

ADD 7154

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL LMNED-HC	SUBJECT Lake Pontchartrain, La. & Vicinity Hurricane Protection Project - Lakefront Levees West of IHNC - High Level Plan
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TO C/Des Svcs Br FROM C/Hyd & Hydro Br DATE 5 Oct 83 CMT 1
Ms Hote/ic/2489
gnt

1. Reference LMNED-HC DF dtd 29 Sep 83, subject as above.

2. Inclosed are wave forces for several ^{LOCATIONS} ~~floodgates~~ within the high level plan levee. The wave forces provided in the referenced DF can also be used for floodgates 1 through 4 in the Seabrook floodwall. The inclosures give wave forces and wave force diagrams for floodgates and floodwalls as listed below.

- a. Inclosure 1: floodgates 5, 9, 10 and 14.
- b. Inclosure 2: floodgates 6, 7, 8, 15, 16, 17, 18A and 19A.
- c. Inclosure 3: floodgates 18 and 19.
- d. Inclosure 4: floodgate 13.
- e. Inclosure 5: floodgate 17A.
- f. Inclosure 6: floodgate 11.
- g. Inclosure 7: floodwall at Pontchartrain Beach and floodgate 12.
- h. Inclosure 8: floodgate 20.
- i. Inclosure 9: floodwall at Orleans Marina and floodgates 21 and 22.

3. Any questions regarding the data should be directed to Janis Hote on ext. 2489.

9 Incl
as

Soileau
CECIL W. SOILEAU
Chief, Hydraulics & Hydrologic Branch

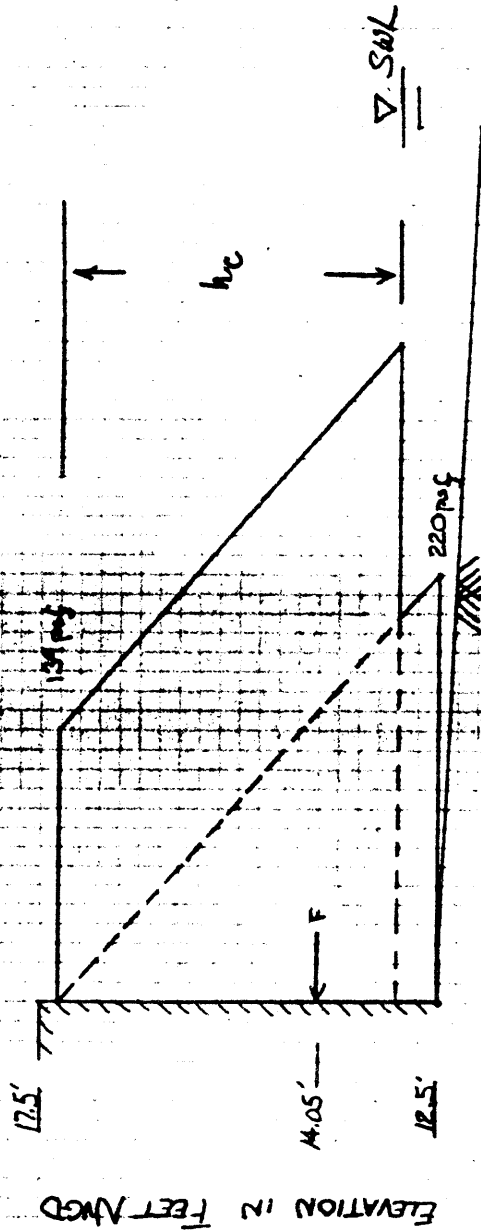
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WORKING FILE COPY

COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + Vic.	PAGE 13 OF 14	COMPUTED BY RWB	DATE 5 Oct 83
SUBJECT FLOODGATE @ APPROX B/L STA 28+00		CHECKED BY	DATE

NOTE: USE THIS FORCE FOR FLOODGATES
 No. 5 @ B/L STA 28+00 (APPROXIMATE)
 No. 9+10 @ B/L STA 79+00 (")
 No. 14 @ B/L STA 167+00 (")



PROJECT

LAKE PONTCHARTRAIN & VIC.

