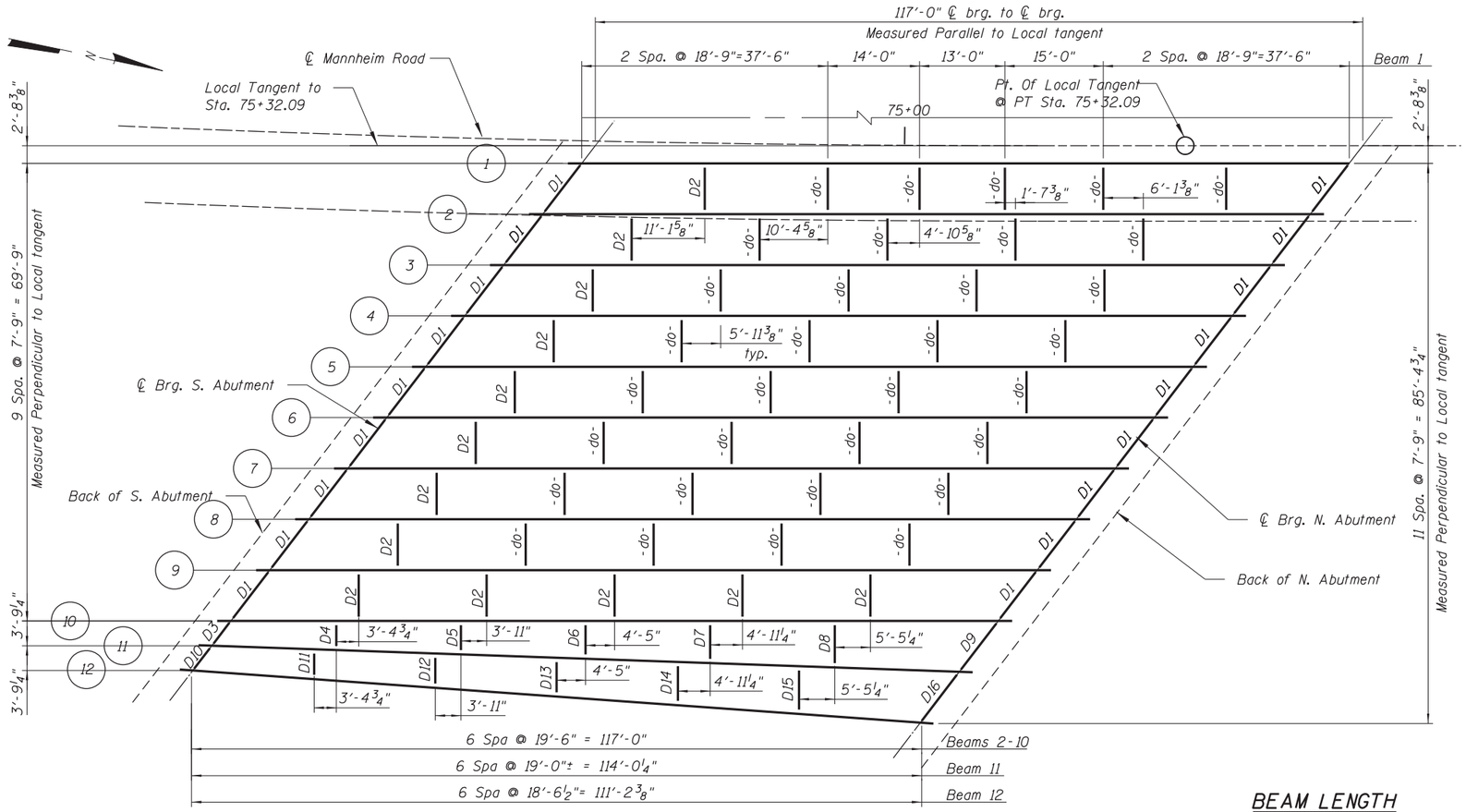
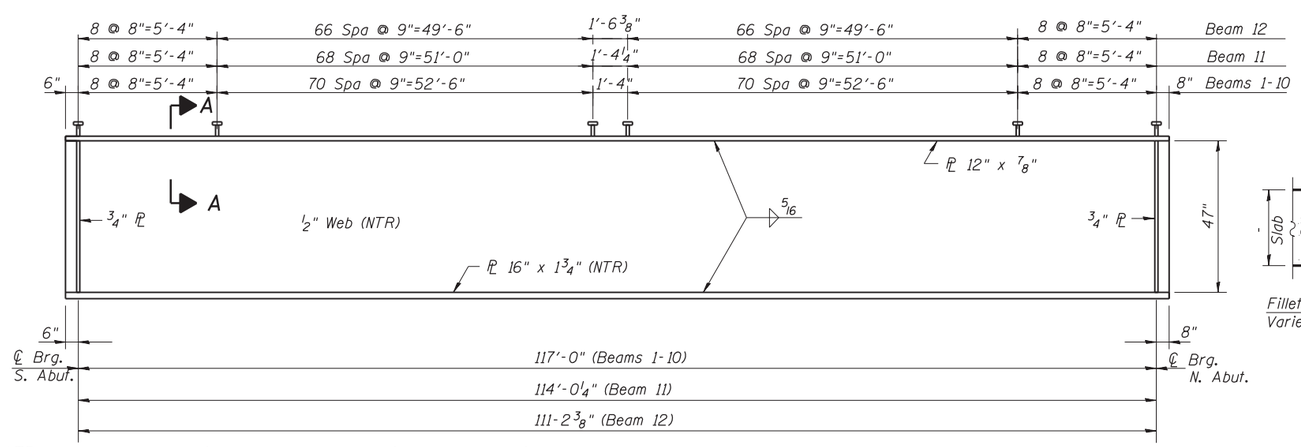


