

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
**MOMENT TABLE SPANS 11, 12 & 13**

Proposed Interior Girder Moment Table - NG1						Proposed Exterior Girder Moment Table - NG3					Existing Interior Girder Moment Table - F					NG6	
	0.4 Span 11	Pier 7	0.5 Span 12	Pier 8	0.6 Span 13	0.4 Span 11	Pier 7	0.5 Span 12	Pier 8	0.6 Span 13	0.4 Span 11	Pier 7	0.5 Span 12	Pier 8	0.6 Span 13	0.5 Span	
$I_s$	(in <sup>4</sup> )	14,812	26,667	15,303	19,016	19,016	14,812	26,667	15,303	19,016	19,016	7,941	17,864	12,323	17,862	12,323	13,200
$I_c(n)$	(in <sup>4</sup> )	29,231	-	34,851	-	40,397	29,974	-	32,343	-	37,480	19,280	-	29,474	-	29,474	25,206
$I_c(3n)$	(in <sup>4</sup> )	21,640	-	25,711	-	30,018	22,147	-	23,739	-	27,869	14,082	-	22,175	-	22,175	18,592
$S_s$	(in <sup>3</sup> )	825	1,046	618	761	761	825	1,046	618	761	446	715	501	714	501	719	
$S_c(n)$	(in <sup>3</sup> )	1,055	-	853	-	1,002	1,104	-	833	-	980	634	-	691	-	692	934
$S_c(3n)$	(in <sup>3</sup> )	958	-	770	-	912	996	-	748	-	888	570	-	633	-	633	836
$Z$	(in <sup>3</sup> )	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$\rho$	(k/')	0.82	1.15	0.73	1.11	0.74	0.87	1.02	0.60	0.98	0.61	0.75	1.12	0.72	1.11	0.72	0.63
$M \rho$	(k)	289.0	954.0	270.7	806.6	281.5	709.6	1322.4	113.1	576.3	271.2	258.8	907.0	265.4	857.5	258.3	234.4
$s \rho$	(k/')	0.37	-	0.37	-	0.36	0.37	-	0.37	-	0.36	0.37	-	0.37	-	0.36	0.46
$M_s \rho$	(k)	138.2	-	171.1	-	146.6	388.3	-	105.7	-	161.9	142.8	-	171.6	-	142.2	161.5
$M \ell$	(k)	451.9	402.0	526.3	360.5	475.1	478.6	370.3	384.4	297.6	466.7	401.4	542.1	398.6	489.7	325.0	
$M_{IM}$	(k)	112.7	94.9	118.0	85.2	118.7	119.4	87.4	86.2	70.3	91.0	116.4	94.8	121.5	94.2	122.3	91.2
$\rho_3 [M \ell + I]$	(k)	941.0	828.3	1,073.8	742.7	989.6	996.7	762.9	784.4	613.2	758.7	971.9	827.1	1,105.9	821.3	1,020.1	693.8
$M_a$	(k)	1,778.6	2,316.9	1,970.2	2,014.2	1,842.9	2,722.9	2,710.8	1,304.0	1,546.3	1,549.5	1,785.5	2,254.2	2,005.8	2,182.4	1,846.7	1,416.5
$M_u$	(k)	4,895.5	-	4,630.1	-	4,748.4	4,969.4	-	4,230.5	-	4,803.5	2,041.7	-	3,024.6	-	2,183.9	3,984.9
$f_s \rho$ non-comp	(ksi)	4.2	10.9	5.3	12.7	4.4	10.3	15.2	2.2	9.1	4.3	7.0	15.2	6.4	14.4	6.2	3.9
$f_s \rho$ (comp)	(ksi)	1.7	-	2.7	-	1.9	4.7	-	1.7	-	2.2	3.0	-	3.3	-	2.7	2.3
$f_s \rho_3 [M \ell + M_I]$	(ksi)	10.7	9.5	15.1	11.7	11.8	10.8	8.8	11.3	9.7	9.3	18.4	13.9	19.2	13.8	17.7	8.9
$f_s$ (Overload)	(ksi)	16.6	20.5	23.0	24.4	18.2	25.8	23.9	15.2	18.8	15.8	28.4	29.1	28.8	28.2	26.6	15.1
$f_s$ (Total)	(ksi)	-	26.6	-	31.8	-	-	-	31.1	-	24.4	-	37.9	-	36.7	-	-
VR	(k)	42.8	-	37.8	-	43.1	44.9	-	28.3	-	39.8	44.4	-	40.0	-	45.4	37.6

