GIRDER 1 MOMENT TABLE

		0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.5 Sp. 3	Pier 3	0.5 Sp. 4	Pier 4	0.5 Sp. 5	Pier 5	0.5 Sp. 6	Pier 6	0.5 Sp. 7	Pier 7	0.6 Sp. 8
I_s	(in^4)	41,149	85,972	41,149	78,521	33,322	71,184	33,322	71,184	33,322	71,184	33,322	71,184	33,322	71,184	36,320
$I_c(n)$	(in^4)	92,551	-	92,551	-	74,816	-	74,816	-	74,816	-	74,816	-	74,816	-	83,525
$I_c(3n)$	(in^4)	67,658	-	67,658	-	55,523	-	55,523	-	55,523	-	55,523	-	55,523	-	61,193
$I_c(cr)$	(in^4)	-	96,027	-	88,395	-	80,873	-	80,873	-	80,873	-	80,873	-	80,873	-
S_s	(in^3)	1,463	2,625	1,463	2,416	1,109	2,207	1,109	2,207	1,109	2,207	1,109	2,207	1,109	2,207	1,273
$S_c(n)$	(in^3)	1,905	-	1,905	-	1,484	-	1,484	-	1,484	-	1,484	-	1,484	-	1,693
$S_c(3n)$	(in^3)	1,748	-	1,748	-	1,355	-	1,355	-	1,355	-	1,355	-	1,355	-	1,548
$S_c(cr)$	(in^3)	-	2,726	-	2,518	-	2,310	-	2,310	-	2,310	-	2,310	-	2,310	-
S_{xc}	(in^3)	1,832	2,705	1,848	2,493	1,396	2,281	1,401	2,282	1,400	2,283	1,399	2,282	1,403	2,281	1,582
DC1	(k/')	0.955	1.115	0.954	1.090	0.924	1.065	0.924	1.065	0.924	1.065	0.924	1.065	0.924	1.066	0.937
M_{DC1}	('k)	677	1,885	524	-1,949	736	-2,048	695	-2,005	705	-1,969	713	-1,977	672	-2,062	953
DC2	(k/')	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
M_{DC2}	('k)	130	-319	103	-348	149	-377	137	-368	142	-359	144	-365	140	-367	184
DW	(k/')	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323
M_{DW}	('k)	233	-573	185	-624	267	-678	246	-661	255	-645	258	-655	252	-659	330
M_{L+IM}	('k)	1,511	-2,202	1,573	-2,435	1,798	-2,520	2,012	-2,529	1,876	-2,484	1,879	-2,519	1,841	-2,424	2,114
f_t (Strength I)	(ksi)	2.9	-3.8	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.8	2.6
$M_u + \frac{1}{3} f_t S_{xc}$	('k)	4,151	-7,756	4,299	-8,071	4,653	-8,458	4,930	-8,384	4,724	-8,225	4,747	-8,318	4,615	-8,443	5,730
$\phi_f M_n$	('k)	7,380	-11,218	7,477	-10,354	5,731	-9,484	5,778	-9,487	5,755	-9,487	5,752	-9,488	5,762	-9,480	6,518
f_s DC1	(ksi)	5.6	-8.6	4.3	-9.7	8.0	-11.1	7.5	-10.9	7.6	-10.7	7.7	-10.7	7.3	-11.2	9.0
f_s DC2	(ksi)	0.9	-1.4	0.7	-1.7	1.3	-2.0	1.2	-1.9	1.3	-1.9	1.3	-1.9	1.2	-1.9	1.4
f_s DW	(ksi)	1.6	-2.5	1.3	-3.0	2.4	-3.5	2.2	-3.4	2.3	-3.4	2.3	-3.4	2.2	-3.4	2.6
f_s (L+IM)	(ksi)	9.5	-9.7	9.9	-11.6	14.5	-13.1	16.3	-13.1	15.2	-12.9	15.2	-13.1	14.9	-12.6	15.0
f_t (Service II)	(ksi)	2.2	-2.9	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.1	2.0
$f_s + f_t/2$ (Service II)	(ksi)	21.5	-26.6	22.7	-29.4	30.6	-33.6	32.1	-33.3	30.9	-32.7	31.0	-33.1	30.1	-34.0	33.4
$0.95R_hF_{yf}$	(ksi)	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5
$f_s + f_t/3$ (Total)(Strength I)	(ksi)	28.1	-34.5	28.7	-39.0	40.6	-44.6	42.7	-44.2	41.0	-43.3	41.3	-43.8	40.0	-44.5	43.9
$\phi_f F_n$	(ksi)	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0
V_f	(k)	30.4	31.4	31.4	32.6	32.6	34.9	34.9	35.3	35.3	34.9	34.9	33.2	33.8	33.8	33.7

