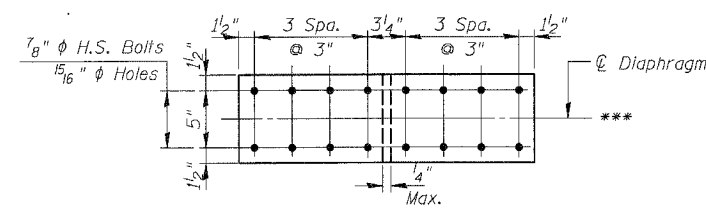


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

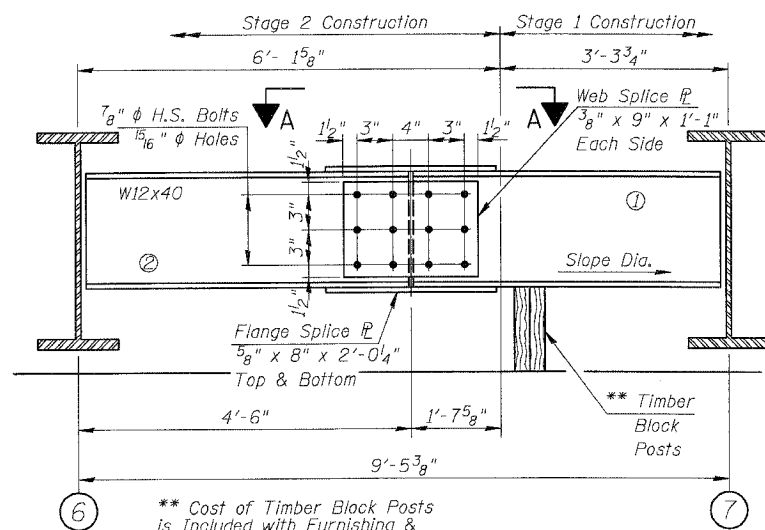
ROUTE NO.	SECTION	COUNTY	SHEET NO.	SHEET	SHEET NO. S13 OF S26 SHEETS
86	Q	GRUNDY	86	52	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT			

Q-BR



*** Place Diaphragms Along the Skew Line.

VIEW A-A



END DIAPHRAGM D

2 Required
(Looking Upstation)

For details of connections to beams for Diaphragm D, see Diaphragm D₁.

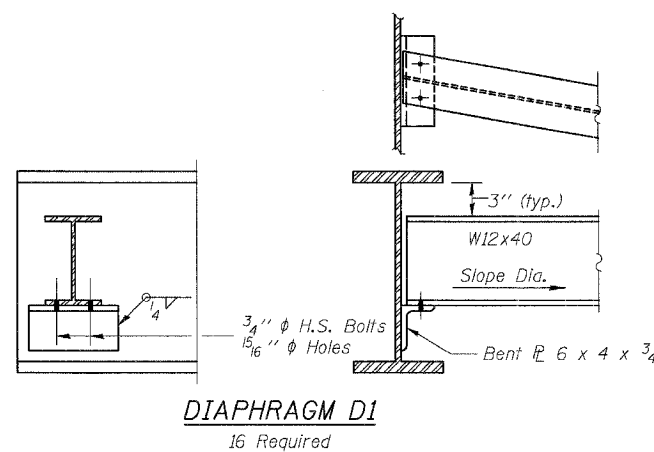
DIAPHRAGM D CONSTRUCTION SEQUENCE

- 1.) Order Diaphragm D in two sections with lengths as shown for Sections ① and ②.
- 2.) Attach section ① of Diaphragm to Beam 7 during Stage 1 Construction.
- 3.) Place Timber Block Posts between section ① of diaphragm and abutment bearing seat.
- 4.) Attach section ② of diaphragm to both Beam 6 and Section ① through top flange splice during Stage 2 Construction.
- 5.) Attach web splice plates to sections ① and ② of diaphragms.
- 6.) Attach bottom flange splice plate to sections ① and ② of diaphragms.
- 7.) Remove Timber Block Posts.

TOP OF BEAM ELEVATIONS

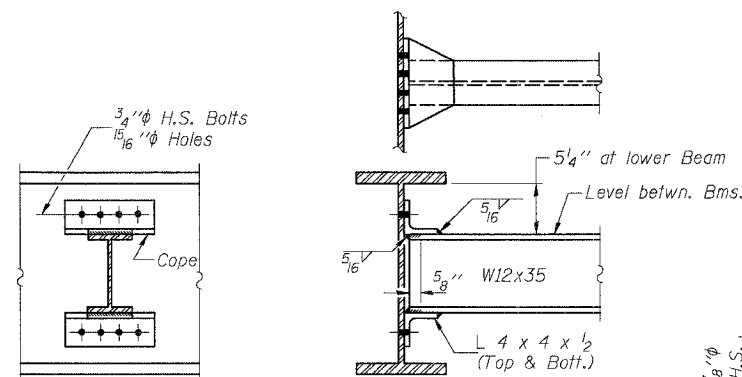
(for fabrication use only)

