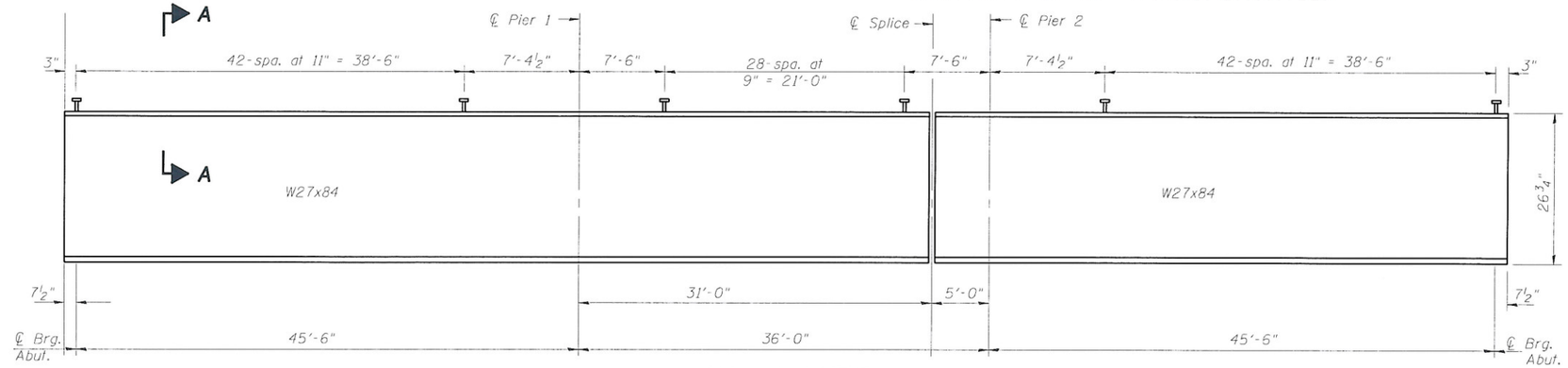
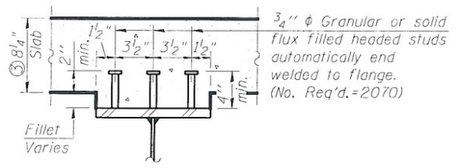
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION





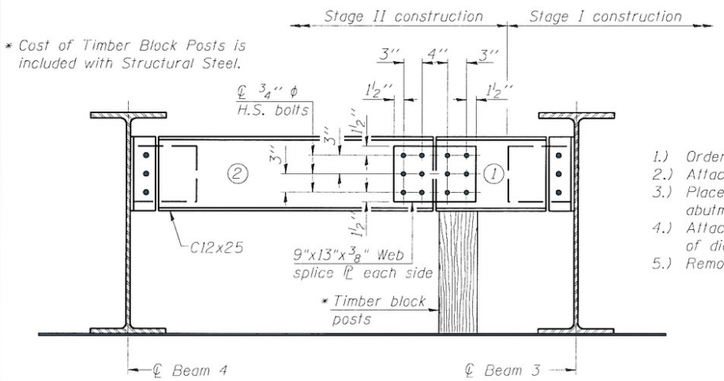
SECTION A-A

③ Prior to Grinding

BEAM ELEVATION

"NTR" denotes plates to which notch toughness requirements are applicable.

* Cost of Timber Block Posts is included with Structural Steel.



