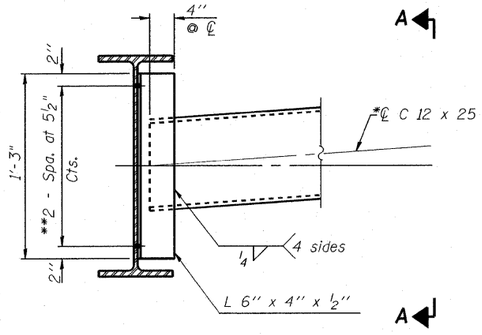
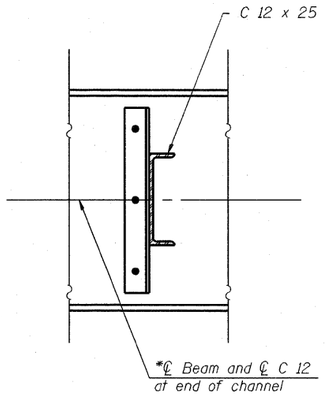


INTERIOR DIAPHRAGM D

Note:
Two hardened washers required for each set of oversized holes.
*Alternate channels (C 12 x 30) are permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section.
The alternate, if utilized, shall be provided at no additional cost to the Department.
**¾" ϕ HS bolts, 15/16" ϕ holes



SECTION A-A

INTERIOR GIRDER MOMENT TABLE		
		0.5 Span
I_s	(in^4)	3,270
$I_c(n)$	(in^4)	10,383
$I_c(3n)$	(in^4)	7,688
S_s	(in^3)	243
$S_c(n)$	(in^3)	390
$S_c(3n)$	(in^3)	352
DC1	(k/')	0.736
M_{DC1}	('k)	257
DC2	(k/')	0.129
M_{DC2}	('k)	45
DW	(k/')	0.286
M_{DW}	('k)	100
M_{L+IM}	('k)	560
M_u (Strength I)	('k)	1,506
$\phi_f M_n$	('k)	2,091
f_s DC1	(ksi)	12.70
f_s DC2	(ksi)	1.53
f_s DW	(ksi)	3.41
f_s (L+IM)	(ksi)	17.23
f_s (Service II)	(ksi)	40.04
$0.95R_hF_{yf}$	(ksi)	47.50
V_f	(k)	23.75

INTERIOR GIRDER REACTION TABLE		
		Abut.
R_{DC1}	(k)	20.1
R_{DC2}	(k)	3.4
R_{DW}	(k)	7.6
R_{L+IM}	(k)	79.4
R_{Total}	(k)	110.5

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) in uncracked sections, 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) in uncracked sections, 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 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).
$M_{DC2} / S_c(3n)$.

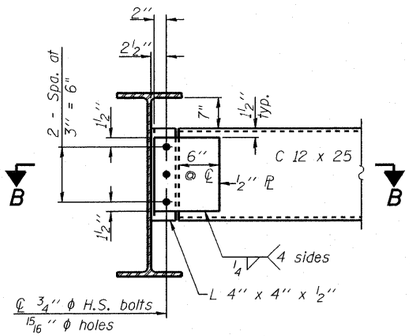
f_s DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
$M_{DW} / S_c(3n)$.

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).
$M_{L+IM} / S_c(n)$.

f_s (Service II): Sum of stresses as computed below (ksi).
$f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3\ f_s(L+IM)$

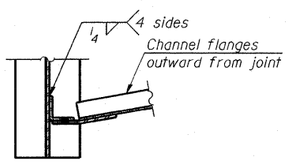
$0.95R_hF_yf$: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

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



END DIAPHRAGM D1

Note:
Two hardened washers required for each set of oversized holes.



SECTION B-B

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.

For Information Only

APEX CONSULTING ENGINEERS, LLC 111 E. Wacker Drive, Suite 520 Chicago, IL 60601 Phone (312) 977-0909 Fax (312) 977-0661	USER NAME =	DESIGNED - HAA	REVISED
		CHECKED - RAD	REVISED
	PLOT SCALE =	DRAWN - WHI	REVISED
	PLOT DATE = 10/13/2011	CHECKED - RAD	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAIL
STRUCTURE NO. 016-0772
SHEET NO. S16 OF S33 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
2845	2011-206-F	COOK	18	9
		CONTRACT NO. 60R36		
	ILLINOIS FED. AID PROJECT			