

INTERIOR DIAPHRAGM-D1
(50 Required)

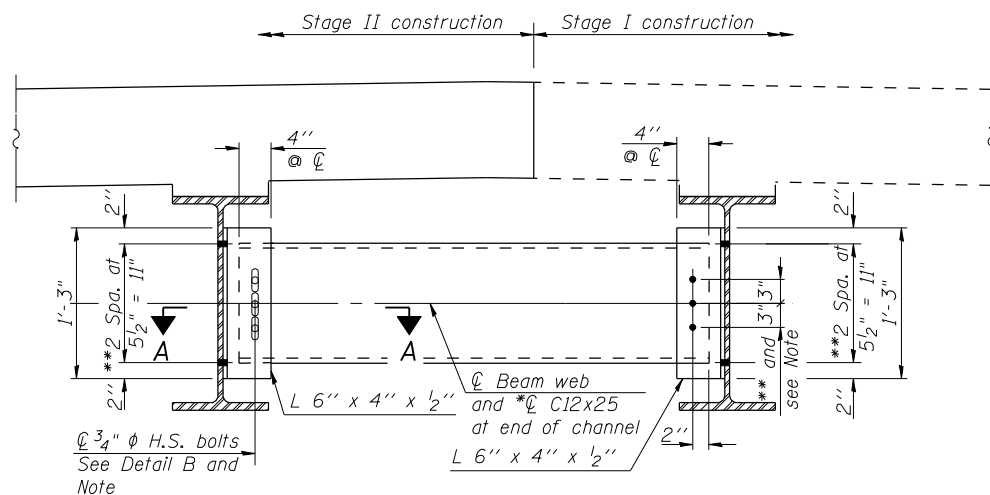
Notes:

- Two hardened washers required for each set of oversized holes.
- *Alternate C12x30 channels 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.
- **3/4" ϕ HS bolts, 15/16" ϕ holes

INTERIOR BEAM REACTION TABLE			
		Abut.	Pier
R_{DC1}	(k)	10.8	34.8
R_{DC2}	(k)	2.3	7.2
R_{DW}	(k)	4.0	12.8
$R_{\pm IM}$	(k)	65.2	81.7
R_{Total}	(k)	82.3	136.6

INTERIOR BEAM MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Pier	0.5 Sp. 2
I_s	(in ⁴)	2,850	2,850	2,850
$I_c(n)$	(in ⁴)	8,859	8,859	8,859
$I_c(3n)$	(in ⁴)	6,589	6,589	6,589
$I_c(cr)$	(in ⁴)	-	4,185	-
S_s	(in ³)	213	213	213
$S_c(n)$	(in ³)	339	339	339
$S_c(3n)$	(in ³)	306	306	306
$S_c(cr)$	(in ³)	-	257	-
$DC1$	(k/')	0.715	0.715	0.715
M_{DC1}	(k)	82.0	136.0	62.2
$DC2$	(k/')	0.150	0.150	0.150
M_{DC2}	(k)	17.3	28.4	13.0
DW	(k/')	0.267	0.267	0.267
M_{DW}	(k)	30.7	50.5	23.1
$M_{\pm IM}$	(k)	353.5	297.0	334.5
M_u (Strength I)	(k)	788.8	800.9	714.2
$\phi_r M_n$	(k)	1,746.3	1,353.9	1,767.8
f_s DC1	(ksi)	4.62	7.66	3.50
f_s DC2	(ksi)	0.68	1.11	0.51
f_s DW	(ksi)	1.21	1.98	0.91
f_s ($\pm IM$)	(ksi)	12.53	10.52	11.86
f_s (Service II)	(ksi)	22.79	24.44	20.34
$0.95R_n F_y f$	(ksi)	47.50	47.50	47.50
V_f	(k)	21.72	20.77	20.77

