06-NOV-09 GEORGIA DEPARTMENT OF TRANSPORTATION PROB. NO. 0001
13:31:39 PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
32' CURB-CURB; 4 BEAMS; 184' SPAN; 80' TALL; BRIDGE 2B ; PIER 2

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW ANG D M S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* MAIN SIZE	* STR SIZ	* MAX TOP	MAX BOT	MIN SIZE	MIN NO.	TOP CL.	MIN S.SP	CAP DEPTH INCR.	BOT CL.
D D D L	2	1	6	0-00-00	3500.	1400.	8.	60000.	24000.	3409.	29000.	0.0030	170.	11	5	16	16	11	2	2.00	4.00	3.00	2.00

COLUMN MIN.P	REINFORCING STEEL MAX.P	CL.SP.	CLEAR	R MODE	KL COEF	OC	OF	CM	BD1	BD2	IMPACT %	SOIL WT KCF	ALL.S.P. KSF	MIN PL SP	MAX PL SP	EDGE DIST	PILE DEPTH	REBAR CLEAR	ALL.PILE CAPACITY	ALL.PILE UPLIFT	I P
1.00	8.00	2.50	3.750	2	2.00	0.70	0.90	1.00	1.00	0.75	16.03	0.120	0.000	3.00	9.00	1.250	1.000	3.000	235.000	-9.999	

CAP DATA

CN	C	L	A	DE	BC	BE	DH	LH	XB1	XB2	XB3	XB4	XB5	XB6	XB7	XB8
11	L	17.625	4.000	4.000	6.000	6.000	4.000	13.625	14.000	9.333	0.667					
12	2 SAME AS CANTILEVER 1															

COLUMN DATA

CN	P	I	T	S	HT	A	DT	BT	DB	BB	DL	FLEX	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	SLOPE	EP	AP
21	0	V	T		80.000	6.000	8.000	6.000	11.083	6.000	6.000	0.000	8	6	11	11	6	11	22	16	11	31	16	11	0.000	0.000	0.000

FOOTING DATA

CN	S/P	B	D	T	DEL.B	DEL.D	DEL.T	R.B/D	R.D/B	S.HT.	NP	SYM.	BP	DP	SET.
31	P	13.083	13.083	3.000	0.500	0.500	0.250	1.000	1.000	2.500	4	3	0.000	0.000	0.000

GROUP II WIND

SUPERSTRUCTURE AREA* TRANS.	STD. LONG.	WIND FT1 FL1	FT2 FL2	FT3 FL3	FT4 FL4	FT5 FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
1934.	1934.	1 50 0	44 6	41 12	33 16	17 19	7.771	7.771	10.077	21.268

GROUP III WIND

STD. WIND	* WIND ON SUPERSTRUCTURE INTENSITIES FT1 FL1	FT2 FL2	FT3 FL3	FT4 FL4	FT5 FL5	* STD. WIND	* WIND ON LIVE LOAD INTENSITIES FT1 FL1	FT2 FL2	FT3 FL3	FT4 FL4	FT5 FL5	* LENGTHS OF LL TRANS.	LONGI.	* WIND ON LL ARMS APT	APL
1	50 0	44 6	41 12	33 16	17 19	1	100 0	88 12	82 24	66 32	34 38	183.5	183.5	16.375	16.375

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
14.624	6.772	16.375	16.375	0.00018000	0.00044000	0.000	0.000

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES

I.D.	NL	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
D.L.	0	464.330	433.220	0.000	0.000	527.900	412.490						
LL01	1	31.740	64.180	0.000	0.000	102.000	117.200						
LL02	1	136.710	71.040	0.000	0.000	71.030	29.490						
LL03	2	47.140	114.160	0.000	0.000	168.170	146.690						
LL04	2	45.590	116.710	0.000	0.000	173.000	122.920						
LL05	2	146.260	135.220	0.000	0.000	115.150	39.410						
LL06	2	168.450	118.320	0.000	0.000	105.780	36.940						