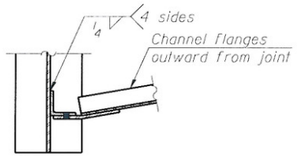
Showing diaphragm for shallow girder

Showing diaphragm for W-beam

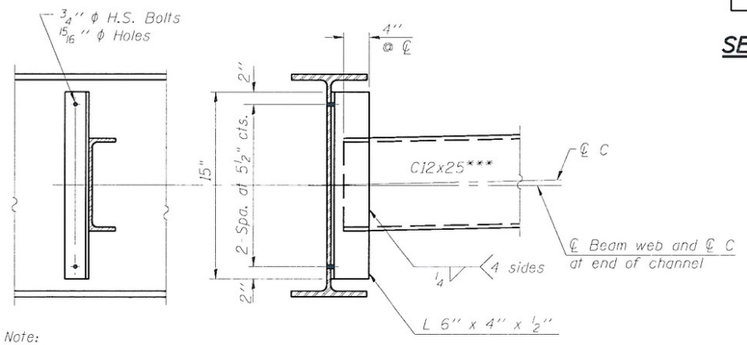
END DIAPHRAGM

END DIAPHRAGM STAGE CONSTRUCTION SEQUENCE

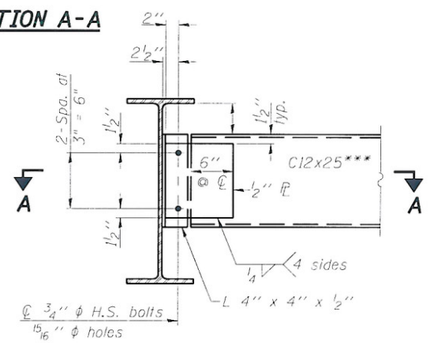
1.) Order Diaphragm in two sections.
2.) Attach section ① of Diaphragm to Beam 3.
3.) Place Timber Block Posts between section ① of diaphragm and abutment bearing section.
4.) Attach section ② of diaphragm to both Beam 4 and section ① of diaphragm during Stage II Construction with splice plates.
5.) Remove Timber Block Posts.



SECTION A-A



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



INTERIOR DIAPHRAGM "D"

END DIAPHRAGM "D1"

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

*** C12x30 is permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section. C12x30, if utilized, shall be provided at no extra cost to the Department.

INTERIOR BEAM MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Pier 1 or 2	.5 Sp. 2
I_s	(in^4)	2850	2850	2850
$I_c(n)$	(in^4)	8994	-	-
$I_c(3n)$	(in^4)	6663	-	-
S_s	(in^3)	213	213	213
$S_c(n)$	(in^3)	342	-	-
$S_c(3n)$	(in^3)	308	-	-
Z	(in^3)	-	244	244
DC1	(k/')	0.716	0.716	0.716
M_{DC1}	('k)	128	125	-9 *
DC2	(k/')	0.150	0.150	0.150
M_{DC2}	('k)	29	21	3
DW	(k/')	0.292	0.292	0.292
M_{DW}	('k)	56	41	6
M_{L+IM}	('k)	363	186	209
M_u (Strength I)	('k)	932	570	368
$\phi_f M_n$, $\phi_f M_{nc}$	('k)	1710	1017	1841
f_s DC1	(ksi)	7.2	7.0	-0.5
f_s DC2	(ksi)	1.1	1.2	0.1
f_s DW	(ksi)	2.2	2.3	0.2
f_s 1.3(L+IM)	(ksi)	16.6	13.6	9.5
f_s (Service II)	(ksi)	27.1	24.1	9.4
V_f	(k)	20.5		

* Section in negative moment bending

INTERIOR BEAM REACTION TABLE			
		Abut.	Pier
R_{DC1}	(k)	14.2	31.9
R_{DC2}	(k)	3.0	6.6
R_{DW}	(k)	5.7	12.8
R_{L+IM}	(k)	73.1	77.2
R_{Total}	(k)	96.0	128.5

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 $in.^3$).
Z: Plastic Section Modulus of the steel section in non-composite areas.

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.).
$\phi_f M_{nc}$: Compact non-composite negative moment capacity computed according to Article A6.1.1 (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.

Beam Number	W. Abut.	Pier 1	℄ Splice	Pier 2	E. Abut.
1	716.69	716.68	716.67	716.65	716.44
2	716.78	716.79	716.79	716.77	716.59
3	716.84	716.87	716.89	716.87	716.73
4	716.81	716.86	716.90	716.89	716.76
5	716.69	716.77	716.82	716.81	716.71
6	716.54	716.65	716.72	716.71	716.63

TOP OF BEAM ELEVATIONS

(for Fabrication use only)

Notes:
Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.

STRUCTURAL STEEL DETAILS STRUCTURE NO. 010-0283

DESIGNED	JLG				
CHECKED	JSP				
DRAWN	UJ				
CHECKED	JLG				

HURST-ROSCHE ENGINEERS, INC.
PROFESSIONAL DESIGN NUMBER:184-005276

SHEET NO. 15	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
24 SHEETS	709	(105BR)BR	CHAMPAIGN	55	27
	SN 010-0283		CONTRACT NO. 70427		
	FED. ROAD DIST. NO. 5 ILLINOIS FED. AID PROJECT				

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