

	0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.5 Sp. 3	Pier 3	0.6 Sp. 4
I_s	10,500	10,500	10,500	10,500	10,500	10,500	10,500
$I_c(n)$	24,826	-	24,826	-	24,826	-	24,826
$I_c(3n)$	18,137	-	18,137	-	18,137	-	18,137
S_s	580	580	580	580	580	580	580
$S_c(n)$	808	-	808	-	808	-	808
$S_c(3n)$	729	-	729	-	729	-	729
Z	-	-	-	668	-	-	-
ρ	0.86	0.86	0.86	0.86	0.86	0.86	0.86
$M\phi$	193	-348	183	-356	183	-348	193
$s\phi$	0.37	0.37	0.37	0.37	0.37	0.37	0.37
$M_s\phi$	93	-135	97	-145	97	-135	93
M_L	371	-231	403	-252	403	-231	371
M_{Iu}	102	-61	103	-64	103	-61	102
$S_3 [M_L + I]$	788	-486	843	-527	843	-486	788
M_o	1,396	-1,260	1,460	-1,337	1,460	-1,260	1,396
M_u	2,656	1,741	3,022	2,004	3,022	1,741	2,656
$f_s \phi$ non-comp	4.0	-7.2	3.8	-7.4	3.8	-7.2	4.0
$f_s \phi$ (comp)	1.5	-2.8	1.6	-3.0	1.6	-2.8	1.5
$f_s S_3 [M_L + M_I]$	11.7	-10.1	12.5	-10.9	12.5	-10.1	11.7
f_s (Overload)	17.2	-20.1	17.9	-21.3	17.9	-20.1	17.2
f_s (Total)	22.4	-26.1	23.3	-27.6	23.3	-26.1	22.4
VR	58.4	-	49.6	-	49.6	-	58.4

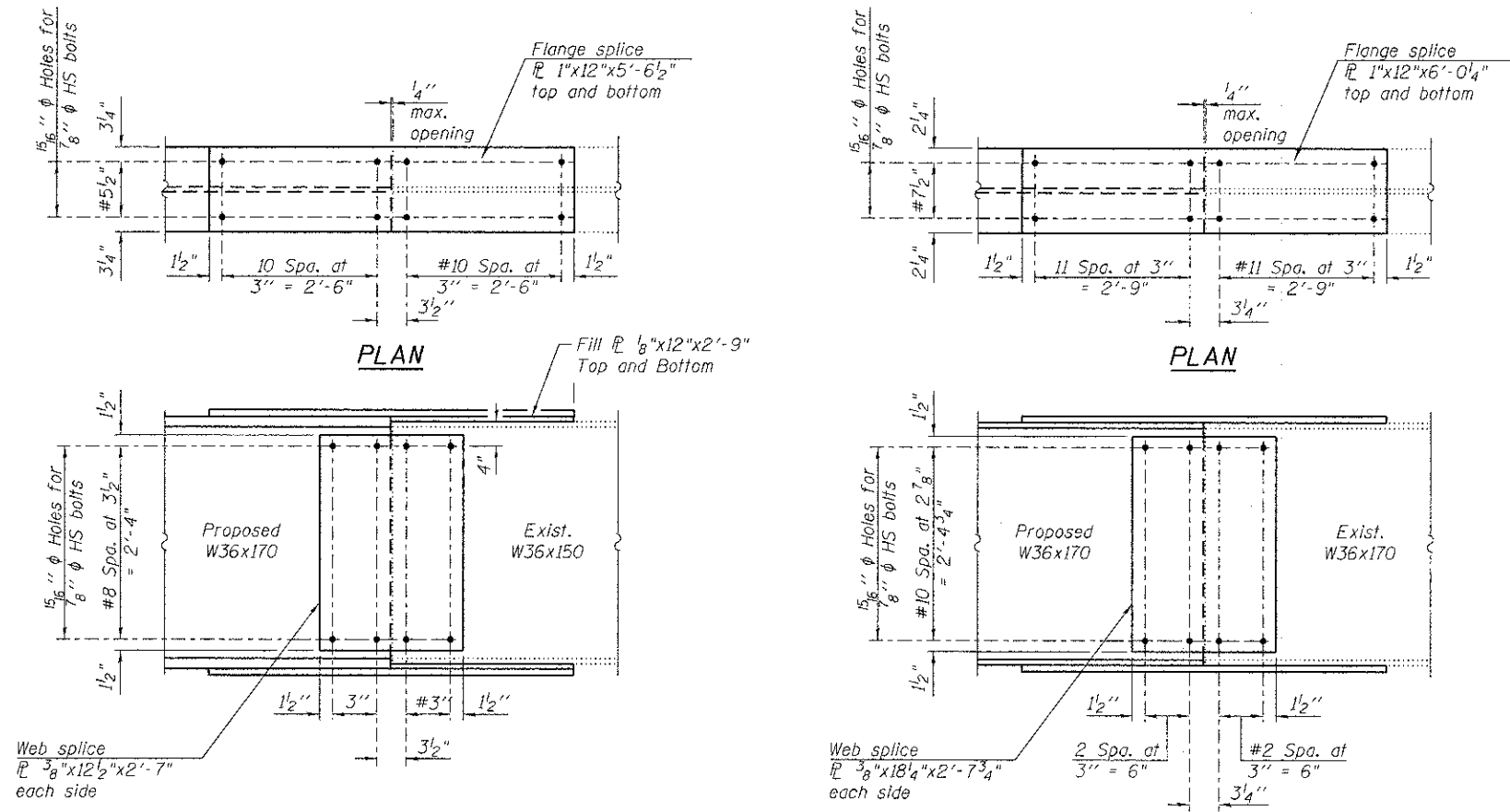
	W. Abut.	Pier 1	Pier 2	Pier 3	E. Abut.
$R\phi$	53.5	86.0	86.8	86.0	53.5
R_L	43.4	85.2	87.9	85.2	43.4
R_I	11.9	16.8	16.4	16.8	11.9
R_{Total}	108.8	188.0	191.1	188.0	108.8

