

2/26/17 PM

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INTERIOR GIRDER MOMENT TABLE					
Unit 1					
	0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.6 Sp. 3
I_s	(in ⁴) 16,195	26,667	15,303	26,667	16,195
$I_c(n)$	(in ⁴) 42,794	32,738	39,881	32,738	42,794
$I_c(3n)$	(in ⁴) 32,706	32,738	30,678	32,738	32,706
S_s	(in ³) 674	1,046	618	1,046	674
$S_c(n)$	(in ³) 975	1,129	901	1,129	975
$S_c(3n)$	(in ³) 897	1,129	827	1,129	897
Z	(in ³) -	-	-	-	-
Q	(k/ft.) 0.96	1.02	0.95	1.02	0.96
M_Q	(k) 396	899	334	870	393
s_Q	(k/ft.) 0.57	0.57	0.57	0.57	0.57
M_{sQ}	(k) 239	511	211	500	235
M_L	(k) 619	650	600	639	618
M_I	(k) 151	151	133	148	151
$^{5/3}[M_L + M_I]$	(k) 1,283	1,335	1,222	1,312	1,282
M_a	(k) 2,393	3,569	2,296	3,486	2,483
* M_u	(k) 3,605	-	3,868	-	3,651
$f_s Q$ non-comp	(ksi) 7.05	10.32	6.48	9.98	7.00
$f_s Q$ (comp)	(ksi) 3.20	5.43	3.05	5.33	3.14
$f_s ^{5/3} [M_L + M_I]$	(ksi) 15.79	14.19	16.28	13.95	15.77
f_s (Overload)	(ksi) 26.04	29.94	25.81	29.26	25.91
** f_s (Total)	(ksi) -	38.92	-	38.01	-
VR	(k) 64.7	66.1	66.1	65.5	64.7

EXTERIOR GIRDER G4 MOMENT TABLE																			
Unit 2						Unit 3						Unit 4							
	0.4 Sp. 4	Pier 4	0.5 Sp. 5	Pier 5	0.6 Sp. 6	0.4 Sp. 7	Pier 7	0.5 Sp. 8	Pier 8	0.5 Sp. 9	Pier 9	0.6 Sp. 10	0.4 Sp. 11	Pier 11	0.5 Sp. 12	Pier 12	0.5 Sp. 13	Pier 13	0.6 Sp. 14
I_s	(in ⁴) 17,036	26,667	16,195	26,667	17,036	23,599	55,655	47,035	55,655	17,948	28,869	21,951	22,934	43,606	31,332	55,775	38,185	49,632	29,719
$I_c(n)$	(in ⁴) 46,940	33,248	44,059	33,248	46,940	70,277	63,460	107,070	63,460	48,700	35,814	63,444	64,801	50,529	86,369	63,014	100,185	56,716	79,826
$I_c(3n)$	(in ⁴) 35,172	33,248	33,233	33,248	35,172	50,251	63,460	77,804	63,460	36,455	35,814	46,032	46,878	50,529	60,984	63,014	70,457	56,716	57,095
S_s	(in ³) 730	1,046	674	1,046	730	1,197	2,100	2,153	2,100	749	1,143	1,050	1,146	1,693	1,696	2,125	2,081	1,909	1,531
$S_c(n)$	(in ³) 1,076	1,509	1,000	1,509	1,076	1,721	2,616	2,772	2,616	1,105	1,636	1,516	1,609	2,173	2,293	2,613	2,749	2,393	2,068
$S_c(3n)$	(in ³) 984	1,509	914	1,509	984	1,578	2,616	2,553	2,616	1,008	1,636	1,389	1,480	2,173	2,113	2,613	2,534	2,393	1,906
S_L	(in ³) 24	36	21	36	24	64	107	117	107	32	53	53	67	95	108	121	135	108	95
Q	(k/ft.) 0.87	0.93	0.87	0.93	0.87	0.96	1.14	1.10	1.14	0.91	0.98	0.94	0.92	1.04	0.99	1.11	1.04	1.08	0.97
M_Q	(k) 361	868	309	901	381	500	2,186	1,479	1,722	-67	659	674	611	1,596	704	1,962	939	2,023	859
s_Q	(k/ft.) 0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
M_{sQ}	(k) 264	614	250	628	282	395	1,292	768	1,053	41	515	441	443	1,015	475	1,183	552	1,204	581
M_L	(k) 583	578	629	580	647	934	1,053	1,145	1,031	634	598	726	880	945	1,018	1,144	1,126	1,067	1,044
M_I	(k) 146	116	157	116	162	234	211	286	206	159	120	181	220	189	392	229	281	213	261
$^{5/3}[M_L + M_I]$	(k) 1,215	1,155	1,310	1,161	1,348	1,947	2,107	2,386	2,061	1,321	1,196	1,512	1,834	1,890	2,351	2,288	2,345	2,133	2,174
M_a	(k) 2,393	3,428	2,430	3,497	2,614	3,694	7,261	6,023	6,287	1,684	3,081	3,415	3,755	5,851	4,588	7,064	4,987	6,969	4,698
M_{b1}	(k) 0	31	23	32	22	1	54	43	51	16	29	34	15	50	16	51	34	54	2
$f_s Q$ (non-comp)	(ksi) 5.94	9.96	5.50	10.34	6.27	5.01	12.49	8.25	9.84	-1.07	6.92	7.70	6.41	11.31	4.98	11.08	5.42	12.72	6.73
$f_s Q$ (comp)	(ksi) 3.22	4.88	3.28	4.99	3.43	3.00	5.93	3.61	4.83	0.49	3.78	3.80	3.59	5.60	2.69	5.43	2.61	6.04	3.66
$f_s ^{5/3} [M_L + M_I]$	(ksi) 13.55	9.19	15.72	9.23	15.03	13.57	9.67	10.33	9.46	14.35	8.77	11.97	13.68	10.43	12.30	10.51	10.24	10.70	12.62
f_s	(ksi) 0.00	10.32	13.12	10.55	11.14	0.23	6.11	4.43	5.71	6.16	6.56	7.56	2.64	6.35	1.77	5.03	3.00	5.99	0.24
f_s (Overload)	(ksi) 22.71	24.03	24.49	24.56	24.73	21.59	28.09	22.18	24.13	13.76	19.47	23.47	23.68	27.35	19.98	27.03	18.27	29.46	23.00
f_s (Total)	(ksi) 29.52	31.23	31.84	31.93	32.15	28.06	36.51	28.84	31.36	17.89	25.31	30.52	30.78	35.55	25.97	35.13	23.75	38.29	29.90
F_{cr} (Overload)	(ksi) 34.20	36.0	34.20	36.0	34.20	34.20	36.0	34.20	36.0	21.58	36.0	34.20	34.20	36.0	34.20	36.0	34.20	36.0	34.20
VR	(k) 23.4	26.0	27.4	27.4	27.6	28.0	26.3	27.6	27.6	29.8	29.8	27.5	28.0	26.2	27.5	27.5	27.8	27.8	28.1
F_{cr}	(ksi) 36.0	42.6	31.6	42.6	32.2	35.2	46.6	34.5	46.1	21.6	45.7	33.5	35.1	46.7	35.4	47.3	35.0	47.0	35.9

