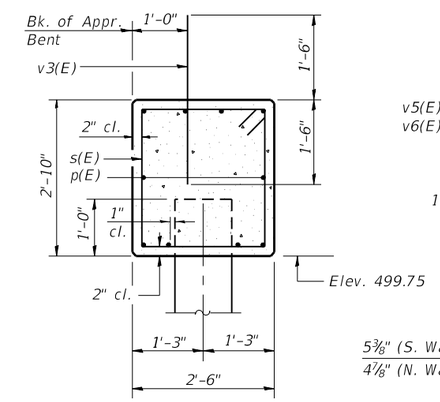
#5 bar = 3'-7"
#8 bar = 5'-9"
#10 bar = 7'-8"

*** 4 Prs.-#5 h1(E) bars at 12" cts.

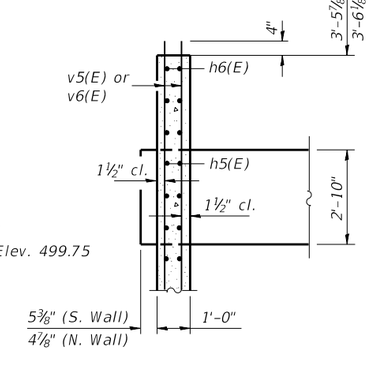
* 3-#5 v3(E) bars at 12" cts.
** 6-#5 v3(E) bars at 12" cts. typ. between beams



VIEW C-C



SECTION B-B



SECTION D-D

AV-I-0 2-17-2017

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		CHECKED -	REVISED -
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	PLOT DATE = 1/23/2019	CHECKED -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

WEST ABUTMENT
STRUCTURE NO. 090-0180
SHEET S-288 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1196
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			

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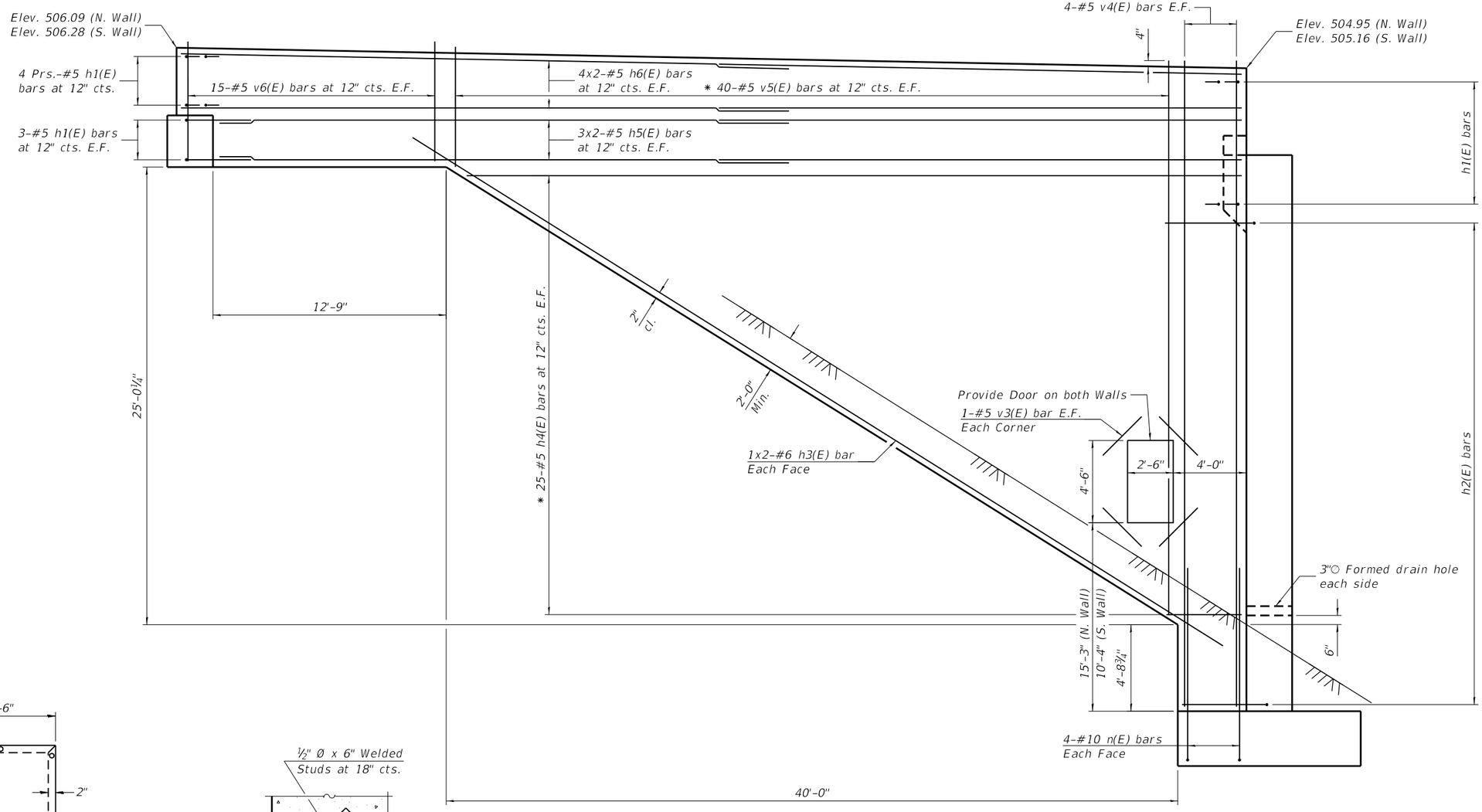
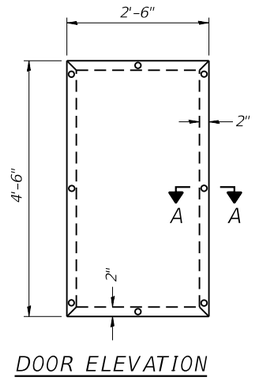


