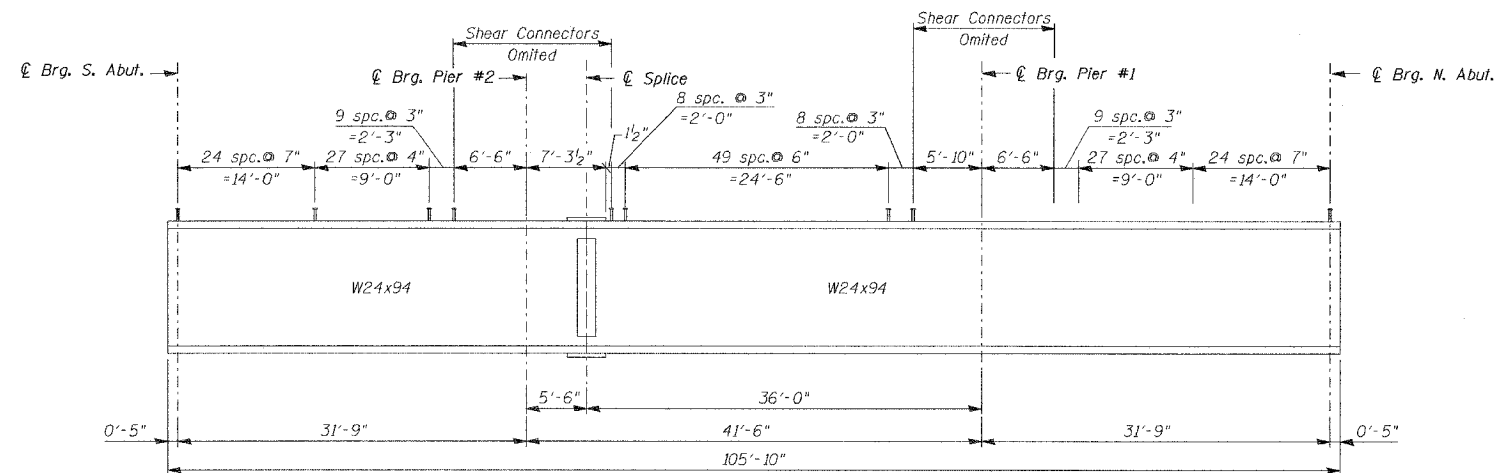


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

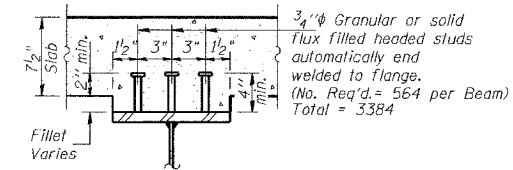
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 59 SHEETS S20
F. A. P. 846	4-RB	WILL	87	37	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT			

CONTRACT NO. 62269



BEAM ELEVATION

NOTE:
All wide flange beams and splice plate material shall be AASHTO M270 Grade 50 and shall meet notch toughness requirements.



SECTION A-A
(Typical, unless noted otherwise)
SHEAR CONNECTOR DETAIL

INTERIOR BEAM MOMENT TABLE				
		0.4 Sp. 1 0.6 Sp. 3	Pier #1 Pier #2	0.5 Sp. 2
I_s	(in ⁴)	2700	2700	2700
$I_c(n)$	(in ⁴)	9400	-	9400
$I_c(3n)$	(in ⁴)	6907	-	6907
S_s	(in ³)	222	222	222
$S_c(n)$	(in ³)	373	-	373
$S_c(3n)$	(in ³)	336	-	336
Z	(in ³)	-	254	-
DC1	(K/')	0.92	0.92	0.92
MDC1	(K)	61	126	73
DC2	(K/')	0.25	0.25	0.25
MDC2	(K)	16	33	19
DW	(K/')	0.33	0.33	0.33
MDW	(K)	22	45	26
MLL+I	(K)	324	249	328
M_u (Strength I)	(K)	696.0	703.0	728.0
$\phi_f M_n$, $\phi_f M_{nc}$	(K)	1900.0	805.0	1900.0
f_s DC1	(ksi)	3.3	6.8	3.9
f_s DC2	(ksi)	0.5	1.8	0.6
f_s DW	(ksi)	0.7	2.4	0.8
f_s 1.3(LL+I)	(ksi)	13.5	17.6	13.6
f_s (Service II)	(ksi)	18.2	28.8	19.2
f_s (Total) (Strength I)	(ksi)	-	38.3	-
Vf	(K)	11.9	15.6	10.4

I_s and S_s are the moment of inertia and section modulus of the steel section used in computing f_s due to non-composite loads.

