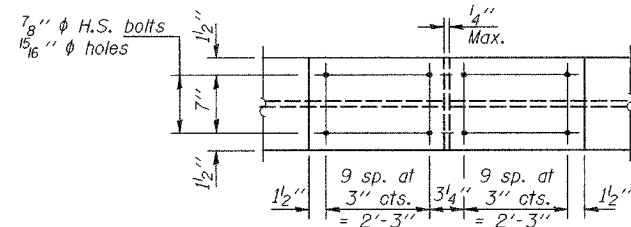


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

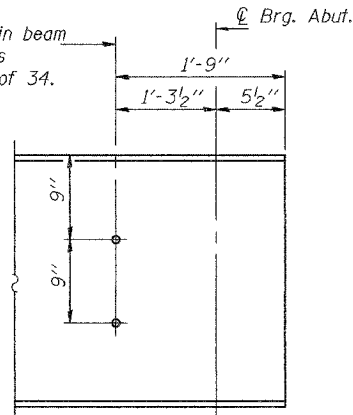
ROUTE NO.	SECTION	COUNTY	LISTED	SHEET NO.	SHEET NO. 20 34 SHEETS
FAP 301	3HBR-2	WINNEBAGO	171	106	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

Contract No. 64292

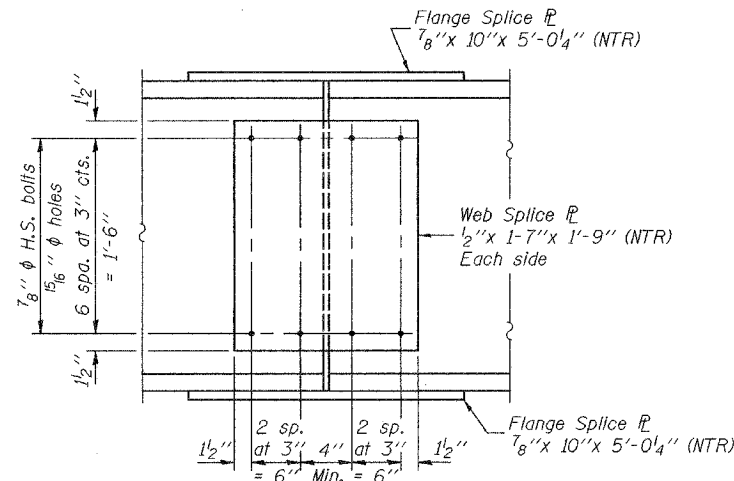


PLAN - SPLICES 1-3
(Top & Bottom flanges)

1" ϕ holes in beam for $m_1(E)$ bars
See sheet 18 of 34.



END OF BEAM ELEVATION



ELEVATION - SPLICES 1-3
(48 Required)

		0.4 Sp. 1 & 0.6 Sp. 4	Piers 1 & 3	0.5 Sp. 2 & Sp. 3	Pier 2
I_s	(in ⁴)	4760	4760	4760	4760
$I_c(n)$	(in ⁴)	12308	—	12308	—
$I_c(3n)$	(in ⁴)	8994	—	8994	—
S_s	(in ³)	345	345	345	345
$S_c(n)$	(in ³)	498	—	498	—
$S_c(3n)$	(in ³)	449	—	449	—
ρ	(k/')	0.744	1.207	0.744	1.207
$M \rho$	(k)	54	387	185	553
$s \rho$	(k/')	0.463	—	0.463	—
$M_s \rho$	(k)	47	—	155	—
M_L	(k)	233	200	422	248
M_{Imp}	(k)	70	55	106	62
$^5_3 [M_L + M_{Imp}]$	(k)	505	425	880	517
M_a	(k)	788	1056	1586	1391
M_u	(k)	2016	—	1878	—
$f_s \rho$ non-comp	(ksi)	1.9	13.5	6.4	19.2
$f_s \rho$ (comp)	(ksi)	1.3	—	4.1	—
$f_s \rho_3 [M_L + M_{Imp}]$	(ksi)	12.2	14.8	21.2	18.0
f_s (Overload)	(ksi)	15.4	28.3	31.7	37.2
f_s (Total)	(ksi)	—	36.8	—	48.4
VR	(k)	45.8	—	49.3	—

	Abutments	Piers 1 & 3	Pier 2	
$R \rho$	(k)	****42.5	76.6	92.9
R_L	(k)	30.6	39.2	43.7
Imp.	(k)	9.2	10.7	11.0
R_{Total}	(k)	82.3	126.5	147.6

**** Dead load reactions includes 26.4 Kips for concrete diaphragm and approach pavement.

- 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 (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 and Overload) 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 and Overload) due to long-term composite (superimposed) dead loads (in⁴ and in³).
- ρ : Un-factored non-composite dead load (kips/ft.).
- $M \rho$: Un-factored moment due to non-composite dead load (kip-ft.).
- $s \rho$: Un-factored long-term composite (superimposed) dead load (kips/ft.).
- $M_s \rho$: Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).
- M_L : Un-factored live load moment (kip-ft.).
- M_{Imp} : Un-factored moment due to impact (kip-ft.).
- M_a : Factored design moment (kip-ft.).
- 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).
 $M \rho + M_s \rho + \frac{5}{3} (M_L + M_{Imp})$
- f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 $1.3 [M \rho + M_s \rho + \frac{5}{3} (M_L + M_{Imp})]$
- VR: Maximum $L +$ impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

