EXTERIOR GIRDER 1 MOMENT TABLE - UNIT IV				
		0.4 Sp. 7	Pier 7	0.6 Sp. 8
I_s	(in^4)	163,564	326,533	163,564
$I_c(n)$	(in^4)	290,152	-	290,152
$I_c(3n)$	(in^4)	222,405	-	222,405
$I_c(cr)$	(in^4)	-	345,546	-
S_s	(in^3)	3,518	7,054	3,518
$S_c(n)$	(in^3)	4,268	-	4,268
$S_c(3n)$	(in^3)	3,937	-	3,937
$S_c(cr)$	(in^3)	-	7,175	-
S_{xc}	(in^3)	100	327	100
DC1	(k/')	1.18	1.44	1.18
M_{DC1}	('k)	3,240	8,575	3,132
DC2	(k/')	0.30	0.30	0.30
M_{DC2}	('k)	621	1,484	618
DW	(k/')	0.28	0.28	0.28
M_{DW}	('k)	1,043	2,100	1,038
M_{L+IM}	('k)	4,994	5,376	4,985
f_f (Strength I)	(ksi)	8.17	4.68	8.08
$M_u + 1/3\, f_f\, S_{xc}$	('k)	15,403	25,642	15,238
$\phi_f M_n$	('k)	-	-	-
f_s DC1	(ksi)	11.05	14.59	10.68
f_s DC2	(ksi)	1.89	2.48	1.88
f_s DW	(ksi)	3.18	3.51	3.16
f_s (L+IM)	(ksi)	14.04	8.99	14.02
f_f (Service II)	(ksi)	6.25	3.65	6.17
$f_s + f/2$ (Service II)	(ksi)	37.50	34.09	37.04
$0.95R_hF_{yf}$	(ksi)	47.50	45.73	47.50
$f_s + f/3$ (Total)(Strength I)	(ksi)	48.25	43.90	47.68
$\phi_f F_n$	(ksi)	50.00	49.80	50.00
V_f	(k)	80.10	88.30	80.00

INTERIOR GIRDER 2 MOMENT TABLE - UNIT IV				
		0.4 Sp. 7	Pier 7	0.6 Sp. 8
I_s	(in^4)	163,564	326,533	163,564
$I_c(n)$	(in^4)	298,905	-	298,905
$I_c(3n)$	(in^4)	228,231	-	228,231
$I_c(cr)$	(in^4)	-	347,855	-
S_s	(in^3)	3,518	7,054	3,518
$S_c(n)$	(in^3)	4,303	-	4,303
$S_c(3n)$	(in^3)	3,970	-	3,970
$S_c(cr)$	(in^3)	-	7,189	-
S_{xc}	(in^3)	100	327	100
DC1	(k/')	1.27	1.53	1.27
M_{DC1}	('k)	3,073	9,595	3,211
DC2	(k/')	0.30	0.30	0.30
M_{DC2}	('k)	504	1,406	507
DW	(k/')	0.41	0.41	0.41
M_{DW}	('k)	995	2,448	1,000
M_{L+IM}	('k)	3,809	4,760	3,817
f_f (Strength I)	(ksi)	6.69	4.73	6.77
$M_u + 1/3\, f_f\, S_{xc}$	('k)	12,853	26,269	13,053
$\phi_f M_n$	('k)	-	-	-
f_s DC1	(ksi)	10.48	16.32	10.95
f_s DC2	(ksi)	1.52	2.35	1.53
f_s DW	(ksi)	3.01	4.09	3.02
f_s (L+IM)	(ksi)	10.62	7.95	10.64
f_f (Service II)	(ksi)	5.13	3.70	5.20
$f_s + f/2$ (Service II)	(ksi)	31.39	34.93	31.95
$0.95R_hF_{yf}$	(ksi)	47.50	45.66	47.50
$f_s + f/3$ (Total)(Strength I)	(ksi)	40.34	44.95	41.03
$\phi_f F_n$	(ksi)	50.00	49.70	50.00
V_f	(k)	57.90	62.70	57.90

EXTERIOR GIRDER 1 REACTION TABLE - UNIT IV				
		Pier 6-N	Pier 7	Pier 8-E
R_{DC1}	(k)	101.0	233.4	99.8
R_{DC2}	(k)	20.6	46.1	20.5
R_{DW}	(k)	29.5	56.2	29.5
R_{L+IM}	(k)	130.0	174.4	130.0
R_{Total}	(k)	281.1	510.1	279.8

INTERIOR GIRDER 2 REACTION TABLE - UNIT IV				
		Pier 6-N	Pier 7	Pier 8-E
R_{DC1}	(k)	96.4	443.1	94.4
R_{DC2}	(k)	15.9	70.7	15.8
R_{DW}	(k)	29.4	117.2	29.3
R_{L+IM}	(k)	109.3	249.6	109.3
R_{Total}	(k)	250.9	880.6	248.8

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

$\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (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_s

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.

$f_s + f/2$ (Service II): Sum of stresses as computed below (ksi).
$f_{s\,DC1} + f_{sDC2} + f_{sDW} + 1.3\, f_s(L+IM) + f/2$

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

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

$\phi_f F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

V_f: Maximum factored shear range in span computed according to Article 6.10.10.

Note:
M_{L+IM} and R_{L+IM} include the effects of centrifugal force and superelevation.