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DATE

5 OCT 83

SUBJECT

HIGH LEVEL PLAN FOR FLOODGATE @ APPROX. STA. 28+00

CHECKED BY

DATE

$$T = 7.3 \quad H_{max} = 2.73 \quad d_s = 12.9 - 12.5 = 0.4$$

$$SWL = 12.9$$

$$\frac{H_{max}}{T^2} = 0.001591 \quad m = 0.02$$

$$\frac{H_b}{H_0} = 1.42 \quad H_b = 2.73(1.42) = 3.88$$

$$\frac{H_b}{T^2} = 0.0023 \quad m = 0.02$$

$$d_b/H_0 = 1.12 \quad d_b = 1.12(3.88) = 4.35$$

$$h_c = 0.78 H_b = 0.78(3.88) = 3.03 \quad p_m = \frac{w d_b}{2} = \frac{64(4.35)}{2} = 139.2 \text{ psf}$$

$$R_m = p_m h_c = 139.2(3.03) = 421.78$$

$$M_m = R_m(d_s + \frac{h_c}{2}) = 807.71$$

$$P_s = w(d_s + h_c) = 219.52$$

$$R_s = \frac{w(d_s + h_c)^2}{2} = 436.48$$

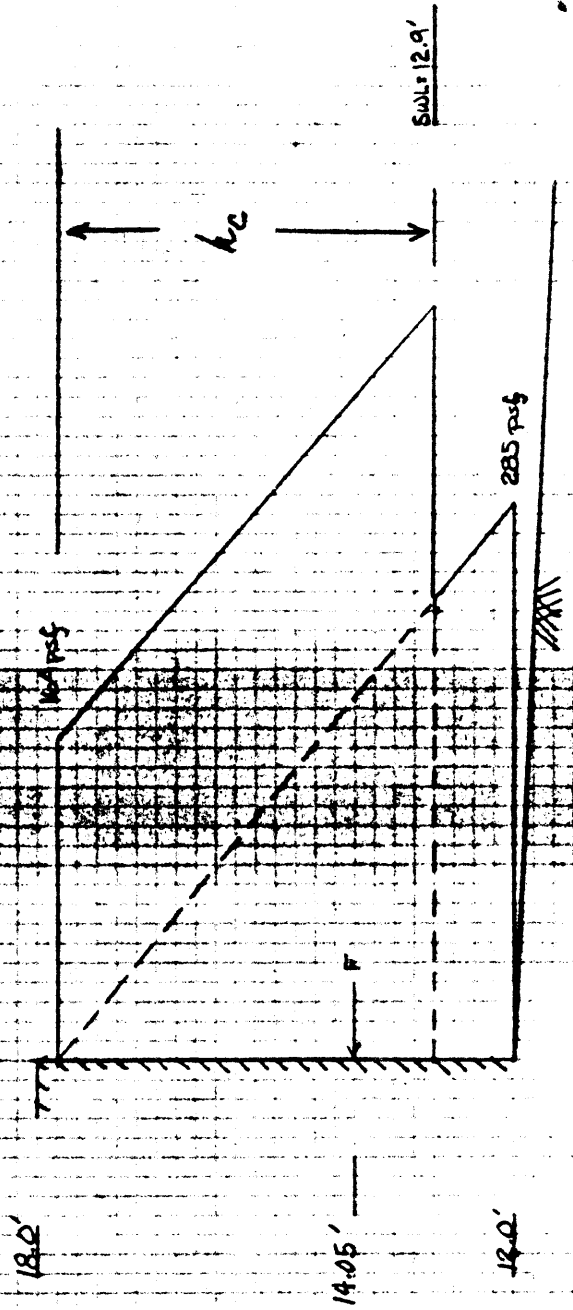
$$M_s = \frac{w(d_s + h_c)^3}{6} = 430.44$$