$I_c(n)$ and $S_c(n)$ are the moment of inertia and section modulus of the composite section based on modular ratio, n , used in computing f_s due to short-term composite live loads.

$I_c(3n)$ and $S_c(3n)$ are the moment of inertia and section modulus of the composite section based upon 3 times modular ratio, $3n$, used in computing f_s due to long-term composite (superimposed) dead loads.

Z is the plastic section modulus used to determine the fully plastic moments in the non-composite areas.

DC1 is the unfactored non-composite dead load acting on the non-composite section.

DC2 is the unfactored long term composite (superimposed excluding future wearing surface) dead load.

DW is the unfactored long term composite (superimposed future wearing surface only) dead load.

M_u (Strength I) Factored design moment
 $1.25(MDC1+MDC2)+1.5MDW+1.75MLL+Imp$

$\phi_f M_n$ is the Compact composite positive moment capacity computed according to Article 6.10.7.1

$\phi_f M_{nc}$ is the Compact non-composite negative moment capacity computed according to Article A6.1.1

f_s (Service II) is the sum of the stresses from the moments below:
 $MDC1+MDC2+MDW+1.3MLL+Imp$

f_s (Total) (Strength I) (Non-Compact Section) is the sum of the stresses due to $1.25MDC1+DC2+1.5MDW+1.75MLL+Imp$

Vf is the factored maximum shear range computed according to Article 6.10.10

TOP OF BEAM ELEVATIONS **					
Beam	€ Brg. S Abut.	€ Brg. Pier #2	€ Splice	€ Brg. Pier #1	€ Brg. N Abut.
1	568.672	568.782	568.804	569.011	569.197
2	568.807	568.917	568.939	569.145	569.332
3	568.920	569.030	569.052	569.259	569.445
4	568.857	568.968	568.989	569.196	569.382
5	568.740	568.850	568.872	569.078	569.265
6	568.589	568.699	568.721	568.927	569.114

** For Fabrication Only.

INTERIOR GIRDER REACTION TABLE HS20 LOADING				
	S. Abut.	Pier #2	Pier #1	N. Abut.
R (DL) (K)	18.1	60.8	60.8	18.1
R (LL) (K)	35.3	44.2	42.1	35.3
R (Imp) (K)	10.6	13.3	12.6	10.6
R (Total) (K)	64.0	118.3	115.5	64.0

INTERIOR GIRDER REACTION TABLE HL93 Loading				
	S. Abut.	Pier #2	Pier #1	N. Abut.
R (DC1) (K)	10.7	37.8	37.8	10.7
R (DC2+DW) (K)	6.7	23.7	23.7	6.7
R (LL) (K)	41.4	83.0	80.3	41.4
R (Imp) (K)	13.6	27.4	26.5	13.6
R (Total) (K)	72.4	171.9	168.3	72.4

BILL OF MATERIAL

Item	Unit	Total
Erecting Structural Steel	L Sum	0.52
Stud Shear Connectors	Each	3384

DESIGNED	NDS/GMK
CHECKED	MTP/SMK/GBC
DRAWN	NDS/DCB
CHECKED	SMK/GBC

ILLINOIS DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS

FAP 846
NB IL. ROUTE 53 OVER PRAIRIE CREEK
STATION 1305+00 SECTION 4-RB
WILL COUNTY

STRUCTURE NO. 099-0090

SCALE: NONE
DATE: AUGUST 2007

DELTA ENGINEERING INC.
CONSULTING ENGINEERS, CHICAGO, ILLINOIS