

GIRDER ELEVATION

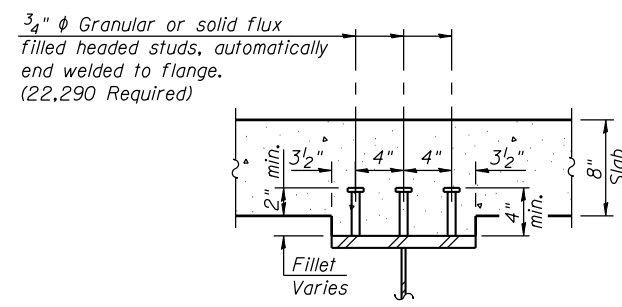
Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

Girder	A	B	C	D	E	F	G	H	I
1 and 14	20 spaces at 6" = 10'-0"	23 spaces at 9" = 17'-3"	51 spaces at 6 1/4" = 26'-6 3/4"	45 spaces at 4 1/2" = 16'-10 1/2"	1'-10 5/8"	1'-9 7/16"	92 spaces at 6 3/4" = 51'-9"	1'-9 3/8"	50 spaces at 8" = 33'-4"
2 thru 13	20 spaces at 6" = 10'-0"	23 spaces at 9" = 17'-3"	57 spaces at 5 3/4" = 27'-3 3/4"	45 spaces at 4 1/2" = 16'-10 1/2"	1'-9"	1'-8 7/8"	93 spaces at 6 3/4" = 52'-3 3/4"	1'-9 3/4"	52 spaces at 7 3/4" = 33'-7"

Girder	J	K	L	M	N	O
1 and 14	54'-1 1/2"	92'-2 5/8"	73'-0 7/8"	55'-3 7/8"	36'-10 3/4"	72'-6 7/8"
2 thru 13	54'-7"	93'-0"	73'-8 1/4"	55'-9 1/2"	37'-2 1/2"	73'-2 1/4"

	S. Abut.	Pier 1 and 3	Pier 2	N. Abut.
R _{DC1} (k)	17.27	77.73	95.36	17.27
R _{DC2} (k)	1.75	8.3	10.03	1.75
R _{DW} (k)	6.42	30.51	36.86	6.42
R _{ℓ + IM} (max) (k)	78.3	137.15	152.62	78.3
R _{ℓ + IM} (min) (k)	-18.22	-16.54	-8.51	-18.23
R _{Total} (k)	103.74	253.69	294.87	103.74

	0.4 Sp. 1 or 0.6 Sp. 4	Pier 1 and 3	0.5 Span 2 and 3	Pier 2
I _s (in ⁴)	9,200	9,200	10,300	10,300
I _c (n) (in ⁴)	21,050	11,423	22,812	12,540
I _c (3n) (in ⁴)	15,768	11,423	17,063	12,540
I _c (cr) (in ⁴)	-	11,690	-	12,810
S _s (in ³)	599	599	667	667
S _c (n) (in ³)	795	863	873	928
S _c (3n) (in ³)	730	863	801	928
S _c (cr) (in ³)	-	645	-	696
DC1 (k/ft)	0.94	0.94	0.96	0.96
M _{DC1} (k)	128	-530	390	-780
DC2 (k/ft)	0.102	0.102	0.102	0.102
M _{DC2} (k)	14	-57	41	-82
DW (k/ft)	0.375	0.375	0.375	0.375
M _{DW} (k)	51	-209	150	-301
M _{ℓ + IM} (k)	675	-915	958	-1,159
M _u (Strength I) (k)	1,435	2,648	2,441	3,557
φ _r M _n (k)	3,795	3,350	4,137	3,672
f _s DC1 (ksi)	2.56	-10.62	7.02	-14.03
f _s DC2 (ksi)	0.23	-1.06	0.61	-1.41
f _s DW (ksi)	0.84	-3.89	2.25	-5.19
f _s (ℓ + IM) (ksi)	10.19	-17.02	13.17	-19.98
f _s (Service II) (ksi)	16.86	-37.64	27.00	-46.53
0.95R _n F _{yf} (ksi)	47.5	47.5	47.5	47.5
f _s (Total)(Strength I) (ksi)	-	-	-	-
φ _r F _n (ksi)	-	-	-	-
V _f (k)	40.24	-	47.48	-



SECTION A-A

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).

