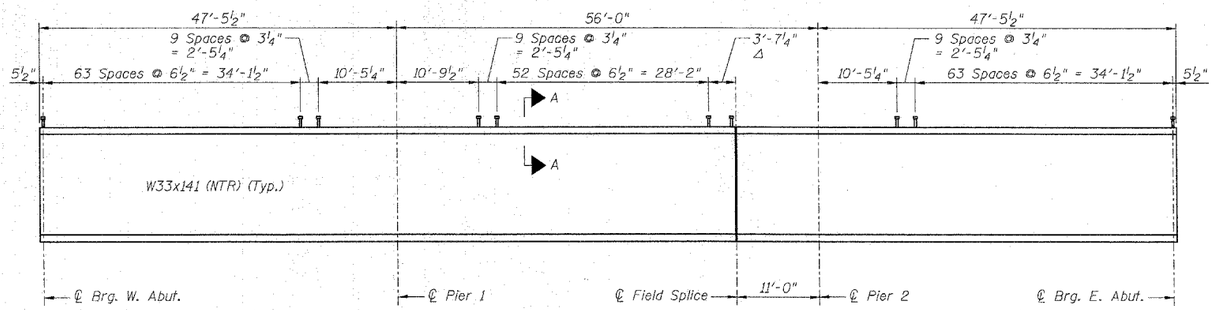
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.P. 301 (US 20)	(2HB -2)D	WINNEBAGO	107	38
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. 16
43 SHEETS

Contract #64B07



PROPOSED BEAM 1 & 12 ELEVATION

Δ See Splice Detail
"NTR" denotes beams to which notch toughness requirements are applicable

Note: Shear stud spacing shown is to be used on both existing and new beams.

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Pier	0.5 Sp. 2
I_s	(in^4)	7450	7450	7450
$I_c(n)$	(in^4)	19305	-	19305
$I_c(3n)$	(in^4)	14260	-	14260
S_s	(in^3)	448	448	448
$S_c(n)$	(in^3)	640	-	640
$S_c(3n)$	(in^3)	580	-	580
Z	(in^3)	-	-	-
ℓ	(k/')	0.90	1.05	0.90
$M\ell$	('k)	143	268	115
$s\ell$	(k/')	0.15	-	0.15
$M_s\ell$	('k)	27	-	27
ML	('k)	337	189	342
M_{Imp}	('k)	98	53	94
$\frac{5}{3}[ML + Imp]$	('k)	725	403	727
M_a	('k)	1164	872	1130
* M_u	('k)	1834	-	1850
f_s ℓ non-comp	(ksi)	3.9	7.3	3.1
f_s ℓ (comp)	(ksi)	0.6	-	0.6
f_s $\frac{5}{3}[ML + M_{Imp}]$	(ksi)	13.6	10.9	13.6
f_s (Overload)	(ksi)	18.1	18.2	17.3
** f_s (Total)	(ksi)	-	23.7	-
VR	(k)	38.3	-	39.9

INTERIOR GIRDER REACTION TABLE			
		Abut.	Pier
$R\ell$	(k)	18.8	59.6
RL	(k)	38.1	45.3
Imp.	(k)	11.1	12.8
R_{Total}	(k)	68.0	117.7

* Compact section
** Braced non-compact and partially braced section

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 ($in.^3$).

ℓ: Un-factored non-composite dead load (kips/ft.).

$M\ell$: Un-factored moment due to non-composite dead load (kip-ft.).

$s\ell$: Un-factored long-term composite (superimposed) dead load (kips/ft.)

$M_s\ell$: Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).

ML: Un-factored live load moment (kip-ft.).

M_{Imp}: Un-factored moment due to impact (kip-ft.).

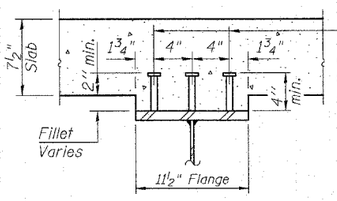
M_a: Factored design moment (kip-ft.).
$1.3\ [M\ell + M_s\ell + \frac{5}{3}(ML + M_{Imp})]$

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).
$M\ell + M_s\ell + \frac{5}{3}(ML + M_{Imp})$

f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
$1.3\ [M\ell + M_s\ell + \frac{5}{3}(ML + M_{Imp})]$

VR: Maximum L + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).



