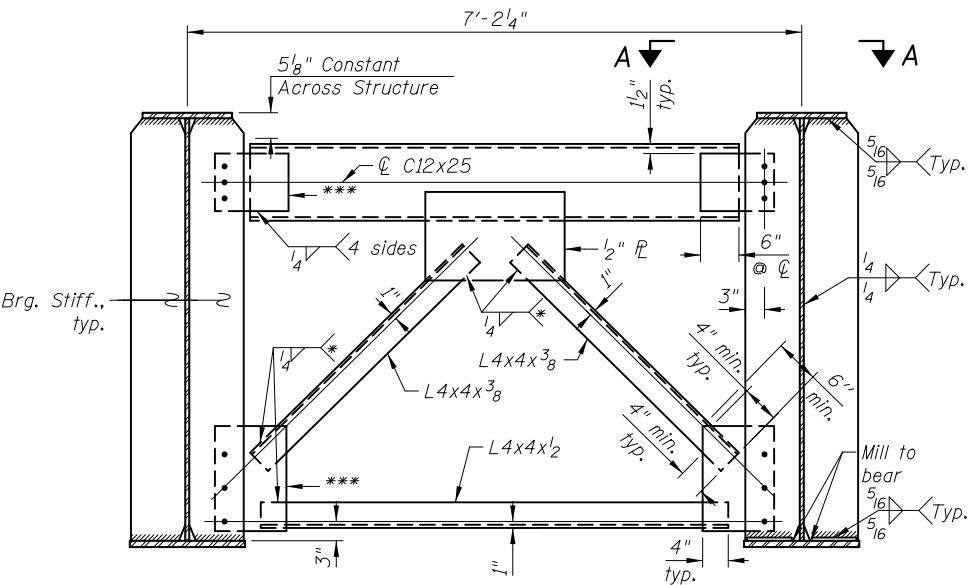
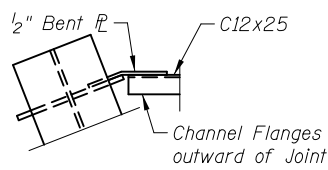


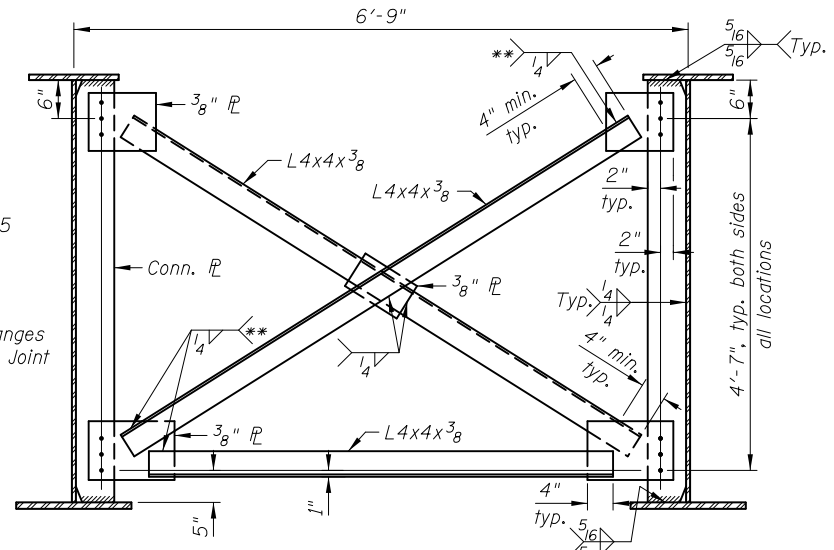
**PLAN**



**END CROSS FRAME D**  
(8 Required)



**SECTION A-A**



**INTERIOR CROSS FRAME D1**  
(28 Required)

- \* Weld on near side of 1/2" plate.
- \*\* Fillet weld angles along 3 sides on one face of gusset plate.
- \*\*\* 1/2" Plates to be bent for skew

**Notes:**  
 Detail 15/16" φ holes for all 3/4" φ bolts.  
 Two hardened washers required for each set of oversized holes.  
 Place diaphragm with channel flanges and outstanding angle legs outward from abutment backwall.  
 All cross frames shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames at supports may be temporarily disconnected to install bearing anchor rods.

INTERIOR GIRDER MOMENT TABLE		
0.5 Span		
$I_s$	(in <sup>4</sup> )	56,305
$I_c(n)$	(in <sup>4</sup> )	130,626
$I_c(3n)$	(in <sup>4</sup> )	92,399
$S_s$	(in <sup>3</sup> )	1,992
$S_c(n)$	(in <sup>3</sup> )	2,661
$S_c(3n)$	(in <sup>3</sup> )	2,406
DC1	(k/')	0.993
M <sub>DC1</sub>	(k)	2,503
DC2	(k/')	0.231
M <sub>DC2</sub>	(k)	582
DW	(k/')	0.300
M <sub>DW</sub>	(k)	756
M <sub>ℓ + IM</sub>	(k)	2,445
M <sub>u</sub> (Strength I)	(k)	9,270
φ <sub>r</sub> M <sub>n</sub>	(k)	12,491
f <sub>s</sub> DC1	(ksi)	15.08
f <sub>s</sub> DC2	(ksi)	2.91
f <sub>s</sub> DW	(ksi)	3.77
f <sub>s</sub> 1.3(ℓ+IM)	(ksi)	14.34
f <sub>s</sub> (Service II)	(ksi)	36.09
f <sub>s</sub> (Total)(Strength I)	(ksi)	—
V <sub>r</sub>	(k)	30.1

INTERIOR GIRDER REACTION TABLE		
Abutment		
R <sub>DC1</sub>	(k)	70.5
R <sub>DC2</sub>	(k)	16.4
R <sub>DW</sub>	(k)	21.3
R <sub>ℓ + IM</sub>	(k)	105.0
R <sub>Total</sub>	(k)	213.2

$I_s, S_s$ : 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) due to long-term composite (superimposed) dead 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) due to long-term composite (superimposed) 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<sub>ℓ + IM</sub>: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).  
 M<sub>u</sub> (Strength I): Factored design moment (kip-ft.).  
 1.25 (M<sub>DC1</sub> + M<sub>DC2</sub>) + 1.5 M<sub>DW</sub> + 1.75 M<sub>ℓ + IM</sub>  
 φ<sub>r</sub>M<sub>n</sub>: Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.).  
 f<sub>s</sub> (Service II): Sum of stresses as computed from the moments below (ksi).  
 M<sub>DC1</sub> + M<sub>DC2</sub> + M<sub>DW</sub> + 1.3 M<sub>ℓ + IM</sub>  
 f<sub>s</sub> (Total)(Strength I): Sum of stresses as computed from the moments below on non-compact section (ksi).  
 1.25 (M<sub>DC1</sub> + M<sub>DC2</sub>) + 1.5 M<sub>DW</sub> + 1.75 M<sub>ℓ + IM</sub>  
 V<sub>r</sub>: Maximum factored shear range in composite portion of span computed according to Article 6.10.10.

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DATE	- 5/3/2012	REVISED	-

**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**

**FRAMING PLAN**  
**SB ENTR. RAMP (RAMP C) OVER CRYSTAL CREEK**  
**STRUCTURE NO. 056-0080**  
 SHEET NO. SD17 OF SD30 SHEETS

O.R. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0003	18A-2	MCHENRY	825	571
CONTRACT NO. 60F72				
ILLINOIS FED. AID PROJECT				