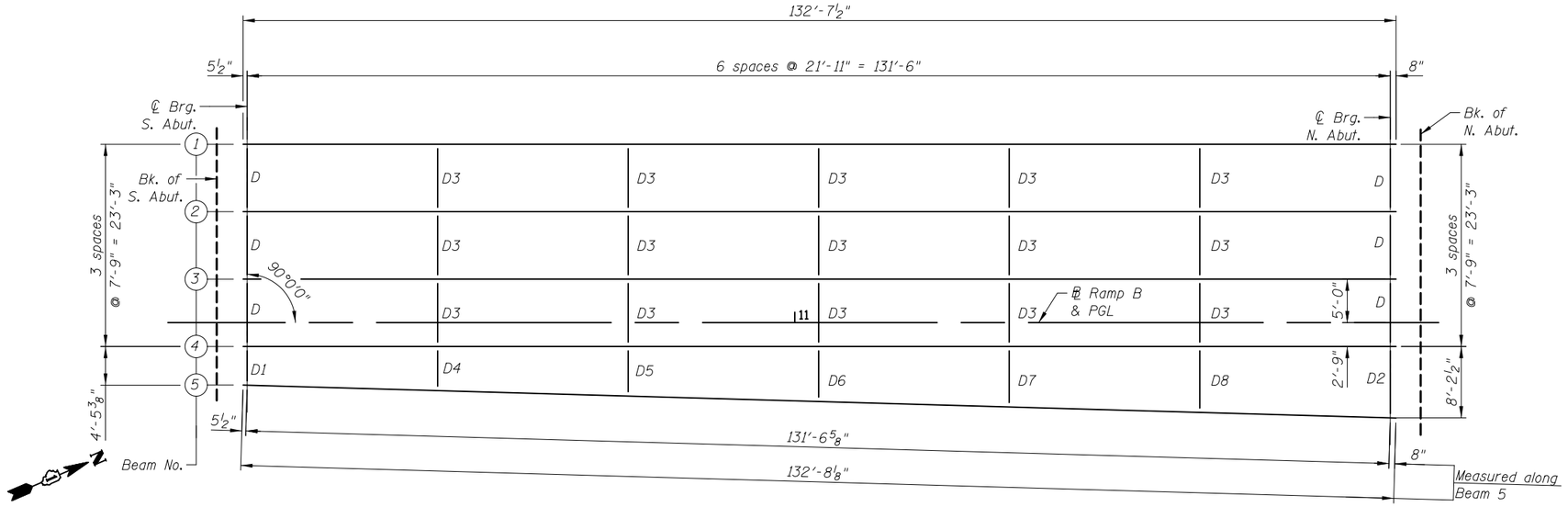
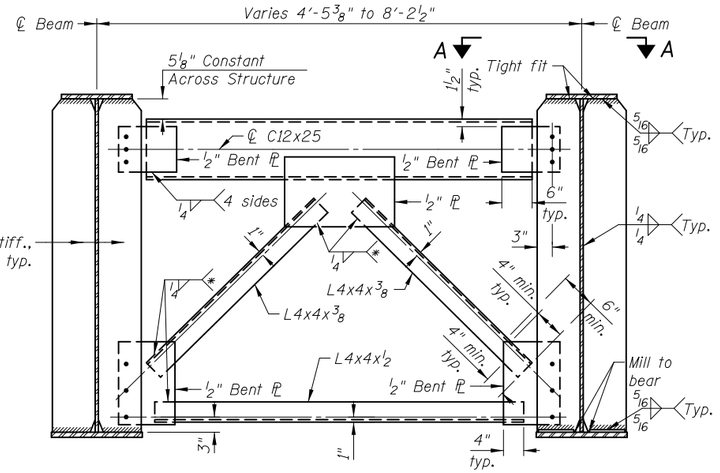
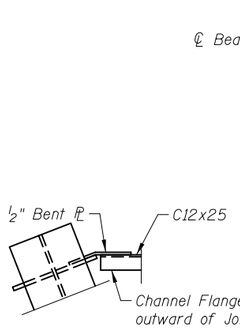