INTERIOR GIRDER REACTION TABLE				
Unit 1				
	Abut. 1	Pier 1	Pier 2	Pier 3
R_Q	(k) 45.0	158.9	156.5	44.7
R_L	(k) 45.8	63.6	63.3	45.8
R_I	(k) 11.2	14.8	14.7	11.2
R_{Total}	(k) 101.9	237.2	234.6	101.7

EXTERIOR GIRDER G4 REACTION TABLE														
Unit 2				Unit 3				Unit 4						
	Pier 3	Pier 4	Pier 5	Pier 6	Pier 6	Pier 7	Pier 8	Pier 9	Pier 10	Pier 10	Pier 11	Pier 12	Pier 13	Abut. 2
R_Q	(k) 47.0	159.4	160.8	50.2	61.0	241.7	217.2	149.9	65.8	64.3	209.9	227.9	232.6	75.8
R_L	(k) 33.6	51.6	51.7	40.9	44.5	66.2	65.9	53.7	41.3	44.1	64.0	68.2	67.3	45.6
R_I	(k) 10.1	12.9	12.9	12.3	13.3	16.5	16.5	13.4	12.4	13.2	16.0	17.0	16.8	13.7
R_{Total}	(k) 90.7	223.9	225.4	103.5	118.9	324.4	299.5	217.0	119.5	121.7	290.0	313.1	316.7	135.1

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

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).

Z : Plastic Section Modulus of the steel section in non-composite areas (in³).

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

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

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

M_{sQ} : 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.).

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

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).

$M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)$

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

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

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

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

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

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

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

M_{sQ} : 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.).

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

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).

$M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)$

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

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

F_{cr} (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_{cr} : Critical average flange stress (smaller of F_{cr1} or F_{cr2} 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 $Q +$ impact shear range within span for stud shear connector design (kips).

Notes:
 M_L and R_L include the effects of centrifugal force and superelevation.
VR is computed from the HS-20 loading in Unit 1 and from the Fatigue Truck in Units 2, 3 and 4.