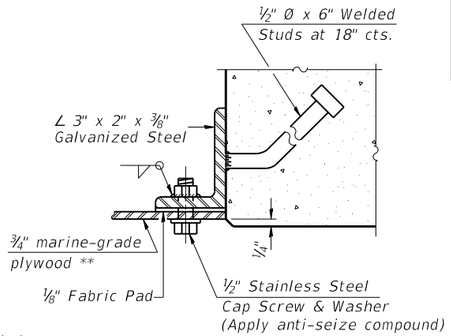
SIDE ELEVATION

* Order h4(E) and V5(E) bars full length. Cut to fit and use the remainder of bars in opposite face.



DOOR ELEVATION

Cost of door and frame are included with Concrete Structures.



SECTION A-A

** Apply clear waterproofing sealant in accordance with manufacturer's recommendations

AV-IW-0 2-17-2017

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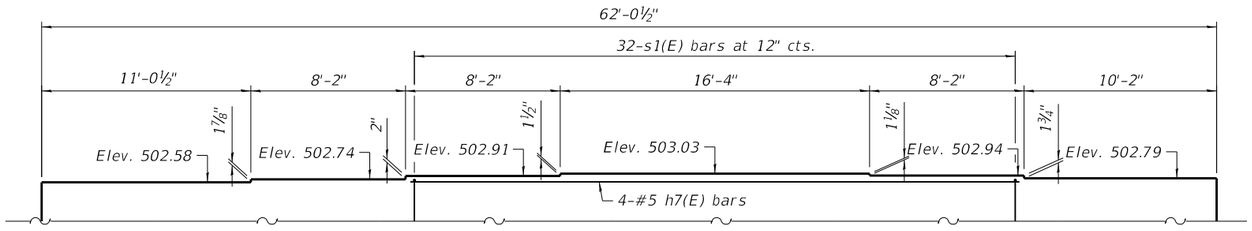
EFK•Moen, LLC Civil Engineering Design	USER NAME = ABenz	DESIGNED -	REVISED -
		CHECKED -	REVISED -
	PLOT SCALE = 2:0 ':" / in.	DRAWN -	REVISED -
	PLOT DATE = 12/11/2018	CHECKED -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

