

**GORE ENGINEERING, INC.**  
**SOIL AND FOUNDATION INVESTIGATIONS**

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REG. C.E.

BORINGS  
ANALYSES

TESTING  
REPORTS

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10 February 1994

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Port of Port Arthur  
c/o Lanier & Associates Consulting Engineers, Inc.  
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New Orleans, Louisiana 70115

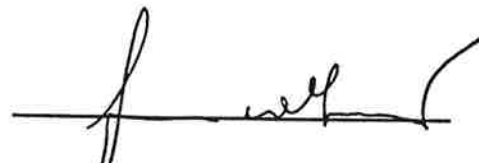
Subsoil Investigation  
Wharf Expansion  
Sabine-Neches Ship Channel  
Port Arthur, Texas

Gentlemen:

Herein is our report on the results of a subsoil foundation investigation  
made for the subject project.

Yours very truly,

GORE ENGINEERING, INC.



Lawrence W. Gilbert

LWG:laq

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**SUBSOIL INVESTIGATION  
WHARF EXPANSION  
SABINE-NECHES SHIP CHANNEL  
PORT ARTHUR, TEXAS**

**INTRODUCTION**

1. This report contains the results of a subsoil foundation investigation made at the subject site. Instructions to proceed with the investigation were received from Lanier and Associates Consulting Engineers, Inc., Consulting Engineers for the project. The study was made for the Port of Port Arthur, Port Arthur, Texas.

2. The study included the drilling of soil test borings to determine subsurface conditions and stratification and the performance of soil mechanics laboratory tests on samples obtained from the borings to evaluate their physical characteristics. Engineering analyses were made, based on the borings and test data to develop criteria to be used in foundation design.

**SOIL BORINGS AND SUBSOIL CONDITIONS**

**Field Exploration**

3. A total of twenty-three (23) soil test borings were made at the proposed site. Thirteen (13) undisturbed sample type soil test borings (B-1 thru B-6, B-10 thru B-14 and B-26 and B-27) were drilled to depths of 30 to 120 ft. on October 5-14, 1993. The borings were made with a truck mounted drill rig at designated locations approximately as

shown in a plan on Figure 1. Undisturbed sampling was performed continuously in all cohesive or semi-cohesive materials with a three inch diameter thin wall tube sampler. Representative samples were cut from the cores and placed in moisture proof containers for preservation until laboratory testing could be performed.

4. When cohesionless material was encountered, which could not be sampled by undisturbed methods, the Standard Penetration test was performed. This test consists of driving a two inch diameter splitspoon sample 1 ft. (after first seating it 6 inches) with a 140 lb. hammer falling 30 inches. The number of blows required to drive the sampler gives an indication of the density of the material.

5. Also, ten (10) shallow borings (B-7 thru B-9 and B-15 thru B-21) were made to the 10 ft. depth on October 14-15, 1993 at locations approximately as shown in a plan on Figure 1. These borings were made to determine the uniformity of near surface soils. Undisturbed samples were taken of representative materials and placed in moisture proof containers for preservation until further laboratory visual classification and testing could be made.

6. In addition to the above, four (4) borings (B-22 thru B-25) were drilled underwater by others from the mudbottom at locations as shown in plan on Figure 1. These borings were made in conjunction with an environmental study of the area by Lanier and

Associates. In addition, representative samples from the geotechnical borings were furnished to others for purpose of the environmental study.

7. Subsoil profiles developed from the deeper borings showing the general stratification and character of the soils are given on Figures 1 and 2. Logs of all the individual borings showing the detailed stratification and sample depths are given on Figures 3 thru 18.

#### Subsoil Description

8. Borings B-1 thru B-6 Reference to the subsoil profile "A" and logs of borings B-1 thru B-6 shows that beginning at the ground surface in all borings there is loose tan fine sand with shell, sand and shell, or clay with sand and shell (fill) to the 1 to 2 ft. depth. Below this depth, medium stiff to stiff dark gray, gray, black or gray and tan clay with silt or sand was encountered to the 4 to 7½ ft. depth. However, a layer of stiff greenish gray clay and reddish tan clay was encountered between the 1½ to 4 ft. depth in boring B-5. Beginning at the 4 to 7½ ft. depth in all borings there is medium stiff to stiff reddish tan and light gray or light gray and reddish tan clay to the 10 to 21½ ft. depth. This is underlain in boring B-1 thru B-3 by medium dense sand or clayey sand to the 23½ to 26½ ft. depth.