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

LOAD	COL	TRANSVERSE PC	MT	V	MB	RF	ML	MR	* LONGITUDINAL MT	V	MB	MF
UNIT F.AT CL.CAP	1	0.000	-6.000	1.000	80.000	0.000	0.000	0.000	6.000	1.000	80.000	80.000
DEAD LOAD TOTAL	1	2042.690 2678.154	-283.888	0.000	283.888	2678.154	9319.895	-9036.007	0.000	0.000	0.000	0.000
TRAC. FORCE 1 LN	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-151.523	-6.772	-652.651	-652.651
CENT. FORCE 1 LN	1	0.000	-327.212	14.624	1409.388	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WIND ON SUBSTR.	1	0.000	-60.462	10.077	806.160	0.000	0.000	0.000	-127.608	-21.268	-1701.440	-1701.440
GROUP 2 WIND 1 1	1	0.000	-1392.118	106.777	9293.616	0.000	0.000	0.000	-127.608	-21.268	-1701.440	-1701.440
GROUP 2 WIND 1 2	1	0.000	-1392.118	106.777	9293.616	0.000	0.000	0.000	127.608	21.268	1701.440	1701.440
GROUP 2 WIND 2 1	1	0.000	-1232.319	95.173	8275.121	0.000	0.000	0.000	-287.407	-32.872	-2719.935	-2719.935
GROUP 2 WIND 2 2	1	0.000	-1232.319	95.173	8275.121	0.000	0.000	0.000	287.407	32.872	2719.935	2719.935
GROUP 2 WIND 3 1	1	0.000	-1152.420	89.371	7765.874	0.000	0.000	0.000	-447.205	-44.476	-3738.429	-3738.429
GROUP 2 WIND 3 2	1	0.000	-1152.420	89.371	7765.874	0.000	0.000	0.000	447.205	44.476	3738.429	3738.429
GROUP 2 WIND 4 1	1	0.000	-939.355	73.899	6407.881	0.000	0.000	0.000	-553.738	-52.212	-4417.426	-4417.426
GROUP 2 WIND 4 2	1	0.000	-939.355	73.899	6407.881	0.000	0.000	0.000	553.738	52.212	4417.426	4417.426
GROUP 2 WIND 5 1	1	0.000	-513.225	42.955	3691.895	0.000	0.000	0.000	-633.637	-58.014	-4926.673	-4926.673

GROUP 2 WIND 5 2	1	0.000	-513.225	42.955	3691.895	0.000	0.000	0.000	633.637	58.014	4926.673	4926.673
GROUP 3 WIND 1 1	1	0.000	-828.217	50.383	4556.566	0.000	0.000	0.000	-38.282	-6.380	-510.432	-510.432
GROUP 3 WIND 1 2	1	0.000	-828.217	50.383	4556.566	0.000	0.000	0.000	38.282	6.380	510.432	510.432
GROUP 3 WIND 2 1	1	0.000	-731.007	44.700	4038.800	0.000	0.000	0.000	-135.492	-12.064	-1028.198	-1028.198
GROUP 3 WIND 2 2	1	0.000	-731.007	44.700	4038.800	0.000	0.000	0.000	135.492	12.064	1028.198	1028.198
GROUP 3 WIND 3 1	1	0.000	-682.403	41.858	3779.917	0.000	0.000	0.000	-232.701	-17.747	-1545.964	-1545.964
GROUP 3 WIND 3 2	1	0.000	-682.403	41.858	3779.917	0.000	0.000	0.000	232.701	17.747	1545.964	1545.964
GROUP 3 WIND 4 1	1	0.000	-552.790	34.281	3089.562	0.000	0.000	0.000	-297.507	-21.536	-1891.142	-1891.142
GROUP 3 WIND 4 2	1	0.000	-552.790	34.281	3089.562	0.000	0.000	0.000	297.507	21.536	1891.142	1891.142
GROUP 3 WIND 5 1	1	0.000	-293.565	19.126	1708.852	0.000	0.000	0.000	-346.112	-24.377	-2150.025	-2150.025
GROUP 3 WIND 5 2	1	0.000	-293.565	19.126	1708.852	0.000	0.000	0.000	346.112	24.377	2150.025	2150.025
LIVE LOAD LL01	1	315.120	1372.946	0.000	-1372.946	315.120	743.888	-2116.834	0.000	0.000	0.000	0.000

