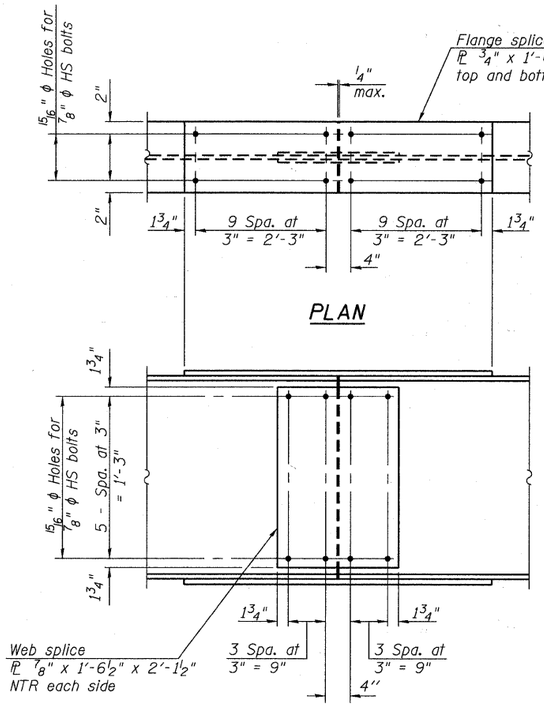
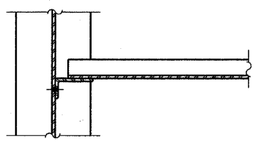


PLAN

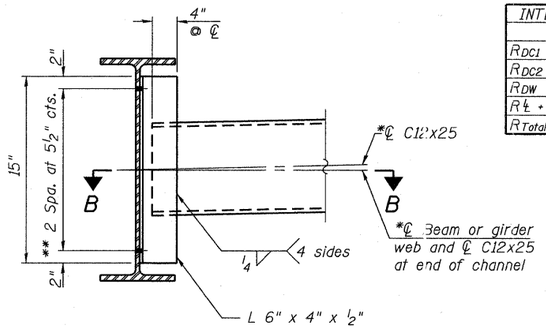


SECTION B-B

ELEVATION

SPLICE DETAIL

(12 Required)



INTERIOR DIAPHRAGM D

(30 Required)

Note:
Two hardened washers required for each set of oversized holes.
*Alternate channels (C12x30) 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

Note:
All splice bolts shall be AASHTO M164/ASTM 325 Type 3.
Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.
All Structural Steel shall be AASHTO M270 Grade 50W.
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.

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Piers	0.5 Sp. 2
I_s	(in^4)	3540	3540	3540
$I_c(n)$	(in^4)	10594	-	10594
$I_c(3n)$	(in^4)	7677	-	7677
S_s	(in^3)	291	291	291
$S_c(n)$	(in^3)	448	-	448
$S_c(3n)$	(in^3)	403	-	403
Z	(in^3)	327	327	327
DC1	(k/')	0.796	0.796	0.820
M_{DC1}	('k)	157	297	163
DC2	(k/')	0.320	0.320	0.320
M_{DC2}	('k)	58	74	69
DW	(k/')	0.213	0.213	0.213
M_{DW}	('k)	39	49	46
M_{L+IM}	('k)	922	571	942
M_u (Strength I)	('k)	1212	1037	1263
* $\phi_f M_n$, $\phi_f M_{nc}$	('k)	2187	1205	2187
f_s DC1	(ksi)	5.2	9.8	5.4
f_s DC2	(ksi)	1.7	3.0	2.0
f_s DW	(ksi)	1.1	2.0	1.3
f_s 1.3(L+IM)	(ksi)	18.3	17.6	18.7
f_s (Service II)	(ksi)	26.4	32.6	27.6
** f_s (Total)(Strength I)	(ksi)	35.1	43.0	36.6
V_f	(k)	15.0	-	14.0

* Compact sections
** Non-Compact and slender sections

INTERIOR GIRDER REACTION TABLE			
		Abut.	Pier
R_{DC1}	(k)	14.1	48.6
R_{DC2}	(k)	6.1	18.8
R_{DW}	(k)	4.2	12.8
R_{L+IM}	(k)	66.7	11.6
R_{Total}	(k)	91.2	195.9

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. Omit line in Moment Table if not used in design calculations (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.).
$\phi_f M_{nc}$: 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.

FILE NAME = W:\755-010 Blivin Phase II\CADD\Sheets\Structural\755-010 SHT-15 S- STRUCTURAL STEEL DETAILS.dgn

Bollinger, Lach & Associates, Inc. ITASCA, ILLINOIS	USER NAME = gonzalo	DESIGNED - SRT	REVISED -
		CHECKED - JJI	REVISED -
	PLOT SCALE =	DRAWN - GM	REVISED -
	PLOT DATE = 3/25/2011	CHECKED - JJI	REVISED -

McHENRY COUNTY
DIVISION OF TRANSPORTATION
BLIVIN STREET OVER NIPPERSINK CREEK

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 056-3191

SCALE: | SHEET NO. 15 OF 28 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	08-00355-00-BR	MCHENRY	69	40
		CONTRACT NO. 63583		
	ILLINOIS FED. AID PROJECT			