INTERIOR GIRDER 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	0.6 Sp. 5
I_s	(in^4)	240,683	811,347	850,036	1,707,502	1,110,267	1,707,502	850,036	984,606	571,914
$I_c(n)$	(in^4)	445,431	1,278,512	1,349,061	2,403,123	1,634,585	2,403,123	1,349,061	1,473,587	939,300
$I_c(3n)$	(in^4)	336,632	1,007,228	1,058,084	1,981,593	1,322,278	1,981,593	1,058,084	1,184,488	727,326
$I_c(cr)$	(in^4)	270,764	868,983	911,067	1,785,695	1,171,527	1,785,695	911,067	1,042,674	617,873
S_s	(in^3)	4,862	11,855	12,781	21,058	16,545	21,058	12,781	14,300	10,772
$S_c(n)$	(in^3)	6,036	13,896	14,955	23,656	18,608	23,656	14,955	16,356	12,545
$S_c(3n)$	(in^3)	5,528	12,860	13,851	22,224	17,515	22,224	13,851	15,276	11,672
$S_c(cr)$	(in^3)	5,102	12,180	13,127	21,415	16,851	21,415	13,127	14,609	11,070
DC1	(k/')	1.813	2.183	2.212	2.604	2.396	2.604	2.212	2.324	2.141
M_{DC1}	('k)	4,223	20,498	16,959	47,024	24,380	43,227	14,268	31,791	17,282
DC2	(k/')	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213
M_{DC2}	('k)	600	2,288	1,716	4,343	2,173	4,014	1,465	3,256	1,811
DW	(k/')	0.479	0.479	0.479	0.479	0.479	0.479	0.479	0.479	0.479
M_{DW}	('k)	1,303	5,032	3,753	9,630	4,754	8,906	3,209	7,176	3,973
M_{LL+IM}	('k)	4,667	7,760	9,439	12,751	11,001	12,592	9,410	9,748	7,888
M_u (Strength I)	('k)	16,151	49,611	45,492	100,968	59,574	94,446	40,947	71,632	43,630
$\phi_f M_n$	('k)	29,114	- -	- -	- -	- -	- -	- -	- -	47,681
f_s DC1	(ksi)	10.42	20.75	15.92	26.80	17.68	24.63	13.40	26.68	19.25
f_s DC2	(ksi)	1.30	2.25	1.49	2.43	1.49	2.25	1.27	2.67	1.86
f_s DW	(ksi)	2.83	4.96	3.25	5.40	3.26	4.99	2.78	5.89	4.08
f_s (LL+IM)	(ksi)	9.28	7.65	7.57	7.15	7.09	7.06	7.55	8.01	7.55
f_s (Service II)	(ksi)	26.61	37.91	30.50	43.93	31.65	41.05	27.27	45.65	35.01
$0.95R_hF_{yf}$	(ksi)	47.50	64.72	47.50	64.85	47.50	64.85	47.50	64.93	47.50
f_s (Total)(Strength I)	(ksi)	-	49.58	39.89	57.15	41.26	53.44	35.72	59.54	-
$\phi_f F_n$	(ksi)	-	62.96	50.00	65.21	50.00	65.23	50.00	64.69	-
V_f	(k)	27	47	42	56	36	56	42	53	32

INTERIOR GIRDER REACTION TABLE							
		W. Abut.	Pier 1	Pier 2	Pier 3	Pier 4	E. Abut.
R_{DC1}	(k)	135.9	775.8	1,184.0	1,131.7	959.8	265.6
R_{DC2}	(k)	17.0	79.0	104.6	100.3	92.4	27.8
R_{DW}	(k)	37.3	178.3	235.3	225.7	208.5	62.0
R_{LL+IM}	(k)	85.7	229.0	270.8	269.2	247.9	99.9
R_{Total}	(k)	275.9	1,262.1	1,794.7	1,726.9	1,508.6	455.3