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.).

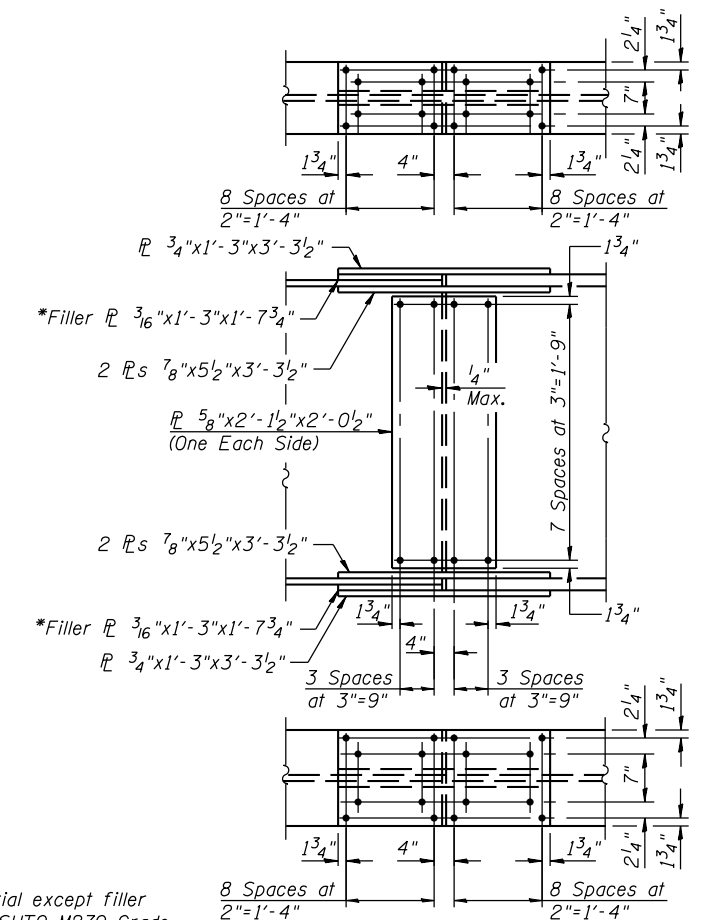
M_{DW}: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

M_{ℓ + IM}: Un-factored live load moment plus dynamic load allowance (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}

Notes:
All splice material except filler plates shall be AASHTO M270 Grade 50. (NTR)



FIELD SPLICE DETAIL

*Only at Splice 1 and 4

φ_rM_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_c

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 load plus impact loads as calculated below (ksi).

M_{ℓ + IM} / S_c(n) or M_{DW} / S_c(cr) as applicable.

f_s (Service II): Sum of stresses as computed below (ksi).

f_s DC1 + f_s DC2 + f_s DW + 1.3 f_s (ℓ + IM)

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).

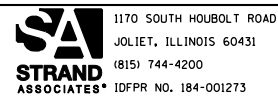
1.25 (f_s DC1 + f_s DC2) + 1.5 f_s DW + 1.75 f_s (ℓ + IM)

φ_rF_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 and R_ℓ include the effects of centrifugal force and superelevation.

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USER NAME = brianf
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CHECKED - AJ5
DRAWN - BJF
CHECKED - RRD

REVISED
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REVISED

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**BEAM DETAILS
STRUCTURE NO. 016-0587**

SHEET NO. 23 OF 42 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	22-1HB-R	COOK/DUPAGE	161	111

CONTRACT NO. 60K77

ILLINOIS FED. AID PROJECT