30-OCT-09
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GEORGIA DEPARTMENT OF TRANSPORTATION
PRECONSTRUCTION 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
43' CURB-CURB; 6 BEAMS; 119' SPAN; 30' TALL; BRIDGE 26 ; PIER 13

PROB. NO. 0001

DESIGN NO.	NO. CAN	NO. COL	NO. LLC	SKEW D	ANG M	F'C S	FC PSI	N	FY PSI	FS PSI	DESIGN DATA		CONC.	Z	* * * CAP			REINFORCING STEEL			* * * CAP							
OPTIONS											EC	ES	STRAIN	FACT	MAIN	STR	MAX	MAX	MIN	MIN	TOP	MIN	TOP	MIN	TOP			
D	D	D	L	L	L	2	2	13	0-00-00	3500.	1400.	8.	60000.	24000.	3409.	29000.	0.0030	170.	11	5	15	15	11	2	2.00	4.00	3.00	2.00

COLUMN REINFORCING STEEL R KL OC OF CM BD1 BD2 IMPACT SOIL WT ALL.S.P. MIN MAX EDGE PILE REBAR ALL.PILE ALL.PILE I
MIN.P MAX.P CL.SP. CLEAR MODE COEF 1 2.00 0.75 0.90 0.00 1.00 0.75 20.49 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	11.500	2.500	4.000	5.500	5.500	2.000	9.000	7.876	5.376						
12	C	23.298	2.500	6.000	5.500		0.000	0.000	2.500	5.241	7.810	5.247				
13	3	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	SLOPE	EP	AP			
21	1	C	R		30.000	0.000	5.000	0.000	0.000	0.000	4.000	0.000	19	0	11	19	0	11	42	0	11	42	0	11	0.000	0.000	0.000
22	1	2	SAME AS COLUMN 1																								

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	2.000	2.000	3.000	0.500	0.500	0.250	1.000	1.000	2.500	4	3	0.000	0.000	0.000
32	2	SAME AS FOOTING 1													

GROUP II WIND INTENSITIES

TRANS.	LONG.	WIND FT1	FT1	FT1	WIND FT2	FT2	FT2	FT2	WIND FT3	FT3	FT3	FT3	FT3	WIND FT4	FT4	FT4	FT4	FT4	WIND FT5	FT5	FT5	FT5	FT5	* WIND FORCE APT	ARM APL	* WIND ON PIER PT	PL
1160.	2321.	1	50	0	44	6	41	12	33	16	17	19	7.375	7.375	1.276	19.712											

GROUP III WIND INTENSITIES

STD. WIND FT1	* WIND FT1	WIND FT2	FT2	FT2	WIND FT3	FT3	FT3	FT3	WIND FT4	FT4	FT4	FT4	FT4	WIND FT5	FT5	FT5	FT5	FT5	LENGTHS OF LL TRANS.	OF LL LONGI.	* WIND ON PIER APT	LL ARMS APL			
1	50	0	44	6	41	12	33	16	17	19	1	100	0	88	12	82	24	66	32	34	38	119.0	238.0	15.583	15.583

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FL	FORCE APT	AND ARMS APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM PT	FLOW PL
0.000	8.516	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	234.730	0.000	271.266	0.000	271.266	271.266	0.000	271.266	0.000	234.730		
LL 1	1	75.795	0.000	47.298	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
LL 2	2	75.795	0.000	91.579	0.000	75.810	3.002	0.000	0.000	0.000	0.000		
LL 3	3	75.795	0.000	91.579	0.000	102.833	78.813	0.000	20.260	0.000	0.000		
LL 4	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	47.298	0.000	75.795		
LL 5	2	0.000	0.000	0.000	0.000	3.002	75.810	0.000	91.579	0.000	75.795		
LL 6	3	0.000	0.000	20.260	0.000	78.813	102.833	0.000	91.579	0.000	75.795		
LL 7	1	0.000	0.000	23.641	0.000	75.810	23.641	0.000	0.000	0.000	0.000		
LL 8	2	40.899	0.000	99.452	0.000	82.194	23.641	0.000	0.000	0.000	0.000		
LL 9	3	40.899	0.000	99.452	0.000	88.577	99.452	0.000	40.899	0.000	0.000		
LL10	2	0.000	0.000	32.270	0.000	90.823	90.823	0.000	32.270	0.000	0.000		
LL11	3	51.775	0.000	103.589	0.000	90.823	90.823	0.000	32.270	0.000	0.000		
LL12	2	75.795	0.000	47.298	0.000	0.000	0.000	0.000	47.298	0.000	75.795		
LL13	3	75.795	0.000	91.579	0.000	75.810	3.002	0.000	47.298	0.000	75.795		

