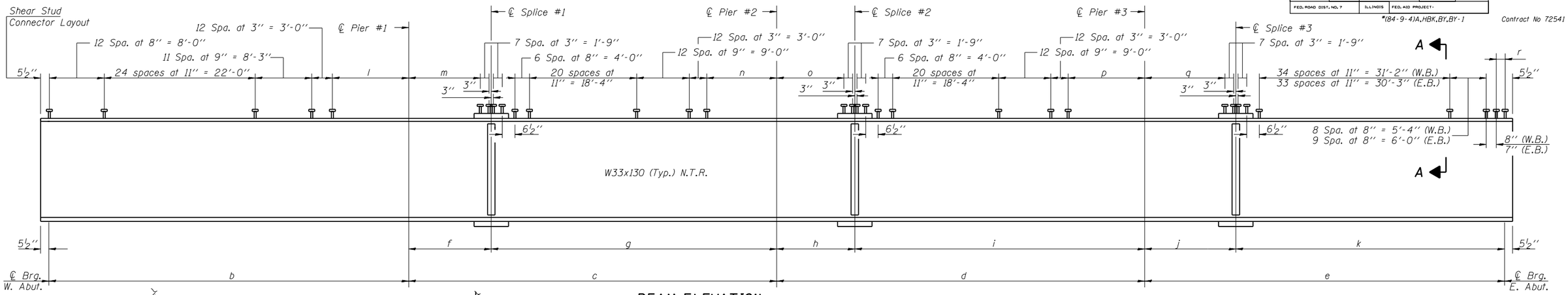
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAI 72 FAU 8021	*	SANGAMON	559	274
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

*(84-9-4)A,HBK,BY,BY-1

SHEET NO. 21

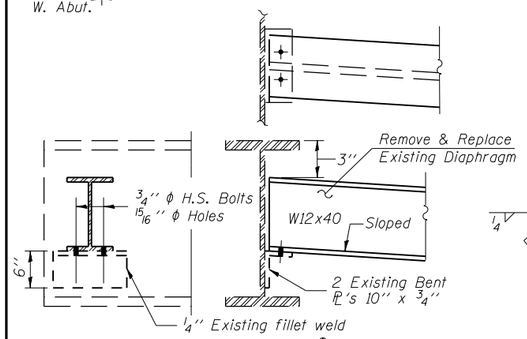
44 SHEETS

Contract No 72541



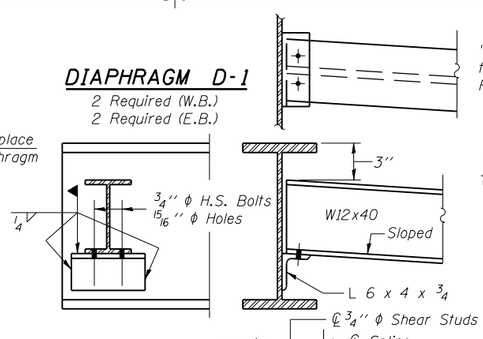
BEAM ELEVATION

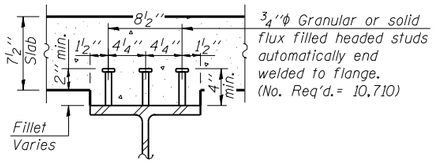
"NTR" denotes members to which notch toughness requirements are applicable.
For dimensions b thru k see sheet 20 of 44.



DIAPHRAGM D-1

2 Required (W.B.)
2 Required (E.B.)

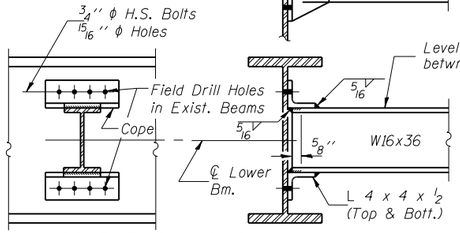




SECTION A-A

DIAPHRAGM D

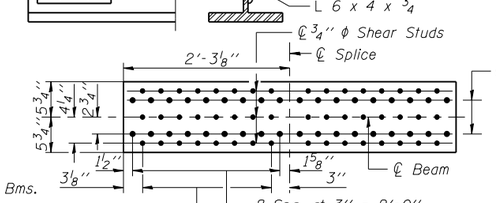
10 Required (W.B.)
10 Required (E.B.)