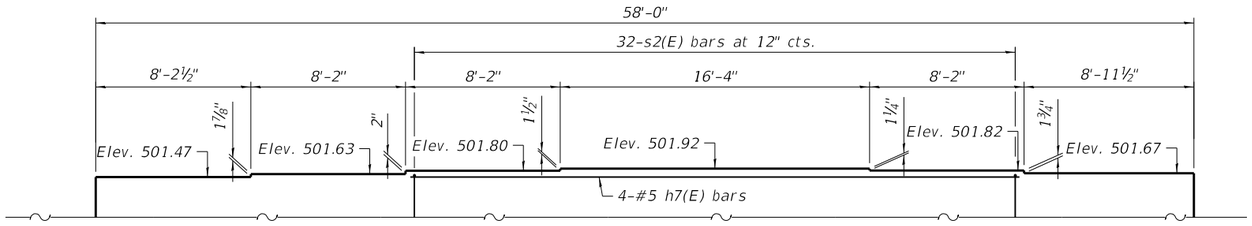
WEST ABUTMENT DETAILS, 1 OF 2
STRUCTURE NO. 090-0180
SHEET S-289 OF 445 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR)BR	PEO/TAZ	1361	1197
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



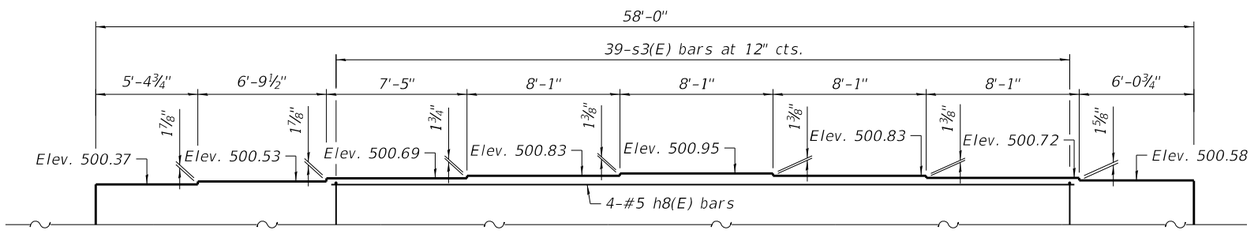
APPROACH BENT STEP DETAIL

(Looking East)



ABUTMENT BACKWALL STEP DETAIL

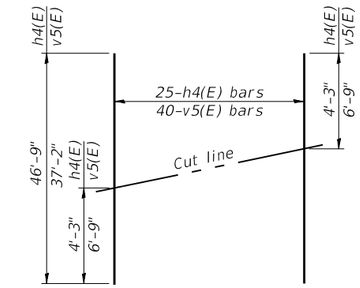
(Looking East)



ABUTMENT STEM STEP DETAIL

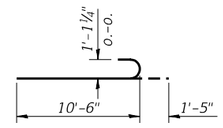
(Looking East)

Notes:
Pour steps monolithically with cap.

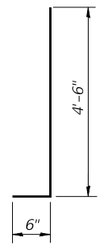


FIELD CUTTING DIAGRAM

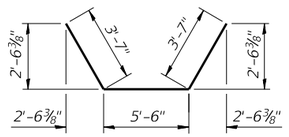
Order h4(E) and v5(E) bars full length.
Cut to fit and use the remainder of bars in opposite face.



BAR n(E)

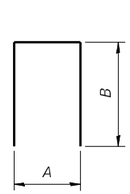


BAR h1(E)

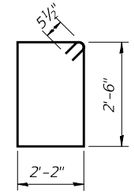


BAR h2(E)

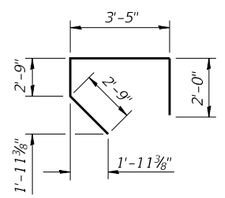
Bar	A	B
s1(E)	2'-2"	1'-0"
s2(E)	11"	1'-0"
s3(E)	3'-5"	1'-0"



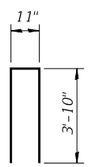
BAR s(E)



BAR s(E)



BAR v1(E)



BAR v2(E)