$$R_c = R_m + R_s = 858.26 \text{ lbs}$$

$$M_c = M_m + M_s = 1238.15 \text{ ft-lbs}$$

$$d_c = \frac{M_c}{R_c} = 1.55 \text{ ft}$$

NOTE: USE THIS FORCE FOR FLOODGATES No. 6, 7, 8, 15, 16, 17, 18A and 19A



ELEVATION IN FEET MVD

PROJECT LAKE PONCHARTRAIN + VIC.	PAGE 12 OF 14	COMPUTED BY RHB	DATE 5 OCT 83
SUBJECT FLOODGATE @ APPROX STA 277+00		CHECKED BY	DATE

$$T = 7.3 \quad H_{max} = 3.25 \quad d_b = 12.9 - 12.0 = 0.9 \quad SWL = 12.9$$

$$\frac{H_{max}}{gT^2} = \frac{3.25}{1716} = 0.0019 \quad m = 0.02$$

$$H_b/H_o = 1.4 \quad H_b = 3.25(1.4) = 4.55$$

$$\frac{H_b}{gT^2} = \frac{4.55}{1716} = 0.00265 \quad m = 0.02$$

$$d_b/H_b = 1.125 \quad d_b = 1.125(4.55) = 5.12$$

$$h_c = 0.78 H_b = 0.78(4.55) = 3.55$$

$$P_m = \frac{w d_b}{2} = \frac{64(5.12)}{2} = 163.84 \text{ psf}$$

$$R_m = P_m h_c = 163.84(3.55) = 581.63$$

$$m_n = R_m (d_b + h_c/2) = 1555.86$$

$$P_s = w (d_b + h_c) = 284.8$$

$$R_o = \frac{w (d_b + h_c)^2}{2} = 633.68$$

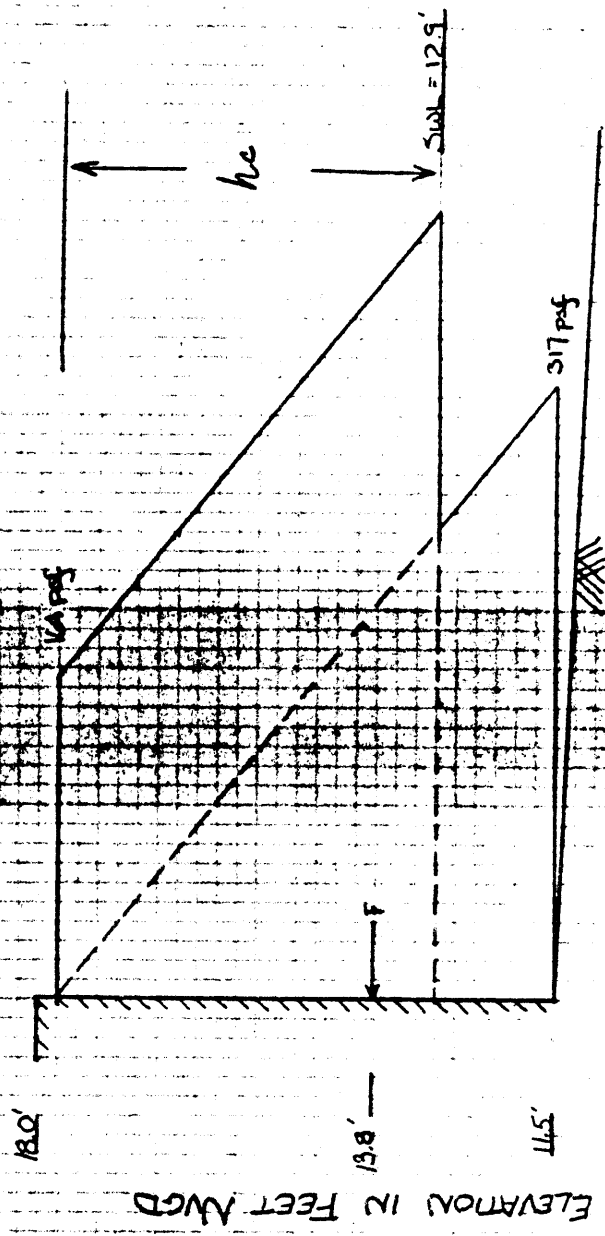
$$M_o = \frac{w (d_b + h_c)^3}{6} = 939.96$$

$$R_c = R_m R_o = 1215.31 \text{ lbs/ft}$$

$$F_b = M_o R_c = 2495.82 \text{ ft-lbs/ft}$$

$$d_r = \frac{F_b}{R_c} = 2.05 \text{ ft}$$

PROJECT LAKE PONTCHARTRAIN + Vic	PAGE 9 OF 14	COMPUTED BY RHB	DATE 5 Oct 83
SUBJECT FLOODGATE @ APPROX STA 277+00 GATE No 18+19		CHECKED BY	DATE