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

**MOMENT TABLE SPANS 14 & 15**

Proposed Interior Girder Moment Table			Proposed Exterior Girder Moment Table			Existing Interior Girder Moment Table							
	0.4 Span 14	Pier 10	0.5 Span 15	0.4 Span 14	Pier 10	0.5 Span 15	0.4 Span 14	Pier 10	0.5 Span 15	Pier 11	0.5 Span 16	Pier 12	
$I_s$	(in <sup>4</sup> )	78,063	257,397	93,371	78,063	257,397	93,371	63,402	149,583	75,095	348,332	146,346	359,812
$I_c(n)$	(in <sup>4</sup> )	142,083	-	157,053	142,866	-	160,623	137,886	-	150,089	-	269,283	-
$I_c(3n)$	(in <sup>4</sup> )	107,966	-	121,212	108,480	-	123,294	100,193	-	111,611	-	201,681	-
$S_s$	(in <sup>3</sup> )	2,110	5,148	2,334	2,110	5,148	2,334	2,013	3,053	1,990	5,349	3,511	5,613
$S_c(n)$	(in <sup>3</sup> )	2,604	-	2,823	2,608	-	2,842	2,545	-	2,522	-	4,277	-
$S_c(3n)$	(in <sup>3</sup> )	2,388	-	2,588	2,392	-	2,604	2,345	-	2,308	-	3,934	-
$Z$	(in <sup>3</sup> )	-	-	-	-	-	-	-	-	-	-	-	-
$\rho$	(k/')	1.04	1.56	0.91	1.06	1.66	0.95	0.97	1.51	0.99	1.67	1.10	1.68
$M \rho$	(k)	1,235.9	6,221.6	1,893.6	1,253.9	6,464.2	1,993.8	1,681.8	3,834.6	602.1	6,290.6	3,208.8	6,434.4
$s \rho$	(k/')	0.41	-	0.41	0.41	-	0.41	0.41	-	0.41	-	0.41	-
$M_s \rho$	(k)	499.3	-	908.3	504.5	-	916.8	744.4	-	363.7	-	1,245.2	-
$M \ell$	(k)	1,306.6	1,825.0	1,427.5	1,293.4	1,947.4	1,583.6	1,477.0	1,684.6	1,433.3	2,525.9	2,687.6	2,521.4
$M_{IM}$	(k)	233.1	308.8	229.8	230.2	328.9	254.3	264.4	284.7	231.2	374.1	368.2	376.4
$\rho_3 [M \ell + I]$	(k)	2,566.2	3,556.4	2,762.3	2,539.5	3,793.9	3,063.2	2,902.3	3,282.3	2,774.2	4,833.4	5,092.9	4,829.8
$M_a$	(k)	5,591.8	12,711.3	7,233.5	5,587.1	13,335.4	7,766.0	6,927.1	9,251.9	4,862.0	14,461.2	12,411.1	14,643.4
$M_u$	(k)	12,689.4	-	12,172.5	12,830.1	-	12,635.8	8,678.5	-	10,417.4	-	15,728.8	-
$f_s \rho$ non-comp	(ksi)	7.0	14.5	9.7	7.1	15.1	10.2	10.0	15.1	3.6	14.1	11.0	13.8
$f_s \rho$ (comp)	(ksi)	2.5	-	4.2	2.5	-	4.2	3.8	-	1.9	-	3.8	-
$f_s \rho_3 [M \ell + M_I]$	(ksi)	11.8	8.3	11.7	11.7	8.8	12.9	13.7	12.9	13.2	10.8	14.3	10.3
$f_s$ (Overload)	(ksi)	21.4	22.8	25.7	21.3	23.9	27.4	27.5	28.0	18.7	25.0	29.1	24.1
$f_s$ (Total)	(ksi)	-	29.6	-	-	31.1	-	-	36.4	-	32.4	-	31.3
VR	(k)	58.0	-	46.9	53.4	-	48.0	59.2	-	54.5	-	66.1	-

