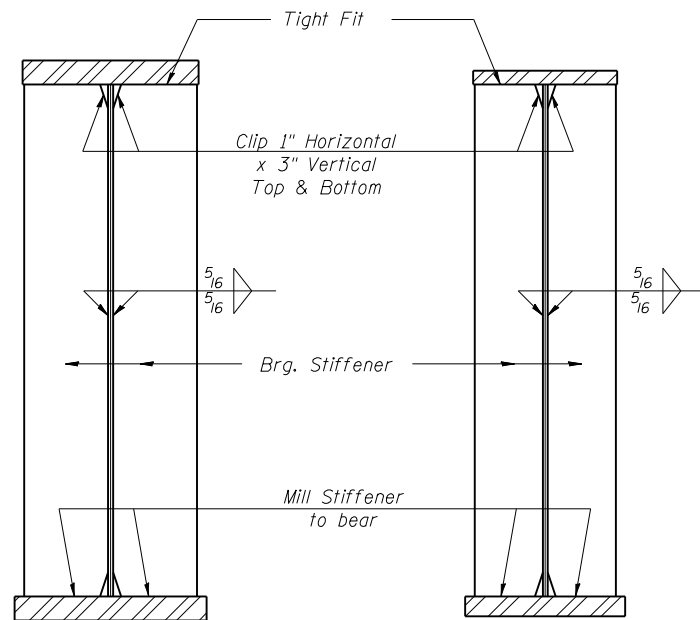


2 Hardened washers required for each set of oversized holes.  
 \* Fillet weld angles along 3 sides on one face of gusset plate.

**CROSS FRAME - CF**

(60-Required per Bridge)



**SECTION AT PIER**

**SECTION AT ABUTMENT**

**BEARING STIFFENERS**

INTERIOR GIRDER MOMENT TABLE			
	0.4 Sp. 1	Pier	0.6 Sp. 2
$I_s$	(in <sup>4</sup> ) 99,775	169,771	58,640
$I_c(n)$	(in <sup>4</sup> ) 203,043	275,821	132,586
$I_c(3n)$	(in <sup>4</sup> ) 148,582	215,724	97,001
$I_c(cr)$	(in <sup>4</sup> ) 110,127	184,611	67,330
$S_s$	(in <sup>3</sup> ) 3,401	4,702	1,924
$S_c(n)$	(in <sup>3</sup> ) 4,168	8,996	2,535
$S_c(3n)$	(in <sup>3</sup> ) 3,858	5,575	2,319
$S_c(cr)$	(in <sup>3</sup> ) 3,513	5,410	2,032
DC1	(k/ft.) 1.43	1.64	1.30
M <sub>DC1</sub>	(k) 4,224	6,913	693
DC2	(k/ft.) 0.180	0.180	0.180
M <sub>DC2</sub>	(k) 552	831	125
DW	(k/ft.) 0.400	0.400	0.400
M <sub>DW</sub>	(k) 1,219	1,836	276
$M_L + IM$	(k) 3,709	4,022	2,517
$M_u$ (Strength I)	(k) 14,289	19,473	5,841
$\phi_r M_n$	(k) 18,875	21,429	13,081
$f_s$ DC1	(ksi) 14.91	17.64	4.32
$f_s$ DC2	(ksi) 1.59	1.84	0.59
$f_s$ DW	(ksi) 3.79	4.07	1.43
$f_s$ ( $L + IM$ )	(ksi) 10.68	8.92	11.91
$f_s$ (Service II)	(ksi) 34.17	35.15	21.83
$0.95R_h F_y f$	(ksi) 47.50	47.50	47.50
$f_s$ (Total)(Strength I)	(ksi) 44.99	46.08	29.13
$\phi_r F_n$	(ksi) 50.00	50.00	50.00
$V_f$	(k) 59.4	60.2	53.6

INTERIOR GIRDER REACTION TABLE			
	W. Abut.	Pier	E. Abut.
$R_{DC1}$	(k) 111.9	343.8	51.4
$R_{DC2}$	(k) 14.2	41.4	7.4
$R_{DW}$	(k) 31.5	91.4	16.3
$R_{L + IM}$	(k) 112.7	230.7	107.7
$R_{Total}$	(k) 270.3	707.3	182.8

