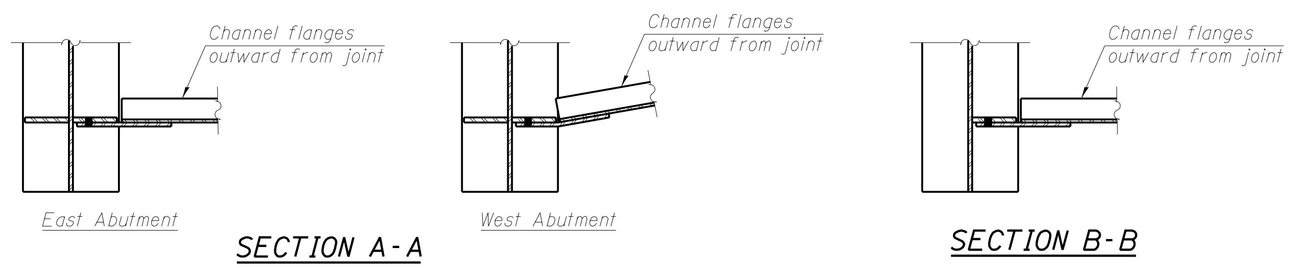
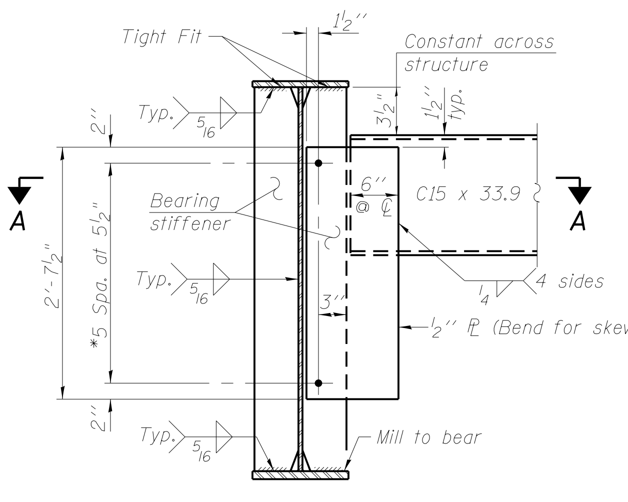
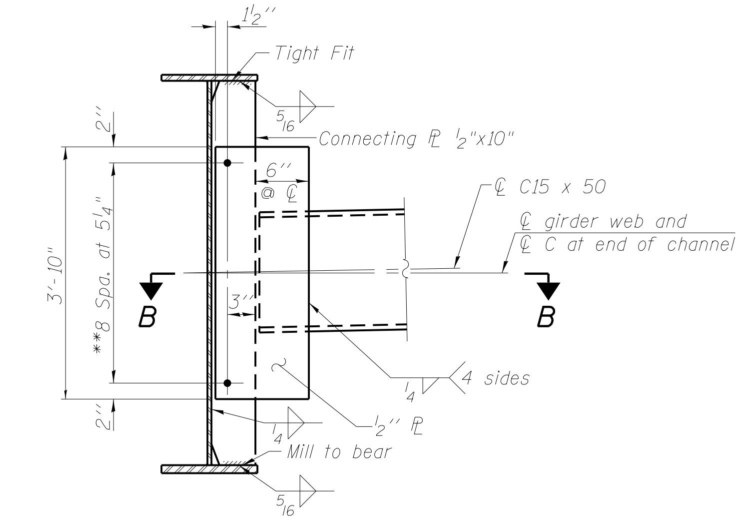




END DIAPHRAGM - D-1

(22 Required)