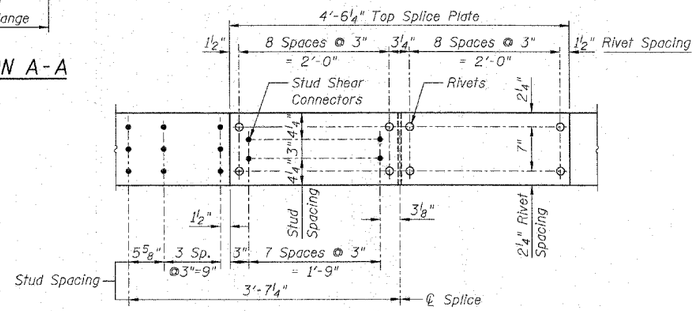
¾" ϕ Granular or solid flux filled headed studs, automatically end welded to flange. (2,640 Required)

SECTION A-A

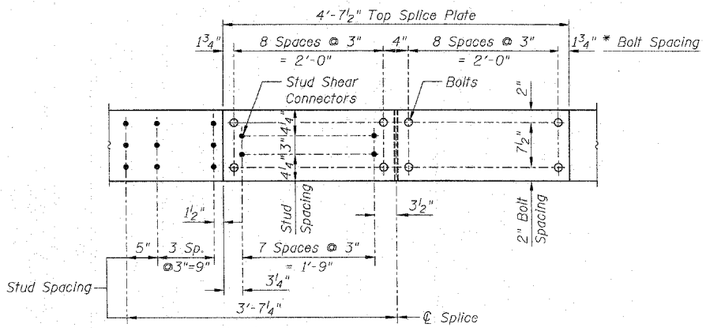
TOP OF BEAM ELEVATIONS

Location/Beam No.	1	12
℄ Brg. W. Abut.	764.48	764.01
Pier 1	763.96	763.60
℄ Field Splice	763.46	763.21
Pier 2	763.37	763.12
℄ Brg. E. Abut.	762.98	762.72

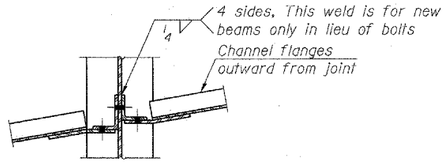
For fabrication only



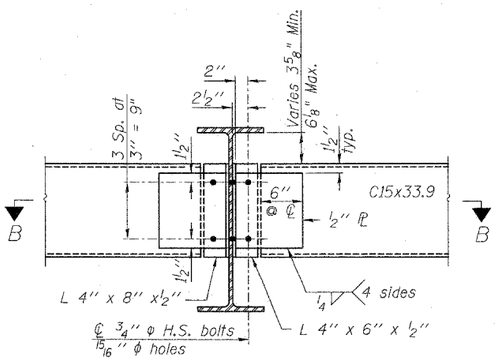
EXISTING SPLICE DETAIL



BEAM 1 & 12 SPLICE DETAIL



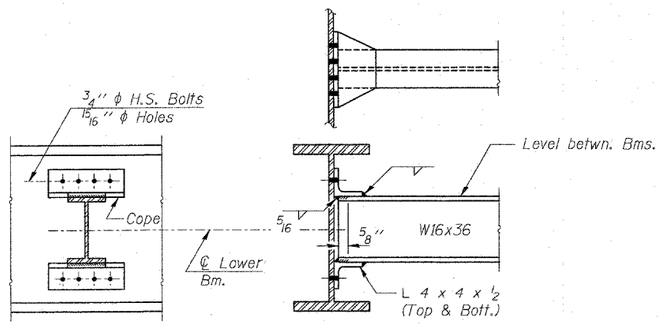
SECTION B-B



END DIAPHRAGM D

(20 Required)

Notes:
Two hardened washers required for each set of oversized holes.
Existing angles welded to existing beams to be removed using the air-arc method.
Bolt holes for proposed diaphragm connection to be field drilled in the existing beam using the proposed connection angle as the template. Cost included with Furnishing and Erecting Structural Steel.



DIAPHRAGM D1

(12 Required)

Note:
Two hardened washers shall be required over all oversize holes for diaphragms.
Bolt holes for proposed diaphragm connection to be field drilled in the existing beam using the proposed connection angle as the template. Cost included with Furnishing and Erecting Structural Steel.

DESIGNED	LAS
CHECKED	DAZ
DRAWN	SAW
CHECKED	LAS

Plans Prepared by: Zroka Engineering, P.C.

STRUCTURAL STEEL DETAILS
F.A.P. ROUTE 301 (US 20)
OVER PRAIRIE ROAD
SECTION (2HB-2)D
WINNEBAGO COUNTY
STATION 841+89.60
STRUCTURE NO. 101-0051 (W.B.)
STRUCTURE NO. 101-0052 (E.B.)