* Compact section
 ** Braced non-compact and partially braced section
 *** Controlled by IL-120 permit loading.

	0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.5 Sp. 3	Pier 3	0.6 Sp. 4
I_s	10,500	10,500	9,040	11,507	9,040	11,507	10,500
$I_c(n)$	24,826	-	22,201	-	22,201	-	24,826
$I_c(3n)$	18,137	-	16,283	-	16,283	-	18,137
S_s	580	580	504	628	504	628	580
$S_c(n)$	808	-	713	-	713	-	808
$S_c(3n)$	729	-	644	-	644	-	729
Z	-	-	-	717	-	717	-
ρ	0.86	0.86	0.84	0.87	0.84	0.87	0.86
$M\phi$	193	-349	168	-362	167	-351	192
$s\phi$	0.37	0.37	0.37	0.37	0.37	0.37	0.37
$M_s\phi$	92	-137	93	-151	92	-139	91
M_L	372	-236	395	-265	394	-240	370
M_{Iu}	102	-62	100	-67	100	-63	101
$S_3 [M_L + I]$	789	-497	825	-554	823	-506	786
M_o	1,397	-1,278	1,412	-1,386	1,406	-1,295	1,390
M_u	2,385	1,596	2,503	1,956	2,672	1,956	2,940
$f_s \phi$ non-comp	4.0	-7.2	4.0	-6.9	4.0	-6.7	4.0
$f_s \phi$ (comp)	1.5	-2.8	1.7	-2.9	1.7	-2.7	1.5
$f_s S_3 [M_L + M_I]$	11.7	-10.3	13.9	-10.6	13.9	-9.7	11.7
f_s (Overload)	17.2	-20.3	19.6	-20.4	19.5	-19.0	17.1
f_s (Total)	22.4	-26.4	25.5	-26.5	25.4	-24.7	22.3
VR	58.3	-	49.5	-	50.3	-	58.3

