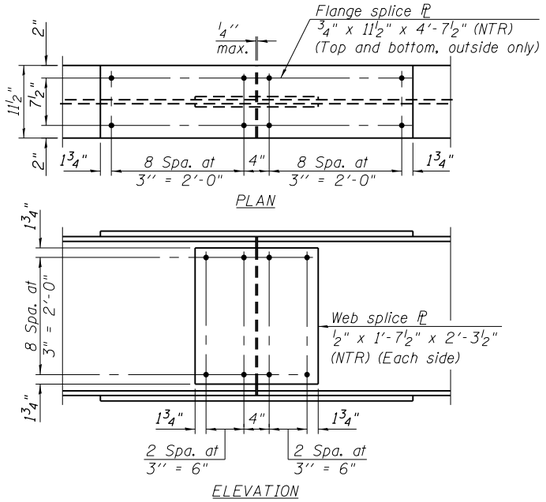
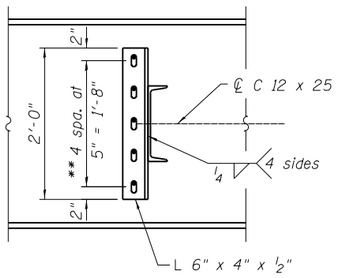


SPLICE DETAIL

(12 Required)

Notes:

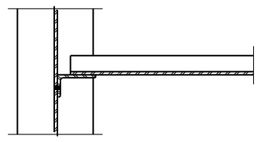
All splices are symmetrical about ℄ splice.
H.S. bolts shall be 7/8" ϕ AASHTO M164/ASTM A325 Type 3.
Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.



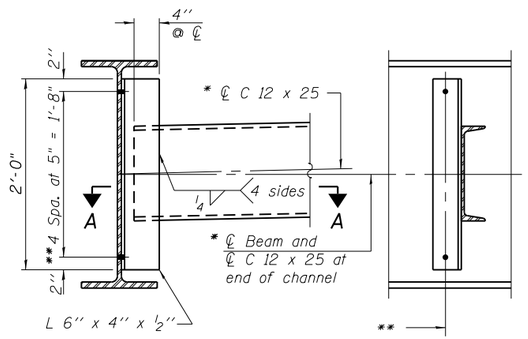
INITIAL BOLT ERECTION POSITION

INTERIOR DIAPHRAGM

(South Side Beam 3 only)



SECTION A-A



INTERIOR DIAPHRAGM

(60 Required)

Notes:

Two hardened washers required for each set of oversized or slotted holes.

* Alternate C 12 x 30 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.

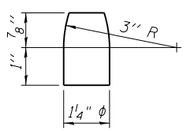
** 3/4" ϕ H.S. bolts. 15/16" ϕ holes typ., except 3/4" ϕ H.S. bolts 13/16" x 1 7/8" slots provided on south side of Beam 3 to accommodate differential displacement between Beams 3 and 4 for Stage Construction.
Bolts in slots shall be finger tight until Stage II Construction is complete.
Position slots so bolts start at one end with no concrete load and finish near the opposite end under deck load, allowing maximum displacement without laterally stressing main members.

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Pier 1 & 2	0.5 Sp. 2
I_s	(in^4)	6710	6710	6710
$I_c(n)$	(in^4)	18650		18650
$I_c(3n)$	(in^4)	13636		13636
$I_c(cr)$	(in^4)		9404	
S_s	(in^3)	406	406	406
$S_c(n)$	(in^3)	610.3		610.3
$S_c(3n)$	(in^3)	550.1		550.1
$S_c(cr)$	(in^3)		474.7	
DC1	(k/')	0.835	0.835	0.835
M_{DC1}	('k)	139	332	209
DC2	(k/')	0.150	0.150	0.150
M_{DC2}	('k)	25	60	37
DW	(k/')	0.300	0.300	0.300
M_{DW}	('k)	49	121	74
M_{L+IM}	('k)	560	566	616
M_u (Strength I)	('k)	1259	1662	1497
$\phi_f M_n$	('k)	3176		3111
f_s DC1	(ksi)	4.1	9.8	6.2
f_s DC2	(ksi)	0.5	1.5	0.8
f_s DW	(ksi)	1.1	3.1	1.6
f_s (L+IM)	(ksi)	11.0	14.3	12.1
f_s (Service II)	(ksi)	20.0	33.0	24.3
$0.95R_hF_{yf}$	(ksi)	47.5	47.5	47.5
f_s (Total)(Strength I)	(ksi)		43.8	
$\phi_f F_n$	(ksi)		50.0	
V_f	(k)	24.9	24.9	24.9

