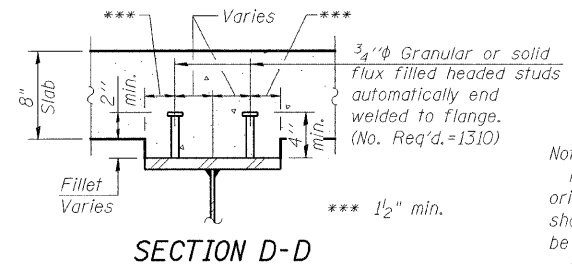
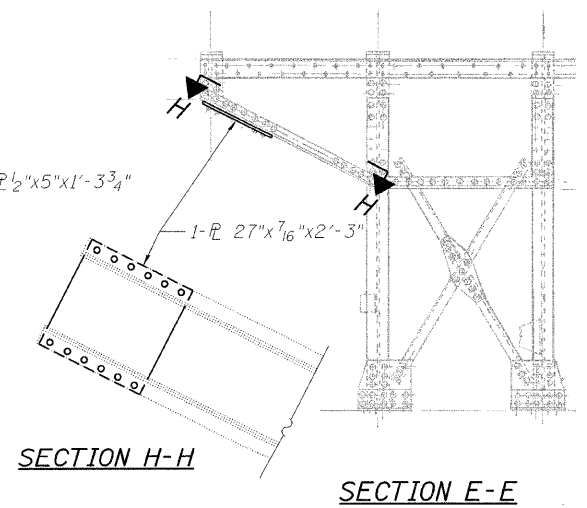
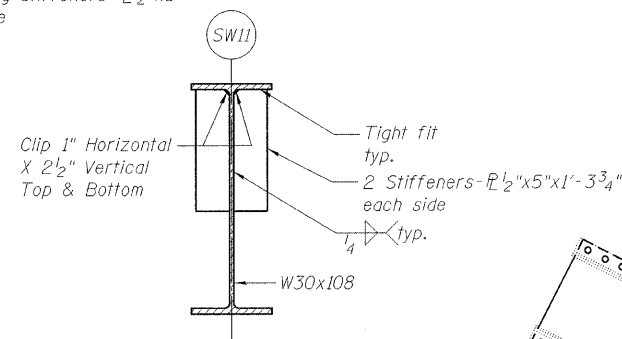
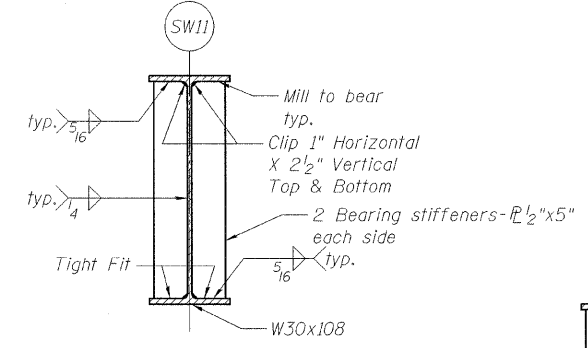
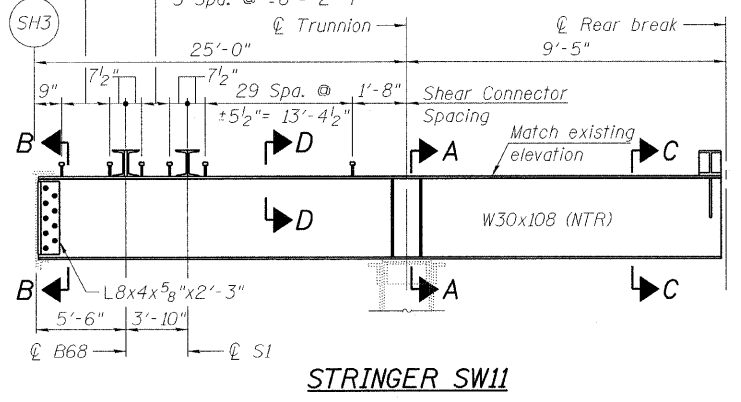