GIRDER 5 MOMENT TABLE

		0.4 Sp. 1	Pier 1	0.5 Sp. 2	Pier 2	0.5 Sp. 3	Pier 3	0.5 Sp. 4	Pier 4	0.5 Sp. 5	Pier 5	0.5 Sp. 6	Pier 6	0.5 Sp. 7	Pier 7	0.6 Sp. 8
I_s	(in^4)	41,149	85,972	41,149	78,521	33,322	71,184	33,322	71,184	33,322	71,184	33,322	71,184	33,322	71,184	36,320
$I_c(n)$	(in^4)	92,551	-	92,551	-	74,816	-	74,816	-	74,816	-	74,816	-	74,816	-	83,525
$I_c(3n)$	(in^4)	67,658	-	67,658	-	55,523	-	55,523	-	55,523	-	55,523	-	55,523	-	61,193
$I_c(cr)$	(in^4)	-	96,027	-	88,395	-	80,873	-	80,873	-	80,873	-	80,873	-	80,873	-
S_s	(in^3)	1,463	2,625	1,463	2,416	1,109	2,207	1,109	2,207	1,109	2,207	1,109	2,207	1,109	2,207	1,273
$S_c(n)$	(in^3)	1,905	-	1,905	-	1,484	-	1,484	-	1,484	-	1,484	-	1,484	-	1,693
$S_c(3n)$	(in^3)	1,748	-	1,748	-	1,355	-	1,355	-	1,355	-	1,355	-	1,355	-	1,548
$S_c(cr)$	(in^3)	-	2,726	-	2,518	-	2,310	-	2,310	-	2,310	-	2,310	-	2,310	-
S_{xc}	(in^3)	1,795	2,699	1,810	2,491	1,405	2,282	1,398	2,282	1,401	2,282	1,400	2,282	1,401	2,282	1,606
DC1	(k/')	0.955	1.115	0.954	1.090	0.924	1.065	0.924	1.065	0.924	1.065	0.924	1.065	0.924	1.066	0.937
M_{DC1}	('k)	1,031	-2,409	886	-2,147	655	-1,977	725	-2,021	689	-1,994	704	2,000	693	-2,028	748
DC2	(k/')	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
M_{DC2}	('k)	197	-422	175	-388	133	-365	142	-370	140	-363	142	-367	143	-364	144
DW	(k/')	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323	0.323
M_{DW}	('k)	353	-758	315	-696	239	-655	255	-665	251	-652	254	-659	256	-653	258
M_{L+IM}	('k)	2,483	-2,902	2,421	-2,829	1,922	-2,592	2,070	-2,572	1,897	-2,553	1,896	-2,517	1,813	-2,370	1,677
f_t (Strength I)	(ksi)	5.0	-5.3	15.6	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.8	2.2
$M_u + \frac{1}{3} f_t S_{xc}$	('k)	6,658	-10,149	6,821	-9,168	4,707	-8,446	5,089	-8,487	4,733	-8,392	4,757	-8,352	4,602	-8,295	4,534
$\phi_f M_n$	('k)	7,406	-11,224	7,447	-10,363	5,781	-9,497	5,775	-9,494	5,764	-9,494	5,758	-9,493	5,750	-9,486	6,522
f_s DC1	(ksi)	8.5	-11.0	7.3	-10.7	7.1	-10.7	7.8	-11.0	7.5	-10.8	7.6	-10.9	7.5	-11.0	7.0
f_s DC2	(ksi)	1.4	-1.9	1.2	-1.8	1.2	-1.9	1.3	-1.9	1.2	-1.9	1.3	-1.9	1.3	-1.9	1.1
f_s DW	(ksi)	2.4	-3.3	2.2	-3.3	2.1	-3.4	2.3	-3.5	2.2	-3.4	2.3	-3.4	2.3	-3.4	2.0
f_s (L+IM)	(ksi)	15.6	-12.8	15.3	-13.5	15.5	-13.5	16.7	-13.4	15.3	-13.3	15.3	-13.1	14.7	-12.3	11.9
f_t (Service II)	(ksi)	3.7	-4.0	11.7	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.1	1.6
$f_s + f_t/2$ (Service II)	(ksi)	34.4	-34.8	36.3	-33.4	30.6	-33.6	33.1	-33.7	30.9	-33.4	31.1	-33.2	30.1	-33.4	26.4
$0.95R_hF_{yf}$	(ksi)	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5	-47.5	47.5
$f_s + f_t/3$ (Total)(Strength I)	(ksi)	44.9	-45.2	45.7	-44.2	40.7	-44.5	44.1	-44.7	41.0	-44.2	41.3	-44.0	40.0	-43.7	34.7
$\phi_f F_n$	(ksi)	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	-50.0	50.0	50.0	50.0	50.0	50.0
V_f	(k)	41.0	41.0	40.6	36.4	33.9	35.6	35.6	35.6	35.6	35.4	35.4	34.6	34.6	33.2	30.1