$T = 7.3$ $H_{0max} = 3.25$ $d_s = 12.9 - 11.5 = 1.4$ $SWL = 12.9$

$\frac{H_0}{gT^2} = 0.0019$ $m = 0.02$

$\frac{H_b}{H_0} = 1.4$ $H_b = 3.25(1.4) = 4.55$

$\frac{H_b}{gT^2} = 0.00265$

$d_b/H_b = 1.125$ $d_b = 1.125(4.55) = 5.12$

$h_c = 0.78H_b = 3.55$

$P_m = \frac{w d_b}{2} = \frac{64(5.12)}{2} = 163.84 \text{ psi}$

$R_m = p_m h_c = 581.63$

$M_m = R_m(d_s + h_c/2) = 1846.68$

$P_s = w(d_s + h_c) = 316.8 \text{ psi}$

$R_s = w(d_s + h_c)^{3/2} = 784.08$

$M_s = w(d_s + h_c)^{3/6} = 1293.73$

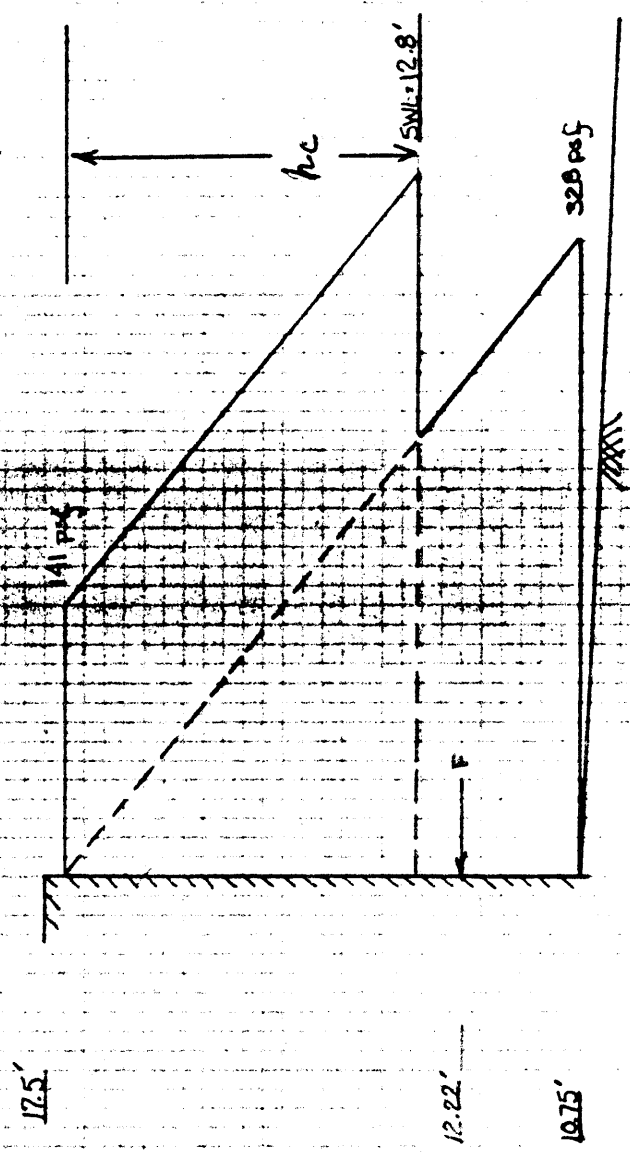
$R_T = R_m + R_s = 1365.71$ lbs/st

$M_T = M_m + M_s = 3140.41$ ft lbs/st

$d_f = M_T/R_T = 2.30$ ft

COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + Vic.	PAGE 7 OF 14	COMPUTED BY RHB	DATE 5 Oct 83
SUBJECT FLOOD GATE @ APPROX STA 136+00 (GATE No. 13)		CHECKED BY	DATE