For fabrication only

EASTBOUND TOP OF WEB ELEVATIONS						
Girder No.	Q Brg. W. Abut.	Q Splice 1	Q Splice 2	Q Brg. Pier	Q Splice 3	Q Brg. E. Abut.
1	495.11	495.43	495.60	495.51	495.29	494.67
2	495.31	495.62	495.76	495.65	495.33	494.45
3	495.43	495.72	495.82	495.70	495.25	494.20
4	495.34	495.61	495.68	495.54	495.05	493.92
5	495.19	495.45	495.48	495.34	494.80	493.59

For fabrication only

WESTBOUND TOP OF WEB ELEVATIONS						
Girder No.	Q Brg. W. Abut.	Q Splice 1	Q Splice 2	Q Brg. Pier	Q Splice 3	Q Brg. E. Abut.
1	495.39	495.95	496.73	496.85	496.93	496.62
2	495.65	496.19	496.93	497.04	497.10	496.77
3	495.85	496.38	497.09	497.18	497.22	496.87
4	495.85	496.36	497.03	497.11	497.13	496.75
5	495.75	496.25	496.88	496.95	496.95	496.54

- $I_s, S_s$ : Non-composite moment of inertia and section modulus of the steel section used for computing  $f_s$  (Total-Strength I, and Service II) due to non-composite dead loads (in<sup>4</sup> and in<sup>3</sup>).
- $I_c(n), S_c(n)$ : Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing  $f_s$  (Total-Strength I, and Service II) in uncracked sections, due to short-term composite live loads (in<sup>4</sup> and in<sup>3</sup>).
- $I_c(3n), S_c(3n)$ : Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing  $f_s$  (Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in<sup>4</sup> and in<sup>3</sup>).
- $I_c(cr), S_c(cr)$ : Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing  $f_s$  (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite dead loads (in<sup>4</sup> and in<sup>3</sup>).
- DC1: Un-factored non-composite dead load (kips/ft.).
- M<sub>DC1</sub>: 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.).
- M<sub>DC2</sub>: 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.).
- M<sub>DW</sub>: 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 ((kip-ft.)).
- $M_u$  (Strength I): Factored design moment (kip-ft.).  
 $1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_L + IM$
- $\phi_r M_n$ : Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.) or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft.).
- $f_s$  DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).  
 $M_{DC1} / S_{nc}$
- $f_s$  DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).  
 $M_{DC2} / S_c(3n)$  or  $M_{DC2} / S_c(cr)$  as applicable.
- $f_s$  DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).  
 $M_{DW} / S_c(3n)$  or  $M_{DW} / S_c(cr)$  as applicable.
- $f_s$  ( $L + IM$ ): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live plus impact loads as calculated below (ksi).  
 $M_L + IM / S_c(n)$  or  $M_L + IM / S_c(cr)$  as applicable.
- $f_s$  (Service II): Sum of stresses as computed below (ksi).  
 $f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3 f_s(L + IM)$
- $0.95R_h F_y f$ : Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
- $f_s$  (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).  
 $1.25 (f_{sDC1} + f_{sDC2}) + 1.5 f_{sDW} + 1.75 f_s(L + IM)$
- $\phi_r F_n$ : Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7.2 (ksi).
- $V_f$ : Maximum factored shear range in composite portion of span computed according to Article 6.10.10.

- NOTES:
- AASHTO M270 Grade 36 steel shall be used for all cross frames and intermediate stiffeners
  - All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

FILE NAME = 0820117-0118-76884-036-CrossFrames.dgn



USER NAME = brazzera	DESIGNED - BTO	REVISED -
PLOT SCALE = 2x0.0000 '1' / IN.	CHECKED - JAN	REVISED -
PLOT DATE = 10/19/2011	DRAWN - BTO	REVISED -
	CHECKED - JAN	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

STEEL DETAILS & MOMENT TABLE  
STRUCTURE NO. 082-0117(E.B.) & 082-0118(W.B.)

SHEET NO. S-36 OF S-62 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
103	27-1-VHB-1	ST. CLAIR	277	151
CONTRACT NO. 76884				
ILLINOIS FED. AID PROJECT				