

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	L-HBR-2F	WINNEBAGO	29	13
FED. ROAD DIST. NO. 7	ILLINOIS	CONTRACT NO. 64F62		

SHEET NO. 11
27 SHEETS

	0.4 Sp. 1 or 0.6 Sp. 4	Piers 1 & 3	0.5 Sp. 2 or 0.5 Sp. 3	Pier 2
I_s	(in ⁴)	4,090	4,090	4,090
$I_c(n)$	(in ⁴)	11,981	-	11,981
$I_c(3n)$	(in ⁴)	8,666	-	8,666
S_s	(in ³)	299	299	299
$S_c(n)$	(in ³)	462	-	462
$S_c(3n)$	(in ³)	414	-	414
Z	(in ³)	-	-	-
DC1	(k/')	0.773	0.773	0.773
M _{DC1}	(k)	99	202	117
DC2	(k/')	0.15	0.15	0.15
M _{DC2}	(k)	19.2	39.1	22.6
DW	(k/')	0.267	0.267	0.267
M _{DW}	(k)	34.1	69.6	40.2
M _{ℓ + IM}	(k)	413	369	451
M _u (Strength I)	(k)	921	1,051	1,023
$\phi_r M_n$, $\phi_r M_{nc}$	(k)	4,022	1,232	4,022
f_s DC1	(ksi)	3.97	8.11	4.7
f_s DC2	(ksi)	0.56	1.57	0.66
f_s DW	(ksi)	0.99	2.79	1.17
f_s 1.3(ℓ+IM)	(ksi)	13.95	19.25	15.23
f_s (Service II)	(ksi)	19.47	31.72	21.76
f_s (Total)(Strength I)	(ksi)	-	-	-
V _r	(k)	13.9	-	13.3

* Compact sections
** Non-Compact and slender sections

	N & S Abut.	Piers 1 & 3	Pier 2	
R _{DC1}	(k)	12.4	43.8	46.0
R _{DC2}	(k)	2.38	8.46	8.93
R _{DW}	(k)	4.22	15.04	15.87
R _{ℓ + IM}	(k)	57.9	111.5	111.5
R _{Total}	(k)	76.9	178.8	182.3

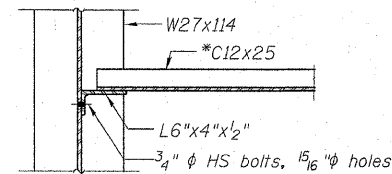
I_s , S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total-Strength I, and Service II) due to non-composite dead loads (in⁴ and in³).

$I_c(n)$, $S_c(n)$: 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 (in⁴ and in³).

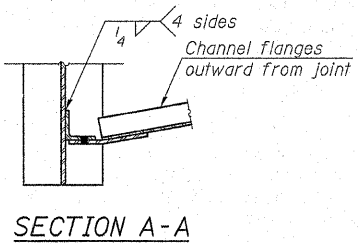
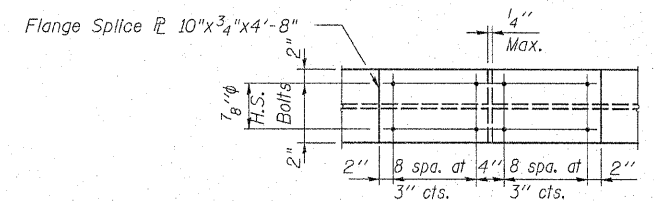
$I_c(3n)$, $S_c(3n)$: Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing f_s (Total-Strength I, and Service II) due to long-term composite (superimposed) dead loads (in⁴ and in³).

Z: Plastic Section Modulus of the steel section in non-composite areas. Omit line in Moment Table if not used in design calculations (in³).

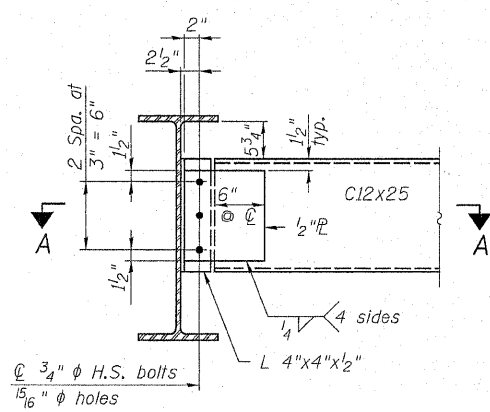
DC1: Un-factored non-composite dead load (kips/ft.).
M_{DC1}: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
M_{DC2}: Un-factored moment due to long-term composite (superimposed excluding 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}
 $\phi_r M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.).
 $\phi_r M_{nc}$: 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} + 1.5 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_r: Maximum factored shear range in composite portion of span computed according to Article 6.10.10.



SECTION A-A

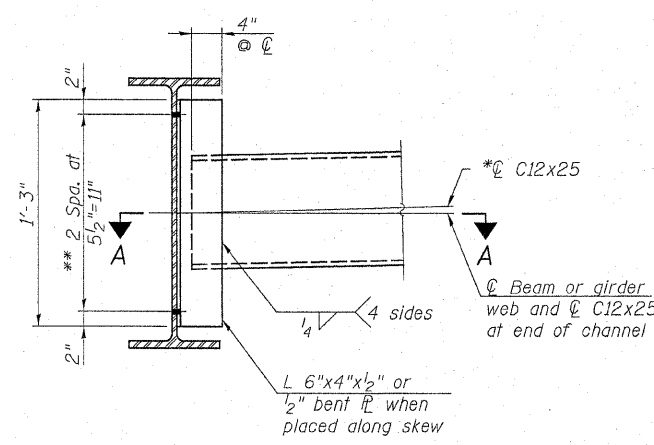


SECTION A-A



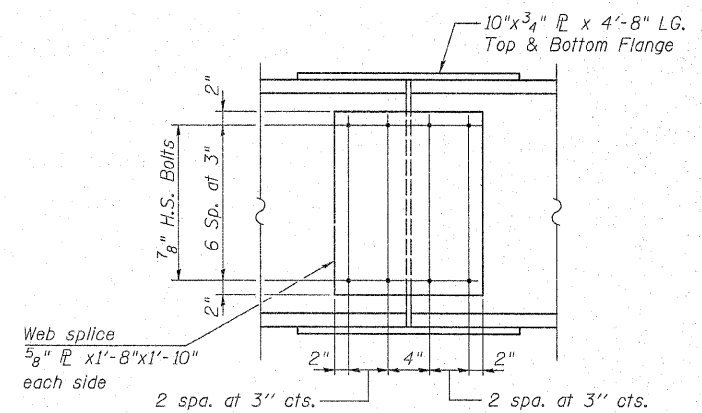
END DIAPHRAGM (D)

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



INTERIOR DIAPHRAGM (D1)

Note:
Two hardened washers required for each set of oversized holes.
* C12x30 channels are permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section.
** 3/4" diameter HS bolts, 1 5/16" diameter holes



SPlice Detail
M270 Grade 50 (N.T.R.)
(18 Required)

STRUCTURAL STEEL DETAILS
MERIDIAN ROAD OVER US 20
F.A.P. 301 (US 20) - SEC. 1-HBR-2F
WINNEBAGO COUNTY
STATION 100+00
STRUCTURE NO. 101-0096

12.07.09 PM
7/22/2009
A:\projects\2945\DGMS\Structural\Meridian Road\Draws from SUNDEN Files\Final Drawings\2009\1010096-64050-01-STEEL\FRMD1.dgn

DESIGNED	GUN / OAO
CHECKED	FCO
DRAWN	TCS / GUN
CHECKED	FCO