

UNIT A GIRDER A4

EXISTING INTERIOR GIRDER MOMENT TABLE				
		0.4 Span 1	Pier 1	0.6 Span 2
I_s	(in ⁴)	5,900	7,769	5,900
$I_c(n)$	(in ⁴)	16,206	7,769	16,206
$I_c(3n)$	(in ⁴)	12,094	----	12,094
S_s	(in ³)	359	462	359
$S_c(n)$	(in ³)	533	----	533
$S_c(3n)$	(in ³)	484	----	484
Z	(in ³)	----	----	----
ρ	(k/')	0.854	1.009	0.854
$M \rho$	('k)	153.5	318.6	142.9
$s \rho$	(k/')	0.130	----	0.130
$M_s \rho$	('k)	26.5	----	24.9
$M \ddagger$	('k)	348.4	185.6	334.6
M_I	('k)	99.0	52.9	95.6
$\ddagger_3 [M \ddagger + I]$	('k)	746	398	717
M_a	('k)	1203.2	931.0	1150.1
M_u	('k)	2467.6	----	2467.6
$f_s \rho$ non-comp	(ksi)	5.1	8.3	4.8
$f_s \rho$ (comp)	(ksi)	0.7	----	0.6
$f_s \ddagger_3 [M \ddagger + M_I]$	(ksi)	16.8	10.3	16.1
f_s (Overload)	(ksi)	22.6	18.6	21.5
f_s (Total)	(ksi)	----	24.2	----
VR	(k)	56.9	----	56.4

INTERIOR GIRDER REACTION TABLE			
		S. Abut	Pier 2
$R \rho$	(k)	19.2	62.5
$R \ddagger$	(k)	41.0	40.7
R_I	(k)	11.6	11.6
R_{Total}	(k)	71.9	71.0

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

UNIT B GIRDER B4

EXISTING INTERIOR GIRDER MOMENT TABLE						
		0.4 Span 3	Pier 3	0.5 Span 4	Pier 4	0.6 Span 5
I_s	(in ⁴)	14,156	109,549	74,921	109,549	14,156
$I_c(n)$	(in ⁴)	39,307	109,549	159,567	109,549	39,307
$I_c(3n)$	(in ⁴)	29,855	----	117,321	----	29,855
S_s	(in ³)	651	2533	2274	2533	651
$S_c(n)$	(in ³)	888	----	2862	----	888
$S_c(3n)$	(in ³)	831	----	2642	----	831
Z	(in ³)	----	----	----	----	----
ρ	(k/')	0.937	1.310	1.137	1.310	0.937
$M \rho$	('k)	221.1	2526.4	1903.1	2526.4	221.1
$s \rho$	(k/')	0.130	----	0.130	----	0.130
$M_s \rho$	('k)	50.1	----	237.7	----	50.1
$M \ddagger$	('k)	784.0	1173.0	1625.9	1173.0	784.0
M_I	('k)	175.6	224.9	272.3	224.9	175.6
$\ddagger_3 [M \ddagger + I]$	('k)	1599	2330	3164	2330	1599
M_a	('k)	2431.7	6312.9	6895.9	6312.9	2431.7
M_u	('k)	3686.3	----	10518.2	----	3686.3
$f_s \rho$ non-comp	(ksi)	4.1	12.0	10.0	12.0	4.1
$f_s \rho$ (comp)	(ksi)	0.7	----	1.1	----	0.7
$f_s \ddagger_3 [M \ddagger + M_I]$	(ksi)	21.6	11.0	13.3	11.0	21.6
f_s (Overload)	(ksi)	26.4	23.0	24.4	23.0	26.4
f_s (Total)	(ksi)	----	29.9	----	29.9	----
VR	(k)	67.1	----	57.8	----	67.1

INTERIOR GIRDER REACTION TABLE				
		Pier 2	Pier 3	Pier 4
$R \rho$	(k)	28.3	190.4	28.3
$R \ddagger$	(k)	49.2	94.8	49.2
R_I	(k)	11.0	12.0	11.0
R_{Total}	(k)	88.5	297.2	88.5