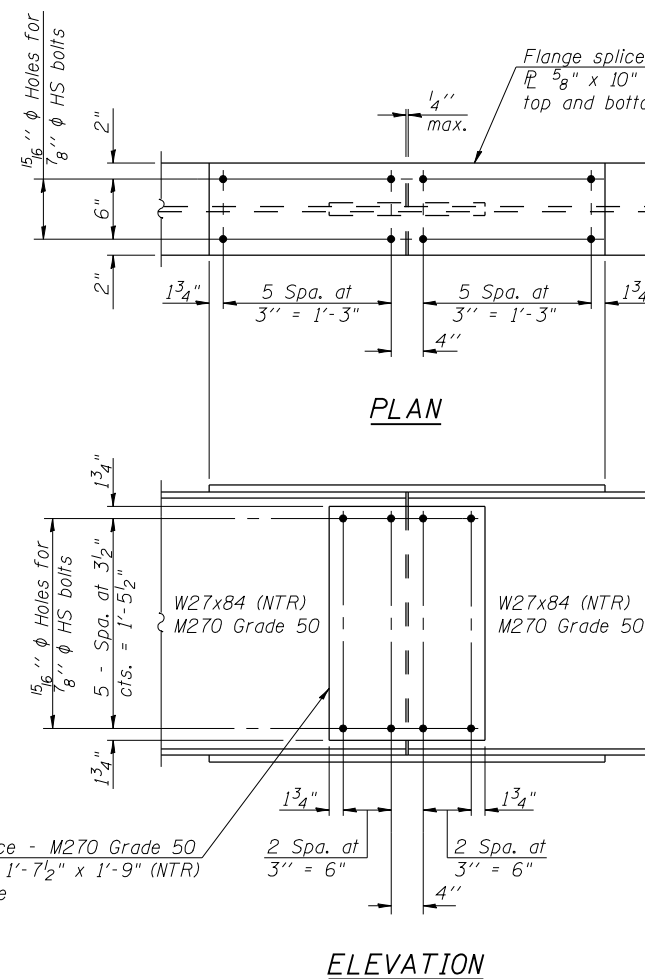
- I_s, S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Service II) due to non-composite dead loads (in.4 and in.3).
- $I_c(n), S_c(n)$: Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing f_s (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 (Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in.4 and in.3).
- $I_c(cr), S_c(cr)$: Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing f_s (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.).
- 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.).
- $M_{\pm IM}$: 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 $M_{\pm IM}$
- $\phi_r M_n$: 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.).
- 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 ($\pm IM$): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
 $M_{\pm IM} / S_c(n)$ or $M_{DW} / S_c(cr)$ as applicable.
- f_s (Service II): Sum of stresses as computed below (ksi).
 $f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3 f_s(\pm IM)$
- $0.95R_n F_y f$: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
- V_f : Maximum factored shear range in span computed according to Article 6.10.10.



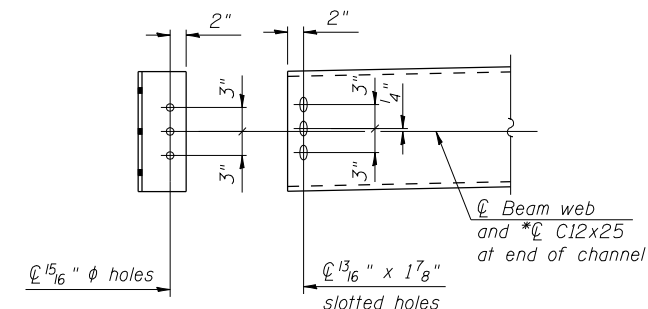
Notes:

- Bolts in *C12x25 shall be finger tightened prior to stage II deck pour to permit differential displacement of beams. Fully tighten after stage II deck pour is complete.

INTERIOR DIAPHRAGM - D2
(5 Required)



SPLICE DETAIL
(6 Required)



DETAIL B

PRINT DRIVER = L:\05-ESCA\B\11
 MAKE NAME = PLOT
 FILE NAME = 030017-12825-16-511F-01.dwg



USER NAME = kah	DESIGNED - SHL 07/13	REVISED -
ESCA PROJECT NO. 1035.03	CHECKED - RDP 09/13	REVISED -
PLOT SCALE = 0/2' = 1/4" / IN.	DRAWN - KAH 07/13	REVISED -
PLOT DATE = 1/22/2014 5:23:27 PM	CHECKED - SHL 08/13	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**STEEL FRAMING DETAILS
STRUCTURE NO. 035-0017**

SHEET NO. 16 OF 29 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
782	115B-1	HARDIN	70	39
ILLINOIS FED. AID PROJECT			CONTRACT NO. 78263	