

UNIT A - MAINLINE - GIRDER A3

EXISTING INTERIOR GIRDER MOMENT TABLE						
		0.4 Span 1	Pier 5	0.5 Span 2	Pier 6	0.6 Span 3
I_s	(in ⁴)	23,358	31,973	26,207	37,832	29,078
$I_c(n)$	(in ⁴)	54,720	----	60,480	----	66,291
$I_c(3n)$	(in ⁴)	41,367	----	46,031	----	50,736
S_s	(in ³)	760	1027	849	1206	938
$S_c(n)$	(in ³)	1037	----	1137	----	1237
$S_c(3n)$	(in ³)	952	----	1050	----	1147
Z	(in ³)	----	----	----	----	----
ρ	(k/')	0.872	1.072	0.953	1.167	1.033
$M \rho$	('k)	414.0	958.2	445.2	1071.4	502.3
$s \rho$	(k/')	0.130	----	0.130	----	0.130
$M_s \rho$	('k)	68.7	----	74.4	----	67.3
$M \zeta$	('k)	622.8	496.0	723.4	560.6	715.5
M_{IM}	('k)	147.9	112.3	156.3	126.9	170.0
$\zeta_3 [M \zeta + i]$	('k)	1285	1014	1466	1146	1476
M_a	('k)	2297.4	2563.6	2581.6	2882.4	2659.2
* M_u	('k)	3284.1	----	4642.0	----	3982.7
$f_s \rho$ non-comp	(ksi)	6.5	11.2	6.3	10.7	6.4
$f_s \rho$ (comp)	(ksi)	0.9	----	0.9	----	0.7
$f_s \zeta_3 [M \zeta + M_I]$	(ksi)	14.9	11.8	15.5	11.4	14.3
f_s (Overload)	(ksi)	22.3	23.0	22.6	22.1	21.4
** f_s (Total)	(ksi)	----	29.9	----	28.7	----
VR	(k)	56.3	----	51.9	----	69.1

EXISTING INTERIOR GIRDER REACTION TABLE					
		Pier 4	Pier 5	Pier 6	Pier 7
$R \rho$	(k)	31.4	110.6	121.0	37.3
$R \zeta$	(k)	41.0	60.2	66.5	50.6
R_I	(k)	9.7	9.5	10.5	12.0
R_{Total}	(k)	82.0	180.3	198.0	99.9

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

UNIT C - GIRDER C5

EXISTING INTERIOR GIRDER MOMENT TABLE	
	0.5 Span 7
I_s	(in ⁴) 11,772
$I_c(n)$	(in ⁴) 29,822
$I_c(3n)$	(in ⁴) 21,247
S_s	(in ³) 723
$S_c(n)$	(in ³) 1001
$S_c(3n)$	(in ³) 907
Z	(in ³) ----
ρ	(k/')
$M \rho$	('k)
$s \rho$	(k/')
$M_s \rho$	('k)
$M \zeta$	('k)
M_{IM}	('k)
$\zeta_3 [M \zeta + i]$	('k)
M_a	('k)
* M_u	('k)
$f_s \rho$ non-comp	(ksi)
$f_s \rho$ (comp)	(ksi)
$f_s \zeta_3 [M \zeta + M_I]$	(ksi)
f_s (Overload)	(ksi)
** f_s (Total)	(ksi)
VR	(k)

EXISTING INTERIOR GIRDER REACTION TABLE		
	Pier 10	Pier 11
$R \rho$	(k)	36.6
$R \zeta$	(k)	40.3
R_I	(k)	10.0
R_{Total}	(k)	86.9

