A0007163

DISPOSITION FORM

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

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-DD	Appl by S&WB of NO to install pile supported floodwall, discharge pipes and fill for hurricane protection at the 17th St. Canal Pumping Station

TO C/Ops Div FROM C/Engr Div DATE 27 Jul 83 CMT 11

Ch Mr. Romero/cmr/2647

1. Reference is made to CMT 10 dated 11 Jul 83 on the subject request.

2. A copy of the letter dated 18 Jul 83, from Burk & Associates, Inc. to Mr. Ronald Ventola of your office was hand delivered to Mr. Jorge Romero of this office by Burk. This letter included copies of revised P&S incorporating the comments we submitted in the referenced DF. We reviewed the revised P&S and verbally recommended to Burk to provide a "T" connector on the steel sheet piling to facilitate tying in future flood protection work at the pumping station. Copies of supplemental drawings, which addressed this recommendation were delivered to Mr. Romero on 21 Jul 83 (inc 1) by Burk and Associates. These drawings have been reviewed and all comments have been satisfactorily resolved.

3. As a result, Engineering Division no longer has any adverse comments relative to the subject permit request.

WBB RG GANNUCH LMNED-DD

1 Incl (1 cys) as

FREDERIC M. CHATRY
Chief, Engineering Division

JUDLIN LMNED-D

CF: w/o incl
LMNED-FS

PD FV JR for PICCIOLA LMNED-F

TO C/Proj Ops Br FROM C/Reg Func Br Ops Div DATE 2 AUG 83 CMT 12 Lucas/2255

Forwarded for comment and return. Please forward a letter of no objection to the appropriate levee board if the applicant's plans are acceptable.

RONALD J. VENTOLA
Chief, Regulatory Functions Branch
Operations Division

MOD-OF

C/Reg Func Br FROM C/Proj Ops Br DATE 4 Aug 83 CMT 13
Mr Collette/2360

Plans are acceptable and a letter of no objection is being forwarded to the levee district.

Incl
2 incrd lg scale dwgs

Rene J Hardy
C/Proj Ops Br

A FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED ☆ U.S. G.P.O. 1980-665141/288

LMNED-DD

Appl by S&WB of NO to install pile supported floodwall, discharge pipes and fill for hurricane protection at the 17th St. Canal Pumping Station

C/Ops Div

C/Engr Div

27 Jul 83

Mr. Romero/cmr/2647

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1 Incl (2 cys)
as

FREDERIC M. CHATRY
Chief, Engineering Division

CF: w/o incl
LMNED-FS

BURK AND ASSOCIATES, INC.
ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS
4176 CANAL STREET
NEW ORLEANS, LOUISIANA 70119-5994
(504) 486-5901

July 18, 1983

Mr. Ronald Ventola
Chief, Regulatory Foundation Board
Operations Division
New Orleans, District
Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160

RE: Appl. S&WB of N. O.
Floodwall, Discharge Pipes for
Hurricane Protection
Pumping Station No. 6
17th Street Canal
B&A Job No. 8133

Dear Mr. Ventola:

In response to the comments of July 11 by the Engineering Division, we submit our response and three sets of final plans and specifications.

Thank you for your attention in this project as we await the permit.

Sincerely,

BURK & ASSOCIATES, INC.
Engineers, Planners,
Environmental Scientists

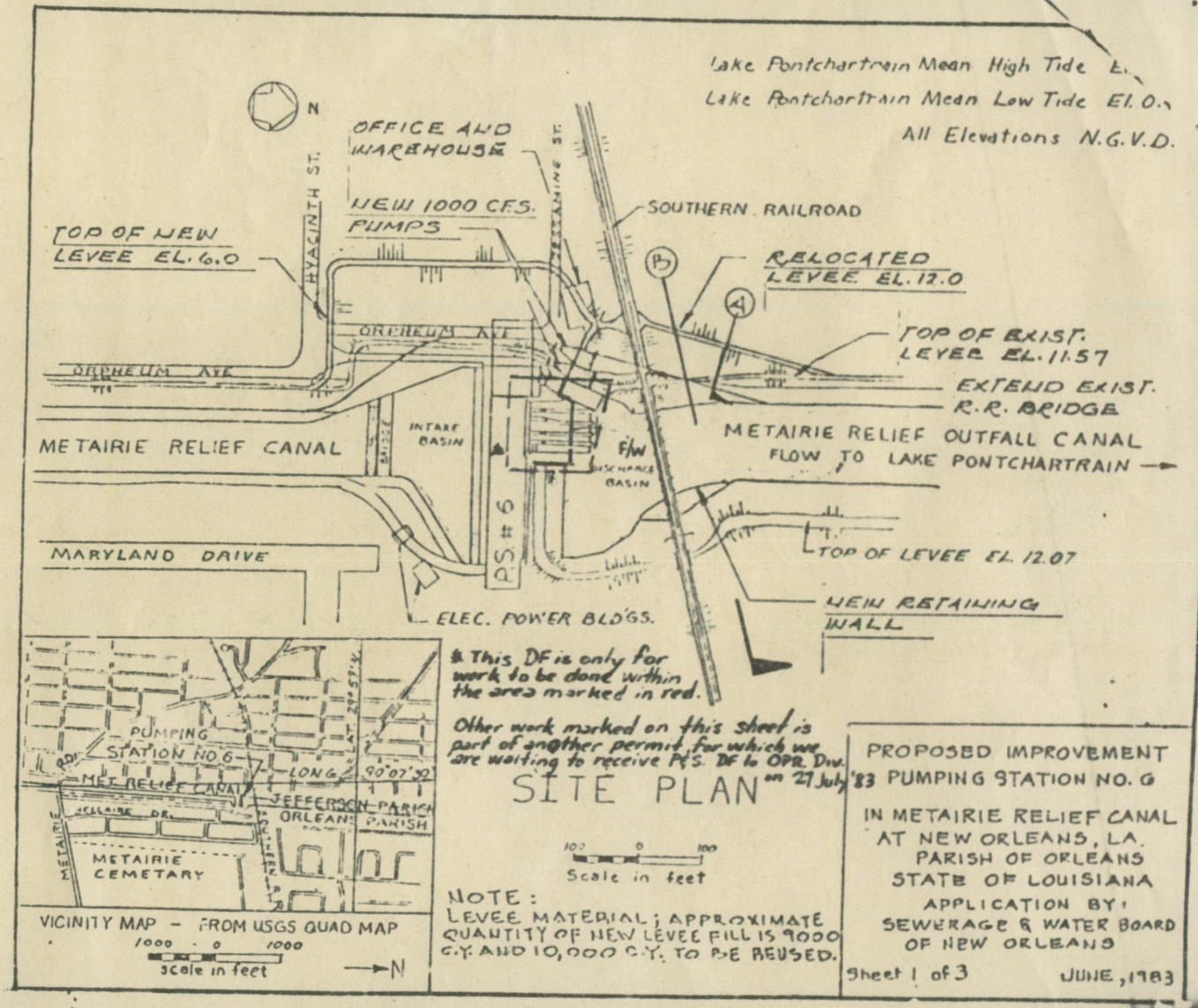
Deborah D. Keller

Deborah D. Keller
Project Engineer

DDK:jrb

Enclosure
cc:Mr. G. Joseph Sullivan

Rec'd 7/20/83 JAN 1480 hrs



-INFORMATION ONLY

OD-S
A-11

LMNED-DD (21 Oct 82)
SUBJECT: (17th St. Canal 3) CMT 9 - Appl S&WB of NO to install pile supported floodwall, disch pipes & fill for hurr prot near Metairie

TO C/Ops Div FROM C/Engr Div DATE 11 Jul 83 CMT 10
Mr. Guggenheimer/cmr/2645

The following are comments made as a result of a review of resubmitted drawings and computations relative to the permit for the subject pumping station. The resubmitted drawings include new details and drawings along with corrected drawings as a result of our comments presented in CMT 6. Conversations have been held with Burk & Associates, concerning the following comments in an effort to resolve them as soon as possible. Accomodation of the following comments, each of which has been previously coordinated with Burk & Associates, will preserve the opportunity for local interests to receive credit for the construction under the high level plan of the Lake Pontchartrain project in the event the high level plan is adopted.

a. The PZ-32-1 and PZ-32-4 sheet pile wall alinement has been changed from the previous submittal. The PZ-32-4 sheet pile wall now ties into an existing concrete discharge tube. A continuous sheet pile cutoff wall under the concrete discharge tube should be provided to prevent seepage from passing around the PZ-32-4 sheet pile wall by going below the concrete discharge. If there is an existing sheet pile cutoff wall under the discharge tube, the plans should show how the sheet pile cutoff will be connected.

b. Dwg. S-1 and Burk's Computations.

(1) Monolith "C". Design and analysis of pile foundation was based on 30^k comp. and 21^k tens. using a FS = 2. Burk's computations indicate maximum loads of 43^k comp. Our analysis indicate max loads of 40^k comp. and 20^k tens. Loads would be within the minimum F.S. of 1.5 comp. and 1.75 tens., if pile test verifies design pile capacity assumptions. Test results should be furnished for our review. The format should be similar to that provided by Burk for Pump Station No. 4 in Jefferson Parish. If the pile tests indicate lower pile capacities, additional piles or longer piles will be required for this monolith.

(2) Monolith "A".

(a) Batter piles on East end of this monolith interfere with vertical piles on monolith "B". It is suggested that the last 6 batter piles on the East end of monolith "A" be changed to a 1 on 10 batter towards the West. The change in batter and direction will help in taking East-to-West lateral water loads and will eliminate the pile interference.

(b) The 12th vertical pile from the East end on the protected side of monolith "A" falls within a monolith joint. This pile can be deleted.

c. Dwgs. S-1, S-6, S-8, S-9 and S-10. Provide a monolith joint between the T-wall base slab and the 2' concrete cap for the steel sheet piling. Extend the joint around the South end of monolith "C" up to the wall stem (otherwise slip joint provided is ineffective). Provide a 3-bulb waterstop at this monolith joint.

Provide a slip joint for the sheet piling at the Northwestern corner of monolith "A" (sheet piling on North side of base slab is embedded in a 2' cap, the sheet pile on the West end of the monolith is embedded into the base slab).

Encl 1 to appl
14 Dec 83

LMNED-DD
SUBJECT: (17th St. Canal 3) CMT 9 - Appl S&WB of NO to install pile supported floodwall, disch pipes & fill for hur prot near Metairie 11 Jul 83

d. Dwgs. E-2 and E-3. (Note: dwgs. E-1 thru E-3 were not included in previous review). The two light post assemblies cannot be supported on the T-wall stem as shown on these drawings. The loads induced by the light standards during high winds can damage the concrete wall.

e. All remaining comments in CMT 6 have been satisfied.

9 Incl
nc

FREDERIC M. CHATRY
Chief, Engineering Division

CF: w/o incl
LMNED-FS

LMNOD-SP(17th Street Canal)3 (21 Oct 82)
SUBJECT: Appl by Sewerage & Water Board of New Orleans, to install and maintain a pile supported floodwall, discharge pipes and fill for hurricane protection, near Metairie, Louisiana, in Jefferson Parish

TO C/Engr Div

FROM C/Reg Func Br
Ops Div

DATE 17 Jun 83 CMT 9
Mrs Lucas/2285/rw

Forwarded for comment and return.

