29-OCT-09 GEORGIA DEPARTMENT OF TRANSPORTATION PROB. NO. 0001
08:46:24 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
40' CURB-CURB; 6 BEAMS; 140' SPAN; 70' TALL; BRIDGE 25 ; PIER 24,25

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	13	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	18.87	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	21.625	6.000	4.000	6.000	6.000	4.000	15.625	18.060	7.224	4.836					
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	1	C	T		70.000	0.000	12.000	6.000	12.000	6.000	6.000	0.000	12	6	11	12	6	11	34	16	11	34	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	14.000	14.000	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	WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
1365.	2730.	1	50	0	44	6	41	12	33	16	17	19	7.375	7.375	8.876	25.133

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	140.0	280.0	15.583	15.583

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
4.054	9.860	15.583	15.583	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	265.660	301.865	0.000	603.731	0.000	301.865	265.660					
LL 1	1	79.205	58.206	0.000	0.000	0.000	0.000	0.000					
LL 2	2	79.205	99.939	0.000	95.678	0.000	0.000	0.000					
LL 3	3	79.205	99.939	0.000	191.356	0.000	41.733	0.000					
LL 4	1	0.000	0.000	0.000	0.000	0.000	58.206	79.205					
LL 5	2	0.000	0.000	0.000	95.678	0.000	99.939	79.205					
LL 6	3	0.000	41.733	0.000	191.356	0.000	99.939	79.205					
LL 7	1	0.000	28.532	0.000	108.879	0.000	0.000	0.000					
LL 8	2	54.934	108.879	0.000	111.009	0.000	0.000	0.000					
LL 9	3	54.934	108.879	0.000	193.487	0.000	54.934	0.000					
LL10	2	0.000	41.733	0.000	191.356	0.000	41.733	0.000					
LL11	3	79.205	99.939	0.000	191.356	0.000	41.733	0.000					
LL12	2	79.205	58.206	0.000	0.000	0.000	58.206	79.205					
LL13	3	79.205	99.939	0.000	95.678	0.000	58.206	79.205					

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

LOAD	COL	PC	TRANSVERSE MT	V	MB	RF	ML	MR	* LONGITUDINAL MT	V	MB	MF
UNIT F.AT CL.CAP	1	0.000	-6.000	1.000	70.000	0.000	0.000	0.000	6.000	1.000	70.000	70.000
DEAD LOAD TOTAL	1	1993.931 2685.131	0.001	0.000	-0.001	2685.131	9290.615	-9290.616	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	-212.808	-9.860	-843.848	-843.848
CENT. FORCE 1 LN	1	0.000	-87.497	4.054	346.953	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WIND ON SUBSTR.	1	0.000	-53.256	8.876	621.320	0.000	0.000	0.000	-150.798	-25.133	-1759.310	-1759.310
GROUP 2 WIND 1 1	1	0.000	-966.100	77.126	5902.164	0.000	0.000	0.000	-150.798	-25.133	-1759.310	-1759.310
GROUP 2 WIND 1 2	1	0.000	-966.100	77.126	5902.164	0.000	0.000	0.000	150.798	25.133	1759.310	1759.310

