

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MOMENT TABLE - SPANS 1, 2 & 3

	SG2					EXISTING GIRDER 16				
	0.4 Sp. 1	Pier 1	.5 Sp. 2	Pier 2	0.6 Sp. 3	0.4 Sp. 1	Pier 1	.5 Sp. 2	Pier 2	0.6 Sp. 3
Is (in ⁴)	13200	13200	13200	13200	13200	12,100	15,865	12,100	15,865	12,100
Ic (n) (in ⁴)	26673	--	28241	--	29559	25,686	--	26,327	--	27,011
Ic (3n) (in ⁴)	19517	--	20595	--	21582	18,742	--	19,208	--	19,728
Ss (in ³)	719	719	719	719	719	664	846	664	846	664
Sc (n) (in ³)	952	--	968	--	981	889	--	896	--	903
Sc (3n) (in ³)	853	--	869	--	883	798	--	806	--	813
Z (in ³)	--	--	--	--	--	--	--	--	--	--
ϕ (k/')	0.70	1.32	0.81	1.47	0.91	0.78	1.42	0.83	1.51	0.88
Mϕ (k)	224	795	283	898	305	240	872	265	927	280
sϕ (k/')	0.53	--	0.6	--	0.65	0.57	--	0.59	--	0.62
Msϕ (k)	180	--	251	--	236	189	--	226	--	212
Mϕ (k)	371	285	503	324	528	400	312	477	334	476
M (IM) (k)	95	71	118	81	136	103	77	112	82	122
ϕ ₃ [Mϕ+I] (k)	778	593	1035	675	1107	839	648	982	693	997
Ma (k)	1537	1807	2041	2047	2145	1,651	1,978	1,917	2,108	1,938
*Mu (k)	4360	--	4643	--	4546	2,967	--	3,402	--	2,978
fsϕ non-comp (ksi)	3.7	13.3	4.7	15.0	5.1	4.4	12.4	4.8	13.1	5.1
fsϕ comp (ksi)	2.5	--	3.5	--	3.2	2.8	--	3.4	--	3.1
fs ⁵ ₃ (Mϕ+MI) (ksi)	9.8	9.9	12.8	11.3	13.5	11.3	9.2	13.1	9.8	13.2
fs (Overload) (ksi)	16.1	23.2	21.0	26.3	21.8	18.5	21.6	21.3	23.0	21.4
**fs (Total) (ksi)	--	30.1	--	34.2	--	--	28.0	--	29.9	--
VR (k)	40.9	--	39.7	--	52.4	42.8	--	38.5	--	49.6

Is, Ss: Non-composite moment of inertia and section modulus of the steel section used for computing fs (Total and Overload) due to non-composite dead loads (in.4 and in.3).

Ic(n), Sc(n): Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing fs (Total and Overload) due to short-term composite live loads (in.4 and in.3).

Ic(3n), Sc(3n): Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing fs (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).

ϕ: Un-factored non-composite dead load (kips/ft.).

Mϕ: Un-factored moment due to non-composite dead load (kip-ft.).

sϕ: Un-factored long-term composite (superimposed) dead load (kips/ft.).

Msϕ: Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).

Mϕ: Un-factored live load moment (kip-ft.).

M (IM): Un-factored moment due to impact (kip-ft.).

Ma: Factored design moment (kip-ft.).

1.3 [Mϕ + Msϕ + $\frac{5}{8}$ (Mϕ + M (IM))]

Mu: 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.).

fs (Overload): Sum of stresses as computed from the moments below (ksi).

Mϕ + Msϕ + $\frac{5}{8}$ (Mϕ + M (IM))

fs (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).

1.3 [Mϕ + Msϕ + $\frac{5}{8}$ (Mϕ + M (IM))]

VR: Maximum ϕ + impact shear range within the composite portion of the span for stud shear connector design (kips).

