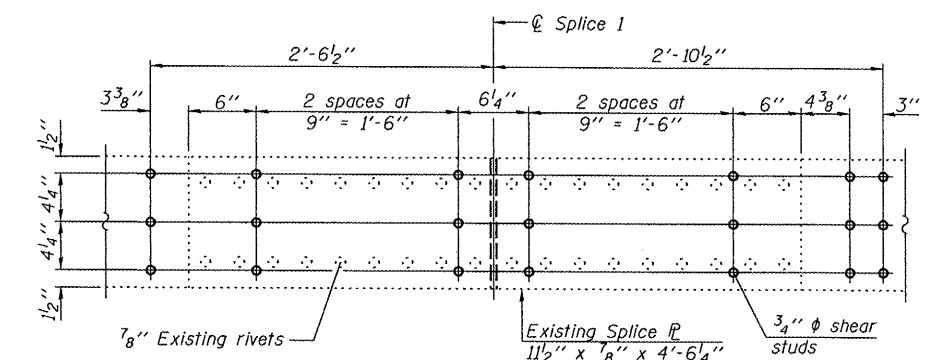


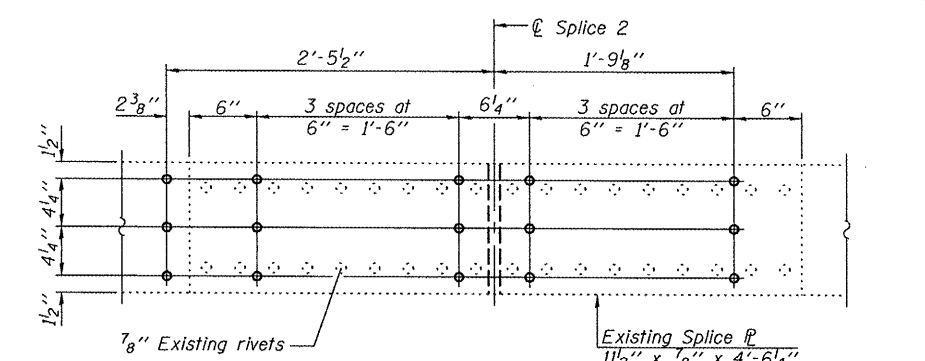
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO. F.A.P. 313	SECTION (21-HB-11)	COUNTY KNOX	SHEET 55	OF SHEETS 42	SHEET NO. 25 35 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT	