GROUP 2 WIND 2 1	1	0.000	-856.558	68.936	5268.462	0.000	0.000	0.000	-369.881	-41.513	-3026.712	-3026.712
GROUP 2 WIND 2 2	1	0.000	-856.558	68.936	5268.462	0.000	0.000	0.000	369.881	41.513	3026.712	3026.712
GROUP 2 WIND 3 1	1	0.000	-801.788	64.841	4951.612	0.000	0.000	0.000	-588.963	-57.893	-4294.115	-4294.115
GROUP 2 WIND 3 2	1	0.000	-801.788	64.841	4951.612	0.000	0.000	0.000	588.963	57.893	4294.115	4294.115
GROUP 2 WIND 4 1	1	0.000	-655.733	53.921	4106.677	0.000	0.000	0.000	-735.018	-68.813	-5139.050	-5139.050
GROUP 2 WIND 4 2	1	0.000	-655.733	53.921	4106.677	0.000	0.000	0.000	735.018	68.813	5139.050	5139.050
GROUP 2 WIND 5 1	1	0.000	-363.623	32.081	2416.807	0.000	0.000	0.000	-844.559	-77.003	-5772.751	-5772.751
GROUP 2 WIND 5 2	1	0.000	-363.623	32.081	2416.807	0.000	0.000	0.000	844.559	77.003	5772.751	5772.751
GROUP 3 WIND 1 1	1	0.000	-591.992	37.138	2968.811	0.000	0.000	0.000	-45.239	-7.540	-527.793	-527.793
GROUP 3 WIND 1 2	1	0.000	-591.992	37.138	2968.811	0.000	0.000	0.000	45.239	7.540	527.793	527.793
GROUP 3 WIND 2 1	1	0.000	-522.870	33.001	2634.921	0.000	0.000	0.000	-183.483	-15.814	-1195.573	-1195.573
GROUP 3 WIND 2 2	1	0.000	-522.870	33.001	2634.921	0.000	0.000	0.000	183.483	15.814	1195.573	1195.573
GROUP 3 WIND 3 1	1	0.000	-488.309	30.932	2467.976	0.000	0.000	0.000	-321.727	-24.088	-1863.352	-1863.352
GROUP 3 WIND 3 2	1	0.000	-488.309	30.932	2467.976	0.000	0.000	0.000	321.727	24.088	1863.352	1863.352
GROUP 3 WIND 4 1	1	0.000	-396.147	25.416	2022.790	0.000	0.000	0.000	-413.889	-29.604	-2308.539	-2308.539
GROUP 3 WIND 4 2	1	0.000	-396.147	25.416	2022.790	0.000	0.000	0.000	413.889	29.604	2308.539	2308.539
GROUP 3 WIND 5 1	1	0.000	-211.822	14.384	1132.417	0.000	0.000	0.000	-483.011	-33.741	-2642.428	-2642.428
GROUP 3 WIND 5 2	1	0.000	-211.822	14.384	1132.417	0.000	0.000	0.000	483.011	33.741	2642.428	2642.428
LIVE LOAD LL 1	1	137.411	-2061.162	0.000	2061.162	137.411	2061.162	0.000	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 LL 2	1	274.822	-2513.381	0.000	2513.381	274.822	2513.381	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	371.010	-1855.046	0.000	1855.046	371.010	2262.043	-406.997	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	137.411	2061.163	0.000	-2061.163	137.411	0.000	-2061.163	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	274.822	2513.382	0.000	-2513.382	274.822	0.000	-2513.382	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	371.010	1855.046	0.000	-1855.046	371.010	406.997	-2262.043	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	137.411	-309.173	0.000	309.173	137.411	309.173	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	274.822	-2171.921	0.000	2171.921	274.822	2171.921	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	371.011	-1418.990	0.000	1418.990	371.011	1954.729	-535.738	0.000	0.000	0.000	0.000
LIVE LOAD LL10	1	274.822	0.000	0.000	0.000	274.822	452.219	-452.219	0.000	0.000	0.000	0.000
LIVE LOAD LL11	1	371.010	-1855.046	0.000	1855.046	371.010	2262.043	-406.997	0.000	0.000	0.000	0.000
LIVE LOAD LL12	1	274.822	0.000	0.000	0.000	274.822	2061.162	-2061.163	0.000	0.000	0.000	0.000
LIVE LOAD LL13	1	371.010	-406.997	0.000	406.997	371.010	2262.043	-1855.046	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	-32.001	-32.001	-32.001	-32.001	-32.001	-32.001	-32.001		-18.588	-363.946	-18.588	-363.946	-18.588	-535.900
P 2	-2829.941	-2829.941	-4072.137	-2829.941	-2829.941	-2829.941	-3573.771		-413.283	-805.708	-413.283	-805.708	-585.237	-1194.629
P 3	-6824.501	-6824.501	-9947.522	-6824.501	-6824.501	-6824.501	-8694.573		-847.470	-847.470	-847.470	-847.470	-1236.392	-1236.392
C 1L	-12077.800	-12077.800	-17534.350	-12077.800	-12077.800	-12077.800	-15345.194		-903.630		-903.630		-1292.552	
C 1R	-12077.801	-12077.801	-17534.352	-12077.801	-12077.801	-12077.801	-15345.197			903.630		1292.552		903.630
P 5	-6824.501	-6824.501	-9947.522	-6824.501	-6824.501	-6824.501	-8694.573		847.470	847.470	1236.392	1236.392	847.470	847.470
P 6	-2829.940	-2829.940	-4072.136	-2829.940	-2829.940	-2829.940	-3573.770		805.708	413.283	1194.629	585.237	805.708	413.283
P 7	-32.000	-32.000	-32.000	-32.000	-32.000	-32.000	-32.000		363.946	18.588	535.900	18.588	363.946	18.588