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

LOAD	COL	TRANSVERSE							* LONGITUDINAL				
		PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF	
UNIT F.AT CL.CAP	1	0.619	7.211	0.500	7.789	0.619	0.000	-7.211	2.000	0.500	15.000	15.000	
	2	-0.619	7.211	0.500	7.789	-0.619	-7.211	0.000	2.000	0.500	15.000	15.000	
EXPANSION OF CAP	1	0.000	142.121	10.615	176.324	0.000	0.000	-142.121	0.000	0.000	0.000	0.000	
	2	0.000	-142.121	-10.615	-176.324	0.000	142.121	0.000	0.000	0.000	0.000	0.000	
SHRINKAGE OF CAP	1	0.000	-347.407	-25.947	-431.015	0.000	0.000	347.407	0.000	0.000	0.000	0.000	
	2	0.000	347.407	25.947	431.015	0.000	-347.406	0.000	0.000	0.000	0.000	0.000	

PIER-43-6-119-30.OUT												
		884.495	-158.100	-7.906	-79.065	961.072	2112.940	-1954.840	0.000	0.000	0.000	0.000
		961.072	158.121	7.906	79.045	960.930	1954.819	-2112.940	0.000	0.000	0.000	0.000
		884.354										
		960.930										
DEAD LOAD TOTAL	1	884.495	-158.100	-7.906	-79.065	961.072	2112.940	-1954.840	0.000	0.000	0.000	0.000
	2	961.072	158.121	7.906	79.045	960.930	1954.819	-2112.940	0.000	0.000	0.000	0.000
		884.354										
		960.930										
TRAC. FORCE 1 LN	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-83.384	-4.258	-194.092	-194.092
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-83.384	-4.258	-194.092	-194.092
WIND ON SUBSTR.	1	0.790	9.201	0.638	9.939	0.790	0.000	-9.201	-39.424	-9.856	-295.680	-295.680
	2	-0.790	9.201	0.638	9.939	-0.790	-9.201	0.000	-39.424	-9.856	-295.680	-295.680
GROUP 2 WIND 1 1	1	55.052	427.426	29.638	461.714	55.052	0.000	-427.426	-39.424	-9.856	-295.680	-295.680
	2	-55.052	427.426	29.638	461.714	-55.052	-427.426	0.000	-39.424	-9.856	-295.680	-295.680
GROUP 2 WIND 1 2	1	55.052	427.426	29.638	461.714	55.052	0.000	-427.426	39.424	9.856	295.680	295.680
	2	-55.052	427.426	29.638	461.714	-55.052	-427.426	0.000	39.424	9.856	295.680	295.680
GROUP 2 WIND 2 1	1	48.541	377.239	26.158	407.501	48.541	0.000	-377.239	-118.628	-16.819	-555.922	-555.922
	2	-48.541	377.239	26.158	407.501	-48.541	-377.239	0.000	-118.628	-16.819	-555.922	-555.922
GROUP 2 WIND 2 2	1	48.541	377.239	26.158	407.501	48.541	0.000	-377.239	118.628	16.819	555.922	555.922
	2	-48.541	377.239	26.158	407.501	-48.541	-377.239	0.000	118.628	16.819	555.922	555.922
GROUP 2 WIND 3 1	1	45.285	352.145	24.418	380.395	45.285	0.000	-352.145	-197.832	-23.782	-816.164	-816.164
	2	-45.285	352.145	24.418	380.395	-45.285	-352.145	0.000	-197.832	-23.782	-816.164	-816.164
GROUP 2 WIND 3 2	1	45.285	352.145	24.418	380.395	45.285	0.000	-352.145	197.832	23.782	816.164	816.164
	2	-45.285	352.145	24.418	380.395	-45.285	-352.145	0.000	197.832	23.782	816.164	816.164
GROUP 2 WIND 4 1	1	36.603	285.229	19.778	308.111	36.603	0.000	-285.229	-250.635	-28.424	-989.659	-989.659
	2	-36.603	285.229	19.778	308.111	-36.603	-285.229	0.000	-250.635	-28.424	-989.659	-989.659
GROUP 2 WIND 4 2	1	36.603	285.229	19.778	308.111	36.603	0.000	-285.229	250.635	28.424	989.659	989.659
	2	-36.603	285.229	19.778	308.111	-36.603	-285.229	0.000	250.635	28.424	989.659	989.659
GROUP 2 WIND 5 1	1	19.239	151.397	10.498	163.543	19.239	0.000	-151.397	-290.237	-31.905	-1119.780	-1119.780
	2	-19.239	151.397	10.498	163.543	-19.239	-151.397	0.000	-290.237	-31.905	-1119.780	-1119.780
GROUP 2 WIND 5 2	1	19.239	151.397	10.498	163.543	19.239	0.000	-151.397	290.237	31.905	1119.780	1119.780
	2	-19.239	151.397	10.498	163.543	-19.239	-151.397	0.000	290.237	31.905	1119.780	1119.780
GROUP 3 WIND 1 1	1	31.841	214.036	14.841	231.206	31.841	0.000	-214.036	-11.827	-2.957	-88.704	-88.704
	2	-31.841	214.036	14.841	231.206	-31.841	-214.036	0.000	-11.827	-2.957	-88.704	-88.704