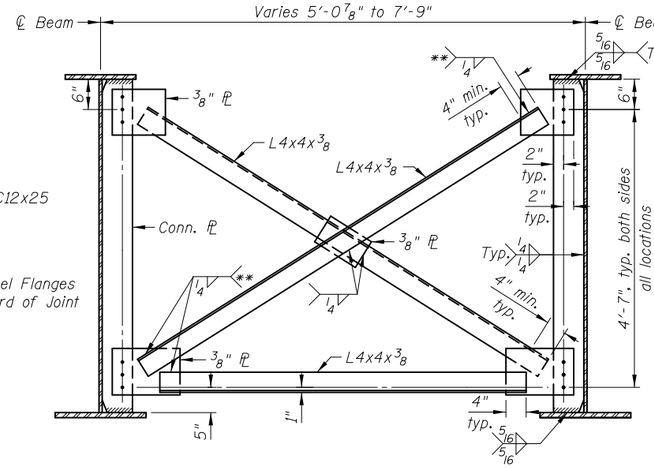


END CROSS FRAMES D THRU D2

(8 Required)



SECTION A-A



INTERIOR CROSS FRAMES D3 THRU D8

(20 Required)

* Weld on near side of ½" plate.
** Fillet weld angles along 3 sides on one face of gusset plate.

INTERIOR GIRDER MOMENT TABLE		
		0.5 Span
I_s	(in^4)	48,350
$I_c(n)$	(in^4)	111,925
$I_c(3n)$	(in^4)	81,250
S_s	(in^3)	1,545
$S_c(n)$	(in^3)	2,110
$S_c(3n)$	(in^3)	1,908
DC1	(k/')	1.084
M_{DC1}	('k)	2,343
DC2	(k/')	0.235
M_{DC2}	('k)	508
DW	(k/')	0.326
M_{DW}	('k)	704
M_{L+IM}	('k)	2,441
M_u (Strength I)	('k)	8,892
$\phi_f M_n$	('k)	11,583
f_s DC1	(ksi)	18.20
f_s DC2	(ksi)	3.19
f_s DW	(ksi)	4.43
f_s 1.3(L+IM)	(ksi)	18.05
f_s (Service II)	(ksi)	43.87
f_s (Total)(Strength I)	(ksi)	———
V_f	(k)	29.9

INTERIOR GIRDER REACTION TABLE		
		Abutment
R_{DC1}	(k)	71.3
R_{DC2}	(k)	15.5
R_{DW}	(k)	21.4
R_{L+IM}	(k)	104.4
R_{Total}	(k)	212.5

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 ($in.^4$ and $in.^3$).

$I_c(n)$, $S_c(n)$: 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 short-term composite live loads ($in.^4$ and $in.^3$).

$I_c(3n)$, $S_c(3n)$: 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 ($in.^4$ and $in.^3$).

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

M_{DC1}: 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_{DC2}: 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_{DW}: 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.).

M_u (Strength I): Factored design moment (kip-ft.).
$1.25\ (M_{DC1} + M_{DC2}) + 1.5\ M_{DW} + 1.75\ M_{L+IM}$

$\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.).

f_s (Service II): Sum of stresses as computed from the moments below (ksi).
$M_{DC1} + M_{DC2} + M_{DW} + 1.3\ M_{L+IM}$

f_s (Total)(Strength I): Sum of stresses as computed from the moments below on non-compact section (ksi).
$1.25\ (M_{DC1} + M_{DC2}) + 1.5\ M_{DW} + 1.75\ M_{L+IM}$

V_f: Maximum factored shear range in composite portion of span computed according to Article 6.10.10.

CROSS FRAME LENGTHS	
Cross Frame	Length (ft.)
D	7'-9"
D1	4'-5⅜"
D2	8'-2½"
D3	7'-9"
D4	5'-0⅞"
D5	5'-8⅜"
D6	6'-4"
D7	6'-11½"
D8	7'-7"

(Lengths measured from ℄ Beam to ℄ Beam)

Notes:
Detail 15/16" ϕ holes for all ¾" 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.

CIVILTECH
450 E Devon Ave, Suite 300
Itasca, Illinois 60143
Tel: 630.773.3900 Fax: 630.773.3975
www.civiltechinc.com

DRAWN	- M. LANGE	REVISED -
DESIGNED	- D. ATKINS	REVISED -
CHECKED	- G. HATLESTAD	REVISED -
DATE	- 5/3/2012	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN
NB EXIT RAMP (RAMP B) OVER CRYSTAL CREEK
STRUCTURE NO. 056-0079
SHEET NO. SC17 OF SC29 SHEETS

O.R. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0003	18A-2	MCHENRY	825	542
		CONTRACT NO. 60F72		
	ILLINOIS FED. AID PROJECT			