

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

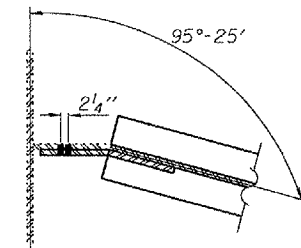
ROUTE NO.	SECTION	COUNTY	SHEET	SHEET NO. 16
F.A.P. 313	18-HB	KNOX	10	37
FED. PROJ. DIST. NO. 7	ILLINOIS	FED. AID PROJECT		23 SHEETS

Contract #68190

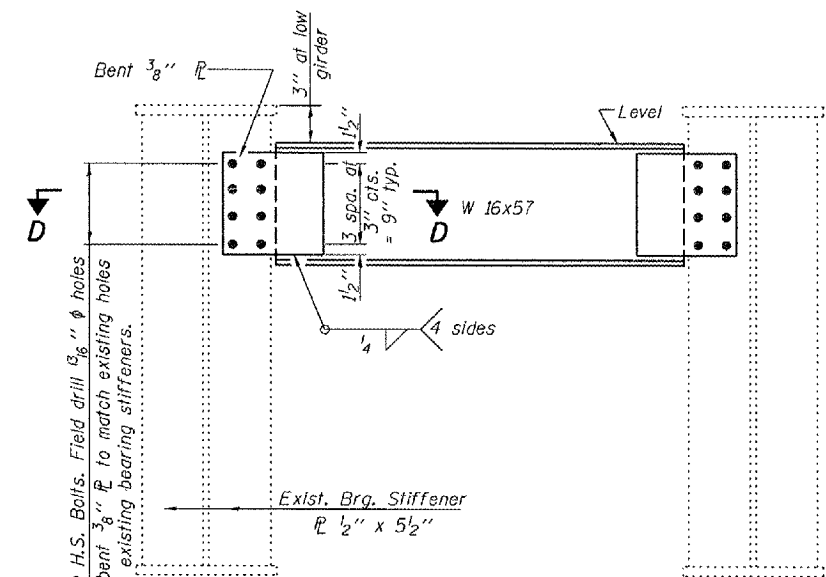
	0.4 Sp. 1	Pier	0.6 Sp. 2
I_s	11972	19829	11972
$I_c(n)$	31416		31416
$I_c(3n)$	23111		23111
S_s	531	896	531
$S_c(n)$	822		822
$S_c(3n)$	747		747
Z		997	
ϕ	0.871	1.299	0.871
$M\phi$	344	1182	422
$s\phi$	0.343		0.343
$M_s\phi$	171		202
M_L	591	438	629
$M(Imp)$	144	105	148
$S_s[M_L + M(Imp)]$	1225	905	1295
M_a	2262	2713	2495
M_u	3359	2991	3359
$f_s\phi$ non-comp	7.8	15.8	9.5
$f_s\phi$ (comp)	2.7		3.2
$f_s S_s [M_a + M(Imp)] / k.s.i.$	17.9	12.1	18.9
f_s (Overload)	28.4	27.9	31.6
f_s (Total)			
VR	50.1		49.7

	W. Abut.	Pier	E. Abut.
$R\phi$	35.6	133.7	39.1
R_L	36.8	54.1	37.0
Imp.	8.9	12.9	8.7
R (Total)	81.3	200.7	84.8

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



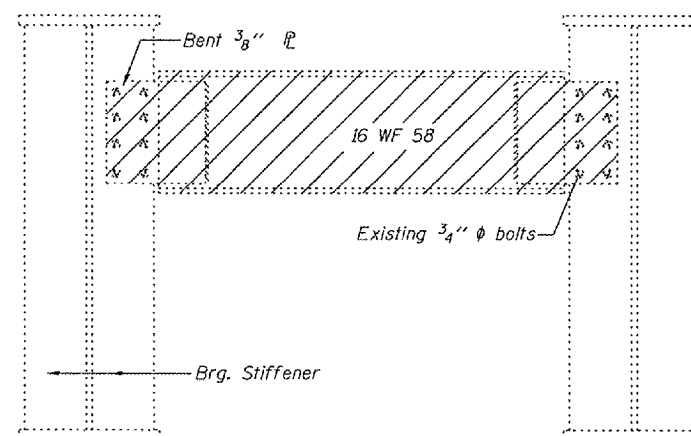
SECTION D-D



END DIAPHRAGM D
(8 required)

Notes:
Field verify all dimensions prior to ordering steel.
Cost of field drilling included with Furnishing and Erecting Structural Steel.
Diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
Care shall be taken not to damage existing steel that is to be reused.

Indicates steel to be removed as Structural Steel Removal



END DIAPHRAGM REMOVAL
(8 locations total, 4 of each abutment)

BILL OF MATERIAL

Item	Unit	Total
Structural Steel Removal	Pound	2820

DESIGNED Stephen M. Ryan
CHECKED Phillip R. Litchfield
DRAWN R. Sommer
CHECKED SMR/SEM

Nov. 20 2007
EXAMINED *Thomas J. Nangalaki*
PASSED *Ralph E. Anderson*

STRUCTURAL STEEL DETAILS
F.A.P. RT. 313 SECTION 18-HB
KNOX COUNTY
STATION 20+11.14
STRUCTURE NO. 048-0069