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

UNIT C GIRDER C3

EXISTING INTERIOR GIRDER MOMENT TABLE				
		0.4 Span 6	Pier 6	0.6 Span 7
I_s	(in ⁴)	8,230	8,230	8,230
$I_c(n)$	(in ⁴)	19,352	8,230	19,352
$I_c(3n)$	(in ⁴)	14,149	----	14,149
S_s	(in ³)	541	541	541
$S_c(n)$	(in ³)	739	----	739
$S_c(3n)$	(in ³)	670	----	670
Z	(in ³)	----	----	----
ρ	(k/')	0.862	1.010	0.862
$M \rho$	('k)	180.1	429.5	243.8
$s \rho$	(k/')	0.148	----	0.148
$M_s \rho$	('k)	34.7	----	45.6
$M \ddagger$	('k)	367.6	214.0	410.9
M_I	('k)	101.3	58.1	110.0
$\ddagger_3 [M \ddagger + I]$	('k)	781	454	868
M_a	('k)	1295.0	1148.0	1505.1
M_u	('k)	2865.4	----	2865.4
$f_s \rho$ non-comp	(ksi)	4.0	9.5	5.4
$f_s \rho$ (comp)	(ksi)	0.6	----	0.8
$f_s \ddagger_3 [M \ddagger + M_I]$	(ksi)	12.7	10.1	14.1
f_s (Overload)	(ksi)	17.3	19.6	20.3
f_s (Total)	(ksi)	----	25.4	----
VR	(k)	53.3	----	52.8

INTERIOR GIRDER REACTION TABLE			
		Pier 5	Pier 6
$R \rho$	(k)	21.3	74.2
$R \ddagger$	(k)	38.3	38.9
R_I	(k)	10.5	10.4
R_{Total}	(k)	70.1	73.9

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

RAMP F SPAN 6 - GIRDER R2

EXISTING INTERIOR GIRDER MOMENT TABLE		
		0.5 Span 6F
I_s	(in ⁴)	6,524
$I_c(n)$	(in ⁴)	20,129
$I_c(3n)$	(in ⁴)	14,338
S_s	(in ³)	507
$S_c(n)$	(in ³)	747
$S_c(3n)$	(in ³)	681
Z	(in ³)	----
ρ	(k/')	0.907
$M \rho$	('k)	387.9
$s \rho$	(k/')	0.104
$M_s \rho$	('k)	44.6
$M \ddagger$	('k)	499.8
M_I	('k)	136.1
$\ddagger_3 [M \ddagger + I]$	('k)	1060
M_a	('k)	1940.0
M_u	('k)	2881.8
$f_s \rho$ non-comp	(ksi)	9.2
$f_s \rho$ (comp)	(ksi)	0.8
$f_s \ddagger_3 [M \ddagger + M_I]$	(ksi)	17.0
f_s (Overload)	(ksi)	27.0
f_s (Total)	(ksi)	----
VR	(k)	56.4

INTERIOR GIRDER REACTION TABLE		
		Pier 6
$R \rho$	(k)	29.8
$R \ddagger$	(k)	43.9
R_I	(k)	12.0
R_{Total}	(k)	85.6

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

UNIT D - GIRDER D4

EXISTING INTERIOR GIRDER MOMENT TABLE										
		0.4 Span 8	Pier 8	0.5 Span 9	Pier 9	0.5 Span 10	Pier 10	0.5 Span 11	Pier 11	0.6 Span 12
I_s	(in ⁴)	4,470	4,470	3,990	5,516	3,990	5,516	3,990	4,470	4,470
$I_c(n)$	(in ⁴)	12,866	4,470	11,872	5,516	11,872	5,516	11,872	4,470	12,866
$I_c(3n)$	(in ⁴)	9,635	----	8,937	----	8,937	----	8,937	----	9,635
S_s	(in ³)	300	300	269	362	269	362	269	300	300
$S_c(n)$	(in ³)	456	----	417	----	417	----	417	----	456
$S_c(3n)$	(in ³)	414	----	378	----	378	----	378	----	414
Z	(in ³)	----	----	----	----	----	----	----	----	----
ρ	(k/')	0.853	1.026	0.843	1.042	0.843	1.042	0.843	1.026	0.853
$M \rho$	('k)	91.8	212.5	95.4	236.5	86.5	234.6	93.4	218.7	101.5
$s \rho$	(k/')	0.173	----	0.173	----	0.173	----	0.173	----	0.173
$M_s \rho$	('k)	21.0	----	25.5	----	23.0	----	25.0	----	23.1
$M \ddagger$	('k)	252.1	150.0	299.4	176.6	298.4	175.8	295.4	151.2	266.1
M_I	('k)	75.6	43.9	84.5	49.9	84.3	49.7	83.4	44.0	79.8
$\ddagger_3 [M \ddagger + I]$	('k)	546	323	640	378	638	376	631	325	577
M_a	('k)	856.7	696.4	989.0	798.3	971.5	793.4	974.7	707.4	911.4
M_u	('k)	1270.3	----	1166.3	----	1172.4	----	1166.8	----	1266.8
$f_s \rho$ non-comp	(ksi)	3.7	8.5	4.3	7.8	3.9	7.8	4.2	8.7	4.1
$f_s \rho$ (comp)	(ksi)	0.6	----	0.8	----	0.7	----	0.8	----	0.7
$f_s \ddagger_3 [M \ddagger + M_I]$	(ksi)	14.4	12.9	18.4	12.5	18.4	12.5	18.2	13.0	15.2
f_s (Overload)	(ksi)	18.7	21.4	23.5	20.3	23.0	20.2	23.1	21.8	19.9
f_s (Total)	(ksi)	----	27.9	----	26.4	----	26.3	----	28.3	----
VR	(k)	55.9	----	43.9	----	44.4	----	43.9	----	56.1