I_s, S_s: Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total-Strength I, and Service II) 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-Strength I, and Service II) in uncracked sections 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-Strength I, and Service II) in uncracked sections due to long-term composite (superimposed) dead loads (in.^{4} and in.^{3}).

$I_c(cr)$, $S_c(cr)$: Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing f_s (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite dead loads (in.^{4} and in.^{3}).

S_{xc}: Section modulus about the major axis of section to the controlling flange, tension or compression, taken as yield moment with respect to the controlling flange over the yield strength of the controlling flange (in.^{3}).

DC1: Un-factored non-composite dead load (kips/ft.).

M_{DC1}: Un-factored moment due to non-composite dead load (kip-ft.).

DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).

M_{DC2}: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).

DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).

M_{DW}: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

M_{L+IM}: Un-factored live load moment plus dynamic load allowance (impact)(kip-ft.).

M_u (Strength I): Factored design moment (kip-ft.).
$1.25\ (M_{DC1} + M_{DC2}) + 1.5\ M_{DW} + 1.75\ M_{L+IM}$

f_t: Factored calculated normal stress at edge of flange for controlling steel flange plate due to lateral bending, Strength I or Service II as applicable (ksi).

$\phi_f M_n$: Factored resistance available according to A6.1.1 (kip-ft).

f_s DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
M_{DC1} / S_{nc}

f_s DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
$M_{DC2} / S_c(3n)$ or $M_{DC2} / S_c(cr)$ as applicable.

f_s DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
$M_{DW} / S_c(3n)$ or $M_{DW} / S_c(cr)$ as applicable.

f_s (L+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live plus impact loads as calculated below (ksi).
$M_{L+IM} / S_c(n)$ or $M_{L+IM} / S_c(cr)$ as applicable.

$f_s + f_t/2$ (Service II): Sum of stresses as computed below (ksi).
$f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3\ f_{sL+IM} + f_t/2$

$0.95R_hF_{yf}$: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

$f_s + f_t/3$ (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
$1.25\ (f_{sDC1} + f_{sDC2}) + 1.5\ f_{sDW} + 1.75\ f_{sL+IM} + f_t/3$

$\phi_f F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7.2 (ksi).

V_f: Maximum factored shear range in the span computed according to Article 6.10.10 (k).

Note:
M_L includes the effects of centrifugal force and superelevation.

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		CHECKED - MRB	REVISED -
04560024_033_SteelDtls4.dgn	PLOT SCALE =	DRAWN - MFH	REVISED -
	PLOT DATE = 11/9/2011	CHECKED - MRB	REVISED -

CITY OF ST. CHARLES

STEEL PLATE GIRDER MOMENT TABLES
STRUCTURE NO. 045-6024 RED GATE ROAD OVER THE FOX RIVER
SHEET NO. S33 OF S56 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	04-00092-00-BR	KANE	440	255
		CONTRACT NO. 63650		
	ILLINOIS FED. AID PROJECT			