$I_s, S_s$ : 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<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>).  
 $\rho$ : 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.).  
 $M \ell$ : Un-factored live load moment (kip-ft.).  
 $M_I$ : Un-factored moment due to impact (kip-ft.).  
 $M_a$ : Factored design moment (kip-ft.).  
 $1.3 [M \rho + M_s \rho + \frac{5}{8} (M \ell + M_I)]$   
 $M_u$ : 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).  
 $M \rho + M_s \rho + \frac{5}{8} (M \ell + M_I)$   
 $f_s$  (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).  
 $1.3 [M \rho + M_s \rho + \frac{5}{8} (M \ell + M_I)]$   
 $VR$ : Maximum  $\ell$  + impact shear range within the composite portion of the span for stud shear connector design (kips).

**REACTION TABLE SPANS 11, 12 & 13**

	Proposed Interior Girder				Proposed Exterior Girder				Existing Interior Girder				NG6	
	N. Brg. C Abut. 4	Pier 7	Pier 8	S. Brg. Pier 9	N. Brg. C Abut. 4	Pier 7	Pier 8	S. Brg. Pier 9	N. Brg. C Abut. 4	Pier 7	Pier 8	S. Brg. Pier 9	N. Brg. C Abut. 4	
$R \rho$	(k)	32.9	111.9	103.5	31.7	63.4	139.9	83.2	29.8	30.9	107.8	105.0	30.8	31.0
$R \ell$	(k)	31.3	45.4	44.8	31.6	30.3	39.4	34.6	29.4	32.7	46.8	47.0	32.9	29.1
$R_I$	(k)	7.8	10.7	10.6	7.9	7.5	9.3	8.2	7.3	8.1	11.1	11.1	8.2	8.2
$R_{Total}$	(k)	72.0	168.0	158.8	71.2	101.2	188.6	126.0	66.6	71.7	165.7	163.1	72.0	68.3

**REACTION TABLE SPANS 14 & 15**

	Proposed Interior Girder			Proposed Exterior Girder			Existing Interior Girder				
	N. Brg. Pier 9	Pier 10	Pier 11	N. Brg. Pier 9	Pier 10	Pier 11	N. Brg. Pier 9	Pier 10	Pier 11	Pier 12	
$R \rho$	(k)	75.1	322.3	91.3	73.3	337.6	92.7	82.3	252.2	328.6	331.4
$R \ell$	(k)	46.5	92.3	39.9	42.2	100.4	39.4	47.5	98.1	116.6	118.0
$R_I$	(k)	8.3	15.6	6.4	7.5	17.0	6.3	8.5	16.6	18.8	17.5
$R_{Total}$	(k)	130.0	430.3	137.6	123.0	455.0	138.4	138.4	366.9	464.0	466.8

**MOMENT & REACTION TABLES  
STRUCTURE NO. 016-3240**

<b>TYLIN INTERNATIONAL</b>	DESIGNED - DY, LS	REVISIONS		SHEET NO. 19	F.A.I RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.					
	CHECKED - AMD, LS	NAME	DATE		55					0711.2R & 1011.1BR	COOK	200	186	
	DRAWN - DY, LS				33 SHEETS					CONTRACT NO. 60L39				
	CHECKED - AMD, LS				FED. ROAD DIST. NO. 1 ILLINOIS FED. AID PROJECT									
DATE - 08/02/10														

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