ELEVATION IN FEET AMSGD

COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + Vic	PAGE 8 OF 14	COMPUTED BY RHB	DATE 5 OCT 83
SUBJECT FLOODGATE @ APPROX STA. 136+00		CHECKED BY	DATE

$$T = 7.3 \quad H_{max} = 2.77 \quad d_b = 12.8 - 10.75 = 2.05$$

$$\frac{H_{max}}{gT^2} = \frac{2.77}{1716} = 0.0016 \quad m = 0.02$$

$$H_b/H_c = 1.42 \quad H_b = 1.42(2.77) = 3.93$$

$$H_b/gT^2 = \frac{3.93}{1716} = 0.0023 \quad m = 0.02$$

$$d_b/H_b = 1.12 \quad d_b = 1.12(3.93) = 4.40$$

$$h_c = 0.78H_b = 3.07$$

$$p_m = \frac{w d_b}{2} = 140.8 \text{ psi}$$

$$R_m = p_m h_c = 432.26$$

$$M_m = R_m (d_b + h_c/2) = 1735.52$$

$$P_s = w(d_b + h_c) = 327.68 \text{ psi}$$

$$R_s = \frac{w(d_b + h_c)^2}{2} = 838.86$$

$$M_s = \frac{w(d_b + h_c)^3}{6} = 1431.66$$

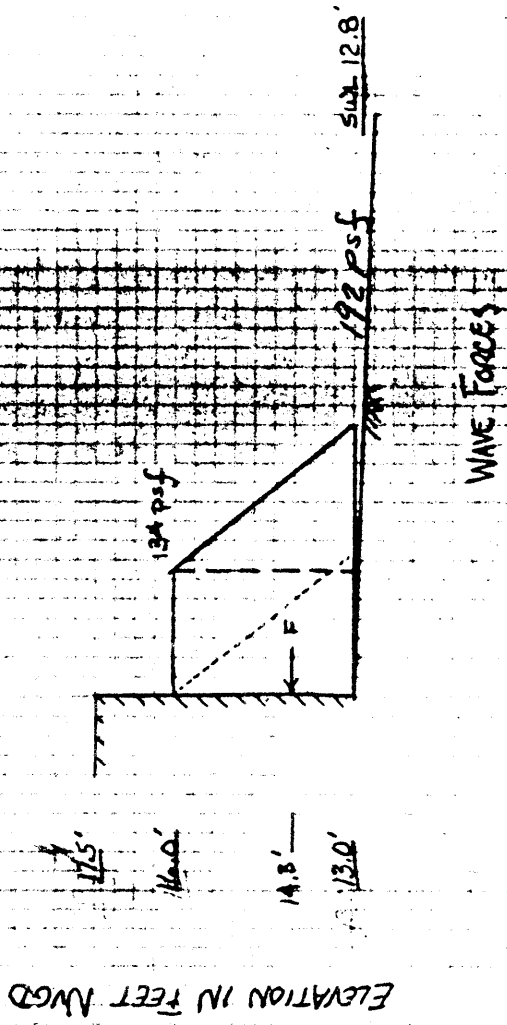
$$R_r = R_m + R_s = 1271.12 \quad \text{lbs/ft}$$

$$M_r = M_m + M_s = 1863.92 \quad \text{ft-lbs/ft}$$

$$d_e = \frac{M_r}{R_r} = 1.47 \quad \text{ft}$$

COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN - VIC.	PAGE 3 OF 14	COMPUTED BY RHR	DATE 5 OCT 83
SUBJECT FLOODGATE @ APPROX STA. 245+00 (GATE No 17A)		CHECKED BY	DATE



COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + Vic	PAGE 4 OF 14	COMPUTED BY RHB	DATE 5 OCT 83
SUBJECT FLOODGATE @ APPROX STA. 245+00		CHECKED BY	DATE