MOMENT TABLE - SPANS 4, 5 & 6

	SG8			SG9				SG12	
	0.4 Sp. 4 or 0.6 Sp. 6	Pier 4 or 5	0.5 Sp. 5	0.4 Sp. 4	Pier 4	.5 Sp. 5	Pier 5	0.6 Sp. 6	.5 Sp. 6
Is (in ⁴)	13200	13200	13200	13200	13200	13200	13200	13200	13200
Ic (n) (in ⁴)	29559	--	29559	29370	--	29370	--	29370	25844
Ic (3n) (in ⁴)	21582	--	21582	21436	--	21436	--	21436	18986
Ss (in ³)	719	719	719	719	719	719	719	719	719
Sc (n) (in ³)	982	--	982	980	--	980	--	980	941
Sc (3n) (in ³)	884	--	884	882	--	882	--	882	842
Z (in ³)	--	--	--	--	--	--	--	--	--
ϕ (k/')	0.91	1.56	0.91	0.89	1.36	0.89	1.36	0.89	0.74
Mϕ (k)	295	932	315	317	714	225	1197	680	296
sϕ (k/')	0.65	--	0.65	0.47	--	0.47	--	0.47	0.43
Msϕ (k)	228	--	268	182	--	145	--	406	181
Mϕ (k)	529	353	585	505	336	558	349	513	287
M (Im) (k)	136	87	137	130	83	131	86	132	78
ϕ ₃ [Mϕ+I] (k)	1108	732	1203	1058	699	1147	724	1076	608
Ma (k)	2123	2166	2326	2026	1837	1975	2499	2813	1411
*Mu (k)	4517	--	4767	4645	--	4749	--	4749	4143
fsϕ non-comp (ksi)	4.9	15.6	5.3	5.3	11.9	3.8	20.0	11.3	4.9
fsϕ comp (ksi)	3.1	--	3.6	2.5	--	2.0	--	5.5	2.6
fs ⁵ ₃ (Mϕ+MI) (ksi)	13.5	12.2	14.7	13.0	11.7	14.0	12.0	13.2	7.8
fs (Overload) (ksi)	21.6	27.8	23.6	20.7	23.6	19.8	32.1	30.0	15.3
**fs (Total) (ksi)	--	36.1	--	--	30.6	--	41.7	--	--
VR (k)	54.3	--	45.8	51.9	--	44.7	--	52.7	38.8

(1) Average

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

REACTION TABLE - SPANS 1, 2 & 3

	SG2				EXISTING GIRDER 16			
	S. Abut.	Pier 1	Pier 2	S. Brg. Pier 3	S. Abut.	Pier 1	Pier 2	S. Brg. Pier 3
Rϕ (k)	31.7	114.4	188.9	42.4	34.6	121.0	128.1	39.6
Rϕ (k)	28.9	42.8	49.9	37.7	30.0	43.7	47.2	35.5
RI (k)	7.4	7.6	8.8	9.7	7.7	7.7	8.4	9.1
R (Total) (k)	68.1	164.8	187.5	89.8	72.4	172.5	183.7	84.2

REACTION TABLE - SPANS 4, 5 & 6

	SG8		SG9			SG12	
	N. Brg. Pier 3 / S. Brg. C. Abut. 1	Pier 4 or 5	N. Brg. Pier 3	Pier 4	Pier 5	S. Brg. C. Abut. 1	S. Brg. C. Abut. 1
Rϕ (k)	41.3	136.1	37.7	162.9	162.9	66.7	34.8
Rϕ (k)	38.8	53.3	37.0	50.7	51.1	37.1	26.7
RI (k)	9.7	9.1	9.5	9.0	9.1	9.6	7.2
R (Total) (k)	89.0	198.5	84.2	170.6	223.1	113.4	68.7

MOMENT & REACTION
TABLES
STRUCTURE NO. 016-3241

TYLIN INTERNATIONAL	DESIGNED - PK	REVISIONS		SHEET NO. 33	F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
	CHECKED - AMD,	NAME	DATE		71 SHEETS	55	0711.2R & 1011.1BR	COOK	741	286
	DRAWN - PK				CONTRACT NO. 60999					
	CHECKED - AMD,				FED. ROAD DIST. NO. 1 ILLINOIS FED. AID PROJECT					
	DATE - 03/25/2011									