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	136	#5	30'-8"	
h1(E)	60	#5	5'-0"	
h2(E)	112	#5	12'-8"	
h3(E)	8	#6	28'-4"	
h4(E)	50	#5	46'-9"	
h5(E)	24	#5	29'-11"	
h6(E)	32	#5	30'-11"	
h7(E)	8	#5	32'-4"	
h8(E)	4	#5	39'-5"	
n(E)	148	#10	11'-11"	
p(E)	20	#8	33'-9"	
s(E)	74	#5	10'-3"	
s1(E)	32	#4	4'-2"	
s2(E)	32	#4	2'-11"	
s3(E)	39	#4	5'-5"	
t(E)	68	#8	9'-8"	
t1(E)	58	#6	9'-8"	
v(E)	132	#10	30'-0"	
v1(E)	58	#5	10'-11"	
v2(E)	58	#5	8'-7"	
v3(E)	100	#5	3'-0"	
v4(E)	16	#5	35'-5"	
v5(E)	80	#5	37'-2"	
v6(E)	60	#5	6'-8"	
w(E)	40	#5	32'-8"	
Structure Excavation			Cu. Yd.	514
Concrete Structures			Cu. Yd.	350.0
Reinforcement Bars, Epoxy Coated			Pound	48,210
Furnishing Metal Shell Piles 12"x0.250"			Foot	342
Furnishing Metal Shell Piles 14"x0.250"			Foot	567
Driving Piles			Foot	909
Test Pile Metal Shells			Each	2
Concrete Sealer			Sq. Ft.	2077

Bars indicated thus 1 x 2-#8 etc. indicates 1 line of bars with 2 lengths per line.

Concrete sealer shall be applied to the front face of abutment, top of abutment and front face of backwall.

AV-IW-0 2-17-2017

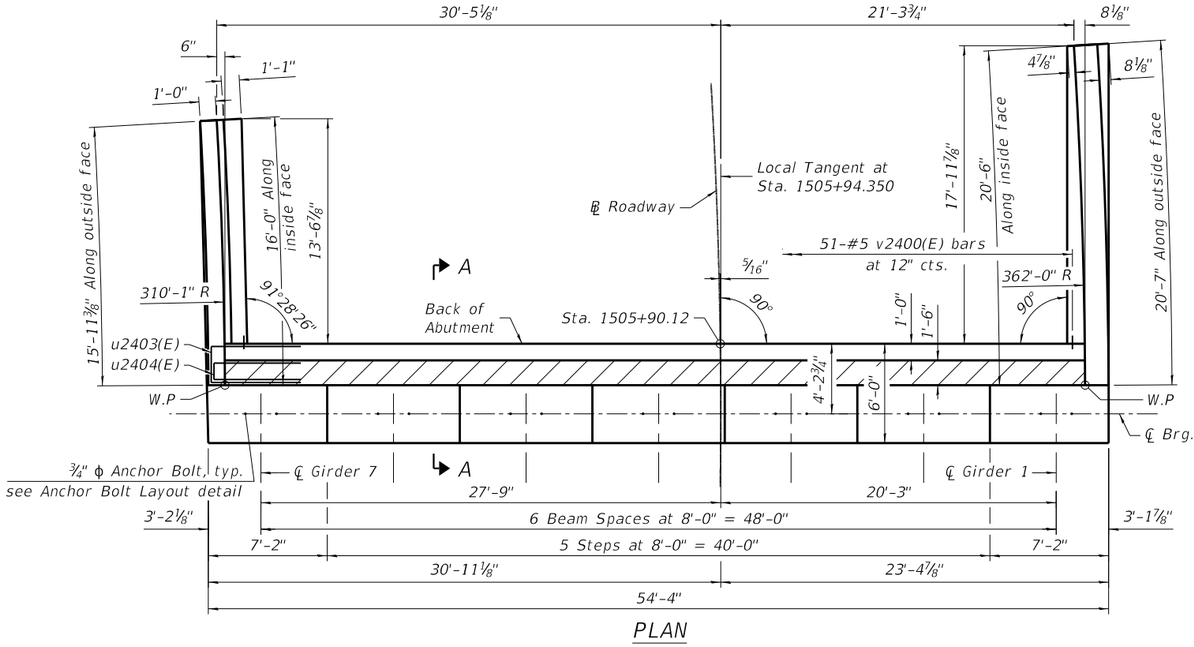
EFK • Moen, LLC
Civil Engineering Design