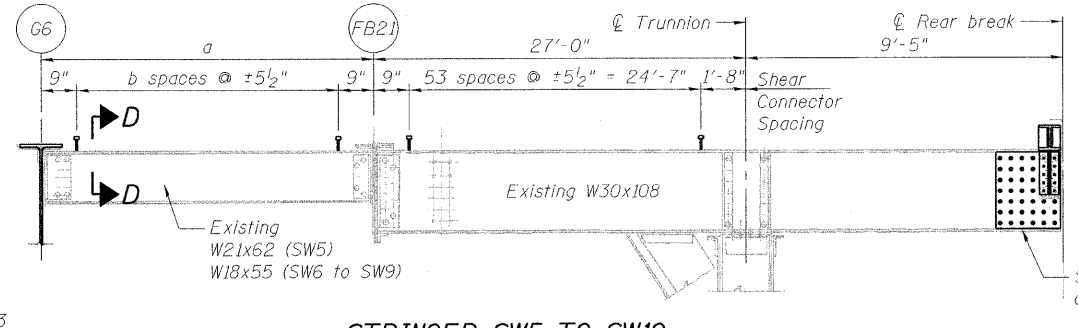
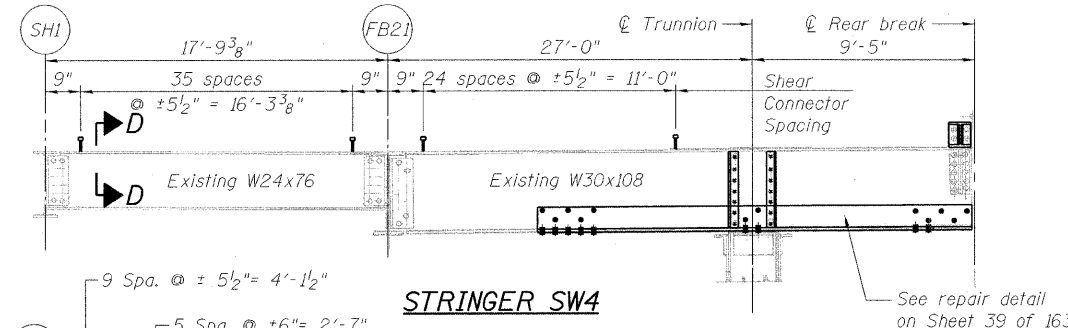
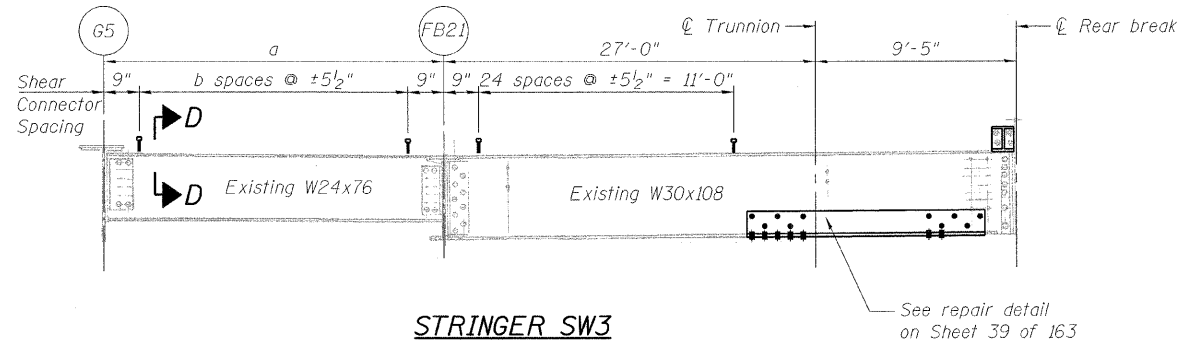
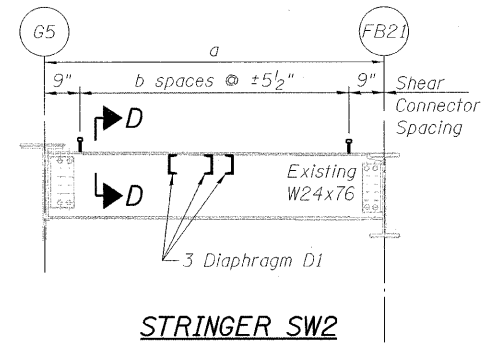


STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION



**Beam Length and Shear Connector Spacing**

Stringer	a	b
SW2	24'-1 7/8"	49
SW3	21'-4 7/8"	43
SW5	16'-6 13/16"	32
SW6	13'-9 3/8"	26
SW7	10'-11 5/16"	20
SW8	8'-2 1/2"	14
SW9	5'-5 1/16"	8
SW10	0	0

$I_s$ : 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.<sup>4</sup> and in.<sup>3</sup>).  
 $I_c(n)$ ,  $S_c(n)$ : 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.<sup>4</sup> and in.<sup>3</sup>).  
 $I_c(3n)$ ,  $S_c(3n)$ : 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.<sup>4</sup> and in.<sup>3</sup>).  
 $Z$ : Plastic Section Modulus of the steel section in non-composite areas (in.<sup>3</sup>).  
 $Q$ : Un-factored non-composite dead load (kips/ft.).  
 $M_Q$ : Un-factored moment due to non-composite dead load (kip-ft.).  
 $s_Q$ : Un-factored long-term composite (superimposed) dead load (kips/ft.).  
 $M_{sQ}$ : 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.).  
 $1.3 [M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)]$   
 $M_u$ : 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).  
 $M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)$   
 $f_s$  (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).  
 $1.3 [M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)]$   
 $VR$ : Maximum  $\pm$  impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

**INTERIOR GIRDER MOMENT TABLE**

	0.4 Span 1	Cross Girder
$I_s$	(in <sup>4</sup> ) 4470	4470
$I_c(n)$	(in <sup>4</sup> ) 11275	--
$I_c(3n)$	(in <sup>4</sup> ) 8293	--
$S_s$	(in <sup>3</sup> ) 300	300
$S_c(n)$	(in <sup>3</sup> ) 430	--
$S_c(3n)$	(in <sup>3</sup> ) 388	--
$Z$	(in <sup>3</sup> ) --	--
$Q$	(k/ft) 0.6	0.74
$M_Q$	(k) 40	39
$s_Q$	(k/ft) 0.14	--
$M_{sQ}$	(k) 10	--
$M_L$	(k) 101	144
$M_I$	(k) 30	43
$5/3 [M_L + M_I]$	(k) 220	311
$M_a$	(k) 350	455
$M_u$	(k) 1490	--
$f_s$ non-comp	(ksi) 1.6	1.5
$f_s$ (comp)	(ksi) 0.3	--
$f_s$ $5/3 [M_L + M_I]$	(ksi) 8.8	12.5
$f_s$ (Overload)	(ksi) 10.7	14.0
$f_s$ (Total)	(ksi) --	18.2
$VR$	(k) 33.0	--

**INTERIOR GIRDER REACTION TABLE**

	Floorbeam 21-21	Cross Girder
$R_Q$	(k) 9.3	19.2
$R_L$	(k) 20.1	31.8
$R_I$	(k) 6.0	9.6
$R_{Total}$	(k) 35.4	60.6

\* Compact section  
 \*\* Braced non-compact and partially braced section

**FRAMING DETAILS  
SOUTHWEST FIXED SPANS  
STRUCTURE NO. 016-2445**

DESIGNED	A. HAMMAD
CHECKED	J. GRAINAWI
DRAWN	D. C. PATEL
CHECKED	A. HAMMAD

**Notes:**  
 Portions of this drawing are extracted from original drawings for this bridge. Details shown are provided to illustrate the work to be performed.  
 Load carrying components designated "NTR" shall conform to the supplemental requirements for Notch Toughness, Zone 2.  
 For Section B-B see Sheet No. 42 of 163.

**LEGEND**

- Existing fastener to remain
- Hole to match existing location
- New hole
- Existing member to remain
- New member

**PB Americas, Inc.**  
 230 WEST MONROE STREET,  
 SUITE 900  
 CHICAGO, IL. 60606

SHEET NO. 35	F.A.P R.T.E.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
163 SHEETS	389	2424.2B-R	COOK	398	116
			CONTRACT NO. 60D61		
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					