9. Beginning at the 10 to 24 ft. depth in borings B-2 thru B-5, soft to stiff reddish tan and light gray or light gray and reddish tan sandy clay was encountered to the 13½ to 32½ ft. depth. Below this depth there is medium stiff to stiff gray or greenish gray clay, sandy clay or silty clay to the 70½ to 98½ ft. depth. However, a layer of loose reddish tan and light gray clayey sand was encountered in boring B-5 between the 13½ to 15½ ft. depth and a stratum of medium dense reddish tan or gray fine sand or silty fine sand was encountered in borings B-3 thru B-6 beginning at the 15½ to 48½ ft. depth and continuing to the 21½ to 60½ ft. depth. Also, a stratum of medium stiff brownish gray organic clay was encountered between the 78½ and 82 ft. depths in boring B-2 and a stratum of medium stiff reddish tan sandy clay was encountered between the 21½ and 47 ft. depths in boring B-6.

10. Beginning at the 70½ to 73 ft. depth in borings B-5 and B-6 there is dense greenish gray clayey sand to the 73 to 79 ft. depth. Below this depth and beginning at the 73½ ft. to 102½ ft. depth in borings B-3 and B-4, stiff to very stiff light gray and reddish tan or greenish gray and reddish tan clay or sandy clay was encountered to the 101 to 108 ft. depth. A layer of loose gray clayey fine sand was encountered between the 98½ and 102½ ft. depths in boring B-3. Beginning at the 101 to 108 ft. depth in borings B-3 thru B-6 there is stiff to very stiff gray clay with silt and sand or concretions to at least the 120 ft. depth. Beginning at the 92½ to 96½ ft. depth in borings B-1 and B-2, dense to very dense gray fine sand was encountered to at least to the 120 ft. depth, the maximum depth explored by borings B-1 thru B-6.

11. Borings B-10 thru B-14 Reference to the subsoil profile "B" and logs of borings B-10 thru B-14 shows that beginning at the ground surface there is loose tan fine sand, shell, silty clay or clay with shell (fill) to the 1 to 2 ft. depth. This is followed in boring B-14 by stiff reddish tan and brown clay with silt layers to the 4 ft. depth. Beginning at the 1½ to 4 ft. depth in boring B-13 and B-14 there is loose to medium dense gray clayey fine sand to the 4 to 7 ft. depth. Beginning at the 1 to 4 ft. depth in borings B-10 thru B-13, medium stiff to stiff gray or dark gray clay with silt encountered to the 4½ to 8 ft. depth. Below this depth in borings B-10 thru B-14 medium stiff to very stiff greenish gray and reddish tan or light gray and reddish tan clay was encountered to the 13½ to 17½ ft. depth. This is followed in boring B-11 and B-12 by medium stiff to stiff sandy clay to the 18 to 31 ft. depth and in boring B-14 by medium stiff reddish tan silty clay to the 20½ ft. depth.

12. Beginning at the 17 to 31 ft. depth in borings B-10 thru B-14 there is generally loose to medium dense sand, silty sand or clayey sand to the 26 to 47 ft. depth. However, a layer of medium stiff to stiff sandy clay or clay was interbedded within this more granular stratum in borings B-11 and B-12 beginning at the 23½ to 35 ft. depth and continuing to the 38 to 38½ ft. depth. Beginning at the 26 to 37 ft. depth in boring B-13 and B-14 there is medium stiff to stiff light gray and reddish tan clay to the 37½ to 43 ft. depth. Beginning at the 26½ ft. depth in boring B-10 there is stiff reddish tan and light gray clay with sand to the 37½ ft. depth. Beginning at the 37½ to 47 ft. depth in all borings there is medium stiff to stiff gray or greenish gray clay with silt or sand lenses or shell fragments to

the 58 to 82 ft. depth. This is underlain in borings B-11 thru B-14 by stiff greenish gray sandy clay with shell or silt concretions to the 67½ to 87 ft. depth and in boring B-1 by stiff brown organic clay to the 87 ft. depth.