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

LOAD	COL	TRANSVERSE								LONGITUDINAL		
		PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
GROUP 3 WIND 1 2	1	31.841	214.036	14.841	231.206	31.841	0.000	-214.036	11.827	2.957	88.704	88.704
	2	-31.841	214.036	14.841	231.206	-31.841	-214.036	0.000	11.827	2.957	88.704	88.704
GROUP 3 WIND 2 1	1	28.049	188.683	13.083	203.819	28.049	0.000	-188.683	-63.553	-6.474	-231.869	-231.869
	2	-28.049	188.683	13.083	203.819	-28.049	-188.683	0.000	-63.553	-6.474	-231.869	-231.869
GROUP 3 WIND 2 2	1	28.049	188.683	13.083	203.819	28.049	0.000	-188.683	63.553	6.474	231.869	231.869
	2	-28.049	188.683	13.083	203.819	-28.049	-188.683	0.000	63.553	6.474	231.869	231.869
GROUP 3 WIND 3 1	1	26.152	176.006	12.204	190.126	26.152	0.000	-176.006	-115.279	-9.991	-375.034	-375.034
	2	-26.152	176.006	12.204	190.126	-26.152	-176.006	0.000	-115.279	-9.991	-375.034	-375.034
GROUP 3 WIND 3 2	1	26.152	176.006	12.204	190.126	26.152	0.000	-176.006	115.279	9.991	375.034	375.034
	2	-26.152	176.006	12.204	190.126	-26.152	-176.006	0.000	115.279	9.991	375.034	375.034
GROUP 3 WIND 4 1	1	21.096	142.202	9.860	153.610	21.096	0.000	-142.202	-149.763	-12.335	-470.478	-470.478
	2	-21.096	142.202	9.860	153.610	-21.096	-142.202	0.000	-149.763	-12.335	-470.478	-470.478
GROUP 3 WIND 4 2	1	21.096	142.202	9.860	153.610	21.096	0.000	-142.202	149.763	12.335	470.478	470.478
	2	-21.096	142.202	9.860	153.610	-21.096	-142.202	0.000	149.763	12.335	470.478	470.478
GROUP 3 WIND 5 1	1	10.982	74.594	5.172	80.578	10.982	0.000	-74.594	-175.625	-14.094	-542.060	-542.060
	2	-10.982	74.594	5.172	80.578	-10.982	-74.594	0.000	-175.625	-14.094	-542.060	-542.060
GROUP 3 WIND 5 2	1	10.982	74.594	5.172	80.578	10.982	0.000	-74.594	175.625	14.094	542.060	542.060
	2	-10.982	74.594	5.172	80.578	-10.982	-74.594	0.000	175.625	14.094	542.060	542.060
LIVE LOAD LL 1	1	147.728	-108.496	-4.849	-36.982	147.728	596.961	-488.465	0.000	0.000	0.000	0.000
	2	-24.635	85.475	4.849	60.003	-24.635	-85.475	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	243.837	-39.876	-1.540	-6.324	243.837	596.961	-557.086	0.000	0.000	0.000	0.000