USER NAME = ABenz	DESIGNED -	REVISED -	
	CHECKED -	REVISED -	
PLOT SCALE = 2:0 ':" / in.	DRAWN -	REVISED -	
PLOT DATE = 1/23/2019	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

WEST ABUTMENT DETAILS, 2 OF 2
STRUCTURE NO. 090-0180
SHEET S-290 OF 445 SHEETS

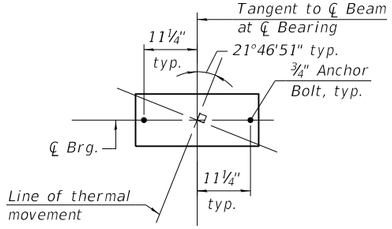
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
317	[15B;(102-1),(14HB)]BR	PEO/TAZ	1361	1198
		CONTRACT NO. 68B46		
	ILLINOIS FED. AID PROJECT NHPP-YRP3(905)			



PLAN

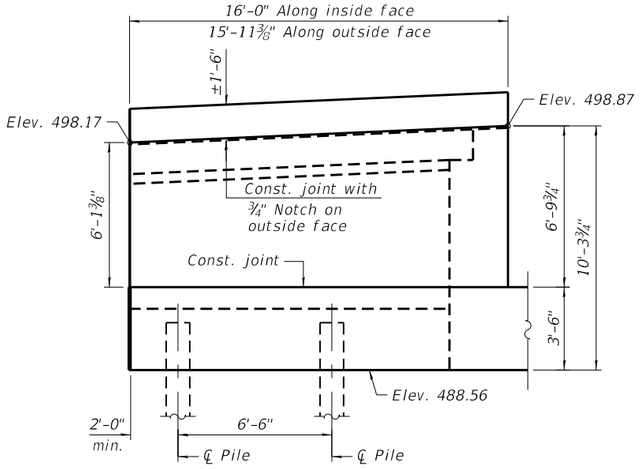
PILE DATA

Type: Metal Shell Piles 12"x0.250"
Nominal Required Bearing: 353 kips
Factored Resistance Available: 194 kips
Est. Length: 30 ft.
No. Production Piles: 18
No. Test Piles: 1



ANCHOR BOLT LAYOUT

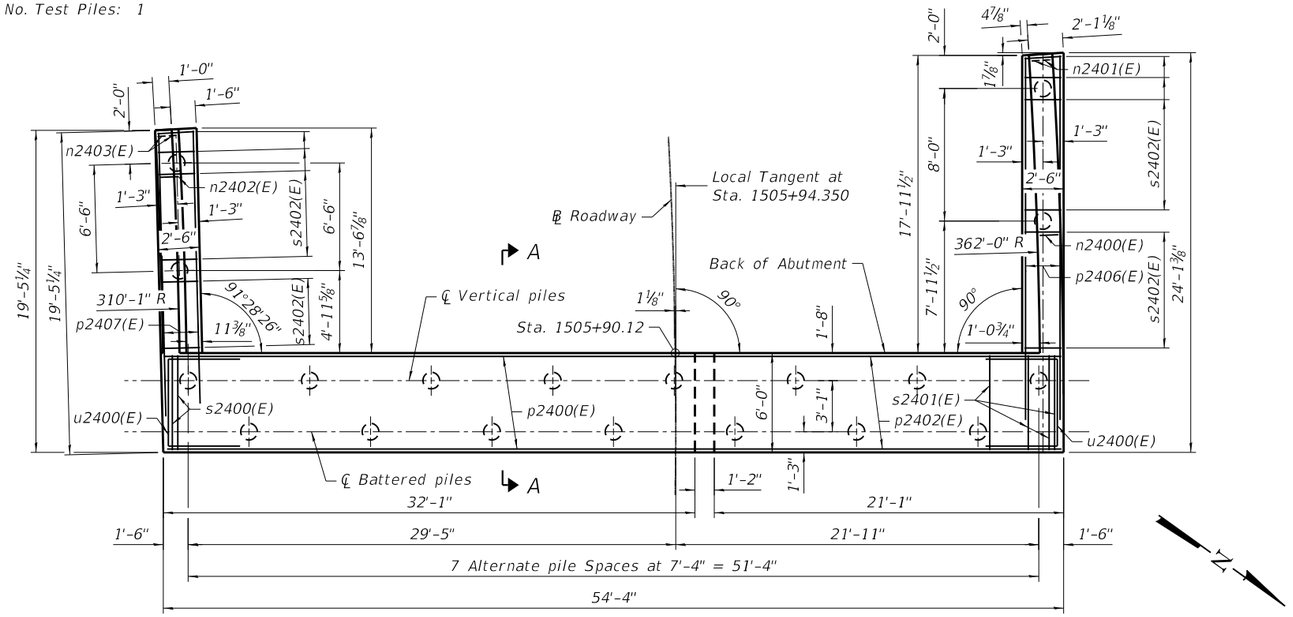
For bearing details, see Sheet S-281 & S-282 of 445.