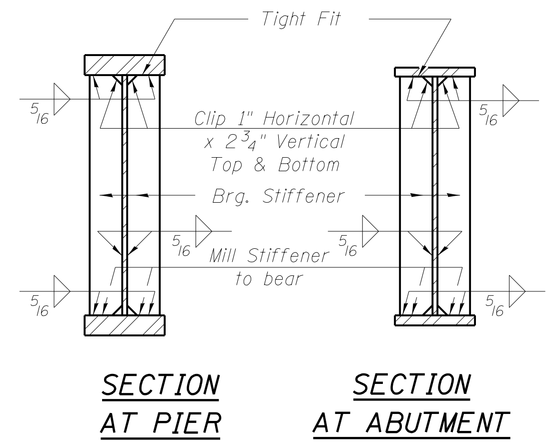
*⅞"φ HS Bolts, 1⁄16"φ holes



INTERIOR DIAPHRAGM - D-2

(154 Required)

**⅞"φ HS bolts, 1⁄16"φ holes



BEARING STIFFENER DETAIL

INTERIOR GIRDER 11 MOMENT TABLE		0.4 Sp. 1	Pier	0.6 Sp. 2
I_s	(in^4)	61,574	82,330	61,574
$I_c(n)$	(in^4)	106,081	-	106,081
$I_c(3n)$	(in^4)	80,858	-	80,858
$I_c(cr)$	(in^4)	-	87,346	-
S_s	(in^3)	2,492	3,107	2,492
$S_c(n)$	(in^3)	2,945	-	2,945
$S_c(3n)$	(in^3)	2,730	-	2,730
$S_c(cr)$	(in^3)	-	3,433	-
DC1	(k/')	1.22	1.30	1.22
M_{DC1}	('k)	2,281	3,652	1,104
DC2	(k/')	0.57	0.57	0.57
M_{DC2}	('k)	1,093	1,670	526
DW	(k/')	0.27	0.27	0.27
M_{DW}	('k)	522	796	250
M_{LL+IM}	('k)	1,851	1,923	1,512
M_u (Strength I)	('k)	8,240	11,212	5,059
$\phi_f M_n$	('k)	11,325	-	11,514
f_s DC1	(ksi)	10.98	14.10	5.32
f_s DC2	(ksi)	4.80	5.84	2.31
f_s DW	(ksi)	2.29	2.78	1.10
f_s (LL+IM)	(ksi)	7.54	6.72	6.16
f_s (Service II)	(ksi)	27.89	31.46	16.74
$0.95R_hF_{yf}$	(ksi)	47.50	47.50	47.50
f_s (Total)(Strength I)	(ksi)	36.38	40.86	21.97
$\phi_f F_n$	(ksi)	-	50.00	-
V_f	(k)	22.40	24.10	22.10

EXTERIOR GIRDER 12 MOMENT TABLE		0.4 Sp. 1	Pier	0.6 Sp. 2
I_s	(in^4)	61,574	82,330	61,574
$I_c(n)$	(in^4)	104,358	-	104,358
$I_c(3n)$	(in^4)	79,900	-	79,900
$I_c(cr)$	(in^4)	-	87,065	-
S_s	(in^3)	2,492	3,107	2,492
$S_c(n)$	(in^3)	2,932	-	2,932
$S_c(3n)$	(in^3)	2,720	-	2,720
$S_c(cr)$	(in^3)	-	3,414	-
DC1	(k/')	1.18	1.26	1.18
M_{DC1}	('k)	2,235	3,612	1,170
DC2	(k/')	0.57	0.57	0.57
M_{DC2}	('k)	1,082	1,682	563
DW	(k/')	0.27	0.27	0.27
M_{DW}	('k)	516	802	268
M_{LL+IM}	('k)	2,102	2,257	1,753
M_u (Strength I)	('k)	8,599	11,770	5,636
$\phi_f M_n$	('k)	11,348	-	11,514
f_s DC1	(ksi)	10.76	13.95	5.63
f_s DC2	(ksi)	4.77	5.91	2.48
f_s DW	(ksi)	2.28	2.82	1.18
f_s (LL+IM)	(ksi)	8.60	7.93	7.17
f_s (Service II)	(ksi)	29.00	32.99	18.63
$0.95R_hF_{yf}$	(ksi)	47.50	47.50	47.50
f_s (Total)(Strength I)	(ksi)	37.89	42.94	24.48
$\phi_f F_n$	(ksi)	-	50.00	-
V_f	(k)	23.00	26.70	24.10