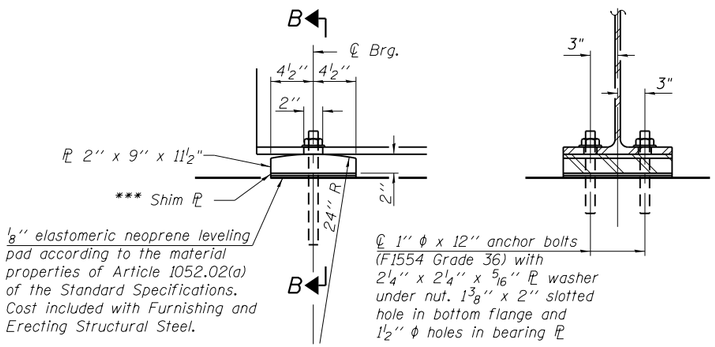
INTERIOR GIRDER REACTION TABLE			
		W. Abut. & E. Abut.	Pier 1 & 2
R_{DC1}	(k)	16.2	58.2
R_{DC2}	(k)	2.8	10.5
R_{DW}	(k)	5.5	21.0
R_{L+IM}	(k)	72.6	100.1
R_{Total}	(k)	97.1	189.8

BILL OF MATERIAL

Item	Unit	Total
Anchor Bolts, 1"	Each	48



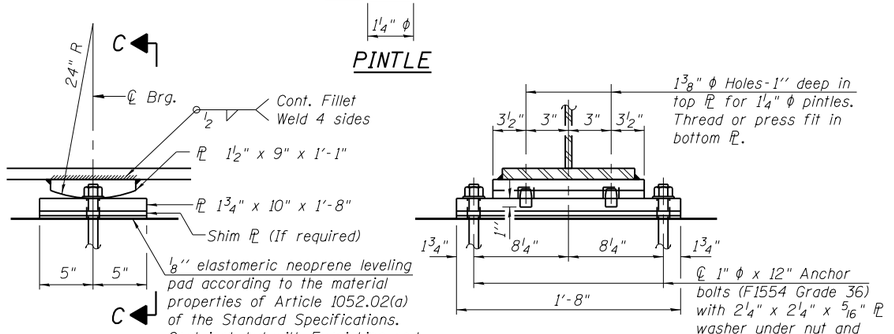
PINTLE



ELEVATION — SECTION B-B

FIXED BEARING AT ABUTMENT

(12 Required)



ELEVATION — SECTION C-C

FIXED BEARING AT PIER

(12 Required)

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).

$I_c(cr)$, $S_c(cr)$: 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 (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 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 load plus impact loads as calculated below (ksi).
$M_{L+IM} / S_c(n)$ or $M_{DW} / S_c(cr)$ as applicable.

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

$0.95R_hF_yf$: 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).
$1.25\ (f_{sDC1} + f_{sDC2}) + 1.5\ f_{sDW} + 1.75\ f_s(L+IM)$

$\phi_f F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

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

Notes:

Anchor bolts shall be ASTM F1554 All-Thread (or an Engineer approved alternate material) of the Grade(s) and Diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts may be either cast in place or installed in holes drilled after the supported member is in place.

Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.

Two 1/8" adjusting shims shall be provided for each bearing in addition to all other plates or shims and placed as shown on Bearing Details.

All plates, shapes and pintles shall conform to the requirements of AASHTO M270 Grade 50W.

*** Provide 1/4" x 9" x 11 1/2" Shim PL
℄ Beam 3 (W. Abut.) and
℄ Beam 4 (E. Abut.)

design firm no. 184001036
whks engineers + planners + land surveyors

USER NAME = $OPERATOR$	DESIGNED - TJZ	REVISED	
FILE NAME = 0110514-72A61.dgn	CHECKED - CWC	REVISED	
PLOT SCALE = 0.2000 '/ in.	DRAWN - DLH	REVISED	
PLOT DATE = 9/26/2013	CHECKED - TJZ	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 011-0514
SHEET NO. 15 OF 31 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
•	(4)I; 136B-1	CHRISTIAN	97	55
• 75 (IL 27) & 714 (IL 48)		CONTRACT NO. 72A61		
	ILLINOIS FED. AID PROJECT			