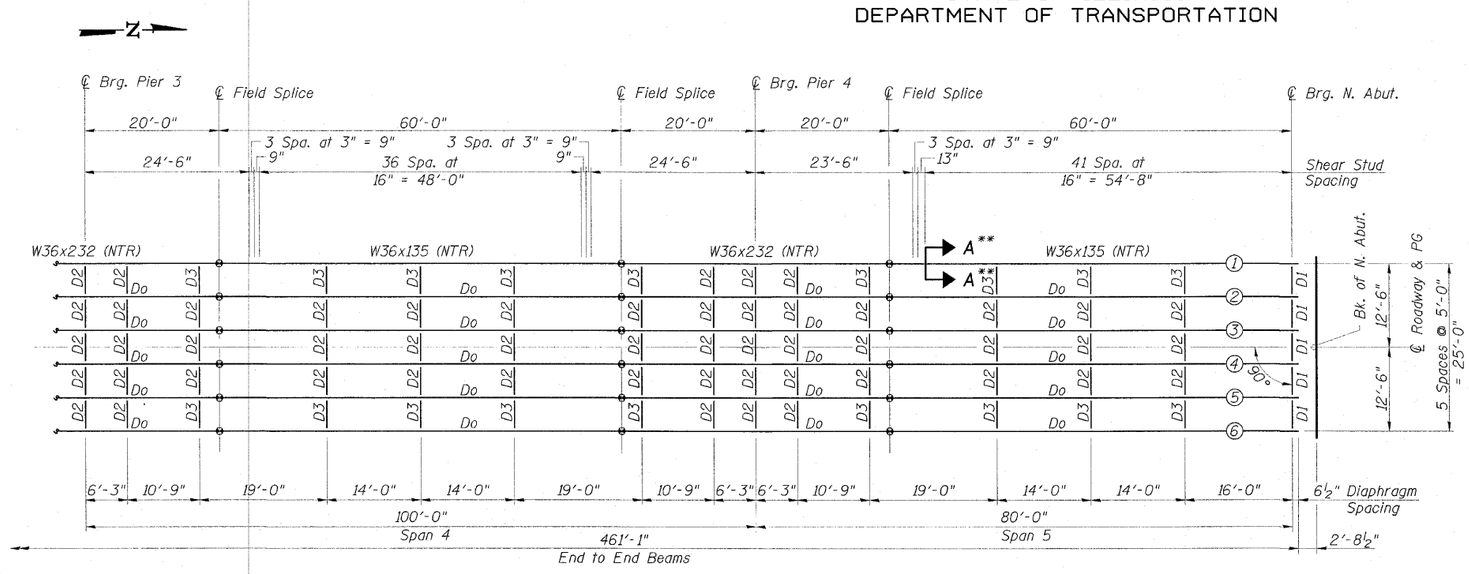
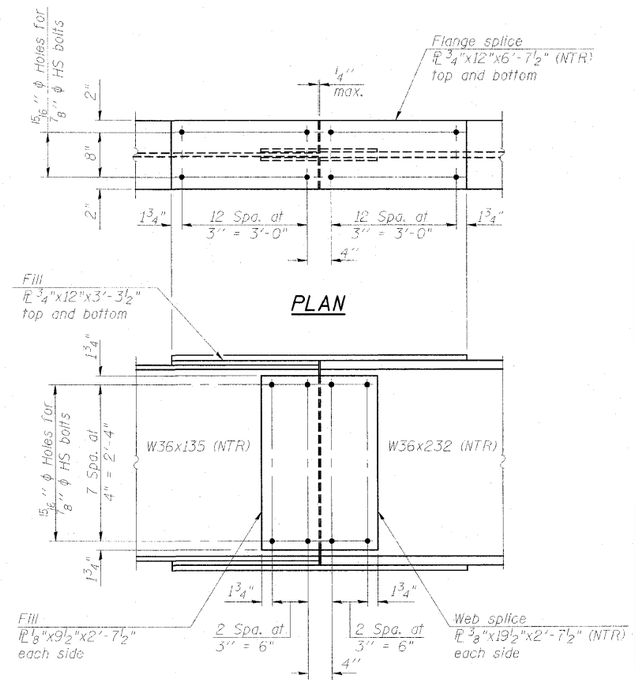
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



** Section A-A on sheet 14 of 25

STEEL FRAMING PLAN (SPANS 4 & 5)



ELEVATION
SPLICE DETAIL
(48 Required)

EXTERIOR BEAM MOMENT TABLE						
		0.4 Sp. 1 or 0.6 Sp. 5	Pier 1 or 4	0.5 Sp. 2 or 0.5 Sp. 4	Pier 2 or 3	0.5 Span 3
I_s	(in^4)	7,800	15,000	7,800	15,000	7,800
$I_c(n)$	(in^4)	18,900	-	18,900	-	18,900
$I_c(3n)$	(in^4)	13,730	-	13,730	-	13,730
S_s	(in^3)	439	809	439	809	439
$S_c(n)$	(in^3)	624	-	624	-	624
$S_c(3n)$	(in^3)	559	-	559	-	559
Z	(in^3)	-	936	-	936	-
$DC1$	(k/')	0.923	1.005	0.923	1.005	0.923
M_{DC1}	('k)	354.7	886.8	289.4	868.1	298.7
$DC2$	(k/')	0.022	0.022	0.022	0.022	0.022
M_{DC2}	('k)	10.1	17.0	10.2	17.6	9.9
DW	(k/')	0.250	0.250	0.250	0.250	0.250
M_{DW}	('k)	114.9	192.7	116.1	200.1	112.4
M_{L+IM}	('k)	1,141.1	1,046.6	1,226.9	1,128.0	1,244.8
M_u (Strength I)	('k)	2,625.4	3,250.3	2,695.8	3,381.3	2,732.7
* $\phi_f M_n$, $\phi_f M_{nc}$	('k)	3,185.0	3,900.0	3,185.0	3,900.0	3,185.0
f_s DC1	(ksi)	9.70	13.15	7.91	12.88	8.16
f_s DC2	(ksi)	0.22	0.25	0.22	0.26	0.21
f_s DW	(ksi)	2.47	2.86	2.49	2.97	2.41
f_s 1.3(4+IM)	(ksi)	28.54	20.18	30.68	21.75	31.13
f_s (Service II)	(ksi)	40.93	36.44	41.30	37.86	41.91
V_f	(k)	28.6	-	23.8	-	23.7

