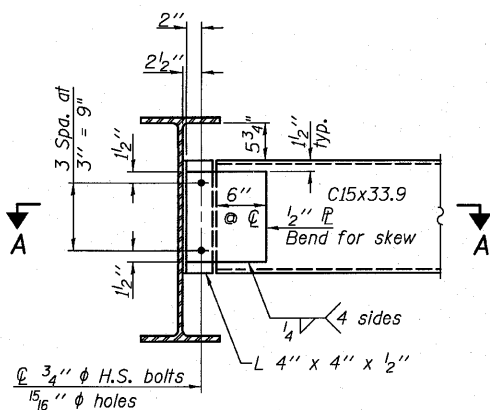
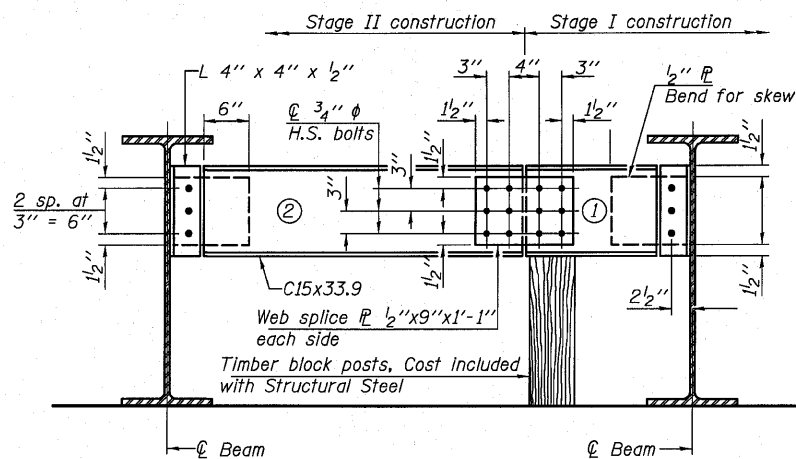


**SECTION A-A**



**END DIAPHRAGM D2**

(32 required for both structures)



**END DIAPHRAGM D3**

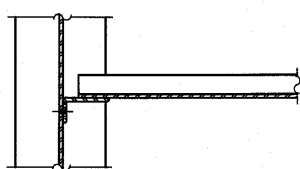
(4 required for both structures)

**END DIAPHRAGM STAGE CONSTRUCTION SEQUENCE**

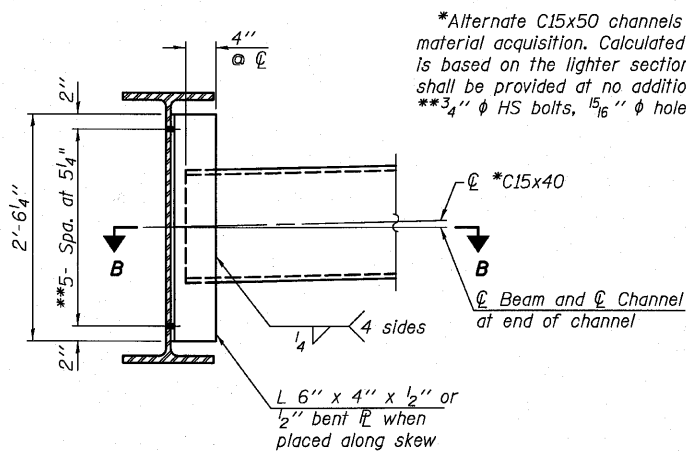
- 1.) Order Diaphragm in two sections.
- 2.) Attach section ① of Diaphragm to Beam
- 3.) Place Timber Block Posts between section ① of diaphragm and abutment bearing section.
- 4.) Attach section ② of diaphragm to both Beam ① and section ① of diaphragm during Stage II Construction with splice plates.
- 5.) Remove Timber Block Posts.

**Notes:**

Two hardened washers required for each set of oversized holes. Diaphragm D1 is similar to D except the connecting angle attached to beams 5 & 16 shall have 1 7/8 inch slotted holes with 1/4 inch plate washers covering the entire slot. The holes in Beams 5 & 16 at this connection shall be oversized. The bolts for the slotted holes shall only be finger tight prior to pouring the deck and then tightened after completion of the pour. The slots shall be positioned so the bolts start at one end of the slot with no concrete load and finish near the opposite end under deck load.



