

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT 62829

PLAN SHEET NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
305	2004-0888	COOK	145	97
FED. ROAD DIST. NO. 1		ILLINOIS	FED. AID PROJECT*	

SHEET NO. SB-14
OF SHEETS SB-44

INTERIOR BEAM MOMENT TABLE
(FOR NEW BEAMS) 1 & 2

	0.4 Sp. #1	Pier 1	0.5 Sp. #2	Pier 2	0.5 Sp. #3	Pier 3	0.6 Sp. #4
Is (in ⁴)	12100	12100	12100	12100	12100	12100	12100
Ic (n) (in ⁴)	26160		26160		26160		26160
Ic (3n) (in ⁴)	19510		19510		19510		19510
Ss (in ³)	663	663	663	663	663	663	663
Sc (n) (in ³)	876		876		876		876
Sc (3n) (in ³)	799		799		799		799
Z (in ³)	767		767		767		767
Q (k/ft)	0.94	0.94	0.94	0.94	0.94	0.94	0.94
M _Q (k*ft)	174	428	262	522	260	426	174
s _Q (k/ft)	0.43		0.43		0.43		0.43
Ms _Q (k*ft)	87		141		140		87
M _L (k*ft)	403	295	531	346	529	294	402
M(Imp) (k*ft)	112	77	130	85	130	77	112
5/3 [M _L +M(Imp)] (k*ft)	858	620	1102	718	1098	618	857
Ma (k*ft)	1455	1362	1956	1612	1947	1357	1453
Mu (k*ft)	2301		2301		2301		2301
fs _Q non-comp (ksi)	3.15	7.75	4.74	9.45	4.71	7.71	3.15
fs _Q (comp) (ksi)	1.31		2.12		2.10		1.31
fs 5/3 [M _L +M(Imp)](ksi)	11.75	11.22	15.10	13.00	15.04	11.19	11.74
fs (Overload) (ksi)	16.21	18.97	21.96	22.45	21.85	18.90	16.2
fs (Total) (ksi)		24.66		29.18		24.57	
VR (k)	40		45.1		45		40

INTERIOR BEAM MOMENT TABLE
(FOR EXISTING BEAMS) 3 THRU 12

	0.4 Sp. #1	Pier 1	0.5 Sp. #2	Pier 2	0.5 Sp. #3	Pier 3	0.6 Sp. #4
Is (in ⁴)	9750	13106	9750	14818	9750	13106	9750
Ic (n) (in ⁴)	22168		22168		22168		22168
Ic (3n) (in ⁴)	16563		16563		16563		16563
Ss (in ³)	542	703	542	790	542	703	542
Sc (n) (in ³)	729		729		729		729
Sc (3n) (in ³)	666		666		666		666
Z (in ³)	624		624		624		624
Q (k/ft)	0.89	0.89	0.89	0.89	0.89	0.89	0.89
M _Q (k*ft)	157	421	226	515	234	401	164
s _Q (k/ft)	0.44		0.44		0.44		0.44
Ms _Q (k*ft)	87		136		140		90
M _L (k*ft)	382	298	501	353	509	277	393
M(Imp) (k*ft)	106	78	122	87	125	76	109
5/3 [M _L +M(Imp)] (k*ft)	813	626	1039	733	1057	589	836
Ma (k*ft)	1374	1361	1821	1622	1860	1287	1418
Mu (k*ft)	1872		1872		1872		1872
fs _Q non-comp (ksi)	3.48	7.19	5.00	7.82	5.18	6.84	3.63
fs _Q (comp) (ksi)	1.57		2.45		2.52		1.62
fs 5/3 [M _L +M(Imp)](ksi)	13.38	10.69	17.10	11.13	17.4	10.05	13.76
fs (Overload) (ksi)	18.43	17.88	24.55	18.95	25.1	16.89	19.01
fs (Total) (ksi)		23.24		24.64		21.96	
VR (k)	38.4		43.3		43.5		38.7

INTERIOR BEAM MOMENT TABLE
(FOR NEW BEAMS) 13 & 14

	0.4 Sp. #1	Pier 1	0.5 Sp. #2	Pier 2	0.5 Sp. #3	Pier 3	0.6 Sp. #4
Is (in ⁴)	9750	9750	9750	9750	9750	9750	9750
Ic (n) (in ⁴)	20904		20904		20904		20904
Ic (3n) (in ⁴)	15506		15506		15506		15506
Ss (in ³)	542	542	542	542	542	542	542
Sc (n) (in ³)	716		716		716		716
Sc (3n) (in ³)	651		651		651		651
Z (in ³)	624		624		624		624
Q (k/ft)	0.75	0.75	0.75	0.75	0.75	0.75	0.75
M _Q (k*ft)	138	340	208	415	207	339	138
s _Q (k/ft)	0.41		0.41		0.41		0.41
Ms _Q (k*ft)	83		134		134		83
M _L (k*ft)	306	225	402	263	401	224	305
M(Imp) (k*ft)	85	58	99	65	99	58	85
5/3 [M _L +M(Imp)] (k*ft)	652	472	835	547	833	470	650
Ma (k*ft)	1135	1056	1530	1251	1526	1052	1132
Mu (k*ft)	1872		1872		1872		1872
fs _Q non-comp (ksi)	3.06	7.53	4.61	9.19	4.58	7.51	3.06
fs _Q (comp) (ksi)	1.53		2.47		2.47		1.53
fs 5/3 [M _L +M(Imp)](ksi)	10.93	7.91	13.99	9.17	13.96	7.88	10.84
fs (Overload) (ksi)	15.52	15.44	21.07	18.36	21.01	15.39	15.43
fs (Total) (ksi)		20.07		23.87		20.00	
VR (k)	30		34		34		30