9 Incl
added 3 incl
7 ltr dated 14 ~~Jan~~ Jun 83
w/attachments
8. specifications
9. 1g set dwgs

for RONALD J. VENTOLA
Chief, Regulartory Functions Branch
Operations Division

BURK AND ASSOCIATES, INC.
ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS
4176 CANAL STREET
NEW ORLEANS, LOUISIANA 70119-5994
(504) 486-5901

June 14, 1983

Mr. Ronald Ventola
Chief-Regulatory Functions Branch
Operations Division
Department of the Army
New Orleans District Corps of Engineers
P.O. Box 60267
New Orleans, LA

RE: Drainage Pumping Station No. 6
Constr. of 250 CFS Pumps and
Floodwall
Orleans Parish
LMNOD-SP (17th Street Canal)
B&A Job No. 8133-6-1

Dear Mr. Ventola:

In response to comments from the Engineering Division on May 4, we are enclosing three copies of our response and revised plans and specifications.

If there are any questions, please call. Your expeditious assistance in completing the permit applications is appreciated.

Yours turly,

BURK AND ASSOCIATES, INC.
Engineers, Planners and
Environmental Scientists

Deborah Keller
Project Engineer

DK/ptb

Enclosure

cc: Mr. G. Joseph Sullivan

INCL 7

BURK AND ASSOCIATES, INC.

Pumping Station No. 6
Construction of 250 CFS Pumps and Floodwall
Job No. 8133
June (, 1983
Response to Comments from
Corps of Engineers, Engineering Division

Comment

2a. Analyses are submitted on sheet pile walls PZ-32-1, PZ-32-4

b. The steel sheet pile is embedded 12 in. into concrete. Also, when the concrete floodwall base for monoliths A and B are poured at El. 21.50, the sand backfill will be replaced with cohesive material for at least 5 feet below the base.

c. See comment 2b.

d. The steel sheet piling receives a 16 mil coating of coal tar epoxy, and the tops of all permanent sheet piling are embedded in concrete.

e. This detail was changed after the first set of plans was submitted.

f. The transition detail is changed.

g. Existing sheet piling on the 1000 cfs pump are shown to a tip of El. (-) 25.0.

h. Seepage collar detail is added.

i. New calculations for monoliths A, B, and C are submitted. New pile foundation analyses are submitted.

j. A note to remove conflicting existing piling is added to this sheet.

k. Calculations are provided.

l. The pipe support is moved from monolith B to monolith A. Because the dimensions of the monoliths change, new calculations are submitted for the redesign.

m. New T-wall base slab calculations are submitted.

n. All concrete design calculations submitted show the Corps design parameters.

o. Three copies of final plans and specifications are submitted herein to the Operations Division.

A row of 10 ft. long PSA-23 has been added for seepage cut-off. Calculations are submitted.

PARTNERS

J. BRES EUSTIS
REG. C. E.

CHARLES A. BRAGG (1918-1979)
REG. C. E.

JOHN W. ROACH, JR.
REG. C. E.

GERALD A. BRAGG
REG. C. E.

LLOYD A. HELD, JR.
REG. C. E.

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
BORINGS • TESTS • ANALYSES
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OFFICERS
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CORP. VICE PRESIDENT AND
CHIEF ADMINISTRATIVE OFFICER
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VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

15 June 1983

Burk and Associates, Inc.
Engineers, Planners and
Environmental Scientists
4176 Canal Street
New Orleans, Louisiana 70119

Attention Mr. Jens Nielsen

Gentlemen:

Additional Information
Sewerage and Water Board of New Orleans
Proposed Additions to Drainage Pumping Station No. 6
New Orleans, Louisiana

In accordance with a request by Mr. Jens Nielsen, we have reviewed the comments made by the Corps of Engineers pertaining to the subject project and offer the following response.

In regard to Comment (a), analyses were made to determine the required penetration and maximum bending moment for sheetpile walls PZ-32-1 and PZ-32-4 considering both "Q" and "S" shear strengths. The computations include a factor of safety of 1.5 applied to the soil shear strengths to determine the required penetration and 1.0 to determine the maximum bending moment. It is understood that the contractor will be required to properly brace sheetpile wall PZ-32-1 during construction, and, therefore, only the final condition was analyzed for this wall. The construction condition and final condition were analyzed for sheetpile wall PZ-32-4. Results of the computations for both walls indicate a sheetpile penetration to el -27.5 Cairo Datum is more than adequate and the maximum bending moment is 23.3 ft-kips per linear foot.

In regard to Comments (b) and (c), it is understood that design plans will be revised to provide a positive connection by embedding the top of the sheetpiles into the base of the concrete floodwall. It is also understood

that revised plans will provide for a minimum 5-ft thickness of clay cover between the base of the concrete floodwall and the granular backfill material beneath the floodwall. Further, a 10-ft long steel sheetpile cutoff will be located beneath the floodwall near the heel. Computations for this sheetpile seepage cutoff indicate a value of 2.6 for LWCR, which is considered acceptable.

In regard to Comment (g), it is understood that the tip penetration of the existing sheetpiles has been furnished to the Corps of Engineers by Burk and Associates.

Yours very truly,

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.
Lloyd A. Held, Jr.

L. J. Napolitano:bh

burk and associates, inc.
engineers planners environmental scientists
1176 CANAL ST. NEW ORLEANS LA 70119 504 486 5901

Sheet Filing

JOB NO.	DESIGN BY:	DATE:	CHECKED BY:	PAGE / OF /
8133	DDK	Feb 83		

1. Inner Row tip -27.5 M_{MAX} = 60"K/L.F.

Outer Row tip -11.0 M_{MAX} = 21"K/L.F.

σ_y = 38500 psi $\sigma_s = .6\,\sigma_y = .6(38500) = 23100$ psi

Moment ÷ σ_A = S

Inner row $60^{"K} \times 12'/' = 720^{"K} = 720000$ in-lbs
$720000 \div 23100 = 31.17 = S$
PZ-32

Outer row $21^{"K} \times 12'/' = 252^{"K} = 252000$ in-lbs.
$252000 \div 23100 = 10.91 = S$
PZ 22

2. Lengths Top PZ-32 $26.5 + 27.5 = 54'$ say 55' LONG

Top PZ-22 $24 + 11 =$ 35' LONG

Top PZ-32 $26.5 + 38.5 =$ 64.5' LONG

burk and associates, inc.
engineers planners environmental scientists
4176 CANAL ST. NEW ORLEANS, LA 70119 504 486 5901

Pile Supported Discharge Tubes

JOB NO.	DESIGN BY:	DATE:	CHECKED BY:	PAGE 1 OF 9
8133	DDK	Feb 83		

Pile Analysis:

Class R Timber Piles: Tip EL. -13.0 C.D. good for 15 T ea

Using 4 piles @ ea pipe support — support 60 T — 84" ⌀
2 piles — 30 T — 48" ⌀
3 piles @ ea pipe support — support 45 T — 84" ⌀
1 pile — 15 T — 48

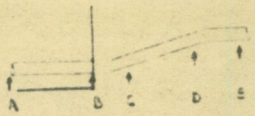
wts.
84 pipe 600 #/L.F.
wt water (~(3.1416)(42.4)) — 84" = 3 #/L.F.

48 pipe 260 #/L.F.
wt water (3.1416)(42.4) — 48" 1.0 #/L.F.

Max span — 60 T = 120 K; 45 T = 90 K; 30 T = 60 K
120 K = 3 #/L.F. — 40 L.F. = 84" ⌀
60 K = 1.5 #/L.F. — 120 L.F. = 48" ⌀
90 K = 2 #/L.F. — 30 L.F. = 84" ⌀
30 K = 1 #/L.F. — 30 L.F. = 48" ⌀

Max M = $wL^2/8$
if L = 30' M = 340 K

COMPUTATION SHEET



PT C 3 piles @ 90° ∠ 30° ∠'s

PT D 3 piles @ 90° ∠ 30° ∠'s

PT E 2 piles @ 60° ∠ 20° ∠

From thrust calculations

5° & 15° PT C 15.0' @ 2.0' : 3/4"ø + 15° = 90° max span = 25'

5° PT D 21.0' @ 2.0' : 3/4"ø + 21.0° = 90° max span = 21' ≈ 20' ∠ 25'

15° PT C 20.0' @ 2.0' : 3/4"ø + 20.0° = 90° max span = 23'

7.5° & 15° PT C 11.8' @ 2.0' : 3/4"ø + 11.8° = 90° max span = 26'

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Pipe Supports

JOB NO.	DESIGN BY:	DATE:	CHECKED BY:	PAGE OF
8133	DDK	3-83		3 9

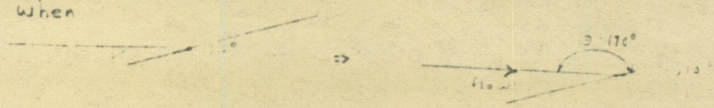
V: 6.5'/s A: 28.5 ft² P: 2160 psf

Compute Thrust at C

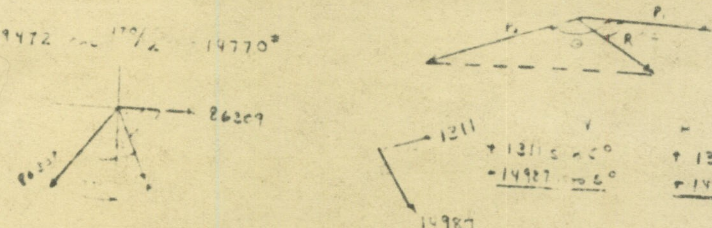
R = 2A (w v²/g + p) cos θ/2 = 169472 cos θ/2

P_1 = pA + v Q w/g = 86309#

when



R = 169472 cos 170/2 = 14770#



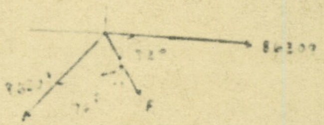
F_H = 86309 − 86309 sin 60°
= 1311#

F_V = 86309 cos 60° = 14987# ↓

V	H
+ 1311 sin 5°	+ 1311 cos 5°
− 14987 cos 5°	+ 14987 sin 5°
+ 114	1306
− 14930	1306
14816 ↓	2612 →
15ᴷ ↓	2.6ᴷ →

at C when

15° R = 169472 cos 165/2 = 22121#

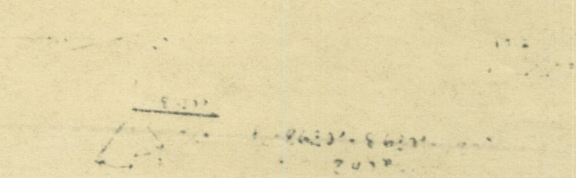


F_H = 86309 − 86309 sin 76°
= 2564#

F_V = 86309 cos 76° = 20880# ↓

2.6ᴷ →
20.8ᴷ ↓

at C when



R = 169472 cos 173/2 = 11822#

F_H = 86309 − 86309 ...
= 2148

F_V = 86309 ...

V	H
+ 840 sin 7°	+ 840 cos 7°
− 12012 cos 7°	− 12012 sin 7°
11820# ↓	2298# →
11.8ᴷ ↓	2.3ᴷ →

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at D

$R = 169472 \cos {}^{14°}/_2 = 22121^{\#}$

$P = 86309$

$P_H = -86309 + 86309 \cos 14° =$

$= 2564^{\#} \leftarrow$ $\qquad$ $2.6^{K} \leftarrow$

$P_V = 86309 \sin 14°$

$= 20880^{\#} \uparrow$ $\qquad$ $20.9^{K} \uparrow$

Compute 48" [illegible] Thrust

$P_{[illegible]}$ [illegible] 7^{K}

$P_{[illegible]}$ 1.0^{K}

V = 6.5'/s [illegible]

P = 21 [illegible]

[illegible]

R =

2 [illegible] [illegible] [illegible]

[illegible]

2070 of

24" Ø

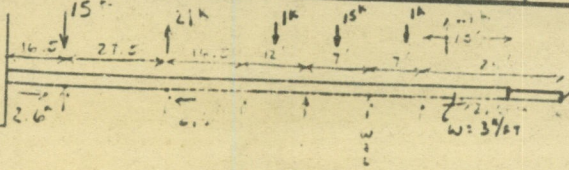
BURK & ASSOCIATES, INC.

