

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER MOMENT TABLE - RAMP 4 FLARE

Girder 4.12				
		0.4 Sp. R4-1	Pier	0.6 Sp. R4-2
I_s	(in ⁴)	126,687	126,687	126,687
$I_c(n)$	(in ⁴)	185,044	185,044	185,044
$I_c(3n)$	(in ⁴)	150,261	150,261	150,261
S_s	(in ³)	3913	3913	3913
$S_c(n)$	(in ³)	4410	4410	4410
$S_c(3n)$	(in ³)	4145	4145	4145
S_1	(in ³)	228	228	228
Q	(k/')	2.43	1.54	1.11
M_D	(k)	1418	2783.5	646.6
s_D	(k/')	0.91	0.53	0.34
M_{sD}	(k)	533.7	956.7	197.9
M_L	(k)	803.4	828.5	722.9
M_I	(k)	156.7	170.7	157.6
$M_{sD} + M_I$	(k)	1600.2	1665.3	1467.5
M_a	(k)	4617.4	7027.2	3005.6
M_{b1}	(k)	44.8	49.8	24.1
$f_s D$ (non-comp)	(ksi)	4.3	8.5	2.0
$f_s D$ (comp)	(ksi)	1.5	2.8	0.6
$f_s D_{3D}$ [$M_L + M_I$]	(ksi)	4.4	4.5	4.0
f_1	(ksi)	2.4	2.6	1.3
f_s (Overload)	(ksi)	10.2	15.8	6.5
f_s (Total)	(ksi)	13.4	20.6	8.6
F_{or} (Overload)	(ksi)	47.5	47.5	47.5
VR	(k)	70.4		69.1
F_{or}	(ksi)	49.7	48.4	49.8

GIRDER REACTION TABLE - RAMP 4 FLARE

Girder 4.12				
		Carrier Girder	Pier	R4 Abut.
R_D	(k)	66.4	371.7	50.2
R_L	(k)	41.0	83.3	42.9
R_I	(k)	8.0	17.1	9.4
R_{Total}	(k)	115.4	472.1	102.5

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).

S_1 : Section modulus of one flange plate for lateral flange bending (in³).

Q : 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.).

$1.3 [M_D + M_{sD} + \frac{5}{3} (M_L + M_I)]$

M_{b1} : Factored lateral bending moment for flange plate (kip-ft.).

f_1 : Factored calculated normal stress at the edge of flange due to lateral bending (ksi).

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

$M_D + M_{sD} + \frac{5}{3} (M_L + M_I)$

f_s (Total): Sum of stresses as computed from the moments below (ksi).

$1.3 [M_D + M_{sD} + \frac{5}{3} (M_L + M_I)]$

F_{or} (Overload): Critical average flange stress at overload computed according to the 2003 AASHTO Guide Specifications for Horizontally Curved Steel Girder Highway Bridges Section 9.5 (ksi.).

F_{or} : Critical average flange stress (smaller of F_{or1} or F_{or2} for partially braced flanges and F_y for continuously braced flanges) computed according to the 2003 AASHTO Guide Specifications for Horizontally Curved Steel Girder Highway Bridges (Sections 5.2, 5.3 and 5.4) (ksi.).

VR: Maximum impact shear range within span for stud shear connector design (kips).

Note:
 M_L and R_L include the effects of centrifugal force and superelevation.

MOMENT TABLE 2
RAMP 4 FLARE
STRUCTURE NO. 016-0724

TYLIN INTERNATIONAL	DESIGNED - PK	REVISIONS		SHEET NO. 170	F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
	CHECKED - AMD,	NAME	DATE		55	0711.2R & 1011.1BR	COOK	741	494	
	DRAWN - PK				CONTRACT NO. 60999					
	CHECKED - AMD,				FED. ROAD DIST. NO. 1 ILLINOIS FED. AID PROJECT					
	DATE - 03/25/2011			239 SHEETS						