$T = 7.3$ $H_{b,max} = 2.77$

SWL = 12.8

Sill Elev = 13.0

$\frac{H_{b,max}}{gT^2} = \frac{2.77}{1716} = 0.0016$

$m = 0.02$

$H_b/H_{b,max} = 1.42$ $H_b = 1.42(2.77) = 3.93$

$\frac{H_b}{gT^2} = \frac{3.93}{1716} = 0.0023$

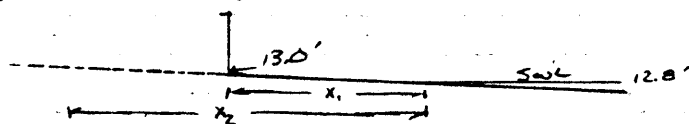
$m = 0.02$

$h_c = 0.78H_b = 3.07$

$d_b/H_b = 1.12$

$d_b = 1.12(3.93) = 4.40$

$\beta = 1.146$



$x_1 = 10'$ $x_2 = 2H_b/m = 2(3.93)/0.02 = 393$

$v' = \sqrt{gd_b} \left(1 - \frac{x_1}{x_2}\right) = 11.6$

$h' = h_c \left(1 - \frac{x_1}{x_2}\right) = 2.99$

$P_m = \frac{wv'^2}{2g} = \frac{64(11.6)^2}{2(32.2)} = 133.72 \text{ psi}$

$R_m = P_m h' = 399.82$

$M_m = R_m \frac{1}{2} = 597.73$

$R_s = w h' \frac{1}{2} = 286.08$

$P_s = w h' = 2.99(64) = 192$

$M_s = R_s \frac{1}{3} = 285.13$

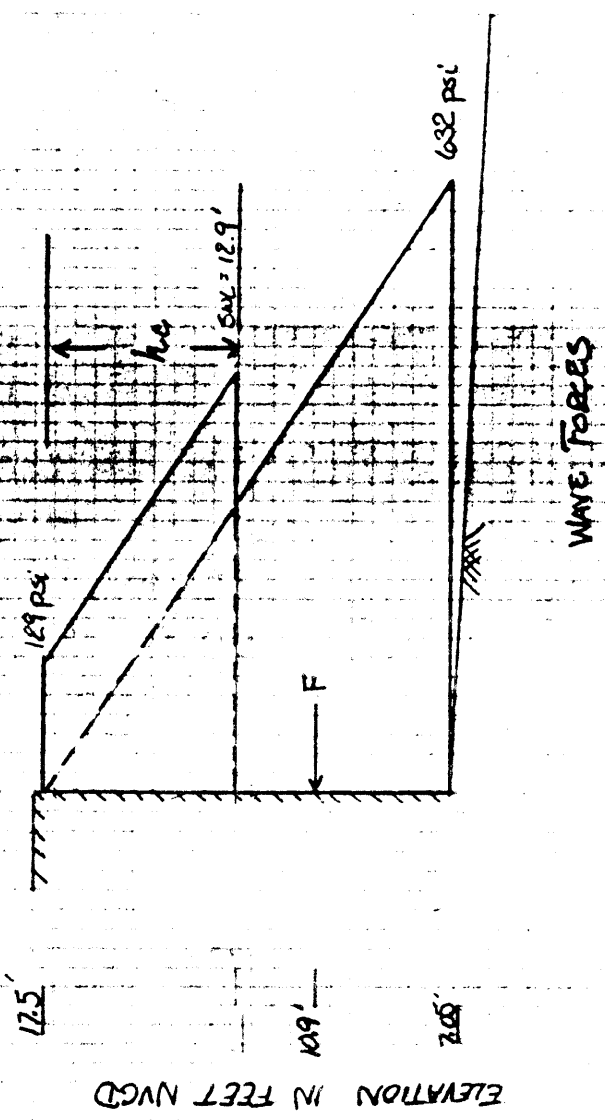
$R_t = R_m + R_s = 685.9 \text{ lbs/ft}$