**SECTION B-B**

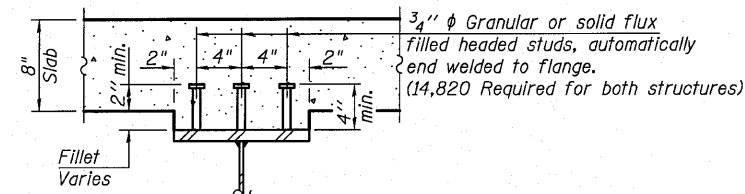


**INTERIOR DIAPHRAGMS D & D1**

(162 required for both structures)

**Notes:**

Load carrying components designated "NTR" shall conform to the Supplement Requirements for Notch Toughness, Zone 2. All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.



**SHEAR STUD DETAIL**

INTERIOR GIRDER MOMENT TABLE				
		0.4 Sp. 1 or 0.6 Sp. 3	Pier 1 or 2	0.5 Sp. 2
$I_s$	(in <sup>4</sup> )	7800	7800	7800
$I_c(n)$	(in <sup>4</sup> )	19730	—	19730
$I_c(3n)$	(in <sup>4</sup> )	14510	—	14510
$S_s$	(in <sup>3</sup> )	439	439	439
$S_c(n)$	(in <sup>3</sup> )	625	—	625
$S_c(3n)$	(in <sup>3</sup> )	565	—	565
$\rho$	(k/')	0.81	1.29	0.81
$M \rho$	('k)	172	705	321
$s \rho$	(k/')	0.48	—	0.48
$M_s \rho$	('k)	126	—	251
$M \xi$	('k)	393	290	554
$M_{IM}$	('k)	106	73	128
$s_3 [M \xi + i]$	('k)	831	605	1137
$M_a$	('k)	1468	1703	2222
$M_u$	('k)	2493	—	2388
$f_s \rho$ non-comp	(ksi)	4.7	19.3	8.8
$f_s \rho$ (comp)	(ksi)	2.7	—	5.3
$f_s s_3 [M \xi + M_I]$	(ksi)	16.0	16.5	21.8
$f_s$ (Overload)	(ksi)	23.4	35.8	35.9
$f_s$ (Total)	(ksi)	—	46.5	—
VR	(k)	47	—	40

\*compact section  
\*\*non-compact partially braced section

INTERIOR GIRDER REACTION TABLE			
	Abut.	Pier	
$R \rho$	(K)	28	108
$R \xi$	(K)	34	47
Imp.	(K)	9	12
$R$ (Total)	(K)	71	167

$I_s, S_s$ : 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).  
 $I(3n), S_c(3n)$ : 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).  
 $\rho$ : Un-factored non-composite dead load (kips/ft.).  
 $M \rho$ : Un-factored moment due to non-composite dead load (kip-ft.).  
 $s \rho$ : Un-factored long-term composite (superimposed) dead load (kips/ft.).  
 $M_s \rho$ : Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).  
 $M \xi$ : Un-factored live load moment (kip-ft.).  
 $M_I$ : Un-factored moment due to impact (kip-ft.).  
 $M_a$ : Factored design moment (kip-ft.).  
 $1.3 [M \rho + M_s \rho + \frac{5}{3} (M \xi + M_I)]$   
 $M_u$ : 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).  
 $M \rho + M_s \rho + \frac{5}{3} (M \xi + M_I)$   
 $f_s$  (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).  
 $1.3 [M \rho + M_s \rho + \frac{5}{3} (M \xi + M_I)]$   
 VR: Maximum  $\xi$  + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

**STRUCTURAL STEEL DETAILS**

SN 028-0081 (SB)

SN 028-0082 (NB)

<b>COOMBE-BLOXDORF P.C.</b> Engineers / Land Surveyors Springfield, Illinois Design Firm License No. 184-002703	PROJECT NO. 07062 DATE 11/12/08 DESIGN BY CME/GB DRAWN BY TFG CHECKED BY CME/MCB	SHEET NO. 26  43 SHEETS	F.A.I. RTE. 57 SECTION (28-3-1)VB-1	COUNTY FRANKLIN TOTAL SHEETS 98 SHEET NO. 50	CONTRACT NO. 78068 FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT
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