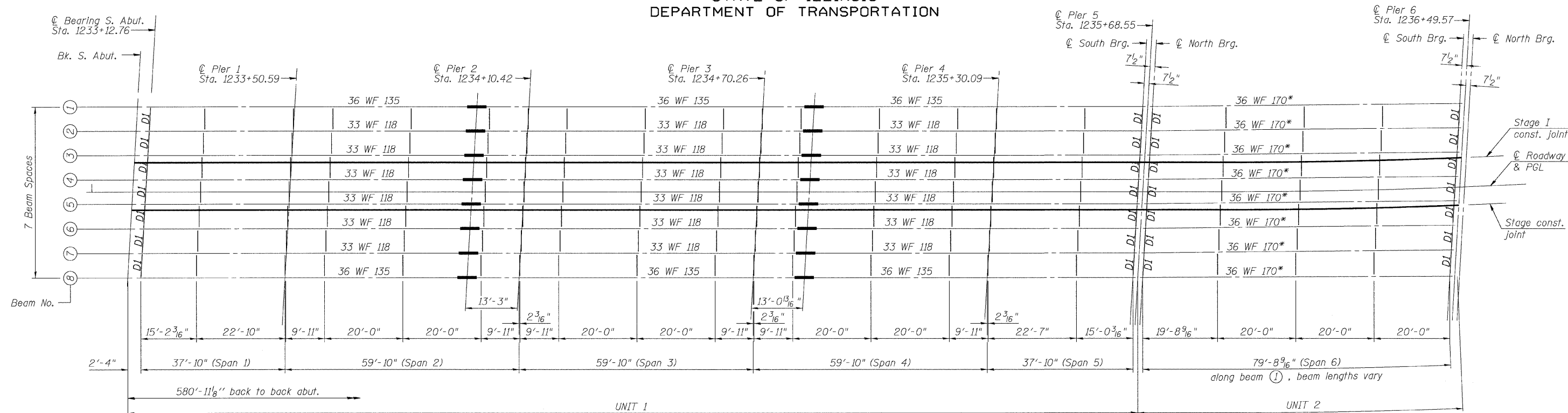


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



*Span 6 beams have cover plates on the bottom flange (13/16"x11" on interior beams, 1"x11" on exterior beams.)

PLAN

Replace Existing DI Diaphragms at the Abutments and at Piers 5, 6 & 8

UNIT 1 (SPANS 1-5)

INTERIOR GIRDER MOMENT TABLE					
	0.4 Span 1 or 0.6 Span 5	Pier 1 or Pier 4	0.5 Span 2 or Span 4	Pier 2 or Pier 3	0.5 Span 3
I_s	(in ⁴) 5900	5900	5900	5900	5900
$I_c(n)$	(in ⁴) 16754		16754		16754
$I_c(3n)$	(in ⁴) 12255		12255		12255
S_s	(in ³) 359	359	359	359	359
$S_c(n)$	(in ³) 548		548		548
$S_c(3n)$	(in ³) 494		494		494
Z	(in ³)	415		415	
R	(k/ft) 0.758	1.011	0.758	1.011	0.758
M_D	(k) 60.3	-241.5	132.2	-305.3	105.8
s_D	(k/ft) 0.253		0.253		0.253
M_{sD}	(k) 24.6		56.2		49.5
M_L	(k) 206.6	-166.4	313.8	-197.2	321.1
M_{IM}	(k) 62.0	-49.9	94.1	-59.2	96.3
$P_5 [M_L + i]$	(k) 447.7	-360.5	679.8	-427.3	695.7
M_a	(k) 692	-783	1129	-952	1106
M_u	(k) 2280	-1245	2280	-1245	2280
$f_s \phi$ non-comp	(ksi) 2.0	7.6	4.4	10.2	3.5
$f_s \phi$ (comp)	(ksi) 0.6		1.2		1.2
$f_s \phi_3 [M_L + M_I]$	(ksi) 9.8	7.9	14.9	14.3	15.2
f_s (Overload)	(ksi) 12.4	15.5	20.5	24.5	19.9
f_s (Total)	(ksi)				
VR	(k) 39.0		39.6		34.2

INTERIOR GIRDER REACTION TABLE						
	Abut.	Pier 1	Pier 2	Pier 3	Pier 4	Pier 5
R_D	(k) 13.2	56.0	63.0	62.9	56.4	13.4
R_L	(k) 29.5	38.2	38.2	38.2	38.2	29.6
R_I	(k) 8.9	11.1	10.3	10.3	11.1	8.9
R_{Total}	(k) 51.6	105.3	111.5	111.4	105.7	51.9

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

UNIT 2 (SPAN 6)

INTERIOR GIRDER MOMENT TABLE		
	0.5 Span 2	0.5 Span 6
I_s	(in ⁴) 13100	
$I_c(n)$	(in ⁴) 34471	
$I_c(3n)$	(in ⁴) 24064	
S_s	(in ³) 626	
$S_c(n)$	(in ³) 1155	
$S_c(3n)$	(in ³) 1038	
Z	(in ³)	
R	(k/ft) 0.84	
M_D	(k) 707.9	
s_D	(k/ft) 0.253	
M_{sD}	(k) 207.6	
M_L	(k) 662.3	
M_{IM}	(k) 158.9	
$P_5 [M_L + i]$	(k) 1369	
M_a	(k) 2970	
M_u	(k) 4154	
$f_s \phi$ non-comp	(ksi) 13.6	
$f_s \phi$ (comp)	(ksi) 2.4	
$f_s \phi_3 [M_L + M_I]$	(ksi) 14.2	
f_s (Overload)	(ksi) 30.2	
f_s (Total)	(ksi)	
VR	(k) 43.2	

INTERIOR GIRDER REACTION TABLE		
	Pier 5	Pier 6
R_D	(k) 45.0	45.0
R_L	(k) 35.7	35.7
R_I	(k) 8.6	8.6
R_{Total}	(k) 89.3	89.3

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

- 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 (in⁴ and in³).
- $I_c(n), S_c(n)$: 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 (in⁴ and in³).
- $I_c(3n), S_c(3n)$: 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 (in⁴ and in³).
- Z : Plastic Section Modulus of the steel section in non-composite areas (in³).
- ϕ : Un-factored non-composite dead load (kips/ft.).
- M_D : Un-factored moment due to non-composite dead load (kip-ft.).
- s_D : Un-factored long-term composite (superimposed) dead load (kips/ft.).
- M_{sD} : 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.).
 $1.3 [M_D + M_{sD} + \frac{5}{8} (M_L + M_I)]$
- 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).
 $M_D + M_{sD} + \frac{5}{8} (M_L + M_I)$
- f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 $1.3 [M_D + M_{sD} + \frac{5}{8} (M_L + M_I)]$
- VR: Maximum ϕ + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

FRAMING PLAN &
STRUCTURAL STEEL DETAILS
STRUCTURE NO. 058-0014

DESIGNED - MJB/MAJ
CHECKED - JFS
DRAWN - MSJ/MLB
CHECKED - MJB



SHEET NO. 24 49 SHEETS	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	710	(50Z-VB)BR	MACON	79	50
FED. ROAD DIST. NO.			ILLINOIS	FED. AID PROJECT	
CONTRACT NO. 74215					