INTERIOR GIRDER 2 MOMENT TABLE		0.4 Sp. 1	Pier	0.6 Sp. 2
I_s	(in^4)	61,574	82,330	61,574
$I_c(n)$	(in^4)	106,081	-	106,081
$I_c(3n)$	(in^4)	80,858	-	80,858
$I_c(cr)$	(in^4)	-	87,346	-
S_s	(in^3)	2,492	3,107	2,492
$S_c(n)$	(in^3)	2,945	-	2,945
$S_c(3n)$	(in^3)	2,730	-	2,730
$S_c(cr)$	(in^3)	-	3,433	-
DC1	(k/')	1.22	1.30	1.22
M_{DC1}	('k)	2,409	3,322	302
** DC2	(k/')	0.62	0.62	0.62
M_{DC2}	('k)	1,224	1,622	161
DW	(k/')	0.27	0.27	0.27
M_{DW}	('k)	548	723	70
M_{LL+IM}	('k)	2,284	2,327	1,459
M_u (Strength I)	('k)	9,360	11,337	3,237
$\phi_f M_n$	('k)	11,380	-	11,779
f_s DC1	(ksi)	11.60	12.83	1.45
f_s DC2	(ksi)	5.38	5.67	0.71
f_s DW	(ksi)	2.41	2.53	0.31
f_s (LL+IM)	(ksi)	9.31	8.13	5.94
f_s (Service II)	(ksi)	31.49	31.60	10.20
$0.95R_hF_{yf}$	(ksi)	47.50	47.50	47.50
f_s (Total)(Strength I)	(ksi)	41.13	41.15	13.57
$\phi_f F_n$	(ksi)	-	50.00	-
V_f	(k)	21.40	22.60	21.60

INTERIOR GIRDER 11 REACTION TABLE		W. Abut.	Pier	E. Abut.
R_{DC1}	(k)	76	234	54
R_{DC2}	(k)	36	107	25
R_{DW}	(k)	17	51	12
R_{LL+IM}	(k)	66	127	63
R_{Total}	(k)	195	519	154

EXTERIOR GIRDER 12 REACTION TABLE		W. Abut.	Pier	E. Abut.
R_{DC1}	(k)	74	228	55
R_{DC2}	(k)	35	107	26
R_{DW}	(k)	17	51	12
R_{LL+IM}	(k)	67	144	65
R_{Total}	(k)	193	530	158

INTERIOR GIRDER 2 REACTION TABLE		W. Abut.	Pier	E. Abut.
R_{DC1}	(k)	78	219	34
R_{DC2}	(k)	39	108	17
R_{DW}	(k)	17	48	7
R_{LL+IM}	(k)	93	177	78
R_{Total}	(k)	227	552	136

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_{LL+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).

M_u (Strength I): Factored design moment (kip-ft.).
$1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_{LL+IM}$

$\phi_f M_n$: 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 (LL+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).
$M_{LL+IM} / S_c(n)$ or $M_{DW} / S_c(cr)$ as applicable.

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

$0.95R_hF_{yf}$: 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).
$1.25 (f_{sDC1} + f_{sDC2}) + 1.5 f_{sDW} + 1.75 f_s(LL+IM)$

$\phi_f F_n$: 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.

** For Girders 2 and 3, the load due to ComEd ductbank is 105 pounds per linear foot. For Girders 4 and 5, the load due to City of Chicago ductbank is 105 pounds per linear foot.

NOTES:

1. All structural steel shall be AASHTO M270 Grade 50 - galvanized.
2. All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
3. Two hardened washers required for each set of oversized holes.