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

		TRANSVERSE							*	LONGITUDINAL		
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
LIVE LOAD LL02	1	308.270	-1501.127	0.000	1501.127	308.270	2245.484	-744.357	0.000	0.000	0.000	0.000
LIVE LOAD LL03	1	476.160	1645.765	0.000	-1645.765	476.160	1192.745	-2838.509	0.000	0.000	0.000	0.000
LIVE LOAD LL04	1	458.220	1345.325	0.000	-1345.325	458.220	1182.946	-2528.271	0.000	0.000	0.000	0.000
LIVE LOAD LL05	1	436.040	-1589.567	0.000	1589.567	436.040	2678.712	-1089.145	0.000	0.000	0.000	0.000
LIVE LOAD LL06	1	429.490	-1899.664	0.000	1899.664	429.490	2910.500	-1010.835	0.000	0.000	0.000	0.000

CAP ANALYSIS AND DESIGN DATA

CAP MOMENTS AND SHEARS

	MOMENTS(KIP-FEET)							**	SHEARS(KIPS)					
POINT	D.L.TOT.	G1 MAX.+	G1 MAX.-	G2 MAX.+	G2 MAX.-	G3 MAX.+	G3 MAX.-		DL T.LT	DL T.RT	G1 + LT	G1 + RT	G1 - LT	G1 - RT
P 1	-33.476	-33.476	-33.476	-33.476	-33.476	-33.476	-33.476		-19.222	-622.851	-19.222	-622.851	-19.222	-988.556
P 2	-6151.136	-6151.136	-9564.260	-6151.136	-6151.136	-6151.136	-8194.923		-693.110	-1256.296	-693.110	-1256.296	-1058.815	-1878.873
P 3	-6991.134	-6991.134	-10819.518	-6991.134	-6991.134	-6991.134	-9283.579		-1262.462	-1262.462	-1262.462	-1262.462	-1885.040	-1885.040
C 1L	-12115.862	-12115.862	-18434.557	-12115.862	-12115.862	-12115.862	-15899.513		-1299.902		-1299.902		-1922.480	
C 1R	-11746.809	-11746.809	-17909.213	-11746.809	-11746.809	-11746.809	-15436.870			1355.594		2039.155		1355.594
P 4	-6399.311	-6399.311	-9827.471	-6399.311	-6399.311	-6399.311	-8452.101		1318.155	1318.155	2001.716	2001.716	1318.155	1318.155
P 5	-5522.167	-5522.167	-8494.392	-5522.167	-5522.167	-5522.167	-7301.942		1311.988	625.718	1995.549	944.182	1311.988	625.718
P 6	-33.476	-33.476	-33.477	-33.476	-33.476	-33.476	-33.477		555.459	19.222	873.923	19.222	555.459	19.222

CAP DESIGN DATA

PT.	M+ UNF. K-FT.	M- UNF. K-FT.	TOP REINFORCE. AS	NO.SIZE	BOT.REINFORCE. AS	NO.SIZE	LEFT STIRRUPS M.SP.	AV/IN	BAR&SPAC	RIGHT STIRRUPS M.SP.	AV/IN	BAR&SPAC	D IN.	FC PSI	PS %	FS/FF RATIO	FS/FZ RATIO
P 1	-25.751	-25.751	3.12	2 # 11	3.12	2 # 11	0.00	0.000	#5@ 0.00	24.00	0.195	D#5@ 6.34	60.77		0.08	0.000	0.098
P 2	-4731.644	-6303.787	24.37	16 # 11	3.12	2 # 11	24.00	0.088	#5@ 7.06	24.00	0.266	D#5@ 4.66	93.65		0.41	0.628	0.986
P 3	-5377.795	-7141.215	26.98	18 # 11	3.12	2 # 11	24.00	0.258	D#5@ 4.81	24.00	0.258	D#5@ 4.81	96.00		0.44	0.609	0.964
C 1	-9036.007	-12230.395	47.70	31 # 11	3.12	2 # 11	24.00	0.268	D#5@ 4.63	12.00	0.293	D#5@ 4.24	96.00		0.77	0.659	0.903
P 4	-4922.547	-6501.616	24.38	16 # 11	3.12	2 # 11	24.00	0.282	D#5@ 4.40	24.00	0.282	D#5@ 4.40	96.00		0.40	0.619	0.990
P 5	-4247.821	-5616.878	21.57	14 # 11	3.12	2 # 11	12.00	0.291	D#5@ 4.26	24.00	0.063	#5@ 9.84	93.65		0.37	0.630	1.045
P 6	-25.751	-25.751	3.12	2 # 11	3.12	2 # 11	24.00	0.156	D#5@ 7.93	0.00	0.000	#5@ 0.00	60.77		0.08	0.000	0.098

NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***

COLUMN ANALYSIS AND DESIGN OUTPUT

CRITICAL COLUMN LOADS

CN	T B	GR	LLC	WC	R	E S	C F	S F	PF	MTF	MLF	PM	MTM	MLM	PU	MTU	MLU	PU/PM	B	D
1	T	1	LL06	0.0			C		3587.9	-5344.0	0.0	3587.9	7311.7	5943.7	5940.1	12130.8	9861.1	1.659	72.00	96.00
1	B	2		4.1					3481.6	8699.3	-5742.7	3481.6	11182.2	11241.7	4843.6	15584.3	15667.4	1.394	72.00	133.00

COLUMN DESIGN DATA

CN	T B	B FACE 1 NO.SIZE	B FACE 2 NO.SIZE	D FACE 3 NO.SIZE	D FACE 4 NO.SIZE	AS	PS	BD12	BD	SUMPU	SUMPC	DEL.T	DEL.L	CM	R	PHIC
1	T	15 # 11	15 # 11	8 # 11	8 # 11	71.76	1.038	1.00	0.057	4001.	14867.	1.368	2.761	1.000	2	0.70
1	B	16 # 11	16 # 11	15 # 11	15 # 11	96.72	1.010	1.00	0.137	3069.	13820.	1.285	1.958	1.000	2	0.70

FOOTING 1 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD

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1 3 LL06  3.1      C      3048.308 8519.799  71.106-2851.267 -31.291 123.531  71.702 241.433 293.262 203.959  43.267  41.327  MAX.P1
1 3 LL06  1.1      C      3962.80012085.383 103.520-2360.455 -25.902 138.159  95.252 336.294 379.202 273.753  57.983  53.725  MAX.MT
1 3 LL06  1.1      C      3962.80012085.383 103.520-2360.455 -25.902 138.159  95.252 336.294 379.202 273.753  57.983  53.725  MAX.VT
1 3 LL05  1.1      C      3970.13911737.949 103.520-2360.455 -25.902 141.835  98.927 333.352 376.260 271.270  57.483  53.826  MAX.VP
1 3 LL06  4.1      C      3962.80010178.276  82.587-4155.378 -45.603 173.732  98.197 300.721 376.256 409.410  51.882  53.725  MAX.ML
1 3 LL06  4.1      C      3962.80010178.276  82.587-4155.378 -45.603 173.732  98.197 300.721 376.256 409.410  51.882  53.725  MAX.VL
1 5       1.1   E         2678.154 9577.504 106.777-1701.440 -21.268  82.753  51.580 245.195 276.368 198.418  42.150  36.251  MAX.P3
                                   FOOTING 1 ANALYSIS/DESIGN RESULTS
     FOOTING SIZE             *   BAR REINFORCEMENT STEEL     *         SECTION CAPACITIES         *
   B       D       T    P1/PA   AS   NO.SIZE  SPAC. PLACEMENT    MT.     VB      VP      DS      FC
23.500  23.500   5.500  0.998  1.27  30 # 9 @ 9.375  TOP TRAN 275.476  59.169 118.337  49.026  0.000
                              1.87  29 #11 @ 9.625  BOT.LONG 421.690  60.700 121.400  50.295  0.000
NUMBER OF PILES = 20  BP = 3.500  DP = 5.250
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