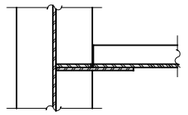
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

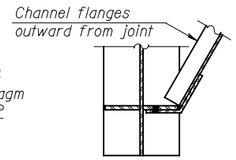
Note:
Two hardened washers required for each set of oversized holes.

* $^{3}/_{4}$" ϕ HS bolts, $^{15}/_{16}$" ϕ holes typical, EXCEPT for diaphragms between beams 3 & 4 use $^{13}/_{16}$" x 1$^{7}/_{8}$" vertical slotted holes in diaphragm plate (both ends), and provide 3" x 3" x $^{5}/_{16}$" PL washers over slotted holes. (Also see Notes.)

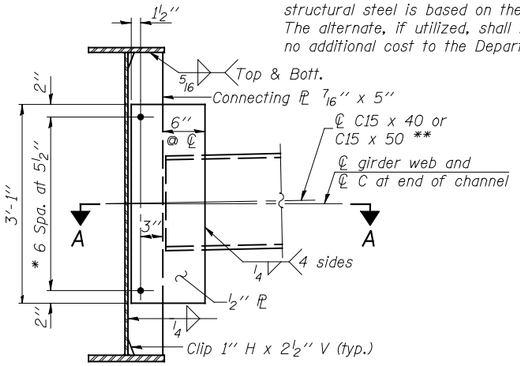
** Alternate channels are permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section. The alternate, if utilized, shall be provided at no additional cost to the Department.



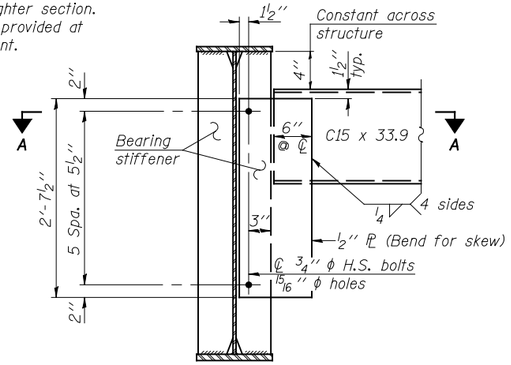
SECTION A-A



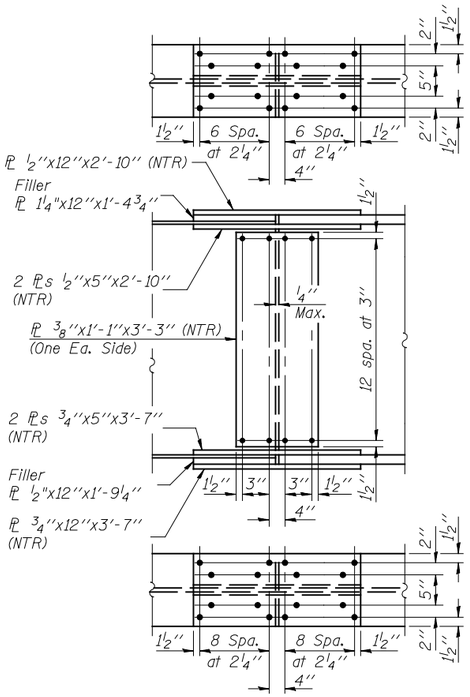
SECTION A-A



INTERIOR DIAPHRAGM

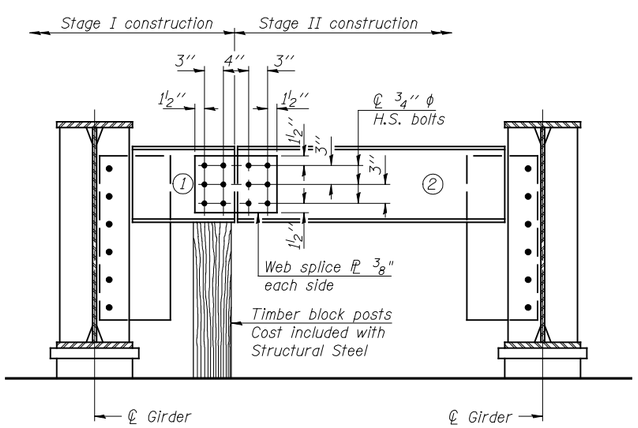


END DIAPHRAGM



FIELD SPLICE DETAIL

(Splice 2 shown, Splice 1 similar by opposite hand)



END DIAPHRAGM

END DIAPHRAGM STAGE CONSTRUCTION SEQUENCE

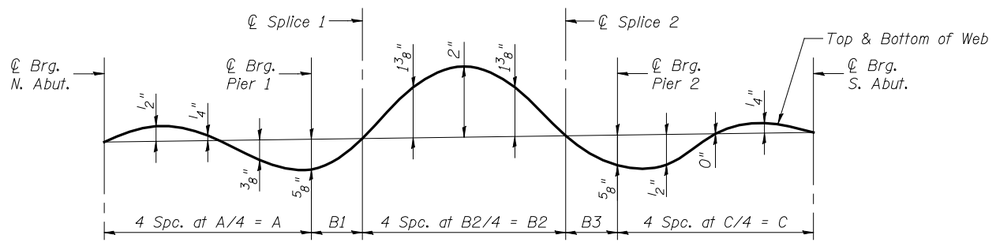
1.) Order diaphragm in two sections.
2.) Attach section ① of diaphragm to girder 3.
3.) Place timber block posts between section ① of diaphragm and abutment bearing section.
4.) Attach section ② of diaphragm to both girder 4 and section ① of diaphragm during stage II construction with splice plates.
5.) Remove timber block posts.

