

**FRAMING PLAN**

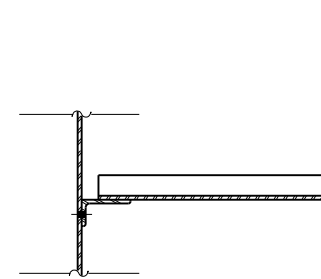
(All Beams W33x141 "NTR" - M270 GR. 50)

- $I_s, S_s$ : 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  $in^3$ ).
- $I(3n), S_c(3n)$ : 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  $in^3$ ).
- DC1: Un-factored non-composite dead load (kips/ft.).
- M<sub>DC1</sub>: 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<sub>DC2</sub>: 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<sub>DW</sub>: 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 (Strength I): Factored design moment (kip-ft.).  
 $1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_L + IM$
- $\phi_r M_n$ : 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):  
 $M_{DW} / S_c(n)$  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 load plus impact loads as calculated below (ksi):  
 $M_{LL+IM} / S_c(n)$  or  $M_{DW} / S_c(cr)$  as applicable  
 Sum of stresses as computed below (ksi).
- $f_s$  (Service II):  $f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3 f_s(L + IM)$
- $V_f$ : Maximum factored shear range in composite portion of span computed according to Article 6.10.10.

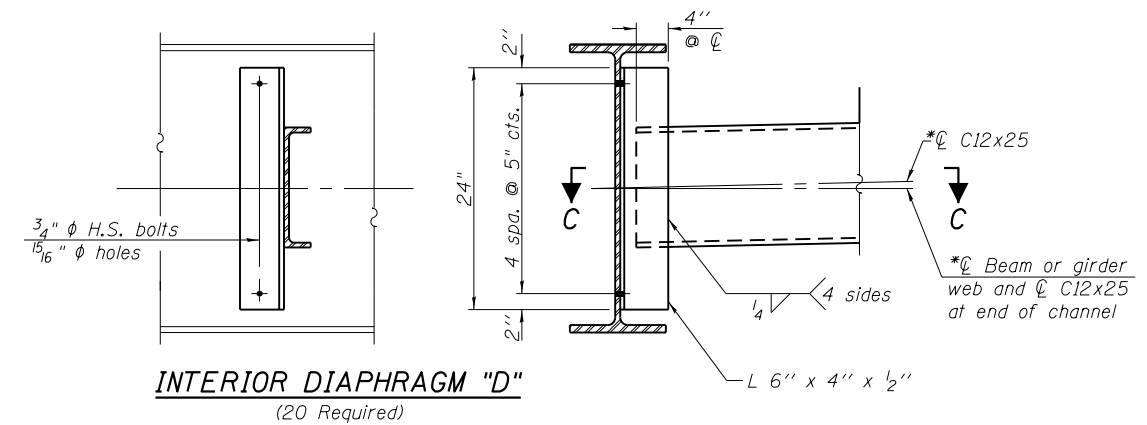
INTERIOR GIRDER MOMENT TABLE		
		0.5 Sp. 1
$I_s$	( $in^4$ )	7450
$I_c(n)$	( $in^4$ )	19448
$I_c(3n)$	( $in^4$ )	14702
$S_s$	( $in^3$ )	448
$S_c(n)$	( $in^3$ )	645
$S_c(3n)$	( $in^3$ )	597
DC1	(k/ft)	0.915
M <sub>DC1</sub>	(k)	502.6
DC2	(k/ft)	0.150
M <sub>DC2</sub>	(k)	82.4
DW	(k/ft)	0.367
M <sub>DW</sub>	(k)	201.6
$M_L + IM$	(k)	1002.2
$M_u$ (Strength I)	(k)	2788
$\phi_r M_n$	(k)	3524
$f_s DC1$	(ksi)	13.5
$f_s DC2$	(ksi)	1.7
$f_s DW$	(ksi)	4.1
$f_s (L + IM)$	(ksi)	18.6
$f_s$ (Service II)	(ksi)	43.5
$0.95R_h F_y f$	(ksi)	47.5
$V_f$	(k)	53.2

\*\*Compact sections

INTERIOR GIRDER REACTION TABLE		
		Abutment
R <sub>DC1</sub>	(k)	30.3
R <sub>DC2</sub>	(k)	5.0
R <sub>DW</sub>	(k)	12.2
$R_L + IM$	(k)	86.1
R <sub>Total</sub>	(k)	133.6

