

BEAM	RADIUS
(1)	782.440'
(2)	774.773'
(3)	767.107'
(4)	759.440'

NOTE:  
 All beams shall be fabricated to their respective radii given in the table

		INTERIOR BEAM MOMENT TABLE			
		SPAN 1 OR .5 SPAN 3	BENT 1 or 2	.5 SPAN 2	
PRIMARY LOADING	$I_s$	(in <sup>4</sup> )	4470	4470	4470
	$S_s$	(in <sup>3</sup> )	299	299	299
	Z	(in <sup>3</sup> )	346	346	346
	$\phi$	(K/I)	.86	.86	.86
	$M\phi$	(K)	58.1	-135.5	82.1
	$S\phi$	(K/I)	.38	.38	.38
	$M_s\phi$	(K)	25.6	-59.9	36.2
	$M\phi$	(K)	187.7	-166.9	220.8
	$M_{imp}$	(K)	56.3	-50.0	64.9
	$\phi_s(M\phi+I)$	(K)	406.7	361.5	476.2
	$M_a$	(K)	637.5	724.0	772.9
	$M_u$	(K)	1040	1040	1040
	$f_s\phi$	(K.S.I.)	2.33	5.44	3.30
	$f_s s\phi$	(K.S.I.)	1.03	2.40	1.45
	$f_s \phi_s(L+I)$	(K.S.I.)	16.32	14.51	19.11
$f_s(overload)$	(K.S.I.)	19.63	22.35	23.86	
$f_s(total)$	(K.S.I.)	25.59	29.06	31.02	
TORQUE LOADING	$M\phi+s\phi$	(K)	3.2	2.5	7.4
	$M\phi$	(K)	9.8	9.8	17.4
	$M_{imp}$	(K)	2.9	2.9	5.1
	$\phi_s(M\phi+I)$	(K)	21.2	21.2	37.5
	$M_a$	(K)	31.7	31.2	58.4
	$f_w\phi+s\phi$	(K.S.I.)	0.13	0.11	0.30
	$f_w \phi_s(L+I)$	(K.S.I.)	0.85	0.85	1.50
	$f_w(overload)$	(K.S.I.)	0.92	0.96	1.80
	$f_w(total)$	(K.S.I.)	1.22	1.25	2.34
	$f_s+f_w(overload)$	(K.S.I.)	20.66	23.60	25.66
$f_s+f_w(total)$	(K.S.I.)	26.87	30.31	33.36	

$I_s$  and  $S_s$  are the moment of inertia and section modulus of the steel section used in computing  $f_s$  and/or  $f_w$  (total and overload)