13. Beginning at the 67½ to 77 ft. depth in borings B-12 thru B-14 there is stiff to very stiff greenish gray and reddish tan, reddish tan and greenish gray or gray clay. Borings B-13 and B-14 were both terminated in this stratum at the 100 ft. depth, however it extends to at least the 120 ft. depth in boring B-12. Beginning at the 87 ft. depth in borings B-10 and B-11 there is dense to very dense gray fine sand. Boring B-11 was terminated in this stratum at the 100 ft. depth, however it continues to at least the 120 ft. depth in boring B-10, the maximum depth explored by these borings.

14. Borings B-7 thru B-9 and B-15 thru B-21 Reference to the logs of borings B-7 thru B-9 and B-15 thru B-21 shows that beginning at the ground surface there is generally loose tan or gray fine sand or shell to the 1 to 6½ ft. depth. This is followed in all borings with the exception of B-18 by medium stiff to stiff dark gray, gray, reddish tan and light gray or greenish gray and reddish tan silty clay or clay to at least the 10 ft. depth, the maximum depth explored by these borings. However, a layer of black cinder was encountered between the 1½ to 3 ft. depth in boring B-9 and a layer of very soft greenish gray clay with sand was encountered between the 5½ to 9 ft. depth in boring B-20. Beginning at the 1 ft. depth in boring B-18 there is stiff greenish gray and reddish tan clay



to the 3 ft. depth. This underlain by loose greenish gray clayey fine sand to the 7 ft. depth and then by lime like material to the 10 ft. depth, the maximum depth explored by these borings.

15. Borings B-26 and B-27 Reference to the logs of borings B-26 and B-27 shows that beginning at the ground surface there is stiff brown and tan silty clay or loose tan fine sand to the 1 ft. depth. This is underlain by medium stiff to stiff tan and gray, gray or greenish gray and reddish tan clay to the 13 to 13½ ft. depth. However, a layer of medium stiff tan and brown silty clay was encountered between the 7 to 11 ft. depth in boring B-26. Beginning at the 13 to 13½ ft. depth in both borings there is stiff to very stiff reddish tan and greenish gray or reddish tan clay or sandy clay to the 18 to 21½ ft. depth. This is underlain by medium dense greenish gray clay or reddish tan fine sand to the 25½ to 27 ft. depth and then by medium stiff to stiff reddish tan silty clay or clay to at least the 30 ft. depth, the maximum depth explored by these borings.

16. Groundwater At the time of making the deeper borings, B-1 thru B-6 and B-10 thru B-14, groundwater was measured at depths ranging from 1.3 to 6.2 ft. below the surface. In the shallower borings, borings B-7 thru B-9 and B-15 thru B-21, groundwater was measured at depths ranging from 1.1 to 1.3 below the surface. Also, groundwater was measured at depths of 4.7 to 5.5 ft. below the surface at borings B-26 and B-27. Groundwater was measured shortly after drilling and may not have become fully