ENGINEERS
4176 CANAL ST NEW ORLEANS, LA

Pipe Supports

JOB NO.	DESIGN BY	DATE	CHECKED BY	PAGE OF
8133	DDK	3-83		59

#1



Assume simple spans

	A		B		C		D		E		F		G
	40	56	41	20	25	9	22	12	11	11	32		33
	96'		66'		44'		91'		33'		43'		53'

0 to 1

$\Sigma M_C = 0$ $3(16.5)(8.25) + .5R + 15(16.5) = 0$ $R = 40^{\#}\uparrow$

1 to 2

$\Sigma M_A = 0$ $3(27.5)(13.75) - 2(27.5) - R(27.5) = 0$ $R = 20.2^{\#}\uparrow$

$\Sigma M_B = 0$ $3(27.5)(13.75) + 2(27.5) - L(27.5) = 0$ $L = 56.3^{\#}\uparrow$

2 to 3

$\Sigma M_C = 0$ $3(16.5)(8.25) + .5(16.5) - R = 0$ $R = 20.2^{\#}\uparrow$

$\Sigma V_R = 0$ $-2(16.5) + L(16.5) - 3(16.5)(8.25) = 0$ $L = 41^{\#}\uparrow$

or with L at left

$-L(16.5) + 2(16.5) + 3(16.5)(8.25) = 0$ $L = 20^{\#}\uparrow$

3 to 4

$\Sigma M_L = 0$ $12(3)(2) + 1(2) - R(12) = 0$ $R = 9^{\#}\uparrow$ $\therefore L = 19^{\#}\uparrow$

4 to 5

$\Sigma M_C = 0$ $3(7)(3.5) + 15(5.0) - R(7) = 0$ $R = 72^{\#}\uparrow$ $\therefore L = 72^{\#}\uparrow$

5 to 6

$\Sigma M_C = 0$ $2(7)(3.5) + 1(3.5) - R(7) = 0$

$R = 11^{\#}\uparrow$ $L = 5^{\#}\uparrow$

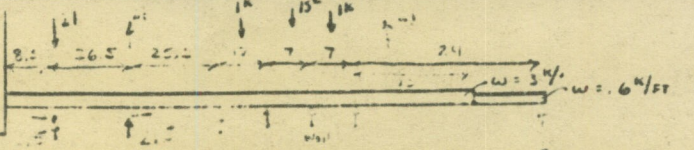
6 to 7

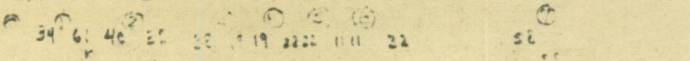
$\Sigma M_C = 0$ $3(4)(7.5) + 2(6)(3.0) - R(24) = 0$ $R = 22^{\#}\uparrow$

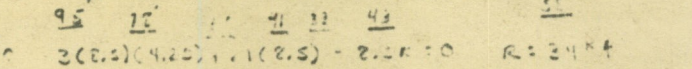
$\Sigma M_R = 0$ $2(6)(20.5) + 15(23.5) - L(24) = 0$ $L = 32^{\#}\uparrow$

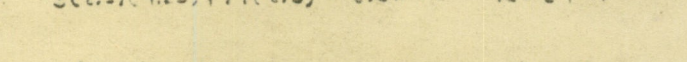
* Point of Coupling or Valve # Uniform DL+LL @ Unif. DL

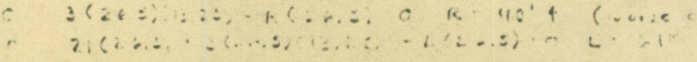
COMPUTATION SHEET

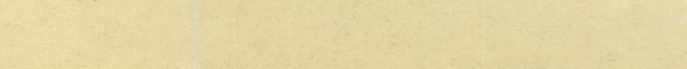


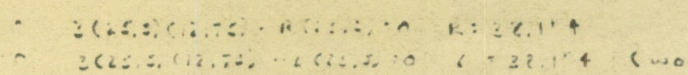


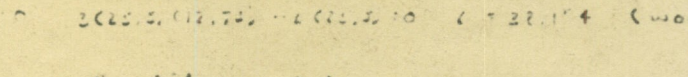


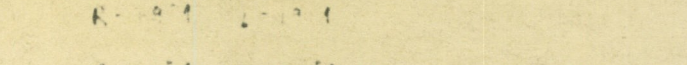


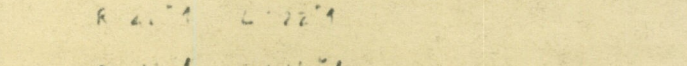


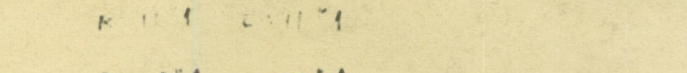


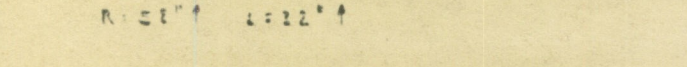


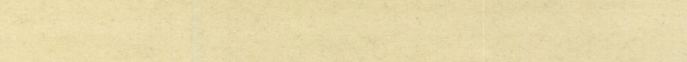


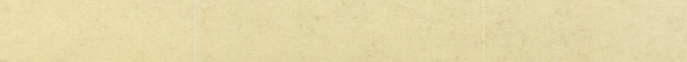


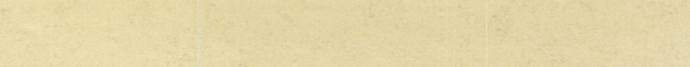


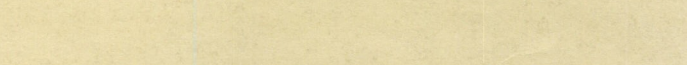


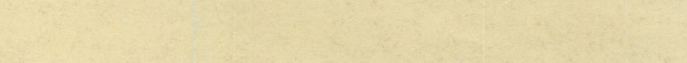


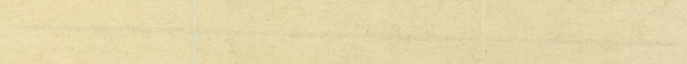


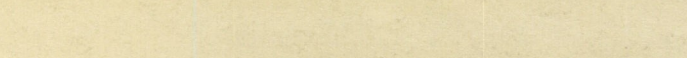


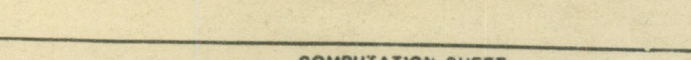


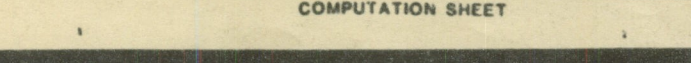












BURK & ASSOCIATES, INC.	Pipe Supports				
ENGINEERS 4176 CANAL ST NEW ORLEANS, LA	JOB NO. 8133	DESIGN BY DDK	DATE 3-83	CHECKED BY	PAGE 6 OF 9

0 to 1 95 78 [illegible] 41 33 43 58

$\Sigma M_L = 0$ 3(8.5)(4.25) + 21(8.5) − 8.5R = 0 R = 34^K↑

1 to 2

$\Sigma M_L = 0$ 3(26.5)(13.25) − R(26.5) = 0 R = 40^K↑ (worse case)

$\Sigma M_R = 0$ 21(26.5) + 3(26.5)(13.25) − L(26.5) = 0 L = 61^K

2 to 3

$\Sigma M_L = 0$ 3(25.5)(12.75) − R(25.5) = 0 R = 38.1^K↑

$\Sigma M_R = 0$ 3(25.5)(12.75) − L(25.5) = 0 L = 38.1^K↑ (worse case)

3 to 4 R = 19^K↑ L = 19^K↑

4 to 5 R = 22^K↑ L = 22^K↑

5 to 6 R = 11^K↑ L = 11^K↑

6 to 7 R = 58^K↑ L = 22^K↑

BURK & ASSOCIATES, INC.

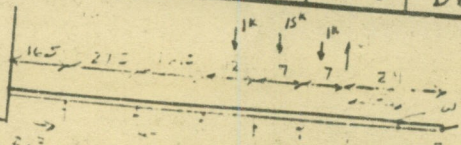
ENGINEERS

4176 CANAL ST NEW ORLEANS, LA

Pipe Supports

JOB NO.	DESIGN BY	DATE	CHECKED BY	PAGE OF
8133	DDK	3-83		7 9

#2



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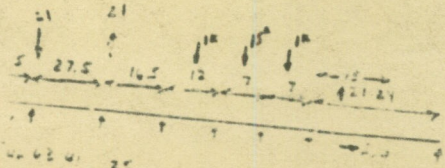


COMPUTATION SHEET

BURK & ASSOCIATES, INC.	Pipe Supports				
ENGINEERS 4176 CANAL ST NEW ORLEANS, LA	JOB NO. 8133	DESIGN BY DDK	DATE 3-83	CHECKED BY	PAGE OF 8 9

ACTUATOR

	1	2	3	4	5	6	7
1	96K	66K	44K	41K	33K	43K	58K
2	95K	78K	57K	41	33	43	58
3	90	66	44	41	33	43	58
4	109	66	44	41	33	43	58
	(1)	(2)	(3) Mono	(4) Mono	(5) Wall Strm	(6) Wall	(7) Pile
	3 piles	3 piles	2	2			2 piles
	90K	90K	60K	60K			60K

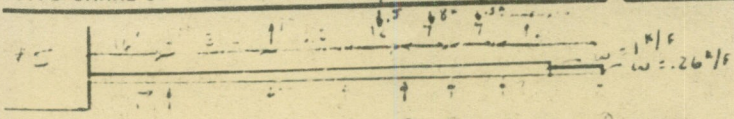
84"Ø Pipe

take 1/3 overstress on pipe 4 at max cond. at pt. 1
OK also receiving soil support

48"

5	38K	24K	14K	12K	13K	11K	11K
	2 piles 60K	Heel	Mono 1	Mono 1	Wall Strm	Wall 1	Pile 1

BURK & ASSOCIATES, INC.	48" ϕ Pipe Supports				
ENGINEERS 4176 CANAL ST NEW ORLEANS, LA	JOB NO. 8133	DESIGN BY DDK	DATE 3-83	CHECKED BY	PAGE OF 9 9



COMPUTATION SHEET

LMNED-DD (21 Oct 82)
SUBJECT: Appl by Sewerage and Water Board of New Orleans, to install and maintain a pile supported floodwall, discharge pipes and fill for hurricane protection, near Metairie, Louisiana, in Jefferson Parish

TO C/Ops Div

FROM C/Engr Div

DATE 4 May 83 CMT 6
Mr. Romero/cmr/2647

1. At present the west bank levee is the only Federal item on the 17th Street Canal which would be impacted by the proposed work. We have therefore reviewed the proposed work relative to its potential impact on the west bank levee and have no adverse comments to offer in this regard.