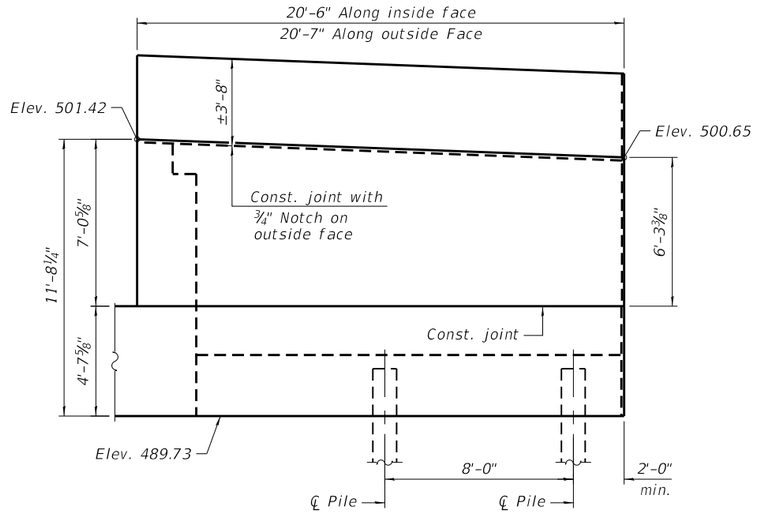
RIGHT WING WALL ELEVATION

(Showing dimensions)

Notes:
Hatched area to be poured after superstructure false work has been removed.
Quantity of concrete in hatched area included with Concrete Superstructure on sheet S-293 of 445.
Space reinforcement in cap to miss anchor bolts.
Pour steps monolithically with cap.
For details of piles see sheet S-431 of 445.
The top of back wall and approach slab seat shall have a constant slope determined from the control points shown.
The abutment shall have all exposed surfaces of backwall, bridge seats and front face of pile cap treated with Concrete Sealer.
For Section A-A, see sheet S-292 of 445.