INTERIOR GIRDER 5 MOMENT TABLE - UNIT IV				
		0.4 Sp. 7	Pier 7	0.6 Sp. 8
I_s	(in^4)	116,554	232,443	116,554
$I_c(n)$	(in^4)	241,213	-	241,213
$I_c(3n)$	(in^4)	179,241	-	179,241
$I_c(cr)$	(in^4)	-	253,156	-
S_s	(in^3)	2,588	5,080	2,588
$S_c(n)$	(in^3)	3,403	-	3,403
$S_c(3n)$	(in^3)	3,088	-	3,088
$S_c(cr)$	(in^3)	-	5,230	-
S_{xc}	(in^3)	67	192	67
DC1	(k/')	1.19	1.38	1.19
M_{DC1}	('k)	1,664	6,403	1,632
DC2	(k/')	0.30	0.30	0.30
M_{DC2}	('k)	344	825	343
DW	(k/')	0.41	0.41	0.41
M_{DW}	('k)	607	1,628	606
M_{L+IM}	('k)	2,371	3,019	2,370
f_f (Strength I)	(ksi)	5.85	5.03	5.84
$M_u + 1/3\, f_f\, S_{xc}$	('k)	7,700	17,082	7,656
$\phi_f M_n$	('k)	-	-	-
f_s DC1	(ksi)	7.72	15.13	7.57
f_s DC2	(ksi)	1.34	1.89	1.33
f_s DW	(ksi)	2.36	3.74	2.36
f_s (L+IM)	(ksi)	8.36	6.93	8.36
f_f (Service II)	(ksi)	4.49	3.93	4.48
$f_s + f/2$ (Service II)	(ksi)	24.52	31.73	24.36
$0.95R_hF_{yf}$	(ksi)	47.50	36.80	47.50
$f_s + f/3$ (Total)(Strength I)	(ksi)	31.43	40.68	31.23
$\phi_f F_n$	(ksi)	50.00	49.60	50.00
V_f	(k)	60.00	63.70	60.00

EXTERIOR GIRDER 6 MOMENT TABLE - UNIT IV				
		0.4 Sp. 7	Pier 7	0.6 Sp. 8
I_s	(in^4)	116,554	232,443	116,554
$I_c(n)$	(in^4)	233,872	-	233,872
$I_c(3n)$	(in^4)	173,842	-	173,842
$I_c(cr)$	(in^4)	-	250,935	-
S_s	(in^3)	2,588	5,080	2,588
$S_c(n)$	(in^3)	3,372	-	3,372
$S_c(3n)$	(in^3)	3,054	-	3,054
$S_c(cr)$	(in^3)	-	5,214	-
S_{xc}	(in^3)	67	192	67
DC1	(k/')	1.10	1.29	1.10
M_{DC1}	('k)	1,626	6,583	1,603
DC2	(k/')	0.30	0.30	0.30
M_{DC2}	('k)	344	946	344
DW	(k/')	0.28	0.28	0.28
M_{DW}	('k)	503	1,470	502
M_{L+IM}	('k)	2,601	3,873	2,601
f_f (Strength I)	(ksi)	6.06	5.42	6.02
$M_u + 1/3\, f_f\, S_{xc}$	('k)	7,904	18,741	7,873
$\phi_f M_n$	('k)	-	-	-
f_s DC1	(ksi)	7.54	15.55	7.43
f_s DC2	(ksi)	1.35	2.18	1.35
f_s DW	(ksi)	1.98	3.38	1.97
f_s (L+IM)	(ksi)	9.26	8.91	9.26
f_f (Service II)	(ksi)	4.63	4.22	4.60
$f_s + f/2$ (Service II)	(ksi)	25.22	34.81	25.09
$0.95R_hF_{yf}$	(ksi)	47.50	45.37	47.50
$f_s + f/3$ (Total)(Strength I)	(ksi)	32.30	44.64	32.15
$\phi_f F_n$	(ksi)	50.00	49.60	50.00
V_f	(k)	56.00	64.50	56.00

INTERIOR GIRDER 5 REACTION TABLE - UNIT IV				
		Pier 6-N	Pier 7	Pier 8-E
R_{DC1}	(k)	62.2	280.3	61.7
R_{DC2}	(k)	12.0	41.1	12.0
R_{DW}	(k)	20.6	77.4	20.6
R_{L+IM}	(k)	100.7	186.4	100.7
R_{Total}	(k)	195.5	585.2	195.1

EXTERIOR GIRDER 6 REACTION TABLE - UNIT IV				
		Pier 6-N	Pier 7	Pier 8-E
R_{DC1}	(k)	58.4	374.7	57.0
R_{DC2}	(k)	12.6	63.9	12.6
R_{DW}	(k)	15.8	88.6	15.7
R_{L+IM}	(k)	82.2	226.8	82.2
R_{Total}	(k)	168.9	754.0	167.5

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AECOM

USER NAME = floresg	DESIGNED - DD	REVISED
	CHECKED - ATB	REVISED
PLOT SCALE = N.T.S.	DRAWN - MRK	REVISED
PLOT DATE = 5/7/2014	CHECKED - DD	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GIRDER MOMENT AND REACTION TABLES – UNIT IV
STRUCTURE NO. 016–1705
SHEET NO. S-90 OF S-165 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
90/94/290	2013-010R	COOK	747	406
		CONTRACT NO. 60W28		
	ILLINOIS FED. AID PROJECT			