FRAMING PLAN



"NTR" denotes plates to which notch toughness requirements are applicable.

GIRDER ELEVATION

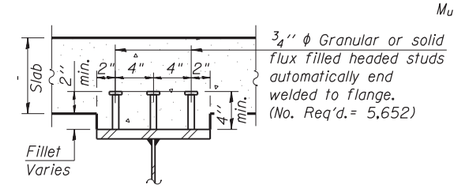
NOTES:

1. All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
2. Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

BEAM LENGTH

Beam	Length *
1-10	117'-0"
11	114'-0 1/4"
12	111'-2 3/8"

* ℄ brg to ℄ brg



SECTION A-A

INTERIOR GIRDER MOMENT TABLE		
		0.5 Span
I_s	(in^4)	23,988
$I_c(n)$	(in^4)	68,514
$I_c(3n)$	(in^4)	47,789
$I_c(cr)$	(in^4)	———
S_s	(in^3)	1,311
$S_c(n)$	(in^3)	1,784.4
$S_c(3n)$	(in^3)	1,643.4
$S_c(cr)$	(in^3)	———
DC1	(k/')	1.02
M_{DC1}	('k)	1,748
DC2	(k/')	0.080
M_{DC2}	('k)	136.9
DW	(k/')	0.39
M_{DW}	('k)	667.3
M_{LL+IM}	('k)	2,023
M_u (Strength I)	('k)	6,897
$\phi_f M_n$	('k)	8,486
f_s DC1	(ksi)	16.00
f_s DC2	(ksi)	1.00
f_s DW	(ksi)	4.81
f_s (LL+IM)	(ksi)	13.6
f_s (Service II)	(ksi)	39.6
$0.95R_hF_{yf}$	(ksi)	47.5
f_s (Total)(Strength I)	(ksi)	52.4
$\phi_f F_n$	(ksi)	———
V_f	(k)	66.9

INTERIOR GIRDER REACTION TABLE		
		Abut.
R_{DC1}	(k)	59.8
R_{DC2}	(k)	4.7
R_{DW}	(k)	22.8
R_{LL+IM}	(k)	114.3
R_{Total}	(k)	201.6

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 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_{LL+IM}: Un-factored live load moment plus dynamic load allowance (impact) ((kip-ft.).

M_u (Strength I): Factored design moment (kip-ft.).
$1.25\ (M_{DC1} + M_{DC2}) + 1.5\ M_{DW} + 1.75\ M_{LL+IM}$

$\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (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_{nc}

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 (LL+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live plus impact loads as calculated below (ksi).
$M_{LL+IM} / S_c(3n)$ or $M_{LL+IM} / S_c(cr)$ as applicable.

f_s (Service II): Sum of stresses as computed below (ksi).
$f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3\ f_s(_{LL+IM})$

$0.95R_hF_{yf}$: 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).
$1.25\ (f_{sDC1} + f_{sDC2}) + 1.5\ f_{sDW} + 1.75\ f_{s\,LL+IM}$

$\phi_f F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7.2 (ksi).

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

CHRISTOPHER B. BURKE ENGINEERING, LTD.
9575 W. Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

USER NAME =	DESIGNED - MM	REVISED
	CHECKED - JMB	REVISED
PLOT SCALE =	DRAWN - PDR	REVISED
PLOT DATE =	CHECKED - MM	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN
NB MANNHEIM ROAD BRIDGE – STRUCTURE NO. 016-7943
SHEET NO. S-17 OF S-26 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	0105 WRS&HB	COOK	605	353

CONTRACT NO. 60G37
ILLINOIS FED. AID PROJECT

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