2. If the applicant wishes to construct the subject work in compliance with the Lake Pontchartrain Hurricane Protection project criteria, the following comments would have to be resolved:

a. No analysis was presented for the steel sheet pile walls PZ-32-4 and PZ-32-1 which tied the new floodwall adjacent to the 48-inch diameter steel discharge tube to the existing concrete wall. This analysis should be presented for our review.

b. Since the base of the floodwall will be placed 12 feet above the groundline on a backfill consisting of pervious material adjacent to the cutoff wall, piping may develop from seepage through the sheet pile interlocks and from seepage between the base slab and the sheet piles. Therefore, a positive means of seepage cutoff should be presented.

c. No analysis was presented for the steel sheet pile retaining wall used for seepage cut-off around the floodside edge of the T-wall base slab. An arbitrary deflection of 1/2-inch on the steel sheet piling was used to design the tension load for the welded studs which anchor the sheet piling to the concrete base slab. The actual deflection could be much larger which would impose a greater load on the studs. This connection could separate creating a seepage path between the concrete base and the sheet piling. The top of this cut off wall should be embedded into the bottom of the concrete base slab as shown in the soils report plates.

d. The steel sheet pile cutoff and the #6 rebars used for cathodic protection will be exposed to the weather. Since the sheet piling specified consists of A328 steel, it would be subject to severe corrosion. Additional provisions must be provided to protect the #6 rebars from the weather by their embedment in the concrete base slab and the steel sheet piling from corroding by either coal tar epoxy coating or changing to Mariner sheet piling.

e. Drawings S-3 and S-6, detail 1 - S-3/S-6, and drawing S-10, detail 3. The steel sheet piling connection details presented allowed a seepage path through the gaps. These details should be revised to eliminate the gaps.

f. Drawing S-10, section B, and details 2A and or 2B. The transition joint details between the concrete wall and the steel sheet pile wall will allow the walls to separate at the slip joint when deflected under hurricane loading. The concrete wall should be extended around the corner and the transition made in a straight wall section in lieu of in perpendicular walls.

Mel wrote ltr
Ing draws on Mels desk

g. No analysis was presented to verify the adequacy of the existing cutoff wall under the discharge culvert on the west end of the wall. The cutoff wall may not be adequate under the higher level of hurricane protection required. The analysis for this cutoff wall should be presented for our review.

h. Details of the seepage collar for the discharge pipe through the floodwall stem were not shown on the drawings.

i. The pile foundation layout presented was analyzed only for hurricane loading. The pile layout should also be analyzed under normal, non-hurricane conditions since reversal in pile reactions can occur. The analysis presented did not include the weight of soil backfill over the T-wall base, nor the lateral pressure exerted on the base slab by the retaining/cut-off sheet pile wall. The lateral water load should include the water pressure on the vertical face of the slab. The pile foundation re-analysis should be presented for our review.

j. Drawing S-2, slab "C". The batter piles on this monolith interfere with the foundation piles under the existing concrete platform.

k. No design computations nor details of the floodwall stem over the existing discharge culvert on the west end were presented. These computations and details, as well as details of the wall connection of the existing concrete floodwall should be presented for our review.

l. Pipe support saddles should be provided on both sides of the T-wall stem, on the same monolith slab to support the steel discharge pipes. The wall stem should not bear the weight of the pipes since cracking of the concrete can occur.

m. The design of the T-wall base slab reinforcement was based on soil pressures. Since these are pile supported structures, the T-walls should be designed for pile reactions into the base slab using factored loads.

n. The reinforced concrete floodwalls were designed with Grade 60 steel reinforcement using a yield strength of 60 ksi, a reinforcement ratio equal to 75% of the balanced ratio and factored loads as per the ACI code. The reinforced concrete floodwalls should be redesigned utilizing the following design parameters.

Dead loads x 1.5
Live loads x 1.9 (includes water pressures)
Grade 60 steel: fy = 48 ksi (use 60 ksi to determine development lengths)
Maximum steel ratio = 0.25 of balanced ratio.

LMNED-DD 4 May 83

SUBJECT: Appl by Sewerage and Water Board of New Orleans, to install and maintain a pile supported floodwall, discharge pipes and fill for hurricane protection, near Metairie, Louisiana, in Jefferson Parish

o. Three copies of the final P&S should be provided this office to assure that all the inclosed comments are satisfied. If there are any questions about these comments or if a meeting is desired, please contact Mr. Carl Guggenheimer, (x2645) or Mr. Jorge Romero, (x2647), of this office.

RJG
FWG

Incl
ic

FREDERICK M. CHATRY
Chief, Engineering Division

F: LMNED-FS

Ops Div 6 May 83 Lucas/2205 7

for comment and return. ~~Please forward a letter of no objection to the ... Board if the applicant's plans are acceptable.~~

for M. Martinez
Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations Division

LMNOD-OF
To C/Reg Funct Br. From C/Proj Ops Br. 10 May 83 Baldini/2356 CAT 8

1. Recommend that applicant be furnished Eng Div's CMT6, above for review and subsequent decision regarding para 2 prior to our writing a letter of no objection to the Jefferson Levee District for that portion of this proposal which affects the "old" Lake Pontchartrain, Louisiana project, (Item c) levee.

2. Please resubmit to Proj Ops Br upon receipt of the above information.

6 Incl
nc

Baldini
for Rixie J. Hardy
C/Proj Ops Br.

LMNOD-OF
SUBJECT: Appl by Sewerage & Water Board of New Orleans, to install and maintain a pile supported floodwall, discharge pipes and fill for hurricane protection, near Metairie, Louisiana, in Jefferson Parish

TO C/Reg Func Br FROM C/Proj Ops Br DATE 29 Nov 82 CMT 4
Mr. Baldini/adc/2356

Prior to our submitting a letter of no objection to the Jefferson Levee District, it will be necessary for the applicant to furnish the information required in para "a", CMT 2 above, for review & approval.

D. O. CLEMENT
Chief, Project Operations Branch

1 Incl
nc

TO C/Engr Div FROM C/Reg Func Br Ops Div DATE 12 Apr 83 CMT 5
Mrs. Lucas/rw/2285

Forwarded for comment and return.

for R. J. VENTOLA
Chief, Regulatory Functions Branch
Operations Division

1 Incl
Added 5
2. ltr with attachment (4Apr 83)
3. Geo Invest 1 Dec 82
4. computation sheets
5. Spec Apr 83
6. lg dwg (24 sheets)

DISPOSITION FORM

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

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNOD-SP (17th Street Canal)3	Appl by Sewerage & Water Board of New Orleans, to install and maintain a pile supported floodwall, discharge pipes and fill for hurricane protection, near Metairie, Louisiana, in Jefferson Parish

TO C/Engr Div

FROM C/Reg Func Br
Ops Div

DATE 21 Oct 82

Mrs. Lucas/mam/2285

CMT 1

Forwarded for comment and return.

1 Incl
Dwg (3 sheets)

for C. W. DECKER
Chief, Regulatory Functions Branch
Operations Division

LMNED-DD

TO C/Ops Div

FROM C/Engr Div

DATE 17 Nov 82

Messrs. Guizerix & Guggenheimer/cmr/2697/2645

CMT 2

The Engineering Division has no adverse comments regarding the subject permit request provided the following requirements are included in the final permit.

a. The plans and specifications along with the computations and design criteria relative to the soil mechanics for the work that would affect the existing Federal levees on the west bank of the canal should be submitted and reviewed prior to approval of the permit.

b. It should be recognized that the existing pumping station and levees along the canal are in the alinement of the Federally authorized Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection project. Under the authority of that project, hurricane protection will be provided at the 17th Street Canal, but the form and location of protection have not been defined. The applicant should be advised that construction done now can be credited as a local interests contribution only if the work meets hurricane protection project design criteria and is ultimately incorporated into the hurricane protection project. Furthermore, the applicant should be advised that the proposed floodwall appears to be deficient in grade to provide protection against the design hurricane, which calls for a maximum still water elevation in Lake Pontchartrain of 11.5 N.G.V.D.

1 Incl
nc

TO C/Reg Func Br

FROM C/Reg F

Ops Div

FREDERIC J. CHATRY
Chief, Engineering Division

DATE 22 Nov 82

CMT 3

Lucas/2285

Please forward a letter to the applicant

DECKER
Chief, Reg Func Br
Ops Div

DA FORM AUG 80 2496

PREVIOUS EDITIONS WILL BE USED

☆ U.S. G.P.O. 1980-665141/288

ENGINEERING DIVISION

Permit Review Sheet

SUBJECT: 17th St. Canal 3
Floodwall Pump Station 6, S&WB of NO, pile tests

LMN

_____ ED-A _____

FORWARDED FOR INFORMATION

SUSPENSE:*

_____ ED-S _____
_____ ED-SP _____
_____ ED-SR _____
_____ ED-SD _____

SUSPENSE:*

_____ ED-H _____
_____ ED-HD _____
_____ ED-HC _____
_____ ED-HH _____

SUSPENSE:*

1 ED-F _____
_____ ED-FG _____
_____ ED-FD _____
_____ ED-FS _____

SUSPENSE:*

_____ ED-D _____
_____ ED-DL _____
_____ ED-DW _____
_____ ED-DR _____
2 ED-DD _____
_____ ED-DG _____

*If suspense date cannot be met, furnish Secretary, Chief of Eng Div, the date it can be met.

Continue comments on separate sheet if necessary

LMN Form 744 5 Apr 83 **(Previous Edition Obsolete)**

DISPOSITION FORM

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

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNOD-SP(17TH ST. CANAL) 3	FLOODWALL PUMP STATION NO. 6, N.O. SEWERAGE AND WATER BOARD, PILE TESTS

TO C/EHGR

FROM C/REG FUHC. BR.

DATE 20 NOVEMBER 1984

DELHOM 2286

CMT 1

FORWARDED FOR YOUR INFORMATION, AS REQUESTED ON THE ATTACHED DISPOSITION FORM.

1 INCL (11 SHTS)

Ernest Delhom

RONALD J. VENTOLA
CHIEF
REG FUHC. BR.

DISPOSITION FORM

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

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMVDD-SP(17TH ST. CANAL) 3	FLOODWALL PUMP STATION NO. 6, N.O. SEWERAGE AND WATER BOARD, PILE TESTS

TO C/EHGR FROM C/REG FUHC. BR. DATE 20 NOVEMBER 1984 CMT 1

DELHOM 2286
GD

FORWARDED FOR YOUR INFORMATION, AS REQUESTED ON THE ATTACHED DISPOSITION FORM.

RONALD J. VENTOLA
CHIEF
REG FUHC. BR.

DA FORM 2496 PREVIOUS EDITIONS WILL BE USED ☆ U.S. Government Printing Office: 1983—406-866

BURK AND ASSOCIATES, INC.
ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS
4176 CANAL STREET
NEW ORLEANS, LOUISIANA 70119-5994
(504) 486-5901
P. O. BOX 19087 - NEW ORLEANS, LA. 70179

November 13, 1984

Mr. Ronald Ventola, Chief
Regulatory Functions
Operations Division
New Orleans District
Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160

RE: Floodwall Pump Station No. 6
LMNED-DD
B&A Job No. 8133

Dear Mr. Ventola:

As required by the conditions of the COE permit, I am submitting the pile tests for construction of the floodwall at Drainage Pumping Station No. 6 on behalf of the Sewerage and Water Board of New Orleans.

The COE memo of July 11, 1983, stated the following requirements:

MONOLITH	DESIGN LOAD COMP.	DESIGN LOAD TENSION	REQUIRED ULTIMATE LOAD COMP.	REQUIRED ULTIMATE LOAD TENSION	MIN. SAFETY FACTOR COMP.	MIN. SAFETY FACTOR TENSION
A	15 Tons	10.2 Tons	30 Tons	20.5 Tons	2.0	2.0
B	15 Tons	10.2 Tons	30 Tons	20.5 Tons	2.0	2.0
C	20 Tons	14.0 Tons	30 Tons	24.5 Tons	1.5	1.75

Test pile nos. 2 and 4 were loaded as indicated herein. Test pile reports state the following:

PILE	TEST	YIELD POINT OR ULTIMATE LOAD	PILE TIP
TP-2	Comp.	30.0 Tons	-16.75 C.D.
TP-4	Comp.	35.0 Tons	-16.75 C.D.
TP-2	Tension	28.5 Tons	-16.75 C.D.

Locations are shown on the enclosed drawings.

To reach a tip elevation of -16.75, the pile lengths were increased from 35 feet to 40 feet. The enclosed letter to the contractor, Atlas Construction Co., details the pile requirements.