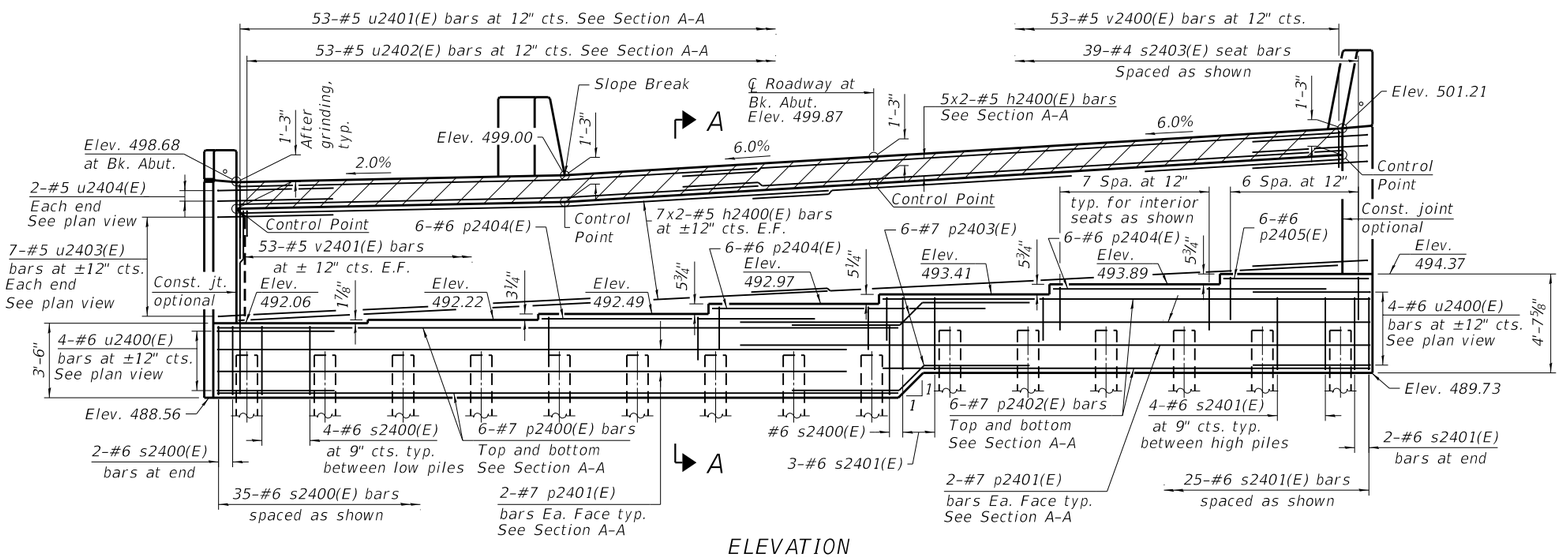


PILE CAP PLAN



LEFT WING WALL ELEVATION

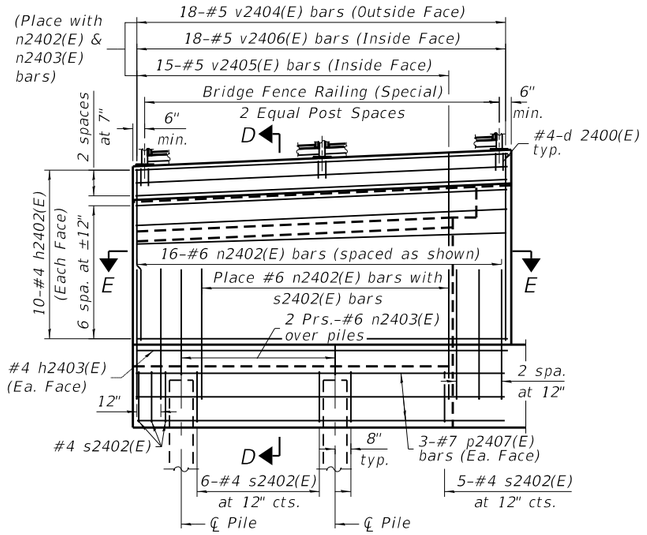
(Showing dimensions)



ELEVATION

MIN. BAR LAP

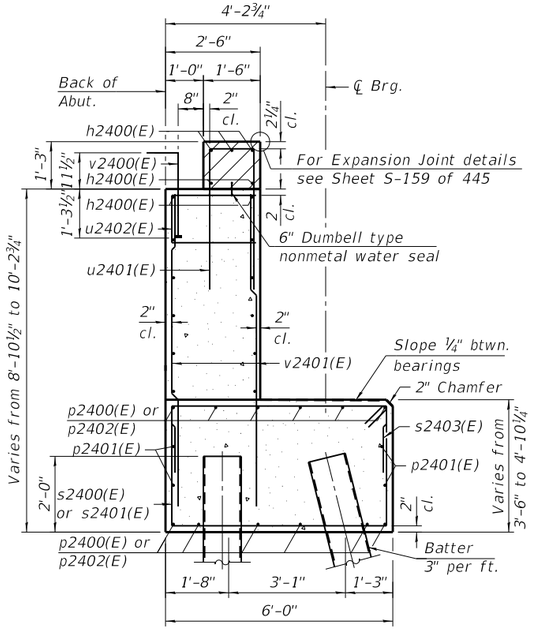
#5 bar = 3'-7"
#7 bar = 5'-0"