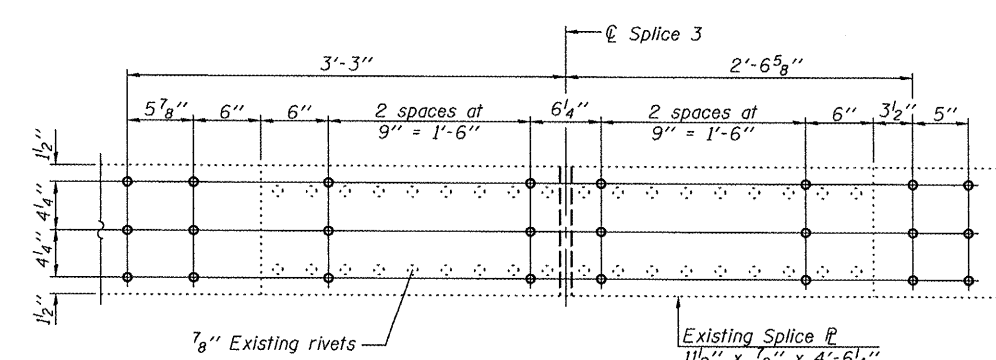
Contract #68216



VIEW A-A



VIEW B-B

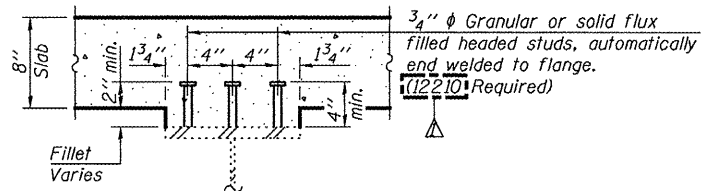


VIEW C-C

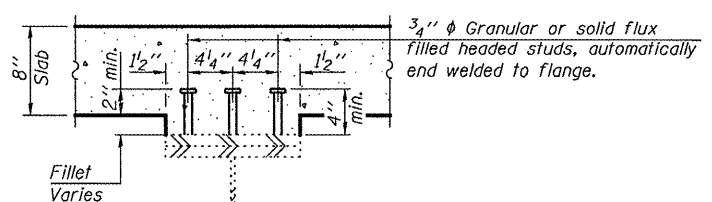
	0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.5 Sp. 3	Pier 3	0.6 Sp. 4
I_s (in^4)	7450	7450	7450	11227	7450	7450	7450
$I_c(n)$ (in^4)	19570		19570		19570		19570
$I_c(3n)$ (in^4)	14331		14331		14331		14331
S_s (in^3)	448	448	448	650	448	448	448
$S_c(n)$ (in^3)	652		652		652		652
$S_c(3n)$ (in^3)	589		589		589		589
Z (in^3)				597			
Q (k/ft)	0.905	1.338	0.905	1.338	0.905	1.338	0.905
M_D (k)	85	438	215	671	196	414	95
s_D (k/ft)	0.433		0.433		0.433		0.433
M_{sD} (k)	54		140		129		57
M_L (k)	270	215	446	296	434	210	273
M_{Imp} (k)	80	58	112	75	110	57	81
$S_3 [M_L + M_{Imp}]$ (k)	584	455	930	617	907	445	589
M_a (k)	940	1161	1671	1675	1601	1117	964
M_u (k)	1967		2693	1790	2049		1983
$f_s Q$ non-comp (ksi)	2.3	11.7	5.8	12.4	5.2	11.1	2.5
$f_s Q$ (comp) (ksi)	1.1		2.8		2.6		1.2
$f_s S_3 [M_L + M_{Imp}]$ (ksi)	10.7	12.2	17.1	11.4	16.7	11.9	10.8
f_s (Overload) (ksi)	14.1	23.9	25.7	23.8	24.5	23.0	14.5
f_s (Total) (ksi)		31.1				29.9	
VR (k)	48.9		44.7		44.9		44.8

	W. Abut.	Pier 1	Pier 2	Pier 3	E. Abut.
R_D (k)	*50.0	85.7	104.2	83.6	*50.8
R_L (k)	33.2	42.1	47.2	41.8	33.3
Imp. (k)	9.8	11.4	11.9	11.4	9.8
R_{Total} (k)	93.0	139.2	163.3	136.8	93.9

*Dead load reactions include 30.3 kips for concrete diaphragm and approach pavement.



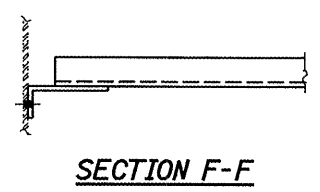
SECTION D-D



SECTION E-E

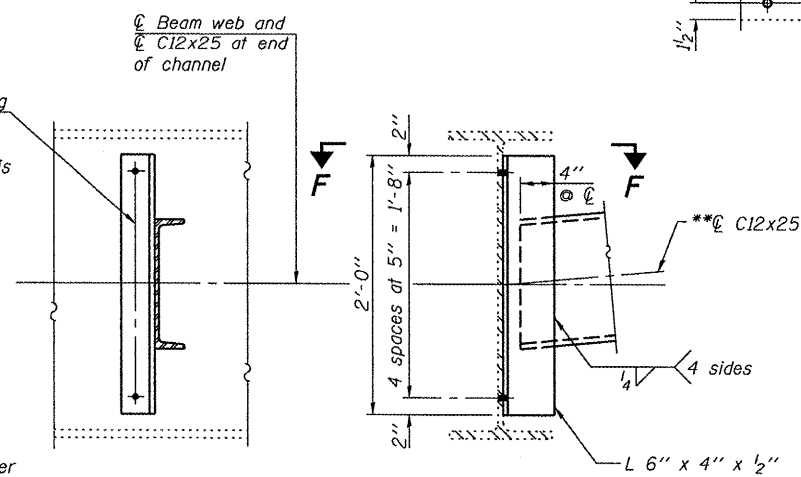
(At existing splice plate)

- 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).
- Q : Un-factored non-composite dead load (kips/ft.).
- M_D : Un-factored moment due to non-composite dead load (kip-ft.).
- s_D : Un-factored long-term composite (superimposed) dead load (kips/ft.).
- M_{sD} : 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.).
 $1.3 [M_D + M_{sD} + \frac{5}{8} (M_L + M_{Imp})]$
- 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).
 $M_D + M_{sD} + \frac{5}{8} (M_L + M_{Imp})$
- f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 $1.3 [M_D + M_{sD} + \frac{5}{8} (M_L + M_{Imp})]$
- VR: Maximum $\frac{1}{4}$ impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).



SECTION F-F

Field drill $\frac{13}{16}$ " ϕ holes in existing beams thru $\frac{13}{16}$ " ϕ holes in new connection angles for $\frac{3}{4}$ " ϕ H.S. Bolts. Cost of field drilling is included with Furnishing and Erecting Structural Steel.



PROPOSED DIAPHRAGM

(14 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.

DESIGNED FT	April 28 2008
CHECKED DPN	EXAMINED <i>Thomas J. Demagalli</i>
DRAWN Gregory D. Farmer	PASSED <i>Ralph E. Anderson</i>
CHECKED FT/DPN	ENGINEER OF BRIDGES AND STRUCTURES

STRUCTURAL STEEL DETAILS
F.A.P. ROUTE 313 - SECTION (21-HB-11)
KNOX COUNTY
STA. 495+98.72
STRUCTURE NO. 048-0021
STRUCTURE NO. 048-0022