If you require any further information or if I can be of further assistance, please call.

Sincerely,

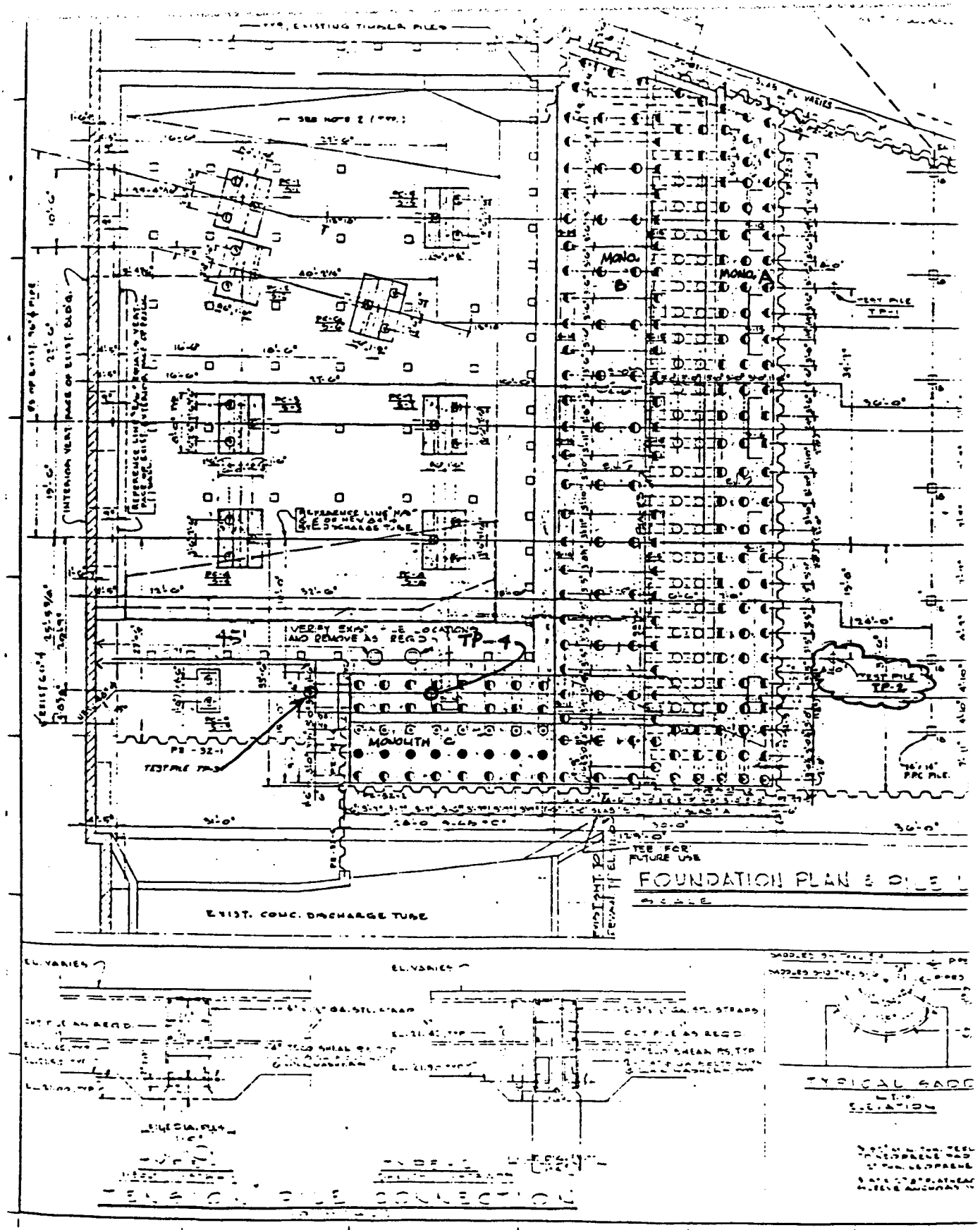
BURK AND ASSOCIATES, INC.
Engineers, Planners and
Environmental Scientists

Deborah Ducote Keller

Deborah Ducote Keller, P.E.
Project Engineer

DDK/ptb
Enclosures

cc: Mr. G. Joseph Sullivan, S&WBNO
Mr. G. Romero, COE


EXIST. CONC. DISCHARGE TUBE
FOUNDATION PLAN & PILE
TYPICAL SADDLE
ELEVATION

BURK AND ASSOCIATES, INC.
ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS
4176 CANAL STREET
NEW ORLEANS, LOUISIANA 70119-5994
(504) 486-5901
P. O. BOX 19087 - NEW ORLEANS, LA. 70179

October 30, 1984

Atlas Construction Co., Inc.
P. O. Box 10
Kenner, Louisiana 70064

RE: Floodwall at Pumping Station
No. 6 - Phase I
Contract No. 5103
B&A Job No. 8133

Gentlemen:

Based on our review of pile test data with Eustis Engineering Company, we have concluded the following:

1. The base length of 35 feet for treated timber piles shall be increased to 40 feet.

2. Prior to placing each pile, prudently pre-jet to elevation (-) 13.0, using a water jet with only a bottom discharge point.

3. Place the pile in the pre-jetted hole and drive this piling with the specified Vulcan No. 1 hammer to elevation (-)18.0(±), or to refusal (30 blows per foot). Additional jetting will be allowed only if approved by the engineer. The Vulcan No. 1 Hammer should be operating efficiently with a 3 foot stroke at approximately 50 to 55 blows per minute.

Please price the additional cost for the two additional compression pile tests, and additional Class B pile lengths based on the price quoted in your proposal to establish the cost of a change order.

Your cooperation is appreciated.

Yours very truly,

BURK AND ASSOCIATES, INC.
Engineers, Planners and
Environmental Scientists

Gasper A. Chifici
Chief Field Engineer

GAC/JJN:lb

cc: Mr. G. J. Sullivan

PUMPING STATION NO. 6
FLOODWALL CONSTRUCTION
PHASE I -- CONTRACT NO: 5103
NEW ORLEANS, LOUISIANA
COMPRESSION TEST PILE PROGRAM

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70179 • PHONE (504) 486-5595

REPORT NO. 2 October 15, 1984 DNO-7153

DESCRIPTION	:	FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6 FLOODWALL CONSTRUCTION PHASE I -- CONTRACT NO: 5103 NEW ORLEANS, LOUISIANA
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
REPORTED TO	:	SEWERAGE AND WATER BOARD OF NEW ORLEANS ROOM 5W02, CITY HALL CIVIC CENTER NEW ORLEANS, LA 70165 ATTN: MR. G. JOSEPH SULLIVAN

MATERIAL:

Three S.Y.P. ASTM D-25 Untreated Round Timber Piles, were originally driven on September 13, 1984 at the above referred to project. Test pile No. 2 was further driven to -16.75' elevation on September 27, 1984 as directed by Burk and Associates. Log of driving, attached hereto, reflects pile dimensions, penetration driven and blows per foot for test piles.

Test pile No. 2 was selected by the consulting engineer to be tested on October 9, 1984.

EQUIPMENT:

Pile was further driven using a conventional crane rig with swinging leads attached and a Vulcan No. 1 hammer air activated and at full stroke to produce 15,000 foot pounds of energy per blow.

Test was conducted using a single calibrated hydraulic jack bearing against a steel cross beam anchored to four wood reaction piles.

Settlement measurements were made using a Surveyor's Level, a scale fixed to the test pile proper and two referenced bench marks. Scales were read to the nearest 1/100 inch.

RESULTS OF TEST:

TEST PILE NO. 2

FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for T.P. 2:

A.) Three and three quarters (3.75) ton increments to thirty (30.0) tons.
B.) Maintain forty-eight (48.0) hold at thirty (30.0) tons, final twenty-four (24.0) hour free of movement.
C.) Seven and one-half (7.5) ton decrements to zero (0.0) tons.

Each increment and decrement was held for one hour free of movement before applying the next increment.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
0:00	0.0	0.00	8:30AM, 10-9-84
0:00	3.75	0.04	1st increment
0:15	"	"	
0:30	"	"	
0:45	"	"	
1:00	3.75	0.04	
1:00	7.50	0.08	2nd increment
1:15	"	"	
1:30	"	"	
1:45	"	"	
2:00	7.50	0.08	
2:00	11.25	0.15	3rd increment
2:15	"	"	
2:30	"	"	
2:45	"	"	
3:00	11.25	0.15	

FOUNDATION PILE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
3:00	15.0	0.22	4th increment
3:15	"	"	
3:30	"	"	
3:45			
4:00	15.0	0.22	
4:00	18.75	0.29	5th increment
4:15	"	"	
4:30	"	"	
4:45			
5:00	18.75	0.29	
5:00	22.50	0.36	6th increment
5:15	"	"	
5:30	"	"	
5:45			
6:00	22.50	0.36	
6:00	26.25	0.43	7th increment
6:15	"	"	
6:30	"	"	
6:45			
7:00	26.25	0.43	
7:00	30.00	0.49	8th increment
7:15	"	"	Start 48 hour
7:30	"	"	hold
7:45			
8:00	30.00	0.49	
9:30	30.00	0.50	Movement
16:31	30.00	0.50	12:01AM -- 10-10-84
21:30	30.00	0.51	Movement
26:00	30.00	0.52	Movement
26:30	30.00	0.53	Movement
	START FINAL 24.0 HOUR HOLD - NO MOVEMENT		
32:00	30.00	0.53	Final 24.0 hour hold
41:31	30.00	0.53	12:01AM -- 10-11-84
56:00	30.00	0.53	End hold period

FOUNDATION PILE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
	REBOUND UPON COMPLETION OF HOLD PERIOD		
56:00	22.50	0.51	1st decrement
56:30	"	"	
57:00	22.50	0.51	
57:00	15.00	0.43	2nd decrement
57:30	"	"	
58:00	15.00	0.43	
58:00	7.50	0.31	3rd decrement
58:30	"	"	
59:00	7.50	0.31	
59:00	0.00	0.11	4th decrement
59:30	"	"	
60:00	0.00	0.11	FINAL READING

The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure.

The above test results are to be interpreted by the Burk and Associates, consulting engineer for project.

