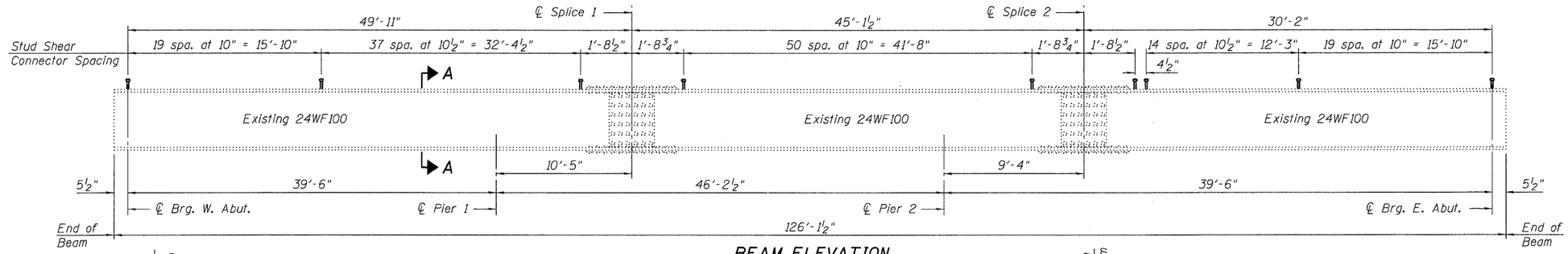
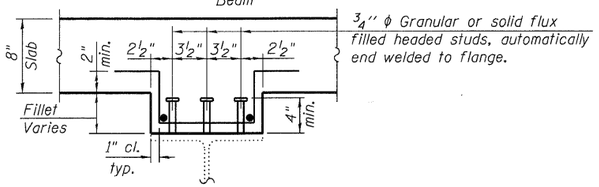
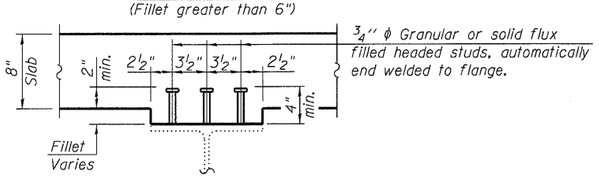


BEAM ELEVATION

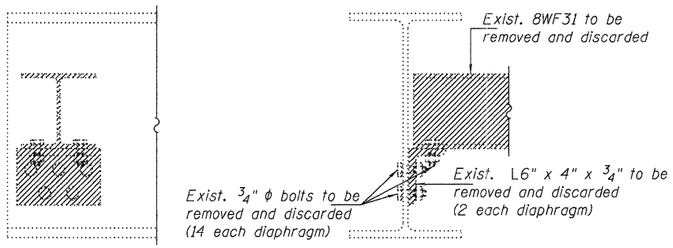


SECTION A-A
(Fillet greater than 6")

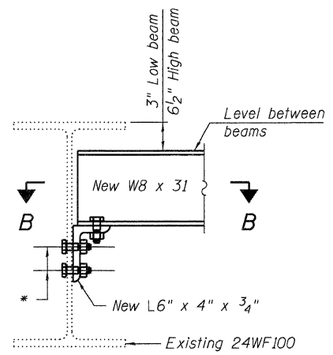


SECTION A-A
(Fillet less than 6")

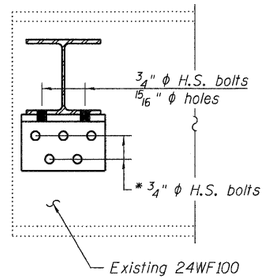
Note:
Stud Shear Connectors required = 2,574/Bridge.

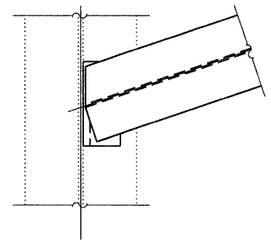


END DIAPHRAGM "D" REMOVAL DETAIL
(Total 20 Diaphragms to be removed. Cost included with Structural Steel Removal.)