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

UNIT E - GIRDER E2

EXISTING INTERIOR GIRDER MOMENT TABLE										
		0.4 Span 8	Pier 12	0.5 Span 9	Pier 13	0.5 Span 10	Pier 14	0.5 Span 11	Pier 15	0.6 Span 12
I_s	(in ⁴)	11,974	13,626	9,040	12,217	9,040	12,217	9,040	16,623	13,275
$I_c(n)$	(in ⁴)	30,521	----	23,064	----	23,064	----	23,064	----	35,843
$I_c(3n)$	(in ⁴)	22,047	----	17,080	----	17,080	----	17,080	----	25,554
S_s	(in ³)	707	733	504	664	504	664	504	879	830
$S_c(n)$	(in ³)	989	----	721	----	721	----	721	----	1166
$S_c(3n)$	(in ³)	898	----	655	----	655	----	655	----	1061
Z	(in ³)	----	----	----	----	----	----	----	----	----
ρ	(k/')	0.951	1.110	0.913	1.096	0.913	1.096	0.913	1.174	1.058
$M \rho$	('k)	439.0	667.6	159.0	521.1	252.7	457.5	100.5	869.2	641.3
$s \rho$	(k/')	0.148	----	0.148	----	0.148	----	0.148	----	0.148
$M_s \rho$	('k)	72.8	----	36.0	----	45.8	----	30.2	----	95.2
$M \zeta$	('k)	630.6	378.0	515.4	354.8	527.8	351.8	478.1	461.3	799.2
M_{IM}	('k)	155.9	93.5	127.6	87.8	130.6	87.1	118.3	111.9	190.0
$\zeta_3 [M \zeta + i]$	('k)	1311	786	1072	738	1097	732	994	955	1649
M_a	('k)	2369.4	1889.5	1646.5	1636.4	1814.6	1545.8	1462.2	2371.8	3100.8
* M_u	('k)	2955.1	----	3047.1	----	3207.1	----	3157.1	----	3379.4
$f_s \rho$ non-comp	(ksi)	7.4	10.9	3.8	9.4	6.0	8.3	2.4	11.9	9.3
$f_s \rho$ (comp)	(ksi)	1.0	----	0.7	----	0.8	----	0.6	----	1.1
$f_s \zeta_3 [M \zeta + M_I]$	(ksi)	15.9	12.9	17.8	13.3	18.3	13.2	16.5	13.0	17.0
f_s (Overload)	(ksi)	24.3	23.8	22.3	22.7	25.1	21.5	19.5	24.9	27.3
** f_s (Total)	(ksi)	----	30.9	----	29.6	----	27.9	----	32.4	----
VR	(k)	62.4	----	66.1	----	66.3	----	66.8	----	70.8

EXISTING INTERIOR GIRDER REACTION TABLE							
		Pier 11	Pier 12	Pier 13	Pier 14	Pier 15	Pier 16
$R \rho$	(k)	34.1	94.1	81.2	76.2	109.0	43.0
$R \zeta$	(k)	46.1	55.6	54.3	53.7	61.2	52.8
R_I	(k)	11.4	10.0	9.7	9.6	10.7	12.5
R_{Total}	(k)	91.6	159.7	145.3	139.5	180.9	108.4

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

UNIT A - RAMP E - GIRDERS R2-R4

EXISTING INTERIOR GIRDER MOMENT TABLE	
	0.5 Span 3E
I_s	(in ⁴) 11,952
$I_c(n)$	(in ⁴) 29,915
$I_c(3n)$	(in ⁴) 21,210
S_s	(in ³) 740
$S_c(n)$	(in ³) 1021
$S_c(3n)$	(in ³) 923
Z	(in ³) ----
ρ	(k/')
$M \rho$	('k)
$s \rho$	(k/')
$M_s \rho$	('k)
$M \zeta$	('k)
M_{IM}	('k)
$\zeta_3 [M \zeta + i]$	('k)
M_a	('k)
* M_u	('k)
$f_s \rho$ non-comp	(ksi)
$f_s \rho$ (comp)	(ksi)
$f_s \zeta_3 [M \zeta + M_I]$	(ksi)
f_s (Overload)	(ksi)
** f_s (Total)	(ksi)
VR	(k)

EXISTING INTERIOR GIRDER REACTION TABLE		
	Pier 39	Pier 7
$R \rho$	(k)	39.8
$R \zeta$	(k)	38.1
R_I	(k)	9.3
R_{Total}	(k)	87.3

* 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.).
 $M \zeta$: Un-factored live load moment (kip-ft.).
 M_I : Un-factored moment due to impact (kip-ft.).
 M_a : Factored design moment (kip-ft.).
 $1.3 [M \rho + M_s \rho + \frac{5}{8} (M \zeta + M_I)]$
 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).
 $M \rho + M_s \rho + \frac{5}{8} (M \zeta + M_I)$
 f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 $1.3 [M \rho + M_s \rho + \frac{5}{8} (M \zeta + M_I)]$
 VR: Maximum ζ + impact shear range within the composite portion of the span for stud shear connector design (kips).



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FILE NAME =	USER NAME = ksnider	DESIGNED - AAY	REVISED -
		CHECKED - KMP	REVISED -
		DRAWN - RMG	REVISED -
		CHECKED - KMP	REVISED -

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

MOMENT & REACTION TABLES
 STRUCTURE NO. 016-2457

SHEET NO. SD62 OF SD83 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
372	2013-038B-R	COOK	821	437
CONTRACT NO. 60J16			ILLINOIS FED. AID PROJECT	

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