Field Book No. 106
Supervisor: 6.0 hours

Respectfully submitted,

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyer

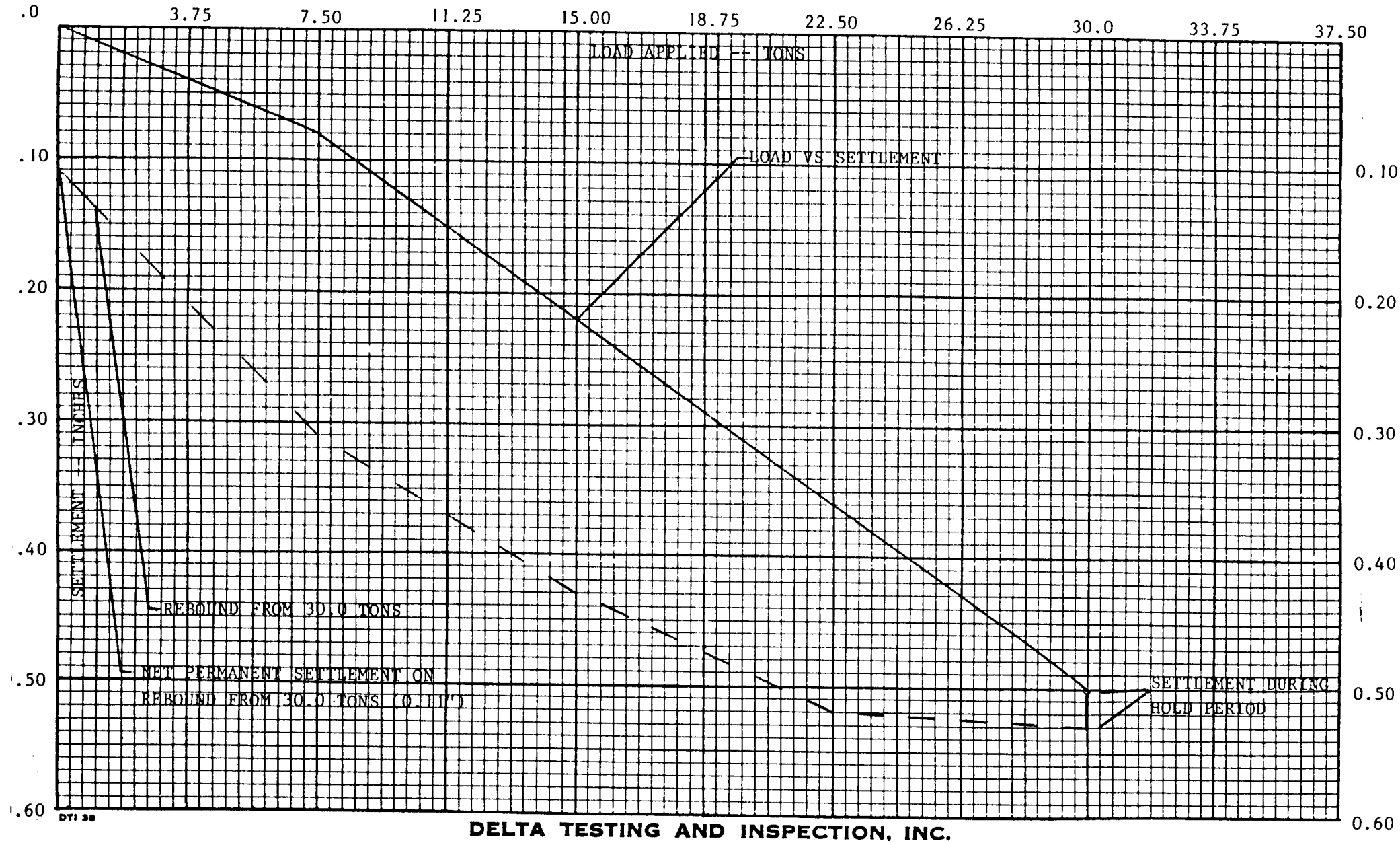
DONALD F. MEYER
President

DJI/DFM/jb
10-16-84
Attachments
1-Sewerage & Water Board of N.O.
1-Burk and Associates, Inc.
1-Atlas Construction Co., Inc.

DESCRIPTION : FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P.
ASTM D-25 UNTREATED ROUND TIMBER X 16.75'
TIP ELEVATION

PROJECT : PUMPING STATION NO. 6
CONSULTING ENGINEER : BURK AND ASSOCIATES
GENERAL CONTRACTOR : ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR : ATLAS CONSTRUCTION CO., INC.

DNO-7153
TEST PILE NO. 2
-16.75' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-27-84
DATE TEST PILE LOADED: 10-09-84



DTI 38

DELTA TESTING AND INSPECTION, INC.

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND [redacted] INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

TEST PILE REPORT NO. 2

DTI 34

PILE DRIVING RECORD

DATE: 9-27-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	----------	Burk & Assc.	DNO-7153

NUMBER OF BLOWS

TIP ELEVATION PENETRATION IN FEET	PILE NO.	TP1	TP2	TP3
	TIP. IN.	9.20"	9.60"	8.25"
	BUTT. IN.	14.3"	15.0"	14.25"
	LENGTH FT.	50'	50'	50'
+21-+15		WOH	WOH	WOH
+14				
3				
2				
1				
+10				10
9				2
8				2
7				3
6				4
+5			2	4
4			2	4
3		1		3
2				4
1		1		4
0				5
-1				12
2		7	8	23
3		6	8	17
4		5	8	13
-5		4	9	22
6		5	6	17
7		4	6	30
8		5	7	30@7"
9		6	6	
-10		11	13	
1		12	20	
2		17	16	
3		16	12	
* 4		17@7"	20@7"	
* -15		25	22	
*-16			50	
*-17			41@9"	

Piles were driven with Delmag D-8 to this elevation

Piles were then driven to this elevation with Vulcan No. 1

ALL PILES LOGGED FROM ELEVATION OF +23.00

SUPERVISOR: G. Mansour 1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 ft. lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: --

INSPECTOR: Chris Schroeder

WORK TIME 1:00 am/pm 3:00 am/pm

TRAVEL TIME: N/A

MILEAGE: N/A

SUBSISTENCE: N/A

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70179 • PHONE (504) 486-5595

REPORT NO. 3 October 15, 1984 DNO-7153

DESCRIPTION	:	FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6 FLOODWALL CONSTRUCTION PHASE I -- CONTRACT NO: 5103 NEW ORLEANS, LOUISIANA
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
REPORTED TO	:	SEWERAGE AND WATER BOARD OF NEW ORLEANS ROOM 5W02, CITY HALL CIVIC CENTER NEW ORLEANS, LA 70165 ATTN: MR. G. JOSEPH SULLIVAN

MATERIAL:

Three S.Y.P. ASTM D-25 Untreated Round Timber Piles, were originally driven on September 13, 1984 at the above referred to project. Test pile No. 4 was driven on September 28, 1984. Test pile No. 4 was originally a pile that was used as a reaction pile for test pile No. 1 and was extracted by jetting and then driven as T.P. 4. Log of driving, attached hereto, reflects pile dimensions, penetration driven and blows per foot for test pile.

Test pile No. 4 was selected by the consulting engineer to be tested on October 9, 1984.

EQUIPMENT:

Pile was driven using a conventional crane rig with swinging leads attached and a Vulcan No. 1 hammer air activated and at full stroke to produce 15,000 foot pounds of energy per blow.

Test was conducted using a single calibrated hydraulic jack bearing against a steel cross beam anchored to four wood reaction piles.

Settlement measurements were made using a Surveyor's Level, a scale fixed to the test piles proper and two referenced bench marks. Scales were read to the nearest 1/100 inch.

RESULTS OF TEST:

TEST PILE NO. 4

LOAD TO FAILURE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for T.P. 4:

A.) Five (5.0) ton increments to forty (40.0) tons.
B.) Maintain forty-eight (48.0) hold at forty (40.0) tons, final twenty-four (24.0) hour free of movement.
C.) Ten (10.0) ton decrements to zero (0.0) tons.

Each increment and decrement was held for one hour free of movement before applying the next increment.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
0:00	0.0	0.00	9:00AM, 10-9-84
0:00	5.0	0.03	1st increment
0:15	"	"	
0:30	"	"	
0:45	"	"	
1:00	5.0	0.03	
1:00	10.0	0.06	2nd increment
1:15	"	"	
1:30	"	"	
1:45	"	"	
2:00	10.0	0.06	
2:00	15.0	0.10	3rd increment
2:15	"	"	
2:30	"	"	
2:45	"	"	
3:00	15.0	0.10	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
3:00	20.0	0.16	4th increment
3:15	"	"	
3:30	20.0	0.17	Movement
3:45	"	"	
4:00	"	"	
4:15	"	"	
4:30	20.0	0.17	
4:30	25.0	0.25	5th increment
4:45	"	"	
5:00	"	"	
5:15	"	"	
5:30	25.0	0.25	
5:30	30.0	0.34	6th increment
5:45	"	"	
6:00	"	"	
6:15	"	"	
6:30	30.0	0.34	
6:30	35.0	0.46	7th increment
6:45	35.0	0.49	Movement
7:00	"	"	
7:15	"	"	
7:30	"	"	
7:45	35.0	0.49	
7:45	40.0	0.60	8th increment
8:00	40.0	0.66	Movement
8:15	40.0	0.73	Movement
8:30	40.0	1.01	Failure
	TEST DISCONTINUED -- PILE UNABLE TO SUSTAIN LOAD		
8:30	0.0	0.53	Rebound
8:45	"	"	
9:00	"	"	
9:15	"	"	
9:30	0.0	0.53	FINAL READING

The above test was to be conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure.

LOAD TO FAILURE -- (CONTINUED)

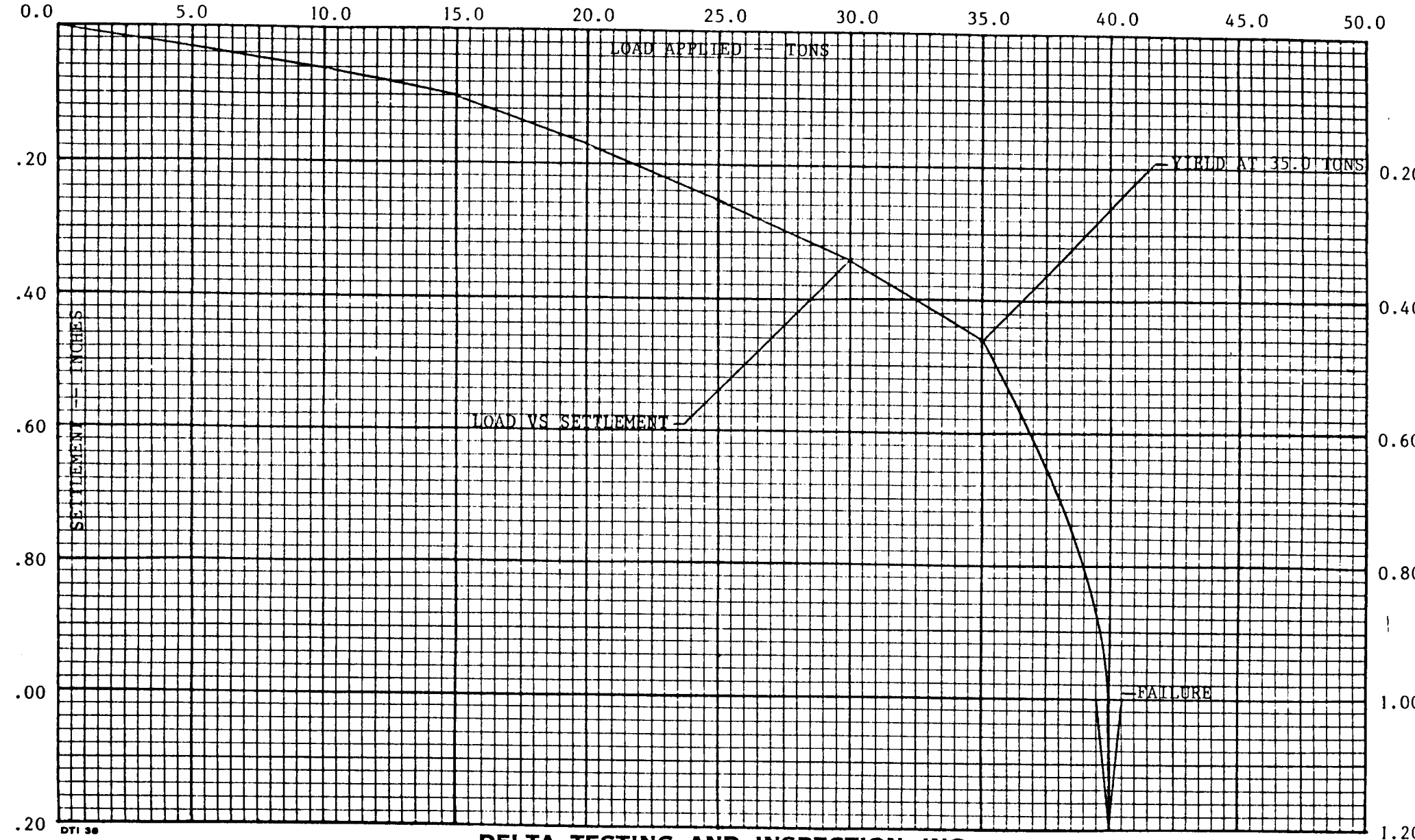
Field Book No. 107
Supervisor: 4.0 hours

Burk and Associates called our office on October 11, 1984 and directed us to go out on Friday, October 12, 1984 and push the pile down until the pile would sustain forty (40.0) tons. Once forty tons is established and sustained to hold forty tons in accordance with the original Load Procedure.