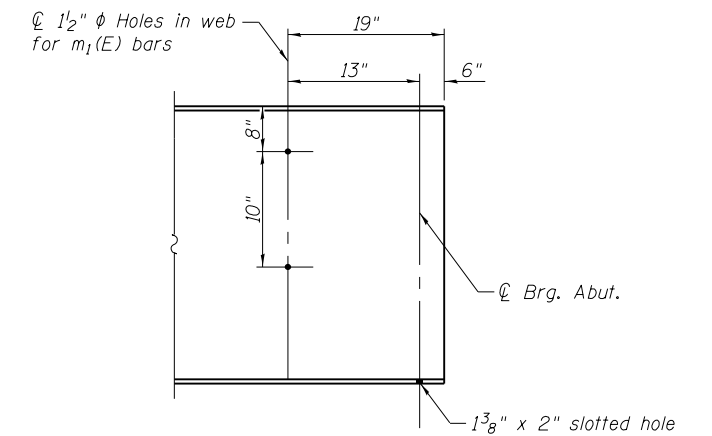


**SECTION C-C**



**INTERIOR DIAPHRAGM "D"**  
(20 Required)

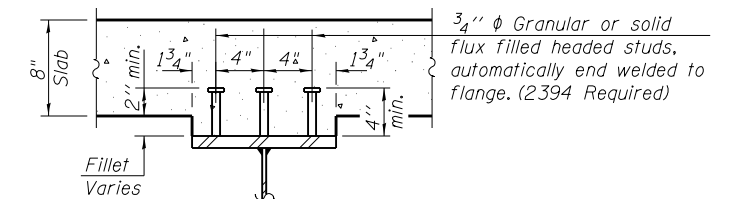
\*Alternate channel (C12x30) is permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section.  
 The alternate, if utilized, shall be provided at no additional cost to the Department.



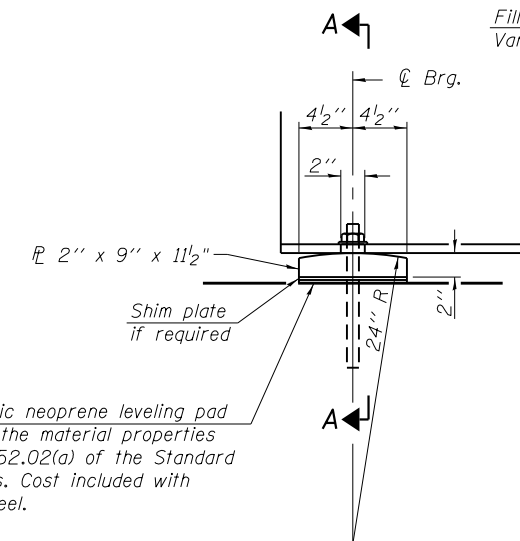
**TYP. END OF BEAM ELEVATION**

Notes:

- 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.
- Load carrying components designated "NTR" shall conform to the Impact Testing Requirements, Zone 2
- Two hardened washers required for each set of oversized holes.
- Anchor bolts shall be ASTM F1554 all-thread (or an Engineer approved alternate material) of the grade(s) and diameter(s) specified. ASTM A307 Grade C anchor bolts may be used in lieu of ASTM F1554 Grade 36 (Fy = 36 ksi). The corresponding specific grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
- Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.
- Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.

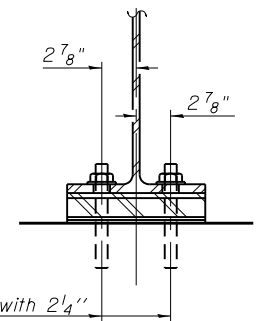


**SECTION B-B**



**ELEVATION AT ABUTMENT**

1/8" elastomeric neoprene leveling pad according to the material properties of Article 1052.02(a) of the Standard Specifications. Cost included with Structural Steel.



**SECTION A-A**

**FIXED BEARING**



USER NAME =	DESIGNED - RJP	REVISED
PLOT SCALE =	CHECKED - MJT	REVISED
PLOT DATE	DRAWN - JTF	REVISED
	CHECKED - MJT	REVISED

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

FRAMING PLAN & STRUCTURAL STEEL DETAILS  
STRUCTURE NO. 045-0078

SHEET NO. 14 OF 22 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326	106X-B	KANE	87	52
CONTRACT NO. 60N13			ILLINOIS FED. AID PROJECT	