INTERIOR GIRDER MOMENT TABLE						
		0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.6 Sp. 3
I_s	(in^4)	10926	25949	14458	25949	10926
$I_c(n)$	(in^4)	28056	25949	41402	25949	28056
$I_c(3n)$	(in^4)	21403	25949	30071	25949	21403
S_s	(in^3)	502	1128	798	1128	502
$S_c(n)$	(in^3)	709	1128	1104	1128	709
$S_c(3n)$	(in^3)	653	1128	1022	1128	653
S_{xt}	(in^3)	709	1128	1104	1128	709
DC1	(k/')	0.966	1.066	0.996	1.066	0.966
M_{DC1}	('k)	302	1263	613	1194	236
DC2	(k/')	0.173	0.173	0.173	0.173	0.173
M_{DC2}	('k)	72	176	145	168	60
DW	(k/')	0.350	0.350	0.350	0.350	0.350
M_{DW}	('k)	147	357	293	339	120
M_{L+IM}	('k)	1115	1227	1449	1195	1032
M_u (Strength I)	('k)	2639	4482	3923	4302	2356
M_{bt}	('k)	15	26	23	25	14
f_s DC1	(ksi)	7.2	13.4	9.2	12.7	5.6
f_s DC2	(ksi)	1.3	1.9	1.7	1.8	1.1
f_s DW	(ksi)	2.7	3.8	3.4	3.6	2.2
f_s 1.3(L+IM)	(ksi)	24.5	17.0	20.5	16.5	22.7
f_t	(ksi)	10.1	6.4	7.5	6.2	9.0
f_s (Service II)	(ksi)	35.7	36.1	34.8	34.6	31.6
f_s (Total)(Strength I)	(ksi)	47.8	47.7	46.4	45.8	42.3
F_{cr} (Service II)	(ksi)	47.5	40.0	47.5	40.0	47.5
V_f (Fatigue I)	(k)	57.6	---	54.0	---	57.6
F_{cr}	(ksi)	50	50	50	50	50

INTERIOR GIRDER REACTION TABLE					
		N. Abut.	Pier 1	Pier 2	S. Abut.
R_{DC1}	(k)	25.2	119.3	115.7	22.7
R_{DC2}	(k)	5.1	19.8	19.2	4.6
R_{DW}	(k)	10.2	40.2	39.0	9.3
R_{L+IM}	(k)	116.0	157.9	156.1	107.4
R_{Total}	(k)	156.5	337.2	330.0	144.0

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 $in.^3$).
S_{xt}: Section modulus about the major axis of section to the controlling flange, tension or compression, taken as yield moment with respect to the controlling flange over the yield strength of the controlling flange ($in.^3$).
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}
M_{bt}: Factored lateral bending moment for controlling flange plate (kip-ft.).
f_t: Factored calculated normal stress at edge of flange for controlling flange plate due to lateral bending (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}
F_{cr} (Service II): Critical flange stress at Service II computed according to Article 6.10.4.2 (ksi).
F_{cr}: Critical flange stress computed according to Article 6.10.7 or 6.10.8 (ksi).
V_f: Maximum factored shear range computed according to Article 6.10.10.

Note:
M_{L+IM} and R_{L+IM} include the effects of centrifugal force and superelevation.



CAMBER DIAGRAM

Note:
For dimensions A, B & C, see previous sheet.

Notes:
All structural steel shall be AASHTO M 270 Grade 50.
Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.
All cross frames or diaphragms between beams or girders shall be installed with erection pins and bolts in accordance with the erection plan approved by the Engineer. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
For STAGE II CONSTRUCTION, the diaphragms between Beams 3 & 4 shall be installed with bolts at both beams only finger-tight and with slots positioned to allow maximum differential deflection during the deck pour. Bolts shall be fully tightened as soon as possible after deck pour to minimize differential deflections due to traffic.

Johnson, Depp & Quisenberry CONSULTING ENGINEERS Springfield, Illinois			
DESIGNED:	DCD	DRAWN:	P. Ray
CHECKED:	CMV	CHECKED:	CMV/DCD

STRUCTURAL STEEL
STRUCTURE NO. 057-0250

SHEET 15 OF 27	F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	55	(57-7HB-1)BR	MCLEAN	153	65
		STA. 626+53.70	CONTRACT NO. 70520		
	FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		