(CONTINUED)

DESCRIPTION	:	LOAD TO FAILURE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVINE CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.

DNO-7153
TEST PILE NO. 4
-15.5' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-28-84
DATE TEST PILE LOADED: 10-09-84



DTI 30

DELTA TESTING AND INSPECTION, INC.

RETEST PILE NO. 4

FOUNDATION PILE -- COMPRESSION LOAD TEST ON S.Y.P. ASTM D-25
UNTREATED TIMBER PILE X 15.5' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for the retest of T.P. 4:

A.) Apply forty (40.0) tons to pile in one continuous increment until 40.0 tons is sustained or 1.5' of settlement occurs, should the pile fail.
B.) Maintain forty-eight (48.0) hold at forty (40.0) tons, with no movement in the final twenty-four (24.0) hour hold.
C.) Ten (10.0) ton decrements to zero (0.0) tons.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
0:00	0.0	0.00	9AM, 10-12-84
0:00	28.5	0.34	Intermittent Reading
0:40	40.0	0.55	1st increment
0:45	"	0.60	Movement
	START 48.0 HOUR HOLD PERIOD AT 9:45AM 10-12-84		
1:00	40.0	0.63	Movement
1:15	"	0.66	"
1:30	"	0.66	"
1:45	"	0.67	"
2:00	40.0	0.68	"
2:45	"	0.69	"
3:45	"	0.70	"
4:30	40.0	0.71	"
7:45	40.0	0.72	Movement
9:30	40.0	0.73	" 6:30PM
11:30	40.0	0.74	Movement
14:30	40.0	0.75	"
15:01	40.0	0.75	12:01AM, 10-13-84

The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method I, Forty-eight (48.0) hour hold procedure, as modified by the Burk and Associates, as noted above.

The above test results to be interpreted by the consulting engineer, Burk and Associates.

Field Book No. 101
Supervisor: 4.0 hours

Respectfully submitted,

DELTA TESTING AND INSPECTION, INC.

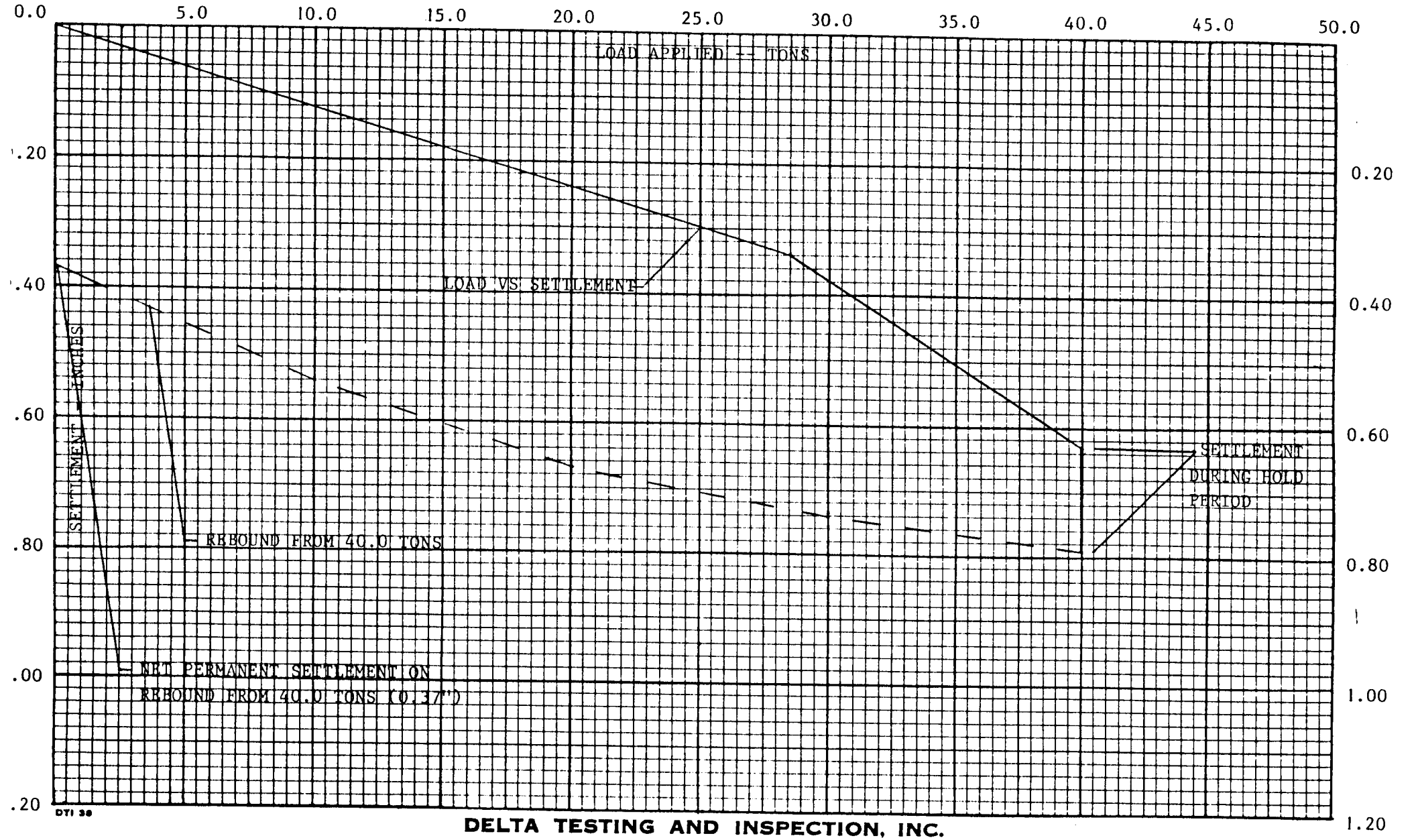
DONALD F. MEYER
President

DJI/DFM/jb
10-17-84
Attachments
1-Sewerage & Water Board of N.O.
1-Burk and Associates, Inc.
1-Atlas Construction Co., Inc.

FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P.
ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5'
TIP ELEVATION

PROJECT : PUMPING STATION NO. 6
CONSULTING ENGINEER : BURK AND ASSOCIATES
GENERAL CONTRACTOR : ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR : ATLAS CONSTRUCTION CO., INC.

DNO-7153
TEST PILE NO. 4
-15.5' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-28-84
DATE TEST PILE RELOADED: 10-12-8



DTI 38

DELTA TESTING AND INSPECTION, INC.

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

TEST PILE
REPORT NO. 3

SHEET 1 OF 1

DTI 34

PILE DRIVING RECORD

DATE: 9-28-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	----------	Burk & Assc.	DNO-7153

PILE NO.	TP4	NUMBER OF BLOWS
TIP. IN.	8.00"	
BUTT. IN.	13.80"	
LENGTH FT.	50'	
+21-+15		
+14		
3		
2		
1		
+10		
9		
8		
7		
6		
+5	24	← Foot markings did not start until this elevation.
4	6	These 24 blows account for 19 feet of timber.
3	5	
2	5	
1	6	
0	7	← Pile was driven to this point without jetting.
-1	30	Jetting procedure was used from this elevation
2	60	down to elevation of -12.00
3	41	
4	6	
-5	4	
6	16	
7	6	
8	11	
9	10	
-10	13	
1	12	
2	10	
3	19	← Driving was resumed without jetting.
4	18	
-15	15	
	40@6"	← Driving was stopped at the direction of Mr. Nielsen
		ALL PILES WERE LOGGED FROM AN ELEVATION OF 23.00

TIP ELEVATION PENETRATION IN FEET

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: —

INSPECTOR: Chris Schroeder

WORK TIME 7:30 (am)/pm 9:00 am/(pm)

TRAVEL TIME: N/A

MILEAGE: N/A

SUBSISTENCE: N/A

PUMPING STATION NO. 6
FLOODWALL CONSTRUCTION
PHASE I -- CONTRACT NO: 5103
NEW ORLEANS, LOUISIANA
TENSION TEST PILE PROGRAM

1855 MASON AVENUE, BATON ROUGE, LA.

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70179 • PHONE (504) 486-5595

REPORT NO. 5 October 29, 1984 DNO-7153

DESCRIPTION	:	FOUNDATION PILE -- TENSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6 FLOODWALL CONSTRUCTION PHASE I -- CONTRACT NO: 5103 NEW ORLEANS, LOUISIANA
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
REPORTED TO	:	SEWERAGE AND WATER BOARD OF NEW ORLEANS ROOM 5W02, CITY HALL CIVIC CENTER NEW ORLEANS, LA 70165 ATTN: MR. G. JOSEPH SULLIVAN

MATERIAL:

Three S.Y.P. ASTM D-25 Untreated Round Timber Piles, were originally driven on September 13, 1984 at the above referred to project. Test pile No. 2 was further driven to -16.75' elevation on September 27, 1984 as directed by Burk and Associates. Log of driving, attached hereto, reflects pile dimensions, penetration driven and blows per foot for test piles.

Test pile No. 2 was selected by the consulting engineer to be tension tested on October 23, 1984, which has already been tested in compression on October 9, 1984.

EQUIPMENT:

Pile was further driven using a conventional crane rig with swinging leads attached and a Vulcan No. 1 hammer air activated and at full stroke to produce 15,000 foot pounds of energy per blow.

Test was conducted using a single calibrated hydraulic jack bearing against a steel cross beam anchored to four wood reaction piles.

Uplift measurements were made using a Surveyor's Level, a scale fixed to the test piles proper and two referenced bench marks. Scales were read to the nearest 1/100 inch.

RESULTS OF TEST:

TEST PILE NO. 2

FOUNDATION PILE -- TENSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for T.P. 2:

A.) One (1.0) increment to two and one-half (2.5) tons.
B.) Two (2.0) ton increments to twenty and one-half (20.5) tons.
C.) Maintain forty-eight (48.0) hold at twenty and one-half (20.5) tons with no movement in the final twenty-four (24.0) hours.
D.) Five (5.0) ton decrements to zero (0.0) tons.
E.) One (1.0) increment to two and one-half (2.5) tons.
F.) Two (2.0) ton increments to eighteen and one-half (18.5) tons.
G.) Two (2.0) ton increments to Failure.