* Field drill $^{15}/_{16}$" ϕ holes in new connector angle L6" x 4" x ¾" and connect with ¾" ϕ H.S. bolts. Use existing holes in beam web as a template. Cost included with Furnishing and Erecting Structural Steel.





SECTION B-B

Notes:
Two hardened washers shall be required over all oversized holes in diaphragms.

END DIAPHRAGM "D"
(Total 16 required)

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Pier 1 & 2	0.5 Sp. 2
I_s	(in^4)	2987.3	2987.3	2987.3
$I_c(n)$	(in^4)	11962.5		11962.5
$I_c(3n)$	(in^4)	8468.6	8468.6	8468.6
$I_c(cr)$	(in^4)		5230.3	
S_s	(in^3)	248.9	248.9	248.9
$S_c(n)$	(in^3)	455.2		455.2
$S_c(3n)$	(in^3)	405.5	405.5	405.5
$S_c(cr)$	(in^3)		292.7	
Z	(in^3)			
$\mathcal{D}$	(k/')	0.855	0.855	0.855
$M\mathcal{D}$	('k)	98	156	72
$s\mathcal{D}$	(k/')	0.310	0.310	0.310
$M_s\mathcal{D}$	('k)	35	57	26
M_L	('k)	203	156	196
M_{IM}	('k)	61	47	57
$^5/_3[M_L + I]$	('k)	439	338	422
M_a	('k)	744	717	676
* M_u	('k)	1255		1284
f_s $\mathcal{D}$ non-comp	(ksi)	4.7	7.5	3.5
f_s $\mathcal{D}$ (comp)	(ksi)	1.0	2.3	0.8
$f_s(^5/_3[M_L + M_{IM}])$	(ksi)	11.6	13.9	11.1
f_s (Overload)	(ksi)	17.3	23.7	15.4
** f_s (Total)	(ksi)		30.8	
VR	(k)	29.6	53.4	31.2

INTERIOR GIRDER REACTION TABLE			
		W. Abut. & E. Abut.	Pier 1 & 2
*** $R\mathcal{D}$	(k)	46.7	55.3
R_L	(k)	34.1	42.1
R_I	(k)	10.2	10.0
R_{Total}	(k)	91.0	107.4

* Compact section
** Braced non-compact and partially braced section
*** Includes Approach Slab dead load reaction at Abutments.

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 $in.^3$).

$I_c(cr)$, $S_c(cr)$: Composite moment of inertia and section modulus of the steel and deck based upon the cracked concrete section with negative moment reinforcement. Used for computing f_s (Total and Overload) due to short and long-term composite dead and live loads in the negative moment region.

Z: Plastic Section Modulus of the steel section in non-composite areas ($in.^3$).

$\mathcal{D}$: Un-factored non-composite dead load (kips/ft.).

$M\mathcal{D}$: Un-factored moment due to non-composite dead load (kip-ft.).

$s\mathcal{D}$: Un-factored long-term composite (superimposed) dead load (kips/ft.)

$M_s\mathcal{D}$: 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.).
$1.3\ [M\mathcal{D} + M_s\mathcal{D} + \frac{5}{3}(M_L + M_I)]$

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).
$M\mathcal{D} + M_s\mathcal{D} + \frac{5}{3}(M_L + M_I)$

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

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

BILL OF MATERIAL

Item	Unit	Total
Furnishing and Erecting Structural Steel	Pound	4,160
Structural Steel Removal	Pound	5,170
Stud Shear Connectors	Each	5,148

USER NAME = dheberling	DESIGNED - RJN/BRD	REVISED -	
FILE NAME = 043D002&3-64C94.dgn	CHECKED - SBC	REVISED -	
PLOT DATE = 12/6/2011	DRAWN - DLH	REVISED -	
PLOT TIME = 10:03:00 AM	CHECKED - SBC	REVISED -	

WHKS & CO. ENGINEERING
7018 KINGSMILL CT., SPRINGFIELD, IL
(217) 483-9457
DESIGN FIRM #184001036

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 043-0002 & 043-0003
SHEET NO. 19 OF 28 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	(43B, 44B, 44HB, 45B)D	JO DAVIESS	309	104
		CONTRACT NO. 64C94		
	ILLINOIS FED. AID PROJECT			