Z is the plastic section modulus used to determine the Fully Plastic Moments

$M_a$  (Applied Moment) =  $1.3 [M_D + M_D + 5 (M_L + I)]$

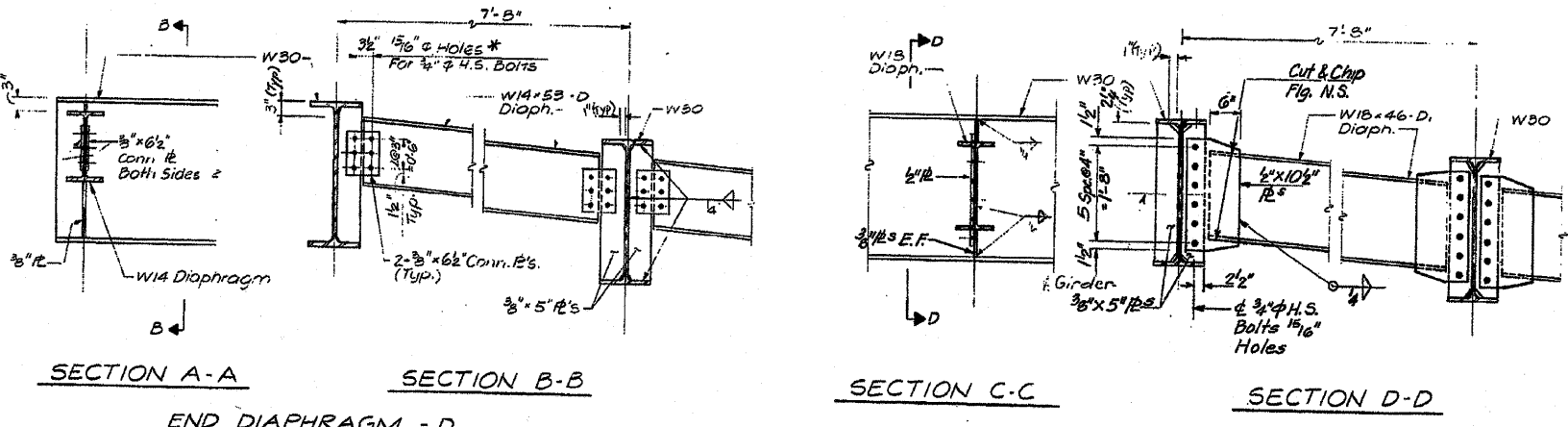
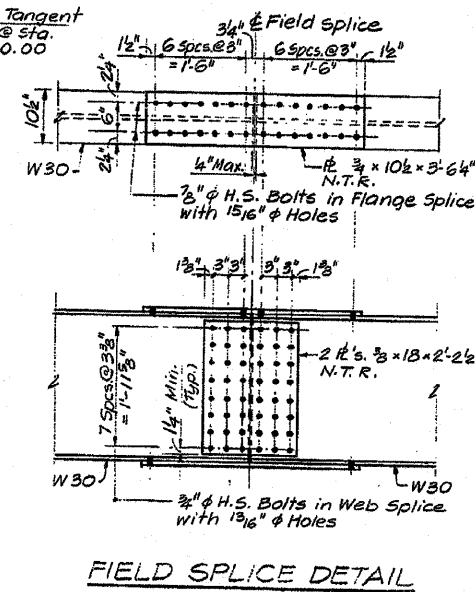
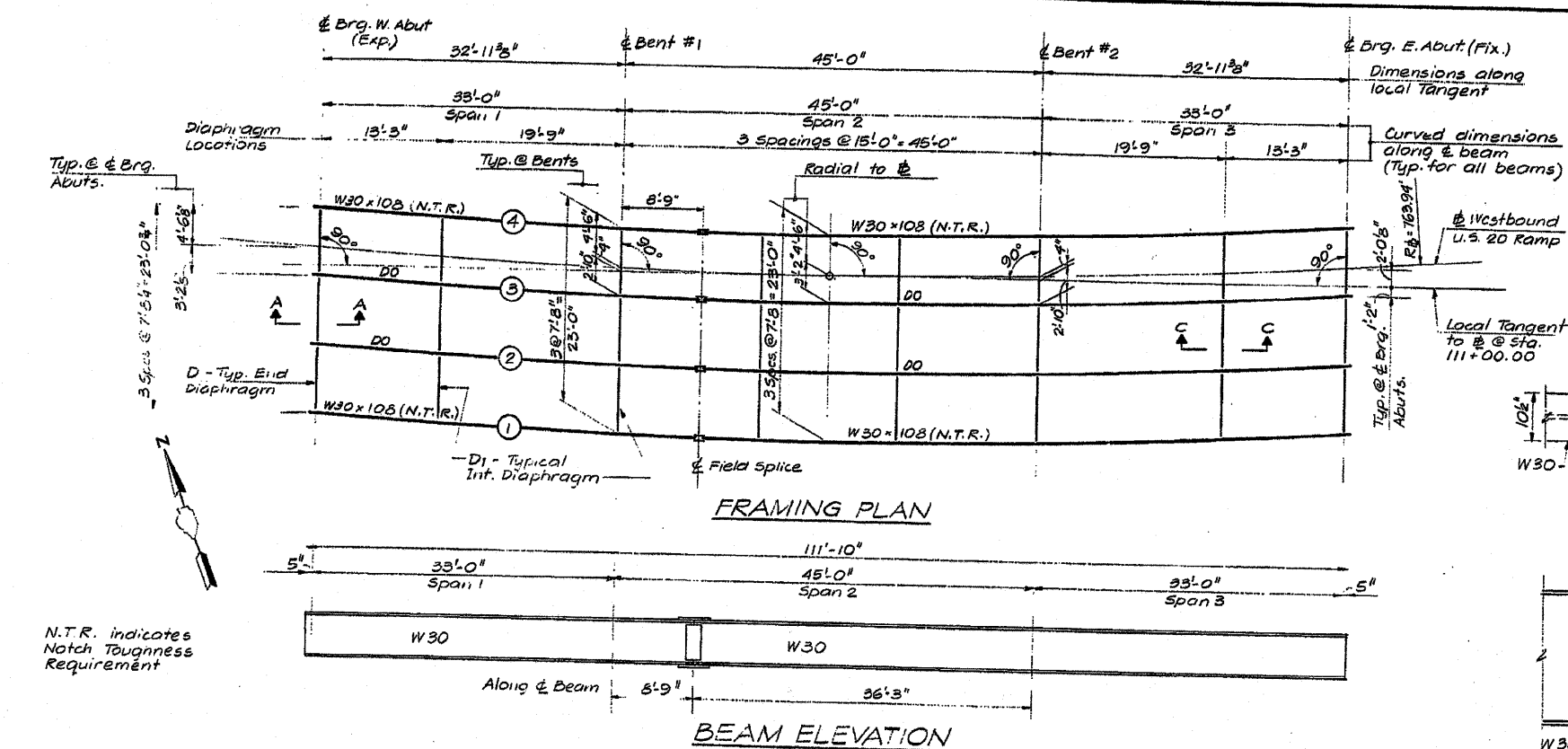
$M_u$  is the Full Plastic Moment Capacity for Compact, Braced section.

$f_s$  and/or  $f_w$  (Overload) is the sum of the stresses due to  $M_D + M_D + 5 (M_L + I)$

$f_s$  and/or  $f_w$  (Total) is the sum of the stresses due to  $1.3 [M_D + M_D + 5 (M_L + I)]$

$f_w$  is the warping normal stress

	ABUTMENT	BENT	
$R\phi$	(K)	14.4	54.0
$R\phi$	(K)	33.9	45.3
Imp.	(K)	10.2	13.6
$R$ Total	(K)	58.5	112.9



WESTBOUND RAMP					
TOP OF BEAM ELEVATIONS (FOR FABRICATION ONLY)					
LOCATION	BRGS WESTABUT	BRGS BENT #1	SPLICE	BRGS BENT #2	BRGS EASTABUT
4	760.18	759.71	759.59	759.25	758.94
3	760.58	760.22	760.13	759.83	759.56
2	760.99	760.73	760.67	760.41	760.18
1	761.39	761.25	761.21	760.99	760.80

\* NOTE: Two hardened washers shall be required over all 15/16" holes.

**FOR INFORMATION ONLY**

DESIGNED BY J.D.  
 CHECKED BY Z.B.  
 DRAWN BY D.L.  
 CHECKED BY B.C.O.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.  
 CONSULTING ENGINEERS  
 PARK RIDGE, ILLINOIS

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 DISTRICT 2  
 FRAMING PLAN & DETAILS  
 STEPHENSON COUNTY, SECTION 177-4B-3  
 F.A. 401 RAMP OVER SILVER CREEK  
 STA. 111+00.00