

INTERIOR GIRDER MOMENT TABLE - SN 026-0106

	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	0.6 Sp. 6	
I_s	(in ⁴)	66,578	117,454	66,578	117,454	66,578	132,399	66,578	117,454	66,578	147,528	73,332
$I_c(n)$	(in ⁴)	145,296	214,011	145,296	214,011	145,296	233,407	145,296	214,011	145,296	252,771	162,716
$I_c(3n)$	(in ⁴)	106,737	-	106,737	-	106,737	-	106,737	-	106,737	-	118,283
$I_c(cr)$	(in ⁴)	-	132,639	-	132,639	-	147,835	-	132,639	-	163,206	-
S_s	(in ³)	1,675	2,891	1,675	2,891	1,675	3,239	1,675	2,891	1,675	3,587	1,942
$S_c(n)$	(in ³)	2,307	-	2,307	-	2,307	-	2,307	-	2,307	-	2,647
$S_c(3n)$	(in ³)	2,068	-	2,068	-	2,068	-	2,068	-	2,068	-	2,380
$S_c(cr)$	(in ³)	-	3,031	-	3,031	-	3,376	-	3,031	-	3,721	-
DC1	(k/')	1.160	1.220	1.165	1.225	1.165	1.230	1.165	1.225	1.165	1.250	1.170
M _{DC1}	(k)	1365	3692	1400	3579	1310	3876	1731	3505	876	4915	2721
DC2	(k/')	0.173	0.173	0.173	0.173	0.173	0.173	0.173	0.173	0.173	0.173	0.173
M _{DC2}	(k)	223	511	234	518	204	571	266	508	160	669	420
DW	(k/')	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
M _{DW}	(k)	451	1032	474	1047	413	1154	539	1028	323	1352	850
M _{Σ + IM}	(k)	2,384	2,924	2,396	3,076	2,462	3,257	2,572	3,143	2,436	3,463	3,050
M _u (Strength I)	(k)	6,834	11,918	6,946	12,074	6,820	12,989	7,805	12,059	6,043	15,069	10,538
Φ _r M _n	(k)	11,515	-	11,488	-	11,563	-	11,264	-	11,857	-	12,469
f _s DC1	(ksi)	9.8	15.3	10.0	14.9	9.4	14.4	12.4	14.5	6.3	16.4	16.8
f _s DC2	(ksi)	1.3	2.0	1.4	2.0	1.2	2.0	1.5	2.0	0.9	2.2	2.1
f _s DW	(ksi)	2.6	4.1	2.7	4.1	2.4	4.1	3.1	4.1	1.9	4.4	4.3
f _s (Σ + IM)	(ksi)	12.4	11.6	12.5	12.2	12.8	11.6	13.4	12.4	12.7	11.2	13.8
f _s (Service II)	(ksi)	29.8	36.5	30.3	36.9	29.6	35.5	34.5	36.8	25.6	37.5	41.2
0.95R _n F _{yf}	(ksi)	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5
f _s (Total)(Strength I)	(ksi)	-	48.1	-	48.7	-	46.9	-	48.6	-	49.3	-
Φ _r F _n	(ksi)	-	50.0	-	50.0	-	50.0	-	50.0	-	50.0	-
V _r	(k)	67.9	72.9	-	73.2	-	72.9	-	74.1	-	73.4	67.8

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 (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-Strength I, and Service II) in uncracked sections 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-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in⁴ and in³).

$I_c(cr), S_c(cr)$: 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 (in⁴ and in³).

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 (in³).

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

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

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

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

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

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

M_{Σ + IM}: Unfactored live load moment plus dynamic load allowance (impact) (kip-ft.).

M_u (Strength I): Factored design moment (kip-ft.).

$1.25(M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_{Σ + IM}$

f₁: Factored calculated normal stress at edge of flange for controlling flange plate due to lateral bending, Strength I or Service II as applicable (ksi).

Φ_rM_n: Compact composite positive moment capacity computed according to Article 6.10.7.1.

f_s DC1: Unfactored 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: Unfactored 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: Unfactored 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 (Σ + IM): Unfactored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).

M_{Σ + IM} / S_{c(n)} or M_{DW} / 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(Σ + IM)

f_s + f₁/2 (Service II): Sum of stresses as computed from the moments below (ksi).

f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3 f_s(Σ + IM) + f₁/2

0.95R_nF_{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_s(Σ + IM)

f_s + f₁/3 (Total) (Strength I): Sum of stresses as computed from the moments below on non-compact section (ksi).