Beam No.	Abut. E.	Splice 1	Pier 1	Pier 2	Splice 2	Abut. E.
1	537.49	537.29	537.26	537.08	537.05	536.93
2	537.67	537.47	537.44	537.27	537.24	537.13
3	537.84	537.64	537.62	537.45	537.42	537.32
4	537.98	537.78	537.76	537.59	537.57	537.48
5	538.12	537.92	537.90	537.73	537.71	537.64
6	538.13	537.94	537.91	537.75	537.73	537.67
7	538.03	537.83	537.80	537.65	537.62	537.57
8	537.92	537.72	537.70	537.54	537.51	537.48
9	537.78	537.58	537.56	537.40	537.37	537.34
10	537.63	537.43	537.41	537.25	537.23	537.20



DIAPHRAGM D1

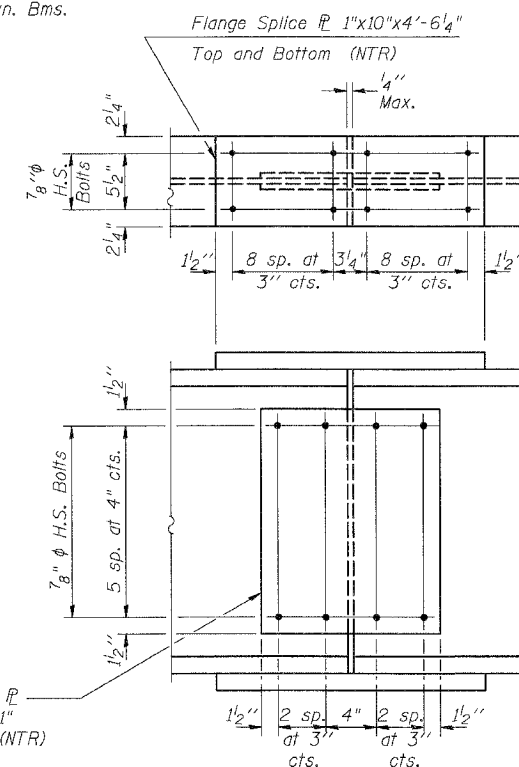
16 Required



DIAPHRAGM D2

54 Required

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



DETAIL OF SPLICE 1 & 2

INTERIOR BEAM MOMENT TABLE

	0.4 Sp. 1 & 0.6 Sp. 3	Pier 1 & Pier 2	0.5 Sp. 2
I _s	4090	4090	4090
I _c (n)	12340	-	12340
I _c (3n)	9104	-	9104
S _s	299	299	299
S _c (n)	467	-	467
S _c (3n)	422	-	422
Z	-	-	-
ϕ	0.89	1.39	0.89
M _ϕ	120	303	101
s _ϕ	0.50	-	0.50
M _{sϕ}	76	-	78
M _ϕ	315	164	343
M (Imp)	93	49	97
ϕ ₃ (M _ϕ +M (Imp))	681	355	733
M _a	1139	855	1186
M _u	1401	-	1401
f _{sϕ} (non-comp) (k.s.i.)	4.8	12.1	4.1
f _{sϕ} (comp) (k.s.i.)	2.2	-	2.2
f _{sϕ} (ϕ+Imp) (k.s.i.)	17.5	14.2	18.8
f _s (Overload) (k.s.i.)	24.5	26.3	25.1
f _s (Total) (k.s.i.)	-	34.2	-
VR	60.0	-	45.0

INTERIOR BEAM REACTION TABLE

	Abuts.	Piers
R _ϕ	23.3	73.7
R _ϕ	43.7	49.7
Imp.	13.0	14.4
R (Total)	80.0	137.8

I_s and S_s are the moment of inertia and section modulus of the steel section used in computing f_s (Total & Overload).
I_c (n) and S_c (n) are the moment of inertia and section modulus of the composite section used in computing stresses due to ϕ.
I_c (3n) and S_c (3n) are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed ϕ.
VR is the maximum ϕ + Impact shear range within the composite portion of span.
Z is the plastic section modulus used to determine the Fully Plastic Moments in the non-composite areas.
M_a (Applied Moment) = 1.3[M_ϕ + M_{sϕ} + ϕ₃(M_ϕ + M (Imp))].
M_u is the Full Plastic Moment Capacity for Compact, Braced section.
f_s (Overload) is the sum of the stresses due to M_ϕ + M_{sϕ} + ϕ₃(M_ϕ + M (Imp)).
f_s (Total) is the sum of the stresses due to 1.3[M_ϕ + M_{sϕ} + ϕ₃(M_ϕ + M (Imp))].

DESIGNED	LT/MRM
CHECKED	MRM/UM
DRAWN	MTR/MRM
CHECKED	BLU

DATE: 3/19/07

BOWMAN, BARRETT & ASSOCIATES INC.
CONSULTING ENGINEERS
130 E. RANDOLPH STREET
CHICAGO, ILLINOIS 60601
JOB NO. 541



BEAM DETAILS
U.S. ROUTE 6 OVER
NETTLE CREEK
FAU 5952-SEC. Q-BR
GRUNDY COUNTY
STATION 449+79.12
S.N. 032-0107