	2	2.349	21.724	1.540	24.476	2.349	-21.724	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	258.255	40.390	2.501	34.646	258.255	537.265	-577.656	0.000	0.000	0.000	0.000
	2	74.097	-59.658	-2.501	-15.378	74.097	59.658	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	-24.635	-85.475	-4.849	-60.003	-24.635	0.000	85.475	0.000	0.000	0.000	0.000
	2	147.728	108.496	4.849	36.982	147.728	488.465	-596.961	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	2.369	-21.697	-1.539	-24.467	2.369	0.000	21.697	0.000	0.000	0.000	0.000
	2	243.817	39.855	1.539	6.309	243.817	557.106	-596.961	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	74.139	59.672	2.502	15.375	74.139	0.000	-59.672	0.000	0.000	0.000	0.000
	2	258.213	-40.391	-2.502	-34.656	258.213	577.657	-537.265	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	82.273	85.270	4.176	40.017	82.273	0.000	-85.270	0.000	0.000	0.000	0.000
	2	40.819	-81.779	-4.176	-43.508	40.819	81.779	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	216.557	32.300	1.828	22.529	216.557	322.121	-354.420	0.000	0.000	0.000	0.000
	2	29.629	-40.805	-1.828	-14.024	29.629	40.805	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	221.246	89.128	4.752	53.435	221.246	289.908	-379.036	0.000	0.000	0.000	0.000
	2	111.105	-100.956	-4.752	-41.607	111.105	100.955	0.000	0.000	0.000	0.000	0.000

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

TRANSVERSE * LONGITUDINAL

PIER-43-6-119-30.OUT

2	3	LL	6	5.1R	1542.079	-39.385	0.854	1385.943	33.267	372.153	171.836	175.071	375.388	122.539	-0.607	54.844	MAX.VT
1	3	LL	3	4.1	1555.456	134.288	5.240	-1292.885	-30.981	362.479	175.637	189.204	376.046	125.943	-0.607	55.309	MAX.VP
1	3	LL	3	5.1	1542.309	39.347	-0.854	-1385.943	-33.267	372.193	171.876	175.108	375.425	110.559	-0.607	54.852	MAX.ML
2	3	LL	6	5.1R	1542.079	-39.385	0.854	1385.943	33.267	372.153	171.836	175.071	375.388	110.548	-0.607	54.844	MAX.VL
1	3	LL	13	5.1R	1113.823	-209.187	-17.850	1066.110	25.590	263.377	109.287	133.434	287.524	93.692	-0.467	39.670	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
10.000	10.000	3.500	0.992	0.99	17 # 7	@ 7.000	TOP LONG	113.398	30.851	61.702	25.562	0.000
				1.09	14 # 8	@ 8.500	BOT.TRAN	127.265	31.982	63.965	26.500	0.000

NUMBER OF PILES = 6 BP = 3.750 DP = 3.750

FOOTING 2 DESIGN SAME AS FOOTING 1