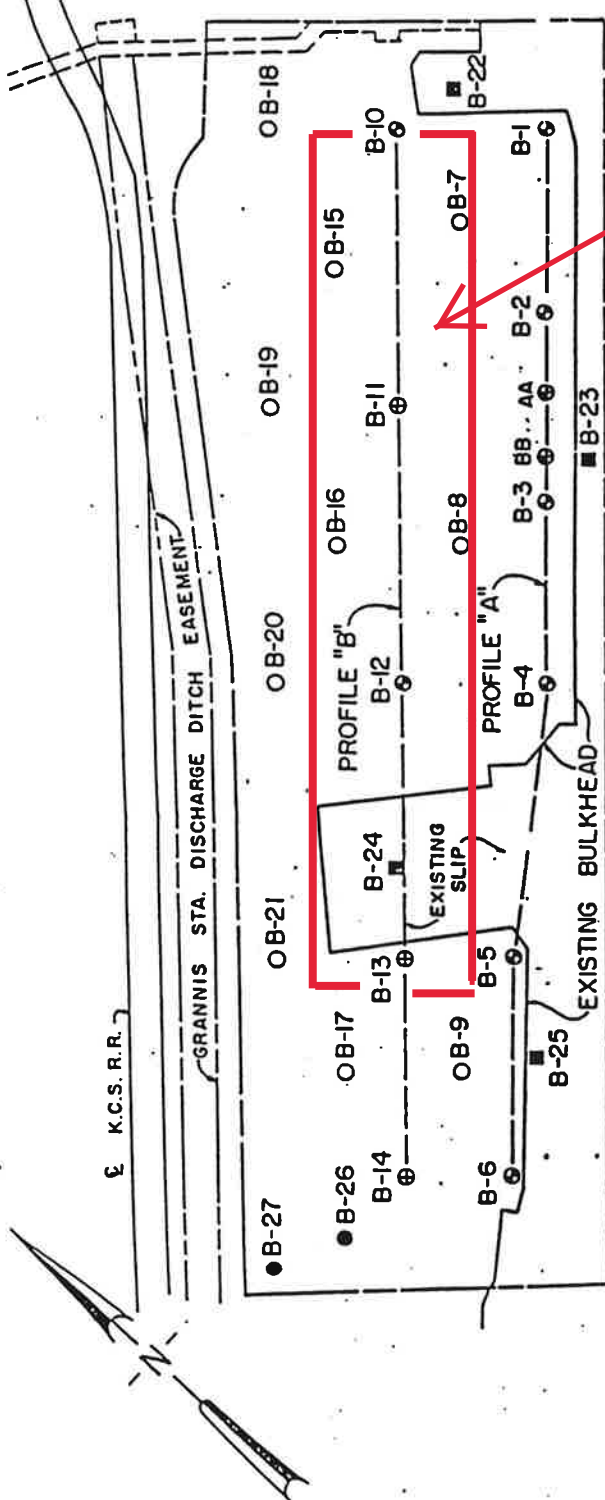
static at the time of measurement. In any event, groundwater could fluctuate due to seasonal precipitation, drainage, prolonged drought or the water level in the nearby Sabine-Neches Ship Channel. If groundwater is important to construction, it should be measured at that time.

### LABORATORY TESTS

17. In order to develop the physical properties of the soils, soil mechanics laboratory test were performed on samples obtained from the borings. This testing consisted primarily of Natural Moisture Content, Unit Weight and Unconfined Compression. Triaxial Shear Tests were performed on some of the more granular materials and Atterberg Limits were performed on selected samples. The results of all the laboratory tests are tabulated along side the boring logs at the appropriate sample and depth on Figures 3 thru 18.

18. The unconfined compressive strength is used to determine lateral earth pressures for use in bulkhead wall analyses, load-deflection (P-Y) parameters of soil for use in lateral load analyses of a proposed Monopile and the undrained shear strength or cohesion for slope stability analyses. It also gives a measure of "skin friction" values used to estimate pile load capacities. The Atterberg Limits along with the Natural Moisture Content give an indication of the compressibility of the soils and are used empirically to estimate settlements.

J-5441F



SABINE-NECHES SHIP CHANNEL

ICCP Deep Well  
General Project Area

LEGEND

- ⊙ 120' DEEP BORING
- ⊕ 100' DEEP BORING
- ⊙ 30' DEEP BORING
- 10' DEEP BORING
- 4' TO 5' DEEP SPLITSPOON SAMPLE
- ⊕ 120' DEEP BORING - WASH TO 70'

BORING LOCATIONS  
SCALE: 1" = 300'

ADDITIONAL GEOTECHNICAL INVESTIGATION  
SOIL BORINGS & PILE ANALYSIS  
WHARF EXPANSION  
SABINE-NECHES SHIP CHANNEL  
PORT ARTHUR, TEXAS