DIAPHRAGM D-2

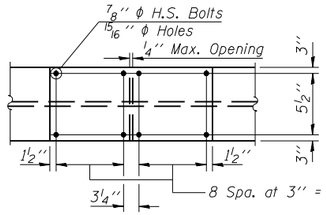
13 Required (W.B.)
13 Required (E.B.)

Note:
Two hardened washers shall be required over all oversize holes for diaphragms.

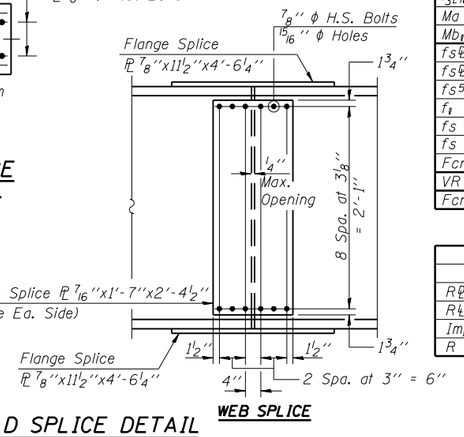


SHEAR STUD LAYOUT AT SPLICE

H.S. Bolts and Stud patterns are symmetrical.



TOP & BOTTOM FLANGE SPLICE



WEB SPLICE

*TOP OF BEAM ELEVATIONS

Location \ Beam	Beam #1	Beam #14
℄ Brg. W. Abut.	631.16	632.81
℄ Pier #1	631.25	632.95
℄ Splice #1	631.27	632.99
℄ Pier #2	631.31	633.09
℄ Splice #2	631.33	633.12
℄ Pier #3	631.30	633.15
℄ Splice #3	631.29	633.16
℄ Brg. E. Abut.	631.28	633.20

* For Fabrication only.

FIELD SPLICE DETAIL

H.S. Bolts shall conform to AASHTO M-164 Specifications (ASTM A325)

BEAM DIMENSIONS

(Measured Along Centerline of Beam)

Line No.	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5	Beam 6	Beam 7	Beam 8	Beam 9	Beam 10	Beam 11	Beam 12	Beam 13	Beam 14
l	11'-1 7/16''	11'-1⅛''	11'-0 7/8''	11'-0 5/8''	11'-0½''	11'-0''	10'-11¾''	10'-8 5/8''	10'-8½''	10'-8⅛''	10'-7¾''	10'-7 5/8''	10'-7¼''	10'-7 1/16''
m	12'-1½''	12'-1½''	12'-1⅜''	12'-1¼''	12'-1⅛''	12'-1⅛''	12'-1''	12'-0⅜''	12'-0¼''	12'-0⅛''	12'-0''	11'-11⅞''	11'-11⅞''	11'-11¾''
n	11'-11½''	11'-11¼''	11'-10 7/8''	11'-10½''	11'-10⅛''	11'-9¾''	11'-9 5/8''	11'-6½''	11'-6¼''	11'-5 7/8''	11'-5 7/8''	11'-5½''	11'-5⅛''	11'-5''
o	11'-6⅛''	11'-6⅛''	11'-6⅛''	11'-6⅛''	11'-6''	11'-6''	11'-5 3/4''	11'-5''	11'-4 7/8''	11'-4¾''	11'-4½''	11'-4½''	11'-4½''	11'-4 3/8''
p	13'-2 5/8''	13'-2¼''	13'-1 7/8''	13'-1½''	13'-1¼''	13'-0 7/8''	13'-0½''	12'-9''	12'-8 5/8''	12'-8½''	12'-8¼''	12'-8''	12'-7 3/8''	12'-7¼''
q	11'-8''	11'-8''	11'-7 5/8''	11'-7½''	11'-7½''	11'-7½''	11'-7⅜''	11'-6½''	11'-6½''	11'-6¼''	11'-6''	11'-5 7/8''	11'-5 7/8''	11'-6 5/8''
r	6 3/8''	6⅛''	6''	5 5/8''	5⅛''	4 7/8''	4½''	5¾''	5⅜''	5⅛''	5''	4¾''	4⅜''	3 7/16''

