

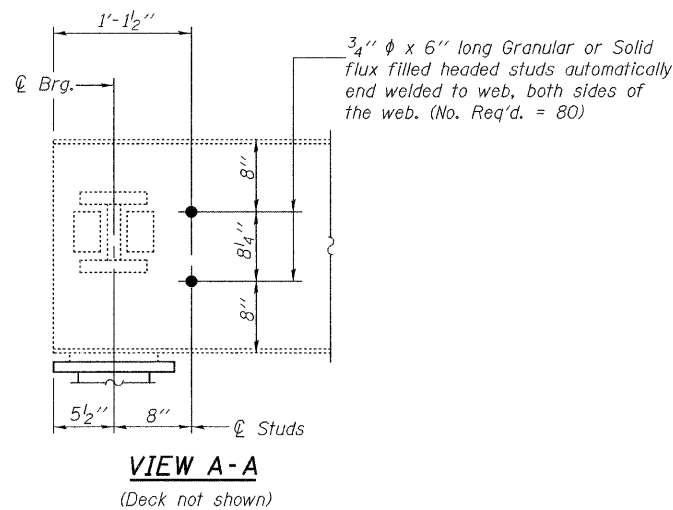
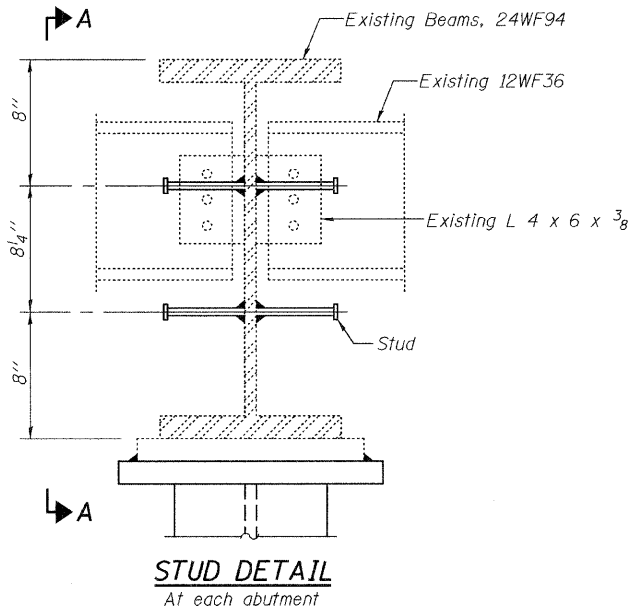
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 16
F.A.U. 9181	52BR	ST. CLAIR	41	32	25 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

Contract #76120

		0.4 Sp. 1 0.6 Sp. 3	Pier 1 Pier 2	0.5 Span 2
I_s	(in ⁴)	2700	2700	2700
$I_s(n)$	(in ⁴)	8104	-	8104
$I_c(3n)$	(in ⁴)	5944	-	5944
S_s	(in ³)	222	222	222
$S_c(n)$	(in ³)	346	-	346
$S_c(3n)$	(in ³)	311	-	311
q	(k/ft)	0.69	1.09	0.69
Mq	(k)	34.2	148.4	66.2
sq	(k/ft)	0.4	-	0.4
Msq	(k)	24.2	-	49.2
M_L	(k)	134.3	94.4	201.6
M_I	(k)	40.3	28.3	60.5
$S_3(M_L+I)$	(k)	291	204.5	436.8
M_a	(k)	454.2	458.8	717.9
M_u	(k)	1030	-	1115
$f_{s\ell}$ non-comp	(ksi)	1.9	8.0	3.6
$f_{s\ell}$ comp	(ksi)	0.9	-	1.9
$f_{s\ell} S_3(M_L+I)$	(ksi)	10.1	11.1	15.2
f_s (Overload)	(ksi)	12.9	19.1	20.7
f_s (Total)	(ksi)	-	24.8	-
VR	(k)	38.0	-	34.8

	Abut.	Piers	
Rq	(k)	11.4	45.3
R_L	(k)	26.3	35.2
R_{Imp}	(k)	7.9	10.6
R (Total)	(k)	45.6	91.1



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).

q : Un-factored non-composite dead load (kips/ft.).
 Mq : Un-factored moment due to non-composite dead load (kip-ft.).
 sq : Un-factored long-term composite (superimposed) dead load (kips/ft.).
 Msq : 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_a : Factored design moment (kip-ft.).
 $1.3 [Mq + Msq + \frac{5}{3} (M_L + M_I)]$
 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).
 $Mq + Msq + \frac{5}{3} (M_L + M_I)$

f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 $1.3 [Mq + Msq + \frac{5}{3} (M_L + M_I)]$

VR: Maximum $\frac{1}{2}$ + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

DESIGNED	WAB/SMR
CHECKED	DFZ/FT
BML DRAWN	PAUL W. SWEET
CHECKED	DFZ/SMR/DPN/FT

November 23, 2009
 EXAMINED *Thomas J. Demagala*
 ENGINEER OF BRIDGE DESIGN
 PASSED *Ralph E. Anderson*
 ENGINEER OF BRIDGES AND STRUCTURES

STRUCTURAL STEEL DETAILS
 F.A.U. RTE. 9181 - SECTION 52BR
 ST. CLAIR COUNTY
 STATION 39+89.80
 STRUCTURE NO. 082-0136