1.25 (f_{sDC1} + f_{sDC2}) + 1.5 f_{sDW} + 1.75 f_s(Σ + IM) + f₁/3

Φ_rF_n: Non-compact composite negative stress capacity for Strength I loading according to 6.10.8 (ksi).

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

INTERIOR GIRDER MOMENT TABLE - SN 026-0107

	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	0.6 Sp. 6	
I_s	(in ⁴)	66,578	132,399	66,578	132,399	66,578	132,399	66,578	117,454	66,578	147,528	73,332
$I_c(n)$	(in ⁴)	145,296	233,407	145,296	233,407	145,296	233,407	145,296	214,011	145,296	252,771	162,716
$I_c(3n)$	(in ⁴)	106,737	-	106,737	-	106,737	-	106,737	-	106,737	-	118,283
$I_c(cr)$	(in ⁴)	-	147,835	-	147,835	-	147,835	-	132,639	-	163,206	-
S_s	(in ³)	1,675	3,239	1,675	3,239	1,675	3,239	1,675	2,891	1,675	3,587	1,942
$S_c(n)$	(in ³)	2,307	-	2,307	-	2,307	-	2,307	-	2,307	-	2,647
$S_c(3n)$	(in ³)	2,068	-	2,068	-	2,068	-	2,068	-	2,068	-	2,380
$S_c(cr)$	(in ³)	-	3,376	-	3,376	-	3,376	-	3,031	-	3,721	-
S_{xc}	(in ³)	2,123	3,328	2,121	3,330	2,134	3,327	2,086	2,982	2,184	3,665	2,303
DC1	(k/')	1.160	1.225	1.165	1.230	1.165	1.230	1.165	1.225	1.165	1.250	1.170
M _{DC1}	(k)	1344	3750	1350	3632	1293	3863	1735	3509	875	4913	2718
DC2	(k/')	0.260	0.260	0.260	0.260	0.173	0.173	0.173	0.173	0.173	0.173	0.173
M _{DC2}	(k)	326	775	343	785	202	570	267	509	160	670	420
DW	(k/')	0.388	0.388	0.388	0.388	0.350	0.350	0.350	0.350	0.350	0.350	0.350
M _{DW}	(k)	488	1159	514	1176	409	1152	540	1029	324	1354	850
M _{Σ + IM}	(k)	2,557	3,218	2,569	3,383	2,455	3,256	2,574	3,133	2,434	3,465	3,052
f ₁ (Strength I)	(ksi)	2.7	1.7	3.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M _u + 1/3 f ₁ S _{xc}	(k)	7,453	13,183	7,565	13,363	6,779	12,967	7,817	12,049	6,038	15,073	10,538
Φ _r M _n	(k)	11,500	-	11,489	-	11,563	-	11,261	-	11,858	-	12,470
f _s DC1	(ksi)	9.6	13.9	9.7	13.5	9.3	14.3	12.4	14.6	6.3	16.4	16.8
f _s DC2	(ksi)	1.9	2.8	2.0	2.8	1.2	2.0	1.5	2.0	0.9	2.2	2.1
f _s DW	(ksi)	2.8	4.1	3.0	4.2	2.4	4.1	3.1	4.1	1.9	4.4	4.3
f _s (Σ + IM)	(ksi)	13.3	11.4	13.4	12.0	12.8	11.6	13.4	12.4	12.7	11.2	13.8
f ₁ (Service II)	(ksi)	2.0	1.1	2.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _s + f ₁ /2 (Service II)	(ksi)	32.6	36.2	33.2	36.6	29.4	35.5	34.5	36.8	25.5	37.5	41.2
0.95R _n F _{yf}	(ksi)	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 ₁ /3 (Total)(Strength I)	(ksi)	-	47.6	-	48.2	-	46.8	-	48.5	-	49.3	-
Φ _r F _n	(ksi)	-	50.0	-	50.0	-	50.0	-	50.0	-	50.0	-
V _r	(k)	73.9	79.0	-	79.1	-	73.0	-	74.1	-	73.4	68.2

Note:
M_Σ and R_Σ include the effects of centrifugal force and superelevation.



USER NAME = has	DESIGNED - ELH	08/13	REVISED -
ESCA PROJECT NO. 1070.09	CHECKED - RDP	08/13	REVISED -
	DRAWN - DWH	08/13	REVISED -
PLOT DATE = 1/28/2014 1:30:40 PM	CHECKED - ELH	01/14	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**STEEL FRAMING DETAILS
STRUCTURE NOS. 026-0106 & 026-0107**

SHEET NO. 66 OF 113 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
70	(26-3B-1, 3B-1(3))BR	FAYETTE	277	146
CONTRACT NO. 74175				
ILLINOIS FED. AID PROJECT				