

MOMENT AND REACTION TABLES - RAMP GIRDERS

	Girder A1 & C1	Girder A2 & C2	Girder A3 & C3	Girder A4 & C4	Girder A5 & C5	Girder A6 & C6	Girder B1 & D1	Girder B2 & D2	Girder B3 & D3	Girder B4 & D4	Girder B5 & D5	
	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	0.5 Span	
I_s	(in ⁴)	5900	5900	5900	5900	5900	8160	5900	5900	5900	8160	13182
I_c (n)	(in ⁴)	-	16429	16564	16960	17852	23069	-	16242	16682	22198	28227
I_c (3n)	(in ⁴)	-	12263	12349	12600	13168	16459	-	12045	12321	16032	20781
S_s	(in ³)	359	359	359	359	359	487	359	359	359	487	799
S_c (n)	(in ³)	-	537	540	547	565	746	-	535	544	728	1033
S_c (3n)	(in ³)	-	488	490	496	510	664	-	485	492	653	944
Z	(in ³)	-	-	-	-	-	-	-	-	-	-	-
DL	(k/')	0.86	0.86	0.86	0.86	0.86	0.83	0.81	0.81	0.81	0.84	0.90
Mdl	(' k)	10.5	53	129	238	380	537	17.6	93	227	439	749
$s DL$	(k/')	0.46	0.46	0.46	0.46	0.53	0.72	0.46	0.46	0.46	0.53	0.72
Ms_{α}	(' k)	5.7	29	70	129	237	470	10.1	53	130	276	603
M_{LL}	(' k)	54.1	122	243	394	545	652	67.2	182	370	565	727
M (Imp)	(' k)	16.2	37	73	114	148	166	20.2	55	107	149	176
$5/3[M_{LL} + M(Imp)]$	(' k)	117	264	527	847	1155	1363	146	395	796	1189	1504
M_{α}	(' k)	173	450	945	1578	2303	3081	225	704	1499	2476	3714
M_u	(' k)	1729	2611	2915	2915	2915	3484	1729	2816	2816	3463	4568
f_s DL non-comp	(ksi)	0.35	1.8	4.3	8.0	12.7	13.2	0.59	3.1	7.6	10.8	11.3
f_s DL (comp)	(ksi)	-	0.7	1.7	3.1	5.6	8.5	0.34	1.3	3.2	5.1	7.7
f_s 5/3[M _{LL} + M(Imp)]	(ksi)	-	5.9	11.7	18.6	24.5	21.9	-	8.9	17.5	19.6	17.5
f_s (Overload)	(ksi)	-	8.4	17.8	29.6	42.8	43.6	-	13.3	28.3	35.5	36.4
f_s (total)	(ksi)	0.24	-	-	-	-	-	0.32	-	-	-	-
VR	(k)	28.4	38.9	46.7	50.8	52.6	50.2	26.6	41.2	47.4	49.5	48.2
Girder Reaction Table												
	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia	Abut. or Fascia
R_{α}	(k)	6.5	14.7	22.9	31.1	41.4	55.9	8.4	19.3	30.1	44.4	66.3
R_{LL}	(k)	21.8	29.9	35.9	39.4	41.4	40.0	20.4	31.7	36.8	39.2	38.8
Imp.	(k)	6.5	9.0	10.8	11.4	11.2	10.2	6.1	9.5	10.7	10.3	9.4
R (Total)	(k)	34.9	53.6	69.6	81.9	94.0	106.1	34.9	60.5	77.6	93.9	114.5

I_s and S_s are the moment of inertia and section modulus of the steel section used in computing f_s (Total & Overload).

$I_c(n)$ and $S_c(n)$ are the moment of inertia and section modulus of the composite section used in computing stresses due to Live Load.

$I_c(3n)$ and $S_c(3n)$ are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed dead loads. (see AASHTO 10.38)

VR is the maximum Live Load + Impact shear range in span.

Z is the plastic section modulus used to determine the fully plastic moments in the non-composite areas.

M_{α} (Applied Moment) = $1.3[M_{LL} + Ms_{\alpha} + 5_3(M_{LL} + M(Imp))]$.


The Plastic Moment capacity (M_u) is computed according to AASHTO 10.48.1 and 10.50.1.1.

f_s (Overload) is the sum of the stresses due to $M_{LL} + Ms_{\alpha} + 5_3(M_{LL} + M(Imp))$.

f_s (Total) (Non-compact section) is the sum of the stresses due to $1.3[M_{LL} + Ms_{\alpha} + 5_3(M_{LL} + M(Imp))]$.

REVISIONS	
NAME	DATE

SHT. S-45 OF S-68



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ILLINOIS DEPARTMENT OF TRANSPORTATION
 IL ROUTE 162 OVER I-55/70 IN TROY
 F.A.I ROUTE 70 SECTION 60-10K-1, 60-10HB
 MADISON COUNTY STATION 499+48.35
 STRUCTURE NO. 060-0338
**MOMENT AND REACTION TABLES
 RAMP GIRDERS**

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DATE: 03/06