$M_t = M_m + M_s = 882.86 \text{ ft-lbs/ft}$

$d_p = \frac{M_t}{R_t} = 1.29 \text{ ft}$

COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + Vic.	PAGE 1 OF 14	COMPUTED BY RHB	DATE 5-22-83
SUBJECT FLOODGATE @ APPROX STA. 106+00 (GATE No 11)		CHECKED BY	DATE



COMPUTATION SHEET

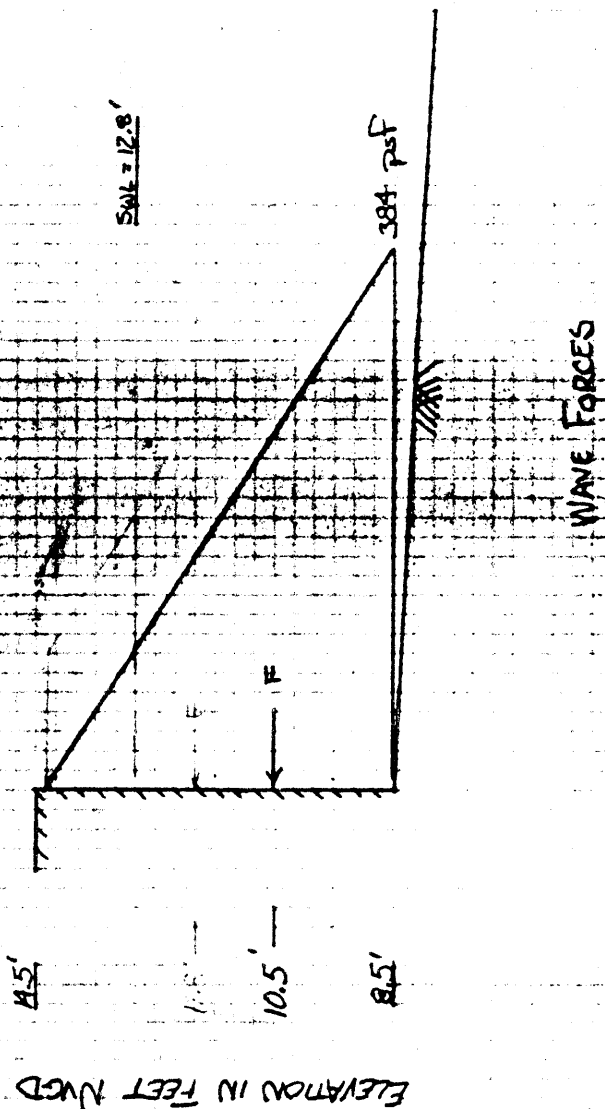
PROJECT LAKE PONTCHARTRAIN + Vc	PAGE 2 OF 14	COMPUTED BY RUB	DATE 5 Oct 83
SUBJECT FLOODGATE @ APPROX STA. 106+00		CHECKED BY	DATE

$T = 7.3$ $H'_{max} = 2.49$ $d_s = 129 - 5.75 = 7.05$ $SWL = 12.9$
 $\frac{H'_{max}}{gT^2} = \frac{2.49}{1716} = 0.00145$ $n = 0.02$
 $H_b/H'_b = 1.45$ $H_b = 3.61$
 $\frac{H_b}{gT^2} = \frac{3.61}{1761} = 0.0021$
 $d_b/H_b = 1.125$ $d_b = 1.125(3.61) = 4.02$
 $h_c = 0.78H_b = 2.82$
 $P_m = \frac{w d_b}{2} = 128.64 \text{ psi}$
 $R_n = P_m h_c = 362.77$
 $M_n = R_n (d_s + h_c/2) = 3069.03$
 $P_s = w (d_s + h_c) = 631.68 \text{ psi}$
 $R_s = \frac{w (d_s + h_c)^2}{2} = 3117.34$
 $M_s = \frac{w (d_s + h_c)^3}{6} = 10256.05$
 $R_r = R_n + R_s = 3480.11 \text{ lbs/ft}$
 $M_r = M_n + M_s = 13325.08 \text{ ft-lbs/ft}$
 $d_f = \frac{M_r}{R_r} = 3.83 \text{ ft}$

COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + Vic	PAGE 5 OF 14	COMPUTED BY RMB	DATE 5 OCT 83
SUBJECT FLOODWALL AT PONTCHARTRAIN BEACH		CHECKED BY	DATE

NOTE: USE THIS FORCE FOR FLOODGATE 12



COMPUTATION SHEET

PROJECT LAKE PONTCHARTRAIN + VIC	PAGE 6 OF 14	COMPUTED BY RMB	DATE 5 Oct 83
SUBJECT FLOODGATE AT PONTCHARTRAIN BEACH		CHECKED BY	DATE

$T = 7.3$ $H_{0max} = 2.77$ $d_s = 12.8 - 8.5 = 4.3$

$\frac{H_{0max}}{\sqrt{gT^3}} = \frac{2.77}{1716} = 0.0016$ $n = 0.02$

$\frac{H_0}{H_{0max}} = 1.42$ $H_b = 1.42(2.77) = 3.93$

$\frac{H_b}{\sqrt{gT^3}} = \frac{3.93}{1716} = 0.0023$

$\frac{d_b}{H_b} = 1.12$ $d_b = 1.12(3.93) = 4.40$

$h_c = 0.78H_0 = 3.07$

$F = \frac{4d^2}{2} = \frac{4(6)^2}{2} = 72 \text{ lbs/st}$ $dF = \frac{d}{3} = 2 \text{ ft}$

$P_s = wd = 64(6) = 384 \text{ psf}$

COMPUTATION SHEET

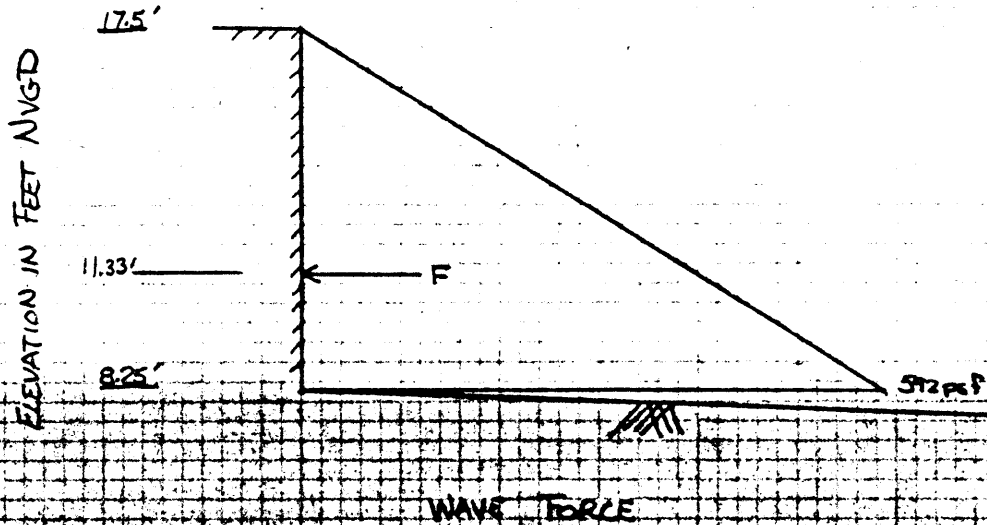
PROJECT LAKE PONCHARTRAIN + VIC	PAGE OF	COMPUTED BY RHB	DATE 5 OCT
SUBJECT FLOODGATE @ APPROX STA 306+00 (GATE No 20)		CHECKED BY	DATE

$$d = 17.5 - 8.25 = 9.25$$

$$F = \frac{\rho g d^3}{2} = \frac{(62.4)(9.25)^3}{2} = 2738 \text{ lbs/ft}$$

$$P = (62.4)(9.25) = 572 \text{ psf}$$

$$df = \frac{9.25}{3} = 3.08 \text{ ft}$$



$$d = 13.5 - 6.75 = 6.75$$

$$F = \frac{\rho g d^3}{2} = \frac{64(6.75)^2}{2} = 1458 \text{ lbs/ft}$$

$$P_s = 64(6.75) = 432 \text{ psf}$$

$$d_f = \frac{6.75}{3} = 2.25'$$