LANIER & ASSOCIATES  
CONSULTING ENGINEERS, INC.  
NEW ORLEANS, LOUISIANA

Fig. 1

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441-

Boring No. AA








## LOG OF BORING

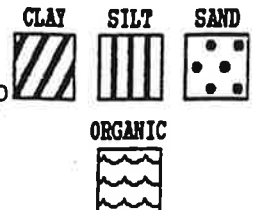
Date of Boring: 9 Jan 1961

Project: SOIL BORINGS & PILE ANALYSIS - WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL  
PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION             | Blows per Foot | Symbol Log  | Scale (ft) | REMARKS |
|------------|----------------------|-------|-----------------------|-----------------------------------|----------------|---|------------|---------|
|            | From                 | To    |                       |                                   |                |   |            |         |
|            |                      |       | 0                     |                                   |                |   |            |         |
|            |                      |       |                       | WASH                              |                |   | 20         |         |
|            |                      |       |                       |                                   |                |   | 40         |         |
|            |                      |       |                       |                                   |                |   | 60         |         |
|            |                      |       | 70.0                  |                                   |                |   |            |         |
| 1          | 74.5                 | 75.0  |                       | STIFF GRAY CLAY W/SILT LENSES     |                |  | 80         |         |
| 2          | 79.5                 | 80.0  |                       |                                   |                |   |            |         |
| 3          | 84.5                 | 85.0  | 83.0                  | STIFF GREENISH GRAY CLAY W/SILT   |                |  |            |         |
| 4          | 86.5                 | 88.0  | 86.5                  | DENSE LIGHT GRAY FINE SAND        | 30 = .6'       |  |            |         |
| 5          | 88.5                 | 90.0  |                       |                                   | 30 = .6'       |   |            |         |
| 6          | 93.5                 | 95.0  | 93.5                  | MEDIUM DENSE LIGHT GRAY FINE SAND | 20             |  | 100        |         |
| 7          | 98.5                 | 100.0 | 98.5                  |                                   | 30 = .4'       |  |            |         |
| 8          | 103.5                | 105.0 |                       | DENSE LIGHT GRAY FINE SAND        | 30 = .5'       |  |            |         |
| 9          | 108.5                | 110.0 |                       |                                   | 30 = .4'       |   |            |         |
| 10         | 113.5                | 115.0 |                       |                                   | 30 = .5'       |   |            |         |
| 11         | 118.5                | 120.0 | 120.0                 |                                   | 30 = .5'       |  | 120        |         |
|            |                      |       |                       |                                   |                |   |            |         |



Predominant type bold.  
Modifying type light.

\*140 lb. hammer dropped  
30 in. on 2 in. split-  
spoon sampler after  
first being seated 6 in

Fig.

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441

Boring No. BB

## LOG OF BORING


Date of Boring: 10 Jan 19

Project: SOIL BORINGS & PILE ANALYSIS - WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL  
PORT ARTHUR, TEXAS


LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hil


| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION            | *Blows per Foot | Symbol Log | Scale (ft) | REMARKS                       |
|------------|----------------------|-------|-----------------------|----------------------------------|-----------------|------------|------------|-------------------------------|
|            | From                 | To    |                       |                                  |                 |            |            |                               |
|            |                      |       | .0                    |                                  |                 |            |            |                               |
|            |                      |       |                       | WASH                             |                 |            | 20         |                               |
|            |                      |       |                       |                                  |                 |            | 40         |                               |
|            |                      |       |                       |                                  |                 |            | 60         |                               |
| 1          | 71.5                 | 72.0  | 70.0                  | STIFF GRAY CLAY W/ORGANIC        |                 |            |            |                               |
| 2          | 74.5                 | 75.0  | 73.0                  |                                  |                 |            |            |                               |
| 3          | 79.5                 | 80.0  |                       |                                  |                 |            | 80         |                               |
| 4          | 84.5                 | 85.0  |                       | STIFF GREENISH GRAY CLAY W/SHELL |                 |            |            |                               |
| 5          | 89.5                 | 90.0  |                       |                                  |                 |            |            | WATER TABLE AT 1.1 (SEE TEXT) |
| 6          | 94.5                 | 95.0  |                       |                                  |                 |            |            |                               |
| 7          | 99.5                 | 100.0 |                       |                                  |                 |            | 100        |                               |
| 8          | 104.5                | 105.0 | 102.0                 |                                  |                 |            |            |                               |
| 9          | 109.5                | 110.0 |                       | STIFF GRAY CLAY W/ORGANIC        |                 |            |            |                               |
| 10         | 114.5                | 115.0 | 114.0                 |                                  |                 |            |            |                               |
| 11         | 119.5                | 120.0 |                       | STIFF GREENISH GRAY CLAY         |                 |            |            |                               |
|            |                      |       | 120.0                 |                                  |                 |            | 120        |                               |




CLAY



SILT



SAND



ORGANIC

Predominant type bold.  
Modifying type light.  
\* 140 lb. hammer dropped 30 in. on 2 in. split-spoon sampler after first being seated 6 in.