RIGHT WING WALL ELEVATION

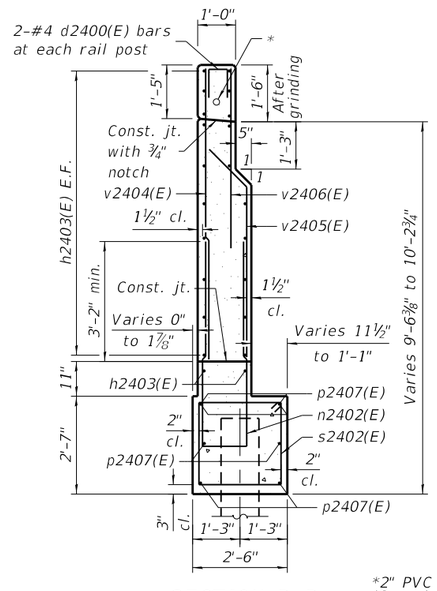
(Showing reinforcement)

Notes:
Hatched area to be poured after superstructure false work has been removed.
Quantity of concrete in hatched area included with Concrete Superstructure on sheet S-153 of 445.
For details of Ornamental Railing, see S-154 & S-155 of 445.
Pour steps monolithically with cap.
The top of back wall and approach slab seat shall have a constant slope determined from the control points shown.
The abutment shall have all exposed surfaces of the backwalls, bridge seats and front face of pile cap treated with Concrete Sealer.

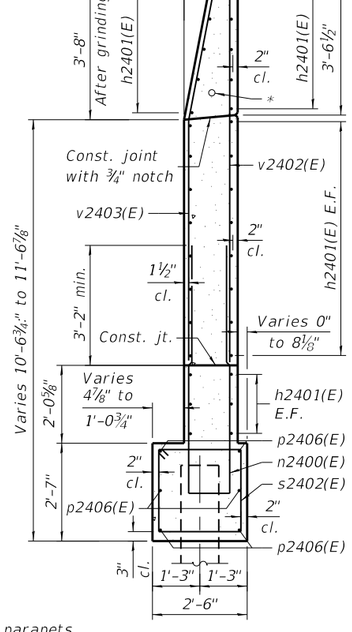


SECTION A-A

(Showing reinforcement)

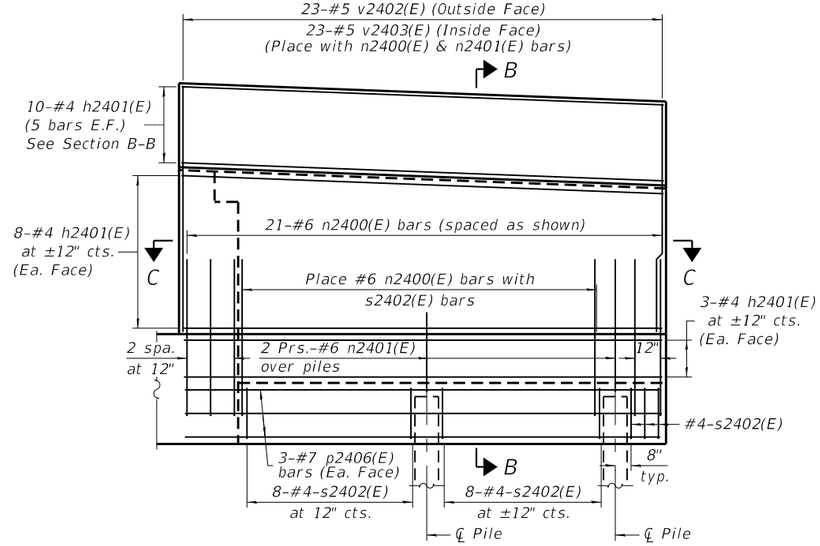


SECTION D-D



SECTION B-B

*2" PVC Conduit in parapets (See electrical plans). Maintain 1½" cl. between conduit and reinforcement. Cost included with Concrete Superstructure.



LEFT WING WALL ELEVATION

(Showing reinforcement)