

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

GIRDER MOMENT TABLE - CENTRAL AVE.

	Fascia Girder G1 and G22 (Note 1)							Interior girder G2 and 21						
	0.4 Sp.7	C. Abt 2	0.5 Sp.8	Pier 6	0.5 Sp.9	C. Abt 3	0.6 Sp.10	0.4 Sp.7	C. Abt 2	0.5 Sp.8	Pier 6	0.5 Sp.9	C. Abt 3	0.6 Sp.10
$I_s$	(in <sup>4</sup> ) 128965	179592	179592	179592	179592	179592	128965	83898	83898	83898	83898	83898	83898	83898
$I_c(n)$	(in <sup>4</sup> ) 209125	-	268800	-	268800	-	209125	153635	-	153635	-	153635	-	153635
$I_c(3n)$	(in <sup>4</sup> ) 163380	-	216353	-	216353	-	163380	116813	-	116813	-	116813	-	116813
$S_s$	(in <sup>3</sup> ) 3474	4742	4742	4742	4742	4742	3474	2283	2283	2283	2283	2283	2283	2283
$S_c(n)$	(in <sup>3</sup> ) 4103	-	5385	-	5385	-	4103	2805	-	2805	-	2805	-	2805
$S_c(3n)$	(in <sup>3</sup> ) 3793	-	5050	-	5050	-	3793	2580	-	2580	-	2580	-	2580
Z	(in <sup>3</sup> ) -	-	-	-	-	-	-	-	-	-	-	-	-	-
$\bar{Q}$	(k/ft) 6.96	8.0	2.62	4.6	4.5	7.83	4.88	1.11	1.69	1.11	1.69	1.11	1.69	1.11
$M\bar{Q}$	(k) 2664	5271	833	2921	1429	5162	1870	429	1083	362	1055	362	1083	429
$s\bar{Q}$	(k/ft) 2.87	-	1.18	-	1.84	-	2.01	0.58	-	0.58	-	0.58	-	0.58
$M_s\bar{Q}$	(k) 1093	-	374	-	586	-	770	233	-	207	-	207	-	233
$M\bar{L}$	(k) 944.5	621.8	943.5	625.7	943.5	621.7	944.5	568	413	574	436	574	409	559
$M(IM)$	(k) 238.0	151.2	221.6	147.0	221.6	151.2	238.0	143	100	135	102	135	99	141
$M_s[M\bar{L}+I]$	(k) 1970.8	1288.3	1941.8	1287.8	1941.8	1288.2	1970.8	1186	855	1182	897	1182	847	1166
$M_a$	(k) 7453	8527	4094	5472	5144	8385	5994	2406	2522	2279	2540	2279	2511	2380
$M_u$	(k) 18145.3	-	22060.0	-	22060.0	-	18145.3	14104	-	14104	-	14104	-	14104
$f_s\bar{Q}_{non-comp}$	(ksi) 9.2	13.3	2.1	7.4	3.6	13.1	6.5	2.3	5.7	1.9	5.5	1.9	5.7	2.3
$f_s\bar{Q}_{comp}$	(ksi) 3.5	-	0.9	-	1.4	-	2.4	1.1	-	1.0	-	1.0	-	1.1
$f_s\bar{Q}_s(M\bar{L}+M I)$	(ksi) 5.8	3.3	4.3	3.3	4.3	3.3	5.8	5.2	4.5	5.1	4.7	5.1	4.5	5.1
$f_s(Overload)$	(ksi) 18.4	16.6	7.3	10.7	9.3	16.3	14.7	8.5	10.2	8.0	10.3	8.0	10.1	8.4
$f_s(Total)$	(ksi) -	21.6	-	13.9	-	21.2	-	-	13.2	-	13.3	-	13.2	-
VR	(k) 90.3	-	79.0	-	79.0	-	90.3	61.0	-	45.7	-	45.9	-	60.3

Note 1: Moments for G22 are opposite hand.

