THE ANALYSIS AND DESIGN OF MULTIPLE COLUMN PIERS

GEORGIA DEPARTMENT OF TRANSPORTATION

PIER DESCRIPTION

APR., 1981

IDENTIFICATION

1 PROG	PROB. NO.	9 REMARKS, PROJECT NUMBER, COUNTY, NAME, DATE, ETC. 80
*1	8 0 3	

DESIGN DATA

1 CN	DES. OPT. C A P	C O L	F / T	S / L	C A N	NO COL	NO LLC	SKEW ANGLE DEG	MIN	SEC	GENERAL DESIGN DATA 18 f'c	22 fc	N	28 fy	33 fs	38 Ec	42 Es	47 εc 50	51 Z	CAP DESIGN DATA BAR SIZE	STR. SIZE	MAX T.B.	MAX B.B.	MIN. SIZE	MIN BARS	TOP CL.	MIN. S. SP	CAP D INCR.	BOT. CL. 77
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1 CN	COLUMN DESIGN DATA 3 MIN. Ps	MAX. Ps	MIN. SPAC.	CLEAR	R	KL	Φc	Φf	Cm	βD1	βD2 34	FOOTING DESIGN DATA 35 IMPACT %	SOIL WEIGHT	ALL. S. P.	MIN. PL. SP.	MAX. PL. SP.	EDGE DIST.	PILE DEPTH 76	CLEAR	PL. CAPk	PL. UPLk 77	IP
0 2																						

CANTILEVER AND CAP DATA

1 CN	I	4 L	9 A	14 DE	19 BC	24 BE	29 DH	34 LH	39 XB1	44 XB2	49 XB3	54 XB4	59 XB5	64 XB6	69 XB7	74 XB8 78
1 1																
1 2																
1 3																
1 4																
1 5																
1 6																

ALL DIMENSIONS IN FEET FOR CANTILEVER/CAP, COLUMN, AND FOOTING DATA.

COLUMN DATA

1 CN	RB	I	T	S	7 HT	12 A	17 DT	22 BT	27 DB	32 BB	37 DL	FLEX 41	REINFORCEMENT STEEL LOWER LIMIT / ACTUAL 45 TOP ND	NB	SIZE	51 BOTTOM ND	NB	SIZE	UPPER LIMIT / ACTUAL 57 TOP ND	NB	SIZE	63 BOTTOM ND	NB	SIZE	69 SLOPE	73 EP	77 AP 80
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2 5																											

FOOTING DATA

1 CN	%p	4 B	9 D	14 T	19 ΔB	24 ΔD	29 ΔT	34 R B/D	38 R D/B	42 SOIL HT.	NP	S	50 B P	55 D P	60 SETTLE. 64
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3 3															
3 4															
3 5															

DEFAULTS:

- f'c - 3000 psi
- fc - .4(f'c)
- N - Es/Ec
- fy - 40,000 psi
- fs - 29,000 ksi
- Ec - $145^{1.5} 33 (f'c)^{\frac{1}{2}}$ ksi
- Es - 29,000 ksi
- εc - .0030 in./in.
- Z - 170
- BAR SIZE - 11
- STR. SIZE - 5
- MAX. TB - 6
- MAX. BB - 6
- MIN. SIZE - BAR SIZE
- MIN. BARS - 2
- TOP CL. - 2 in.
- MIN. S. SP. - 3 in.
- CAP D. INCR. - 3 in.
- BOT. CL. - TOP CL.
- MIN. Ps - 1%
- MAX. Ps - 8%
- MIN. SPAC. - 2.25 in.
- CLEAR (COL.) - 4.0 in.
- R - 1 ROUND/SPIRAL
  2 TIED
- KL - 2.0
- Φc - .75 ROUND/SPIRAL
  .7 TIED
- Φf - .9 LOAD FACTOR
- Φc, Φf - .35 S. L.
- Cm - COMPUTED
- BDI - 1.0
- MIN. PL. SP. - 2.5 ft.
- MAX. PL. SP. - 5.0 ft.
- EDGE DIST. - 1.25 ft.
- PILE DEPTH - 1.0 ft.
- CLEAR (FTG.) - 3.0 in.

PIER LOADS
APR., 1981

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FORCES — KIPS
INTENSITY - LBS./ FT.^{2}
AREAS - FT.^{2}
LENGTHS - FT.
TRACTION AND CENTRIFUGAL FORCE - 1 LANE
COEFFICIENTS — UNITS / UNITS

GROUP II WIND

CN	SUPERSTRUCTURE AREA 3 TRANS.	9 LONG.	STD. W.	WIND ON SUPERSTRUCTURE INTENSITY FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	WIND FORCE ARMS 36 APT	41 APL	WIND ON PIER 46 PT	51 PL 55
411																	

GROUP III WIND

CN	STD. W.	WIND ON SUPERSTRUCTURE INTENSITY FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	STD. W.	WIND ON LIVE LOAD INTENSITY FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	LENGTH OF LIVE LOADS 46 TRANS.	51 LONG.	WIND ON L.L. ARMS 56 APT	61 APL 65
412																										

STD. W. GR. II, III	FT -	50	44	41	33	17
SUPERSTRUCTURE	FL -	0	6	12	16	19
STD. W. GR. III	FT -	100	88	82	66	34
LIVE LOAD	FL -	0	12	24	32	38

MISCELLANEOUS FORCES

CN	CENT. FORCE 3 FT	9 FL	C.F. & T.F. ARMS 15 APT	20 APL	EXPANSION 25 COEFFICIENT	SHRINKAGE 33 COEFFICIENT	STREAM FLOW 41 PT	46 PL 50
413								

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES (ONE LIVE LOAD CASE REQUIRED - MAXIMUM IS 25 CASES)

CN	I.D.	NL	9 P1,13,25	15 P2,14,26	21 P3,15,27	27 P4,16,28	33 P5,17,29	39 P6,18,30	45 P7,19,31	51 P8,20,32	57 P9,21,33	63 P10,22,34	69 P11,23,35	75 P12,24,36 80
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