16-OCT-09 GEORGIA DEPARTMENT OF TRANSPORTATION PROB. NO. 0001
17:33:38 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; 176' SPAN; 60' TALL; BRIDGE 7 ; PIER 8

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	CAP REINFORCING STEEL MAX BOT	MIN SIZE	* MIN NO.	* TOP CL.	* MIN S.SP	CAP DEPTH INCR.	BOT CL.
D D D L	2	1	8	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 REINFORCING STEEL MIN.P	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	15.38	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	C	T		60.000	0.000	8.000	6.000	8.000	6.000	6.000	0.000	8	6	11	8	6	11	22	16	11	22	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	10.000	10.000	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*STD. TRANS.	LONG.	WIND ON SUPERSTRUCTURE INTENSITIES WIND	FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
1974.	1974.	1	50	0	44	6	41	12	33	16	17	19	8.125	8.125	7.676	16.653

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	175.5	175.5	17.084	17.084

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
16.232	6.516	17.084	17.084	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	345.080	296.920	0.000	0.000	246.110	186.300						
LL01	1	28.820	40.150	0.000	0.000	47.950	54.940						
LL02	1	76.250	44.270	0.000	0.000	30.700	5.410						
LL03	2	38.380	60.340	0.000	0.000	61.070	60.350						
LL04	2	12.390	51.070	0.000	0.000	78.650	28.540						
LL05	2	72.870	84.420	0.000	0.000	45.960	9.760						
LL06	2	105.070	71.110	0.000	0.000	49.010	17.890						
LL 7	2	28.860	132.760	0.000	0.000	132.769	28.869						
LL 8	2	109.675	51.954	0.000	0.000	51.945	109.684						

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	60.000	0.000	0.000	0.000	6.000	1.000	60.000	60.000
DEAD LOAD TOTAL	1	1279.160 1667.960	-2460.050	0.000	2460.050	1667.960	7014.283	-4554.233	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	-150.415	-6.516	-502.279	-502.279
CENT. FORCE 1 LN	1	0.000	-374.699	16.232	1251.228	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WIND ON SUBSTR.	1	0.000	-46.056	7.676	460.560	0.000	0.000	0.000	-99.918	-16.653	-999.180	-999.180
GROUP 2 WIND 1 1	1	0.000	-1440.194	106.376	7184.498	0.000	0.000	0.000	-99.918	-16.653	-999.180	-999.180
GROUP 2 WIND 1 2	1	0.000	-1440.194	106.376	7184.498	0.000	0.000	0.000	99.918	16.653	999.180	999.180
GROUP 2 WIND 2 1	1	0.000	-1272.897	94.532	6377.625	0.000	0.000	0.000	-267.214	-28.497	-1806.052	-1806.052
GROUP 2 WIND 2 2	1	0.000	-1272.897	94.532	6377.625	0.000	0.000	0.000	267.214	28.497	1806.052	1806.052
GROUP 2 WIND 3 1	1	0.000	-1189.249	88.610	5974.189	0.000	0.000	0.000	-434.511	-40.341	-2612.925	-2612.925
GROUP 2 WIND 3 2	1	0.000	-1189.249	88.610	5974.189	0.000	0.000	0.000	434.511	40.341	2612.925	2612.925
GROUP 2 WIND 4 1	1	0.000	-966.187	72.818	4898.359	0.000	0.000	0.000	-546.042	-48.237	-3150.840	-3150.840