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*544

Boring No. B-1

## LOG OF BORING AND TEST RESULTS

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

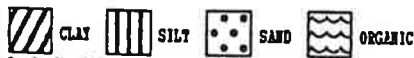
Date of Boring: 5 Oct 199

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION   | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qc) (lbs./sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|---|----------------|------------|------------|------------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |   |                |            |            |                                    |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | .0                   | .5    | .0                    | LOOSE TAN FINE SAND (FILL)                                    |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 2          | 1.5                  | 2.0   | 1.5                   | SHELL W/SAND (FILL)   |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 3          | 2.5                  | 3.0   | 2.0                   | STIFF BLACK CLAY W/SILT                                       |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 4          | 5.5                  | 6.0   | 4.0                   | MEDIUM STIFF GRAY & TAN CLAY W/SILT                           |                | ***        |            | 3345                               | 28.2                    | 87.6                      | 112.3 |                  |      |      |
|            |                      |       |                       |   |                | ***        |            | 1445                               | 30.7                    | 87.5                      | 114.3 | 56               | 20   | 36   |
| 5          | 8.5                  | 9.0   | 7.0                   |   |                | ***        |            | 1135                               | 35.2                    | 81.7                      | 110.4 |                  |      |      |
| 6          | 11.5                 | 12.0  |                       | MEDIUM STIFF TO STIFF LIGHT GRAY REDDISH TAN CLAY             |                | ***        | 10         | 2005                               | 31.2                    | 86.7                      | 113.7 | 55               | 24   | 31   |
| 7          | 14.5                 | 15.0  | 14.0                  |   |                | ***        |            | 2465                               | 30.8                    | 87.0                      | 113.8 |                  |      |      |
| 8          | 19.5                 | 20.0  |                       | STIFF REDDISH TAN & LIGHT GRAY CLAY W/SILT & SILT CONCRETIONS |                | ***        | 20         | 2320                               | 19.1                    | 97.6                      | 116.2 |                  |      |      |
| 9          | 21.0                 | 22.5  | 21.0                  |   | 16             | ***        |            | 24.0                               |                         |                           |       |                  |      |      |
| 10         | 23.5                 | 25.0  |                       | MEDIUM DENSE REDDISH TAN FINE SAND                            | 9              | ***        |            | 24.7                               |                         |                           |       |                  |      |      |
|            |                      |       | 26.5                  |   |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 11         | 29.5                 | 30.0  |                       | STIFF REDDISH TAN & LIGHT GRAY CLAY W/SILT LENSES & LAYERS    |                | ***        | 30         | 2165                               | 35.7                    | 80.4                      | 109.1 |                  |      |      |
|            |                      |       | 32.0                  |   |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 12         | 34.5                 | 35.0  |                       |   |                | ***        |            | 2210                               | 35.2                    | 81.5                      | 110.2 |                  |      |      |
| 13         | 39.5                 | 40.0  |                       |   |                | ***        | 40         | 2375                               | 37.3                    | 78.7                      | 108.1 |                  |      |      |
| 14         | 44.5                 | 45.0  |                       |   |                | ***        |            | 2250                               | 40.6                    | 76.7                      | 107.8 | 68               | 20   | 48   |
| 15         | 49.5                 | 50.0  |                       |   |                | ***        | 50         |                                    |                         |                           |       |                  |      |      |
| 16         | 54.5                 | 55.0  |                       | MEDIUM STIFF TO STIFF GRAY CLAY W/SILT LENSES & LAYERS        |                | ***        |            | 2240                               | 42.7                    | 74.8                      | 106.8 |                  |      |      |
| 17         | 59.5                 | 60.0  |                       |   |                | ***        | 60         | 1605                               | 35.9                    | 80.3                      | 109.1 |                  |      |      |
| 18         | 64.5                 | 65.0  |                       |   |                | ***        |            | 1620                               | 37.6                    | 79.9                      | 109.9 |                  |      |      |
| 19         | 69.5                 | 70.0  |                       |   |                | ***        | 70         | 1510                               | 41.9                    | 74.3                      | 105.4 |                  |      |      |
| 20         | 74.5                 | 75.0  |                       |   |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 21         | 79.5                 | 80.0  |                       |   |                | ***        | 80         | 2300                               | 46.7                    | 70.0                      | 102.7 | 87               | 42   | 45   |
| 22         | 84.5                 | 85.0  |                       | (W/TRACE ORGANIC @ 84.5 - 85.0)                               |                | ***        |            | 1980                               | 49.9                    | 67.2                      | 100.7 |                  |      |      |
|            |                      |       | 87.5                  |   |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 23         | 89.5                 | 90.0  |                       | VERY STIFF GREENISH GRAY CLAY W/SILT                          |                | ***        | 90         | 4665                               | 28.4                    | 89.6                      | 115.0 |                  |      |      |
| 24         | 94.5                 | 95.0  |                       |   |                | ***        |            | 4060                               | 25.5                    | 93.7                      | 117.6 | 52               | 25   | 27   |
|            |                      |       | 96.5                  |   |                | ***        |            |                                    |                         |                           |       |                  |      |      |
| 25         | 96.5                 | 98.0  |                       |   | 30 = .4'       | ***        |            | 21.6                               |                         |                           |       |                  |      |      |
| 26         | 98.5                 | 100.0 |                       |   | 30             | ***        | 100        |                                    |                         |                           |       |                  |      |      |
| 27         | 103.5                | 105.0 |                       |   | 30 = .3'       | ***        |            |                                    |                         |                           |       |                  |      |      |
| 28         | 108.5                | 110.0 |                       | DENSE TO VERY DENSE GRAY FINE SAND                            | 30 = .5'       | ***        | 110        | 25.3                               |                         |                           |       |                  |      |      |
| 29         | 113.5                | 115.0 |                       |   | 30 = .4'       | ***        |            |                                    |                         |                           |       |                  |      |      |
| 30         | 118.5                | 120.0 |                       |   | 30 = .5'       | ***        | 120        |                                    |                         |                           |       |                  |      |      |
|            |                      |       | 120.0                 |   |                | ***        |            |                                    |                         |                           |       |                  |      |      |