* Compact sections

INTERIOR BEAM MOMENT TABLE						
		0.4 Sp. 1 or 0.6 Sp. 5	Pier 1 or 4	0.5 Sp. 2 or 0.5 Sp. 4	Pier 2 or 3	0.5 Span 3
I_s	(in^4)	7,800	15,000	7,800	15,000	7,800
$I_c(n)$	(in^4)	18,900	-	18,900	-	18,900
$I_c(3n)$	(in^4)	13,730	-	13,730	-	13,730
S_s	(in^3)	439	809	439	809	439
$S_c(n)$	(in^3)	624	-	624	-	624
$S_c(3n)$	(in^3)	559	-	559	-	559
Z	(in^3)	-	936	-	936	-
$DC1$	(k/')	0.705	0.789	0.705	0.789	0.705
M_{DC1}	('k)	269.4	679.4	220.6	665.8	227.4
$DC2$	(k/')	0.022	0.022	0.022	0.022	0.022
M_{DC2}	('k)	10.1	17.0	10.2	17.6	9.9
DW	(k/')	0.250	0.250	0.250	0.250	0.250
M_{DW}	('k)	114.9	192.7	116.1	200.1	112.4
M_{L+IM}	('k)	761.6	711.4	774.9	746.9	786.2
M_u (Strength I)	('k)	1,854.6	2,404.4	1,818.5	2,461.3	1,841.0
* $\phi_f M_n$, $\phi_f M_{nc}$	('k)	3,185.0	3,900.0	3,185.0	3,900.0	3,185.0
f_s DC1	(ksi)	7.36	10.08	6.03	9.88	6.22
f_s DC2	(ksi)	0.22	0.25	0.22	0.26	0.21
f_s DW	(ksi)	2.47	2.86	2.49	2.97	2.41
f_s 1.3(4+IM)	(ksi)	19.05	13.72	19.38	14.40	19.66
f_s (Service II)	(ksi)	29.10	26.91	28.12	27.51	28.50
V_f	(k)	24.3	-	20.2	-	20.1

* Compact sections

EXTERIOR BEAM REACTION TABLE				
		Abut.	Pier 1 or 4	Pier 2 or 3
R_{DC1}	(k)	26.3	97.7	95.1
R_{DC2}	(k)	0.7	2.2	2.2
R_{DW}	(k)	7.6	24.8	25.1
R_{L+IM}	(k)	70.8	109.5	113.3
R_{Total}	(k)	105.4	234.2	236.3

INTERIOR BEAM REACTION TABLE				
		Abut.	Pier 1 or 4	Pier 2 or 3
R_{DC1}	(k)	20.9	75.6	74.1
R_{DC2}	(k)	0.7	2.2	2.2
R_{DW}	(k)	7.6	24.8	25.1
R_{L+IM}	(k)	63.9	98.9	102.3
R_{Total}	(k)	93.1	201.5	203.7

TOP OF BEAM ELEVATIONS
(For fabrication only.)

Beam	Abutments	Splices	Piers
1	657.76	657.82	657.82
2	657.86	657.92	657.92
3	657.96	658.02	658.02
4	657.96	658.02	658.02
5	657.86	657.92	657.92
6	657.76	657.82	657.82

Notes:
Elevations shown do not include deflection and are only intended for use in fabrication of steel beams.
Elevations at splice locations are top of W36x232 flange (not splice plate).

I_s, S_s: Non-composite moment of inertia and section modulus of the steel section used for computing f_s (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 (Service II) 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 (Service II) due to long-term composite (superimposed) dead loads (in.^{4} and in.^{3}).
Z: Plastic Section Modulus of the steel section in non-composite areas (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 (impact) (kip-ft.).
M_u (Strength I): Factored design moment (kip-ft.). $1.25\,(M_{DC1} + M_{DC2}) + 1.5\,M_{DW} + 1.75\,M_{L+IM}$
$\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.).
$\phi_f M_{nc}$: Compact non-composite negative moment capacity computed according to Article A6.1.1 (kip-ft.).
f_s (Service II): Sum of stresses as computed from the moments below (ksi). $M_{DC1} + M_{DC2} + M_{DW} + 1.3\,M_{L+IM}$
V_f: Maximum factored shear range in composite portion of span computed according to Article 6.10.10.

ESCA CONSULTANTS, INC.		
DESIGNED BY:	MTD	10/09
DRAWN BY:	DWH/HAS	11/09
CHECKED BY:	MTD	11/09
APPROVED BY:	RDP	05/10

(Sheet 2 of 2)
STEEL FRAMING PLAN AND DETAILS
STRUCTURE NO. 074-0085

SHEET NO. 15	F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
25 SHEETS	535	08-00255-00-BR	PIATT	62	39
			CONTRACT NO. 91436		
	FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		