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	-24.616	-24.616	3.12	2 # 11	3.12	2 # 11	0.00	0.000	#5@ 0.00	24.00	0.060	#5@10.33	58.96		0.08	0.000	0.096
P 2	-2176.878	-2749.055	11.88	8 # 11	3.12	2 # 11	24.00	0.060	#5@10.33	24.00	0.159	D#5@ 7.80	81.14		0.22	0.539	1.237
P 3	-5249.616	-6688.134	24.69	16 # 11	3.12	2 # 11	24.00	0.120	#5@ 5.18	24.00	0.120	#5@ 5.18	96.00		0.41	0.589	1.019
C 1	-9290.615	-11803.998	45.16	29 # 11	3.12	2 # 11	24.00	0.133	#5@ 4.65	24.00	0.133	#5@ 4.65	96.00		0.73	0.587	0.941
P 5	-5249.616	-6688.134	24.69	16 # 11	3.12	2 # 11	24.00	0.120	#5@ 5.18	24.00	0.120	#5@ 5.18	96.00		0.41	0.589	1.019
P 6	-2176.877	-2749.054	11.88	8 # 11	3.12	2 # 11	24.00	0.159	D#5@ 7.80	24.00	0.060	#5@10.33	81.14		0.22	0.539	1.237

P 7 -24.615 -24.616 3.12 2 # 11 3.12 2 # 11 24.00 0.060 #5@10.33 0.00 0.000 #5@ 0.00 58.96 0.08 0.000 0.096

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	LL 2	0.0			C		3188.7	-5684.0	0.0	3188.7	6306.3	2991.1	13698.0	27103.3	12855.0	4.297	72.00	144.00
1	B	2		5.1	R				3490.7	-3141.9	7504.6	3490.7	4565.4	10740.0	6916.0	9033.3	21250.4	1.979	72.00	144.00

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	16 # 11	16 # 11	18 # 11	18 # 11	106.08	1.023	1.00	0.000	3638.	36868.	1.109	1.563	1.000	2	0.70
1	B	16 # 11	16 # 11	18 # 11	18 # 11	106.08	1.023	1.00	0.000	3041.	36868.	1.090	1.431	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
1	3	LL 3	3.1		C		2997.245	4965.317	41.878	-4141.743	-50.710	187.728	106.067	210.399	292.060	162.115	-0.638	43.634	MAX.P1
1	3	LL 3	2.1		C		3896.418	6671.940	57.131	-4516.152	-55.167	233.150	144.121	284.415	373.445	212.407	-0.829	56.725	MAX.MT
1	3	LL 3	3.1		C		3896.418	6454.912	54.442	-5384.265	-65.923	244.047	137.887	273.518	379.678	210.749	-0.829	56.725	MAX.VT
1	3	LL 9	3.1		C		3896.419	5978.027	54.442	-5384.265	-65.923	248.816	142.656	268.750	374.909	207.358	-0.829	56.725	MAX.VP
1	3	LL 3	4.1		C		3896.418	5876.169	47.271	-5963.008	-73.094	255.975	138.395	261.591	379.171	457.410	65.063	56.725	MAX.ML
1	3	LL 3	4.1		C		3896.418	5876.169	47.271	-5963.008	-73.094	255.975	138.395	261.591	379.171	457.410	65.063	56.725	MAX.VL
1	2		3.1R				2685.131	-4951.613	-64.841	4294.115	57.893	170.943	85.692	192.505	277.756	150.666	-0.638	39.211	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
22.500	22.500	6.000	0.994	1.16	33 # 8	@ 8.125	TOP TRAN	282.163	66.487	132.974	55.090	0.000
				1.86	27 #11	@10.000	BOT.LONG	460.977	67.941	135.883	56.295	0.000

NUMBER OF PILES = 18 BP = 3.333 DP = 5.000