	W. Abut.	Pier 1	Pier 2	Pier 3	E. Abut.
$R\phi$	53.4	85.5	86.1	85.5	53.3
R_L	43.4	85.2	88.3	85.4	43.2
R_I	11.9	16.8	16.5	16.8	11.9
R_{Total}	108.7	187.4	190.9	187.7	108.4

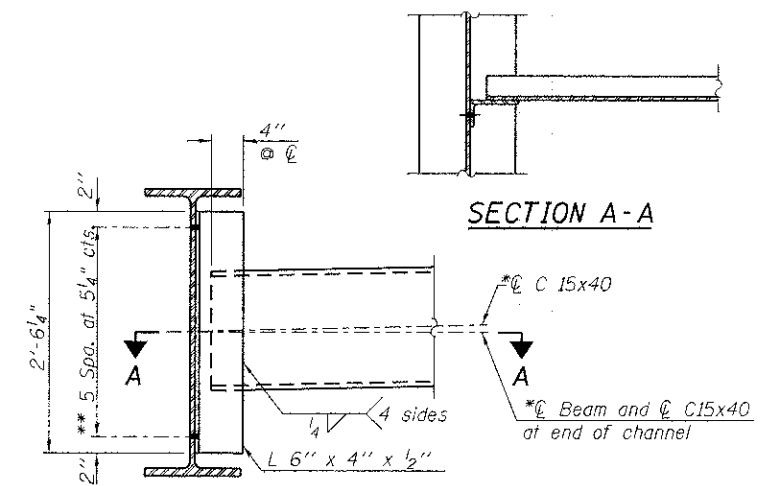
* Compact section
 ** Braced non-compact and partially braced section
 *** Controlled by IL-120 permit loading.



ELEVATION
FIELD SPLICE DETAIL
BEAMS A-F
 (12 Required)

ELEVATION
FIELD SPLICE DETAIL
BEAMS G-K
 (8 Required)

I_s, S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total and Overload) 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 and Overload) 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 and Overload) 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 (in.³).
 ρ : Un-factored non-composite dead load (kips/ft.).
 $M\phi$: Un-factored moment due to non-composite dead load (kip-ft.).
 $s\phi$: Un-factored long-term composite (superimposed) dead load (kips/ft.).
 $M_s\phi$: Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).
 M_L : Un-factored live load moment (kip-ft.).
 M_I : Un-factored moment due to impact (kip-ft.).
 M_o : Factored design moment (kip-ft.).
 $1.3 [M\phi + M_s\phi + \frac{5}{8} (M_L + M_I)]$
 M_u : Compact composite moment capacity according to AASHTO LFD 10.50.1.1 or compact non-composite moment capacity according to AASHTO LFD 10.48.1 (kip-ft.).
 f_s (Overload): Sum of stresses as computed from the moments below (ksi).
 $M\phi + M_s\phi + \frac{5}{8} (M_L + M_I)$
 f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 $1.3 [M\phi + M_s\phi + \frac{5}{8} (M_L + M_I)]$
 VR: Maximum $\frac{1}{4}$ + impact shear range within the composite portion of the span for stud shear connector design (kips).



INTERIOR DIAPHRAGM
 (63 Required)

Note:
 Two hardened washers required for each set of oversized holes.
 *Alternate channel C15x50 is 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.
 ** $\frac{3}{4}$ " ϕ HS bolts, $\frac{15}{16}$ " ϕ holes

N:\PROJ\0203408\02\Structural\Design\Structure\18_Structural\Steel_Details.dwg



USER NAME = rdenley	DESIGNED - MHT	REVISED -
PLOT SCALE = 1/8"=1'-0"	CHECKED - SMY	REVISED -
PLOT DATE = 1/28/2013	DRAWN - SRG	REVISED -
	CHECKED - BWS	REVISED -

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS
 STRUCTURE NO. 099-3031

SHEET NO. 5-18 OF 5-24 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
298	04-00069-18-BR	WILL	51	39
CONTRACT NO. 63803				
ILLINOIS FED. AID PROJECT				