***TOP OF BEAM ELEVATIONS (W.B.)

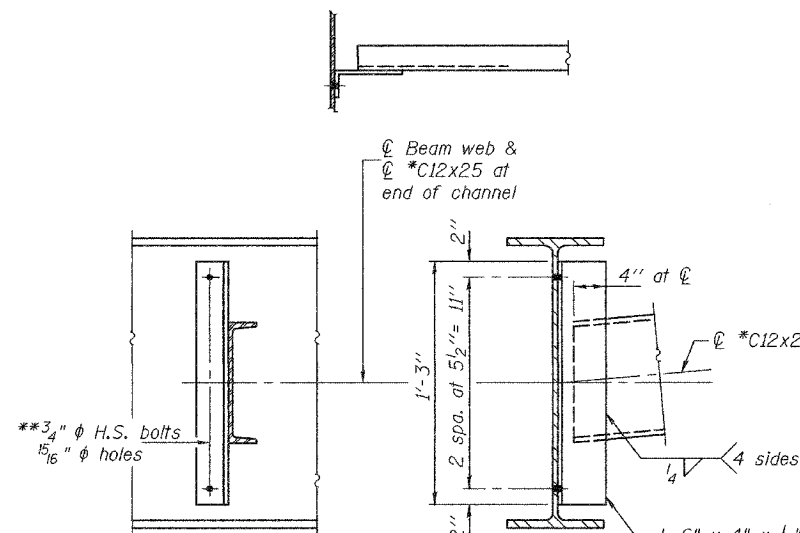
Location	℄ Brg. W. Abut.	℄ Brg. Pier 1	℄ Splice 1	℄ Brg. Pier 2	℄ Splice 2	℄ Splice 3	℄ Brg. Pier 3	℄ Brg. E. Abut.
Beam 1	751.21	751.69	751.81	752.63	752.79	753.46	753.58	754.18
Beam 2	751.34	751.82	751.94	752.76	752.92	753.59	753.71	754.31
Beam 3	751.47	751.95	752.07	752.89	753.05	753.72	753.84	754.44
Beam 4	751.59	752.07	752.19	753.01	753.16	753.84	753.96	754.56
Beam 5	751.69	752.17	752.29	753.10	753.26	753.94	754.06	754.66
Beam 6	751.69	752.18	752.30	753.11	753.27	753.94	754.07	754.67
Beam 7	751.60	752.08	752.20	753.01	753.17	753.85	753.97	754.57
Beam 8	751.48	751.96	752.08	752.90	753.06	753.73	753.85	754.45

***For fabrication use only.

***TOP OF BEAM ELEVATIONS (E.B.)

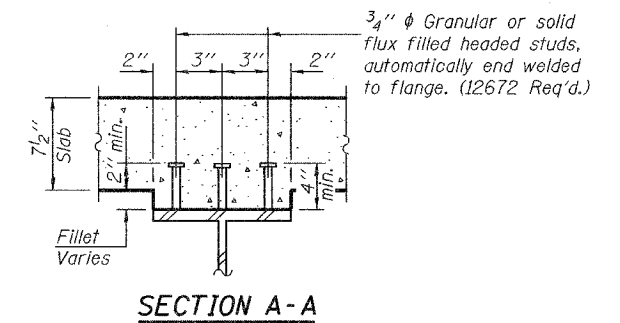
Location	℄ Brg. W. Abut.	℄ Brg. Pier 1	℄ Splice 1	℄ Brg. Pier 2	℄ Splice 2	℄ Splice 3	℄ Brg. Pier 3	℄ Brg. E. Abut.
Beam 9	751.44	751.94	752.04	752.90	753.07	753.76	753.88	754.50
Beam 10	751.55	752.05	752.15	753.01	753.18	753.87	754.00	754.62
Beam 11	751.65	752.15	752.25	753.11	753.28	753.97	754.10	754.71
Beam 12	751.64	752.14	752.24	753.10	753.27	753.96	754.09	754.71
Beam 13	751.54	752.04	752.15	753.01	753.27	753.86	753.99	754.61
Beam 14	751.43	751.92	752.03	752.89	753.05	753.75	753.87	754.49
Beam 15	751.30	751.79	751.90	752.76	752.92	753.62	753.74	754.36
Beam 16	751.17	751.66	751.77	752.63	752.79	753.49	753.61	754.23

***For fabrication use only.



DIAPHRAGM D
(210 Required)

- * Alternate channel C12x30 may be used to facilitate material acquisition. The calculated weight of structural steel is based on the lighter section, C12x25. The alternate, if utilized, will be provided at no extra cost to the department.
- ** Use 1/2" x 1/2" vertical slotted holes in angles at Beam 5 between Beams 5 & 6 for W.B. structure and at Beam 12 between Beams 11 & 12 for E.B. structure. Provide 1/2" plate washers for slotted holes. The bolts for slotted holes in angles on Stage I side of Beams 5 & 12 shall be finger tightened prior to the deck pour for Stage II construction. The bolts shall be fully tightened after completion of the deck pour for Stage II construction.



SECTION A-A

- Notes:
- Two hardened washers required for each set of oversized holes.
 - All splice plates shall be AASHTO M 270, Grade 50.
 - Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.

STRUCTURAL STEEL DETAILS
F.A.P. RTE. 301 - SEC. 3HBR-2
WINNEBAGO COUNTY
STATION 993+43.82
STRUCTURE NO. 101-0065 (E.B.)
STRUCTURE NO. 101-0066 (W.B.)

DESIGNED	Stephen M. Ryan
CHECKED	Fess Tektelaimanot
DRAWN	h.f. duong
CHECKED	SMR/FT

APPROVED	Apr. 25, 2008
EXAMINED	Thomas J. Damagala
PASSED	Ralph E. Anderson