	Girder G3 thru G20			
	0.4 Sp.7 & 0.6 Sp.10	C. Abt 2 & C. Abt 3	0.5 Sp.8 & 0.5 Sp. 9	Pier 6
$I_s$	(in <sup>4</sup> ) 12100	12100	12100	12100
$I_c(n)$	(in <sup>4</sup> ) 28227	-	28227	-
$I_c(3n)$	(in <sup>4</sup> ) 20585	-	20585	-
$S_s$	(in <sup>3</sup> ) 664	664	664	664
$S_c(n)$	(in <sup>3</sup> ) 921	-	921	-
$S_c(3n)$	(in <sup>3</sup> ) 829	-	829	-
Z	(in <sup>3</sup> ) -	767	-	767
$\bar{Q}$	(k/ft) 0.92	1.32	0.92	1.32
$M\bar{Q}$	(k) 357	833	301	816
$s\bar{Q}$	(k/ft) 0.4	-	0.4	-
$M_s\bar{Q}$	(k) 167	-	155	-
$M\bar{L}$	(k) 550	358	573	379
$M(IM)$	(k) 139	87	135	89
$M_s[M\bar{L}+I]$	(k) 1149	742	1180	780
$M_a$	(k) 2178	2039	2133	2067
$M_u$	(k) 4191	-	4407	-
$f_s\bar{Q}_{non-comp}$	(ksi) 6.5	15.1	5.4	14.7
$f_s\bar{Q}_{comp}$	(ksi) 2.45	-	2.27	-
$f_s\bar{Q}_s(M\bar{L}+M I)$	(ksi) 15.2	13.41	15.61	14.1
$f_s(Overload)$	(ksi) 24.1	28.3	23.4	28.7
$f_s(Total)$	(ksi) -	36.8	-	37.3
VR	(k) 58	-	44	-

GIRDER REACTION TABLE - CENTRAL AVE.

	Fascia Girder G1 & G22 (Note 2)					Interior Girder G2 & G21				
	N. Brg. C. Abt.1	C. Abt.2	Pier 6	C. Abt.3	S. Brg. C. Abt.4	N. Brg. C. Abt.1	C. Abt.2	Pier 6	C. Abt.3	S. Brg. C. Abt.4
$R\bar{Q}$	(k) 220.2	730.0	375.4	737.4	189.3	48.5	151.7	148.3	151.7	48.4
$R\bar{L}$	(k) 66.9	83.8	83.8	83.8	66.9	44.0	55.5	56.6	55.2	44.0
Imp.	(k) 16.8	14.6	13.9	14.6	16.8	11.1	9.7	9.4	9.6	11.1
$R(Total)$	(k) 303.9	828.4	473.1	835.8	273.0	103.6	216.8	214.3	216.6	103.5

Note 2: Reactions for G22 are opposite hand

	Interior Girder G3-G20		
	N. Brg. C. Abt.1 & S. Brg. C. Abt.4	C. Abt.2 & C. Abt.3	Pier 6
$R\bar{Q}$	(k) 38	118	116
$R\bar{L}$	(k) 42	50	51
Imp.	(k) 10	12	12
$R(Total)$	(k) 90	180	179

$I_s, S_s$ : 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).  
 $I_c(3n), S_c(3n)$ : 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.4 and in.3).  
Z: Plastic Section Modulus of the steel section in non-composite areas (in.3).  
 $\bar{Q}$ : Un-factored non-composite dead load (kips/ft.).  
 $M\bar{Q}$ : Un-factored moment due to non-composite dead load (kip-ft.).  
 $s\bar{Q}$ : Un-factored long-term composite (superimposed) dead load (kips/ft.).  
 $M_s\bar{Q}$ : Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).  
 $M\bar{L}$ : Un-factored live load moment (kip-ft.).  
M(IM): Un-factored moment due to impact (kip-ft.).  
 $M_a$ : Factored design moment (kip-ft.).  
 $1.3 [M\bar{Q} + M_s\bar{Q} + \frac{2}{3} (M\bar{L} + M(IM))]$   
 $M_u$ : 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).  
 $M\bar{Q} + M_s\bar{Q} + \frac{2}{3} (M\bar{L} + M(IM))$   
 $f_s(Total)$ : Sum of stresses as computed from the moments below on non-compact section (ksi).  
 $1.3 [M\bar{Q} + M_s\bar{Q} + \frac{2}{3} (M\bar{L} + M(IM))]$   
VR: Maximum  $\bar{L}$  + impact shear range within the composite portion of the span for stud shear connector design (kips).

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

MOMENT & REACTION TABLES  
CENTRAL / I-55  
STRUCTURE NO. 016-0724

TYLIN INTERNATIONAL	DESIGNED - JMA	REVISIONS		SHEET NO. 98	F.A.I RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.				
	CHECKED - AMD,	NAME	DATE		55					0711.2R & 1011.1BR	COOK	741	422
	DRAWN - JMA				239 SHEETS					CONTRACT NO. 60999			
	CHECKED - AMD,				FED. ROAD DIST. NO. 1 ILLINOIS FED. AID PROJECT								
	DATE - 03/25/2011												