GROUP 2 WIND 4 2	1	0.000	-966.187	72.818	4898.359	0.000	0.000	0.000	546.042	48.237	3150.840	3150.840
GROUP 2 WIND 5 1	1	0.000	-520.063	41.234	2746.699	0.000	0.000	0.000	-629.690	-54.159	-3554.276	-3554.276
GROUP 2 WIND 5 2	1	0.000	-520.063	41.234	2746.699	0.000	0.000	0.000	629.690	54.159	3554.276	3554.276
GROUP 3 WIND 1 1	1	0.000	-837.182	49.463	3508.173	0.000	0.000	0.000	-29.975	-4.996	-299.754	-299.754
GROUP 3 WIND 1 2	1	0.000	-837.182	49.463	3508.173	0.000	0.000	0.000	29.975	4.996	299.754	299.754
GROUP 3 WIND 2 1	1	0.000	-738.378	43.804	3103.773	0.000	0.000	0.000	-128.779	-10.655	-704.155	-704.155
GROUP 3 WIND 2 2	1	0.000	-738.378	43.804	3103.773	0.000	0.000	0.000	128.779	10.655	704.155	704.155
GROUP 3 WIND 3 1	1	0.000	-688.976	40.974	2901.572	0.000	0.000	0.000	-227.583	-16.314	-1108.555	-1108.555
GROUP 3 WIND 3 2	1	0.000	-688.976	40.974	2901.572	0.000	0.000	0.000	227.583	16.314	1108.555	1108.555
GROUP 3 WIND 4 1	1	0.000	-557.238	33.428	2362.372	0.000	0.000	0.000	-293.452	-20.087	-1378.156	-1378.156
GROUP 3 WIND 4 2	1	0.000	-557.238	33.428	2362.372	0.000	0.000	0.000	293.452	20.087	1378.156	1378.156
GROUP 3 WIND 5 1	1	0.000	-293.761	18.337	1283.970	0.000	0.000	0.000	-342.854	-22.917	-1580.356	-1580.356
GROUP 3 WIND 5 2	1	0.000	-293.761	18.337	1283.970	0.000	0.000	0.000	342.854	22.917	1580.356	1580.356
LIVE LOAD LL01	1	171.860	402.083	0.000	-402.083	171.860	590.860	-992.943	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	156.630	-1055.091	0.000	1055.091	156.630	1274.108	-219.017	0.000	0.000	0.000	0.000
LIVE LOAD LL03	1	220.140	310.987	0.000	-310.987	220.140	818.927	-1129.914	0.000	0.000	0.000	0.000
LIVE LOAD LL04	1	170.650	354.816	0.000	-354.816	170.650	411.804	-766.620	0.000	0.000	0.000	0.000
LIVE LOAD LL05	1	213.010	-1063.033	0.000	1063.033	213.010	1414.168	-351.135	0.000	0.000	0.000	0.000
LIVE LOAD LL06	1	243.080	-1323.661	0.000	1323.661	243.080	1802.850	-479.190	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	323.258	0.168	0.000	-0.168	323.258	1023.631	-1023.799	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	323.258	0.084	0.000	-0.084	323.258	1777.919	-1778.003	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	-467.826	-19.222	-467.826	-19.222	-705.930
P 2	-4704.288	-4704.288	-6926.517	-4704.288	-4704.288	-4704.288	-6034.963		-538.085	-924.081	-538.085	-924.081	-776.189	-1306.568
P 3	-5322.698	-5322.698	-7778.975	-5322.698	-5322.698	-5322.698	-6793.522		-930.247	-930.247	-930.247	-930.247	-1312.734	-1312.734
C 1L	-9118.567	-9118.567	-13032.556	-9118.567	-9118.567	-9118.567	-11462.272		-967.687		-967.687		-1350.174	
C 1R	-5920.502	-5920.502	-9780.547	-5920.502	-5920.502	-5920.502	-8231.907			695.221		1046.137		695.221
P 4	-3214.501	-3214.501	-5670.959	-3214.501	-3214.501	-3214.501	-4685.434		657.781	657.781	1008.697	1008.697	657.781	657.781
P 5	-2777.826	-2777.826	-5000.237	-2777.826	-2777.826	-2777.826	-4108.611		651.614	331.671	1002.530	569.795	651.614	331.671
P 6	-33.476	-33.476	-33.476	-33.476	-33.476	-33.476	-33.476		261.412	19.222	499.536	19.222	261.412	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	0.099	#5@ 6.26	60.77		0.08	0.000	0.098
P 2	-3618.683	-4642.280	17.49	12 # 11	3.12	2 # 11	24.00	0.060	#5@10.33	24.00	0.142	#5@ 4.38	93.65		0.29	0.543	1.056
P 3	-4094.383	-5225.787	19.18	13 # 11	3.12	2 # 11	24.00	0.136	#5@ 4.57	24.00	0.136	#5@ 4.57	96.00		0.32	0.548	1.043
C 1	-4554.233	-8817.133	32.84	22 # 11	3.12	2 # 11	24.00	0.145	#5@ 4.28	24.00	0.080	#5@ 7.72	96.00		0.54	1.026	0.960
P 4	-2472.693	-3604.180	13.89	9 # 11	3.12	2 # 11	24.00	0.071	#5@ 8.68	24.00	0.071	#5@ 8.68	96.00		0.22	0.719	1.162
P 5	-2136.790	-3160.470	12.55	9 # 11	3.12	2 # 11	24.00	0.076	#5@ 8.19	24.00	0.060	#5@10.33	93.65		0.21	0.630	1.046
P 6	-25.751	-25.751	3.12	2 # 11	3.12	2 # 11	24.00	0.060	#5@10.33	0.00	0.000	#5@ 0.00	60.77		0.08	0.000	0.098

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

NOTE: *** FS/FF 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		2190.6	-7046.0	0.0	2190.6	9039.9	1780.4	4566.5	18868.2	3716.1	2.087	72.00	96.00
1	B	3	LL06	1.1			C		2484.4	12732.6	-1695.6	2484.4	15820.0	2228.3	2723.9	17343.7	2443.0	1.096	72.00	96.00

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

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 1  T   15 # 11   15 # 11    8 # 11    8 # 11  71.76  1.038  1.00  0.398    2443.    11077.  1.283     1.355     1.000  2  0.70
 1  B   15 # 11   15 # 11    8 # 11    8 # 11  71.76  1.038  1.00  0.355    2232.    11435.  1.242     1.314     1.000  2  0.70
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FOOTING 1 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
1	3	LL06	3.1		C		1878.638	9011.296	73.438	-2113.114	-29.346	64.429	9.489	236.335	291.275	240.574	47.370	30.428	MAX.P1
1	3	LL06	1.1		C		2442.22	912503.266	106.505	-1695.606	-23.436	59.824	15.754	331.170	375.239	323.125	63.512	39.556	MAX.MT
1	3	LL06	1.1		C		2442.22	912503.266	106.505	-1695.606	-23.436	59.824	15.754	331.170	375.239	323.125	63.512	39.556	MAX.VT
1	3	LL 7	1.1		C		2532.56	611011.691	106.505	-1695.606	-23.436	83.369	39.299	318.917	362.986	310.728	61.205	41.002	MAX.VP
1	3	LL06	4.1		C		2442.22	911013.723	85.660	-3097.529	-43.055	97.435	16.894	293.559	374.099	242.486	39.846	39.556	MAX.ML
1	3	LL06	4.1		C		2442.22	911013.723	85.660	-3097.529	-43.055	97.435	16.894	293.559	374.099	242.486	39.846	39.556	MAX.VL
1	2		3.1				1667.960	8434.238	88.610	-2612.925	-40.341	63.884	-4.636	210.546	279.065	221.351	43.794	27.057	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
21.250	21.250	6.000	0.992	1.31	28 # 9	@ 9.000	TOP LONG		321.378	66.750	133.500	55.308	0.000
				1.30	28 # 9	@ 9.000	BOT.TRAN		328.067	68.111	136.223	56.436	0.000

NUMBER OF PILES = 16 BP = 3.125 DP = 3.125