INTERIOR GIRDER REACTION TABLE						
		Pier 7	Pier 8	Pier 9	Pier 10	Pier 11
$R \rho$	(k)	15.7	52.0	53.7	53.5	52.8
$R \ddagger$	(k)	39.3	47.4	47.7	47.3	47.4
R_I	(k)	11.8	10.9	10.4	10.3	10.8
R_{Total}	(k)	66.8	110.3	111.8	111.1	111.0

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

RAMP F SPAN 7 - GIRDER R2

EXISTING INTERIOR GIRDER MOMENT TABLE		
	0.5 Span 7F	
I_s	(in ⁴)	6,524
$I_c(n)$	(in ⁴)	19,447
$I_c(3n)$	(in ⁴)	13,702
S_s	(in ³)	507
$S_c(n)$	(in ³)	740
$S_c(3n)$	(in ³)	672
Z	(in ³)	----
ρ	(k/')	0.817
$M \rho$	('k)	397.9
$s \rho$	(k/')	0.208
$M_s \rho$	('k)	101.2
$M \ddagger$	('k)	477.7
M_I	('k)	127.4
$\ddagger_3 [M \ddagger + I]$	('k)	1009
M_a	('k)	1959.9
M_u	('k)	2840.5
$f_s \rho$ non-comp	(ksi)	9.4
$f_s \rho$ (comp)	(ksi)	1.8
$f_s \ddagger_3 [M \ddagger + M_I]$	(ksi)	16.4
f_s (Overload)	(ksi)	27.6
f_s (Total)	(ksi)	----
VR	(k)	49.8

INTERIOR GIRDER REACTION TABLE		
		Pier 6
$R \rho$	(k)	32.2
$R \ddagger$	(k)	38.9
R_I	(k)	10.4
R_{Total}	(k)	81.4

* 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).

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

$M \rho$: Un-factored moment due to non-composite dead load (kip-ft.).

$s \rho$: Un-factored long-term composite (superimposed) dead load (kips/ft.).

$M_s \rho$: Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).

$M \ddagger$: Un-factored live load moment (kip-ft.).

M_I : Un-factored moment due to impact (kip-ft.).

M_a : Factored design moment (kip-ft.).

$1.3 [M \rho + M_s \rho + \frac{5}{8} (M \ddagger + M_I)]$

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).

$M \rho + M_s \rho + \frac{5}{8} (M \ddagger + M_I)$

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

$1.3 [M \rho + M_s \rho + \frac{5}{8} (M \ddagger + M_I)]$

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



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FILE NAME =	USER NAME = jsurber	DESIGNED - TJJ	REVISED -
		CHECKED - DTS	REVISED -
		DRAWN - TJJ	REVISED -
		CHECKED - DTS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MOMENT AND REACTION TABLES (1 OF 2)
STRUCTURE NO. 016-0486

F.A.P. RT.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
373	2013-038B-R	COOK	821	651
CONTRACT NO.			60J16	
ILLINOIS FED. AID PROJECT				

SHEET NO. SG61 OF SG100 SHEETS

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