INTERIOR BEAMS REACTION TABLE

	W. Abut.	Pier 1	Pier 2	Pier 3	E. Abut.
R _Q (k)	27.0	101.5	112.0	101.3	27.0
R _L (k)	38.2	49.9	53.6	49.9	38.2
Imp. (k)	10.6	9.7	9.5	9.7	10.6
R (Total) (k)	75.8	161.1	175.1	160.9	75.8

INTERIOR BEAMS REACTION TABLE

	W. Abut.	Pier 1	Pier 2	Pier 3	E. Abut.
R _Q (k)	25.8	98.0	109.2	97.9	25.7
R _L (k)	36.8	48.4	52.3	48.5	36.9
Imp. (k)	10.2	9.3	9.2	9.4	10.2
R (Total) (k)	72.8	155.7	170.7	155.8	72.8

INTERIOR BEAMS REACTION TABLE

	W. Abut.	Pier 1	Pier 2	Pier 3	E. Abut.
R _Q (k)	22.8	85.7	94.6	85.6	22.8
R _L (k)	29.0	37.9	40.7	37.9	29.0
Imp. (k)	8.0	7.3	7.2	7.3	8.0
R (Total) (k)	59.8	130.9	142.5	130.8	59.8

Is and Ss are the moment of inertia and section modulus of the steel section used in computing fs (total and overload).

Ic (n) and Sc (n) are the moment of Inertia and section modulus of the composite section used in computing stresses due to Live Load.

Ic (3n) and Sc (3n) are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed Dead Loads.

VR is the maximum Live Load - Impact shear range in span.

Z is the plastic section modulus used to determine Mu in negative bending areas.

Ma (Applied Moment) = 1.3[MQ + MsQ + 5/3 (MLL + M(Imp.))]

Mu (Plastic Moment Capacity) is computed according to AASHTO 10.48.1 and 10.50.11

fs (Total) is the sum of the stresses due to 1.3[MQ + MsQ + 5/3 (MLL + M(Imp.))]

fs (Overload) is the sum of the stresses due to MQ + MsQ + 5/3 (MLL + M(Imp.))

TOP OF BEAM ELEVATIONS *

Beam	¢ Brg. W. Abut.	¢ Pier 1	¢ Field Splice 1	¢ Field Splice 2	¢ Pier 2	¢ Field Splice 3	¢ Pier 3	¢ Brg. E. Abut
1	655.11	654.58	654.43	654.04	653.72	652.44	652.07	650.68
2	655.11	654.50	654.33	653.86	653.53	652.18	651.81	650.39
3	655.06	654.41	654.20	653.51	653.29	651.92	651.60	650.11
4	655.05	654.35	654.12	653.37	653.13	651.70	651.37	649.87
5	655.08	654.29	654.02	653.16	652.88	651.43	651.09	649.58
6	655.13	654.23	653.94	653.00	652.69	651.18	650.83	649.30
7	655.17	654.18	653.87	652.88	652.56	650.96	650.58	649.07
8	655.17	654.16	653.84	652.81	652.47	650.84	650.46	648.95
9	655.23	654.11	653.76	652.62	652.25	650.61	650.22	648.73
10	655.27	654.07	653.68	652.44	652.03	650.35	649.95	648.43
11	655.32	654.04	653.64	652.35	651.93	650.12	649.70	648.18
12	655.39	653.94	653.53	652.22	651.79	649.89	649.44	647.90
13	655.46	654.00	653.59	652.18	651.68	649.59	649.21	647.77
14	655.52	653.97	653.53	652.06	651.53	649.39	649.01	647.54

NOTE: Field splice elevations are given for the top flange of the rolled section, not the top of the splice plate.

* For fabrication (new beams) only

STRUCTURAL STEEL
DETAILS I
WILLOW ROAD OVER
DES PLAINES RIVER
F.A.P. RTE. 305
SECTION 2004-088B
COOK COUNTY
STA. 397+76.18
STR. NO. 016-0530

EDWARDS AND KELCEY

01/27/2005 11:50:33 AM

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DESIGNED	EL
CHECKED	JAS
DRAWN	ABW
CHECKED	EL