INTERIOR GIRDER LIVE LOAD + IMPACT DISTRIBUTION FACTORS										
Span/Support	Positive Moment			Negative Moment			Shear			Reactions
	1 Lane	Design	Fatigue	1 Lane	Design	Fatigue	1 Lane	Design	Fatigue	Design
W. Abut.	- -	- -	- -	- -	- -	- -	0.37	0.52	0.41	0.52
Span 1	0.37	0.55	0.28	- -	- -	- -	- -	- -	- -	- -
Pier 1	- -	- -	- -	0.34	0.57	0.31	0.51	0.66	0.46	0.56
Span 2	0.37	0.56	0.28	- -	- -	- -	- -	- -	- -	- -
Pier 2	- -	- -	- -	0.35	0.59	0.29	0.52	0.67	0.54	0.56
Span 3	0.38	0.56	0.28	- -	- -	- -	- -	- -	- -	- -
Pier 3	- -	- -	- -	0.35	0.59	0.29	0.51	0.65	0.54	0.56
Span 4	0.38	0.56	0.28	- -	- -	- -	- -	- -	- -	- -
Pier 4	- -	- -	- -	0.34	0.57	0.28	0.49	0.61	0.52	0.56
Span 5	0.38	0.56	0.27	- -	- -	- -	- -	- -	- -	- -
E. Abut.	- -	- -	- -	- -	- -	- -	0.40	0.52	0.44	0.52

EXTERIOR GIRDER LIVE LOAD + IMPACT DISTRIBUTION FACTORS										
Span/Support	Positive Moment			Negative Moment			Shear			Reactions
	1 Lane	Design	Fatigue	1 Lane	Design	Fatigue	1 Lane	Design	Fatigue	Design
W. Abut.	- -	- -	- -	- -	- -	- -	0.52	0.63	0.29	0.63
Span 1	0.41	0.61	0.31	- -	- -	- -	- -	- -	- -	- -
Pier 1	- -	- -	- -	0.43	0.63	0.40	0.70	0.86	0.35	0.70
Span 2	0.42	0.63	0.32	- -	- -	- -	- -	- -	- -	- -
Pier 2	- -	- -	- -	0.41	0.65	0.35	0.66	0.83	0.42	0.69
Span 3	0.42	0.63	0.33	- -	- -	- -	- -	- -	- -	- -
Pier 3	- -	- -	- -	0.41	0.65	0.33	0.66	0.80	0.42	0.69
Span 4	0.43	0.64	0.32	- -	- -	- -	- -	- -	- -	- -
Pier 4	- -	- -	- -	0.42	0.64	0.35	0.63	0.77	0.39	0.70
Span 5	0.43	0.64	0.31	- -	- -	- -	- -	- -	- -	- -
E. Abut.	- -	- -	- -	- -	- -	- -	0.53	0.66	0.32	0.66

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}).

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

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

$\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (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 (LL+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_{LL+IM} / $S_c(n)$ or M_{LL+IM} / $S_c(cr)$ as applicable.

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

$0.95R_hF_yf$: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

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

$\phi_f F_n$: 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 composite portion of span computed according to Article 6.10.10.

ALL GIRDERS LIVE LOAD + IMPACT DISTRIBUTION FACTORS FOR DEFLECTION	
Span 1	0.54
Span 2	0.54
Span 3	0.54
Span 4	0.54
Span 5	0.54

NOTES:

1. Live load distribution for design was determined by a refined method of analysis.

2. The live load + impact distribution factors provided in the tables on this sheet were computed for HL-93 loading only, and are intended to be used to approximate HL-93 live load + impact demands.

3. The live load + impact distribution factors are in the form of a ratio of the girder live load demand obtained from the refined method of analysis caused by HL-93 loading, divided by the girder live load demand obtained from the application of a single lane of HL-93 loading acting on a single isolated girder.

4. Example calculation of interior girder live load design moment in Span 1 based on the distribution factors provided in the tables:

   A. From a line girder analysis with a distribution factor of 1.0 lane, the live load moment at Span 1 is found to be:

   MLL+I = 8,424 k-ft per lane

   B. From the Interior Girder Live Load + Impact Distribution Factor table shown on this sheet, the design distribution factor for positive moment in Span 1 is 0.55. Therefore, the live load + impact moment at Span 1 based on the refined method of analysis is:

   0.55 x 8,424 k-ft = 4,633 k-ft

HDR ENGINEERING, INC.

USER NAME = jmigus	DESIGNED - BWC	REVISED -
FILE NAME = 0600345-76A91-058-FRD.DGN	CHECKED - LGP	REVISED -
PLOT SCALE = NONE	DRAWN - JM	REVISED -
PLOT DATE = 3/18/2011	CHECKED - BSK	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL DETAILS - TABLES
STRUCTURE NO. 060-0345
BRIDGE SHEET NO. 58 OF 133 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60-1B-1	MADISON	712	437

CONTRACT NO. 76A91
ILLINOIS FED. AID PROJECT

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