Each increment and decrement in A, B, D and G was held one (1.0) hour free of movement.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
0:00	0.0	0.00	11AM, 10-23-84
0:00	2.50	0.00	1st increment
0:15	"	"	
0:30	"	"	
0:45	"	"	
1:00	2.50	0.00	
1:00	4.50	0.00	2nd increment
1:15	"	"	
1:30	"	"	
1:45	"	"	
2:00	4.50	0.00	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
2:00	6.50	0.05	3rd increment
2:15	"	"	
2:30	"	"	
2:45	"	"	
3:00	6.50	0.05	
3:00	8.50	0.09	4th increment
3:15	"	"	
3:30	"	"	
3:45	"	"	
4:00	8.50	0.09	
4:00	10.50	0.12	5th increment
4:15	"	"	
4:30	"	"	
4:45	"	"	
5:00	10.50	0.12	
5:00	12.50	0.16	6th increment
5:15	"	"	
5:30	"	"	
5:45	"	"	
6:00	12.50	0.16	
6:00	14.50	0.20	7th increment
6:15	"	"	
6:30	"	"	
6:45	"	"	
7:00	14.50	0.20	
7:00	16.50	0.23	8th increment
7:15	"	"	
7:30	"	"	
7:45	"	"	
8:00	16.50	0.23	
8:00	18.50	0.27	9th increment
8:15	"	"	
8:30	"	"	
8:45	"	"	
9:00	18.50	0.27	
9:00	20.50	0.30	10th increment
9:15	"	"	Start 48.0 hour hold 8PM, 10-23-84
9:30	"	"	
9:45	"	"	
10:00	20.50	0.30	

LOAD TO FAILURE -- (CONTINUED)

NOTE: The hydraulic ram became fully extended at this point. Contractor was called out to jobsite. Contractor placed shoring between the reaction beam and bearing block to support the load at 20.5 tons, while the piston was withdrawn into the ram and steel shims added to fill the void. The ram was loaded back to 20.5 tons and the shoring removed. The pile uplift reading showed no change after this procedure was accomplished. Forty-eight (48.0) hour hold period was restarted at this point.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
	RESTART 48.0 HOUR HOLD		
11:30	20.50	0.30	11:30PM, 10-23-84
12:01	20.50	0.30	12:01AM, 10-24-84
35:30	20.50	0.30	End 1st 24.0 hour hold
	START FINAL 24.0 HOUR HOLD FREE OF MOVEMENT		
35:30	20.50	0.30	11:30PM, 10-24-84
36:01	20.50	0.30	12:01AM, 10-25-84
59:30	20.50	0.30	End final 24.0 hours No Movement
	REBOUND FROM HOLD PERIOD		
59:30	15.00	0.29	1st decrement
59:45	"	"	
60:00	"	"	
60:15	"	"	
60:30	15.00	0.29	
60:30	10.00	0.27	2nd decrement
60:45	"	"	
61:00	"	"	
61:15	"	"	
61:30	10.00	0.27	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
61:30	5.00	0.20	3rd decrement
61:45	"	"	
62:00	"	"	
62:15	"	"	
62:30	5.00	0.20	
62:30	0.00	0.05	4th decrement
62:45	"	"	
63:00	"	"	
63:15	"	"	
63:30	0.00	0.05	
	RELOAD TO FAILURE PROCEDURE		
63:30	2.50	0.08	1st increment
63:40	"	"	
63:50	2.50	0.08	
63:50	4.50	0.11	2nd increment
64:00	"	"	
64:10	4.50	0.11	
64:10	6.50	0.15	3rd increment
64:20	"	"	
64:30	6.50	0.15	
64:30	8.50	0.18	4th increment
64:40	"	"	
64:50	8.50	0.18	
64:50	10.50	0.20	5th increment
65:00	"	"	
65:10	10.50	0.20	
65:10	12.50	0.23	6th increment
65:20	"	"	
65:30	12.50	0.23	
65:30	14.50	0.26	7th increment
65:40	"	"	
65:50	14.50	0.26	
65:50	16.50	0.28	8th increment
66:00	"	"	
66:10	16.50	0.28	
66:10	18.50	0.30	9th increment
66:20	"	"	
66:30	18.50	0.30	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
66:30	20.50	0.32	10th increment Start each increment 1.0 hour free of movement
66:45	"	"	
67:00	"	"	
67:15	"	"	
67:30	20.50	0.32	
67:30	22.50	0.34	11th increment
67:45	"	"	
68:00	"	"	
68:15	"	"	
68:30	22.50	0.34	
68:30	24.50	0.36	12th increment
68:45	"	"	
69:00	"	"	
69:15	"	"	
69:30	24.50	0.36	
69:30	26.50	0.39	13th increment
69:45	"	"	
70:00	"	"	
70:15	"	"	
70:30	26.50	0.39	
70:30	28.50	0.43	14th increment
70:45	"	"	
71:00	"	"	
71:15	"	"	
71:30	28.50	0.43	

Test discontinued, maximum ram extension - Consulting engineer directed us to stop test and rebound.

REBOUND -- UPON COMPLETION OF LOAD TO FAILURE PROCEDURE

71:30	22.50	0.42	1st decrement
71:40	"	"	
71:50	22.50	0.42	
71:50	14.50	0.39	2nd decrement
72:00	"	"	
72:10	14.50	0.39	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
72:10	8.50	0.30	3rd decrement
72:20	"	"	
72:30	8.50	0.30	
72:30	0.00	0.10	4th decrement
72:45	"	"	
73:00	"	"	
73:15	"	"	
73:30	0.00	0.10	FINAL READING

The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure and ASTM D-3689.

The above test results are to be interpreted by the Burk and Associates, consulting engineer for project.

Field Book No. 108
Supervisor: 6.0 hours

Respectfully submitted,

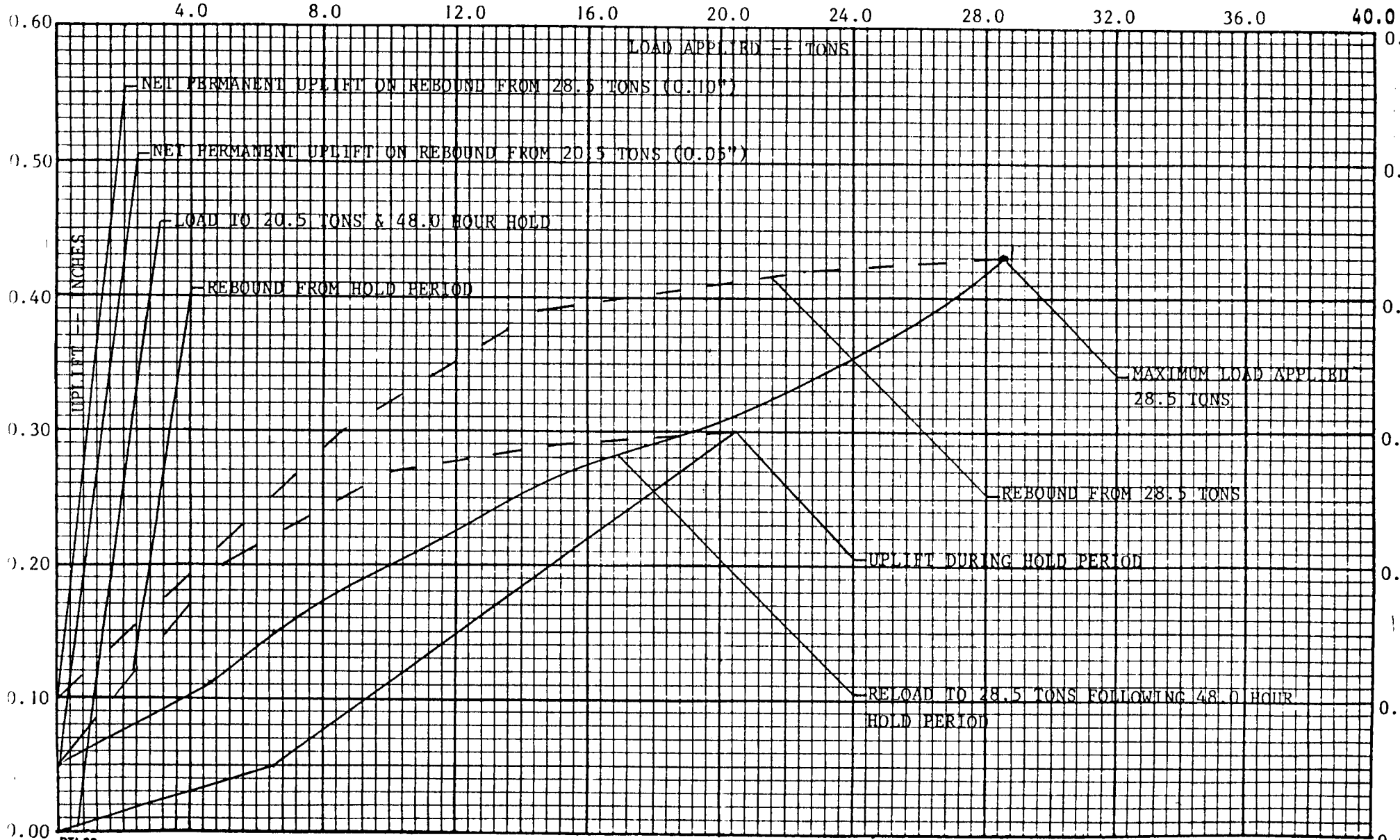
DELTA TESTING AND INSPECTION, INC.

Donald F. Meyn

DONALD F. MEYN
President

DJI/DFM/jb
10-30-84
Attachments
1-Sewerage & Water Board of N.O.
2-Burk and Associates, Inc.
1-Atlas Construction Co., Inc.

DESCRIPTION	: FOUNDATION PILE -- TENSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER X -16.75' TIP ELEVATION	DNO-7153 REPORT NO. 5 TEST PILE NO. 2 -16.75' TIP ELEVATION
PROJECT	: PUMPING STATION NO. 6	DATE TEST PILE DRIVEN: 9-27-84
CONSULTING ENGINEER	: BURK AND ASSOCIATES	DATE TEST PILE LOADED: 10-23-84
GENERAL CONTRACTOR	: ATLAS CONSTRUCTION CO., INC.	
PILE DRIVING CONTRACTOR	: ATLAS CONSTRUCTION CO., INC.	



DTI 30

DELTA TESTING AND INSPECTION, INC.

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND [redacted] INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

TEST PILE
REPORT NO. 2

DTI 34

PILE DRIVING RECORD

DATE: 9-27-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	----------	Burk & Assc.	DNO-7153

TIP ELEVATION PENETRATION IN FEET	NUMBER OF BLOWS			
PILE NO.	TP1	TP2	TP3	
TIP. IN.	9.20"	9.60"	8.25"	
BUTT. IN.	14.3"	15.0"	14.25"	
LENGTH FT.	50'	50'	50'	
+21-+15	WOH	WOH	WOH	
+14				
3				
2				
1				
+10			10	
9			2	
8			2	
7			3	
6			4	
+5		2	4	
4		2	4	
3	1		3	
2			4	
1			4	
0			5	
-1			12	
2	7	8	23	
3	6	8	17	
4	5	8	13	
-5	4	9	22	
6	5	6	17	
7	4	6	30	
8	5	7	30@7"	
9	6	6		
-10	11	13		
1	12	20		
2	17	16		Piles were driven with Delmag D-8 to
3	16	12		← this elevation
* 4	17@7"	20@7"		← Piles were then driven to this elevation
* -15	25	22		with Vulcan No. 1
*-16		50		
*-17		41@9"		
	ALL PILES LOGGED FROM ELEVATION OF +23.00			
			SUPERVISOR: G. Mansour	1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 ft. lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: _____

INSPECTOR: Chris Schroeder
WORK TIME 1:00 am/pm 3:00 am/pm
TRAVEL TIME: N/A
MILEAGE: N/A
SUBSISTENCE: N/A

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TEST PILE
REPORT NO. 2

DTI 34

PILE DRIVING RECORD

DATE: 9-27-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	----------	Burk & Assc.	DNO-7153

TIP ELEVATION PENETRATION IN FEET	NUMBER OF BLOWS
PILE NO.	Reaction Pile
TIP. IN.	Not known
BUTT. IN.	" "
LENGTH FT.	50'
+21-+15	
+14	
3	
2	
1	
+10	
9	
8	
7	
6	
+5	
4	
3	
2	
1	
0	
-1	
2	
3	
4	16@5"
-5	108
6	117
7	
8	
9	
-10	
1	
2	
3	
4	
-15	

Pile logged from this point, pile is southeast reaction pile for L.P.1

These blow counts were at the direction of Mr. Louis Napolitano of Eustis Engineering

SUPERVISOR: G. Mansour 1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.:

INSPECTOR: Chris Schroeder
WORK TIME 1:00 am/pm 3:00 am/pm
TRAVEL TIME: N/A
MILEAGE: N/A
SUBSISTENCE: N/A