INTERIOR BEAM MOMENT TABLE

		0.4 Sp. 1 or 0.6 Sp. 4	Pier #1 or #3	0.5 Sp. 2 or Sp. 3	Pier #2
Is	(in⁴)	6710	6710	6710	6710
Ic (n)	(in⁴)	21228	-	21228	-
Ic (3n)	(in⁴)	15074	-	15074	-
Ss	(in³)	406	406	406	406
Sc (n)	(in³)	665	-	665	-
Sc (3n)	(in³)	591	-	591	-
St	(in³)	18.9	18.9	18.9	18.9
℄	(k/ft.)	0.81	1.08	0.81	1.08
M℄	('k)	168.2	369.0	134.9	354.8
s℄	(k/ft.)	0.27	-	0.27	-
Ms℄	('k)	58.5	-	47.6	-
ML	('k)	305.7	243.4	289.8	248.1
M (Imp)	('k)	76.4	48.7	72.5	49.6
5/3[ML+M(Imp)]	('k)	636.8	486.8	603.8	496.2
Ma	('k)	1122.6	1112.5	1022.2	1106.3
Mbt	('k)	0.5	0.0	0.35	0.0
fs℄ non-comp	(k.s.i.)	5.0	10.9	4.0	10.5
fs℄ (comp)	(k.s.i.)	1.2	-	1.0	-
fs 5/3[ML+M(Imp)]	(k.s.i.)	11.5	14.4	10.9	14.7
ft	(k.s.i.)	0.3	0.0	0.2	0.0
fs (Overload)	(k.s.i.)	17.7	25.3	15.9	25.2
fs (Total)	(k.s.i.)	23.0	32.9	20.7	32.8
Fcr (Overload)	(k.s.i.)	34.2	34.2	34.2	34.2
VR	(k)	56.2	-	58.4	-
Fcr	(k.s.i.)	35.9	36.0	35.9	36.0

INTERIOR BEAM REACTION TABLE

		E.&W. Abut.	Piers #1 & #3	Pier #2
R℄	(k)	22.5	70.6	68.3
RL	(k)	41.5	49.4	49.2
Imp.	(k)	12.4	14.8	14.7
R (Total)	(k)	76.4	134.8	132.2

Fcr Critical average flange stress (smaller of Fcr1 or Fcr2 for partially braced flanges and Fy for continuously braced flanges) computed according to the 2003 AASHTO Guide Specifications for Horizontally Curved Steel Girder Highway Bridges (Sections 5.2, 5.3 and 5.4).

Fcr (Overload) Critical average flange stress at overload computed according to the 2003 AASHTO Guide Specifications for Horizontally Curved Steel Girder Highway Bridges Section 9.5.

Is and Ss are the moment of inertia and section modulus of the steel section used in computing fs (Total & Overload).

Ic(n) and Sc(n) are the moment of inertia and section modulus of the composite section used in computing stresses due to Live Load.

Ic(3n) and Sc(3n) are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed dead loads. (see AASHTO 10.38)

VR is the maximum Live Load + Impact shear range in span.

M℄ Moment due to dead loads on non-composite section.

Ms℄ Moment due to dead loads on composite section.

ML Moment due to live load on non-composite or composite section.

M (Imp) Moment due to live load impact on non-composite or composite section.

Ma (Applied Moment)=1.3[M℄ + Ms℄ +5/3(ML + M(Imp))].

fs (Overload) is the sum of the stresses due to M℄ + Ms℄ +5/3(ML + M(Imp)).

fs (Total) is the sum of the stresses due to 1.3[M℄ + Ms℄ +5/3(ML + M(Imp))].

Sbt is the section modulus for one flange for lateral flange bending.

Mbt is the lateral bending moment for flange (factored).

ft is the calculated normal stress at the edge of flange due to lateral bending (factored).

ML and RL include the effects of centrifugal force and superelevation.

LAYOUT	MNM	06/27/03
DRAWN	DAP	07/17/03
REVIEWED	JWM	10/27/03

$FILE$
12/16/2006

Corporate License Number 184-001-084

STRUCTURAL STEEL DETAILS
F.A.I. 72 OVER UNION PACIFIC RAILROAD
SECTION (84-9-4)A,HBK,BY,BY-1
SANGAMON COUNTY
STATION 608+51.98
STR NO. 084-0074 EB - 084-0075 WB

HANSON

JOB* 96S2002B

DATE: 01/12/06