\*140 lb. hammer dropped 30 in. on 2 in. split spoon sampler after first being seated 6 in.

### REMARKS:

WATER TABLE AT 3.7' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J-5441

Boring No. B-2

## LOG OF BORING AND TEST RESULTS

Date of Boring: 5 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER &amp; ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION                                      | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qu) (lbs/sq. ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu. ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|--|----------------|------------|------------|------------------------------------|-------------------------|----------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |  |                |            |            |                                    |                         | DRY                        | WET   | L.L.             | P.L. | P.I. |
| 1          | .5                   | 1.0   | .0                    | LOOSE TAN FINE SAND (FILL)                                 |                | ***        |            |                                    |                         |                            |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 1.5                   |  |                |            |            | 2165                               | 27.9                    | 89.1                       | 114.0 |                  |      |      |
| 3          | 5.5                  | 6.0   |                       | STIFF DARK GRAY CLAY W/SILT                                |                |            |            | 2010                               | 31.7                    | 85.3                       | 112.3 | 62               | 18   | 44   |
| 4          | 8.5                  | 9.0   | 7.5                   |  |                |            | 10         | 1585                               | 28.6                    | 90.0                       | 115.8 |                  |      |      |
| 5          | 11.5                 | 12.0  |                       | MEDIUM STIFF TO STIFF LIGHT GRAY & REDDISH TAN CLAY W/SILT |                |            |            | 2065                               | 32.2                    | 82.9                       | 109.6 |                  |      |      |
| 6          | 14.5                 | 15.0  |                       |  |                |            |            | 1975                               | 27.1                    | 91.9                       | 116.8 | 58               | 26   | 32   |
| 7          | 19.5                 | 20.0  |                       |  |                |            | 20         | 6040                               | 19.0                    | 104.0                      | 123.8 |                  |      |      |
| 8          | 21.5                 | 23.0  | 21.5                  | MEDIUM DENSE REDDISH TAN FINE SAND                         | 28             | ***        |            |                                    | 22.1                    |                            |       |                  |      |      |
| 9          | 24.0                 | 25.5  | 24.0                  |  | 11             |            |            |                                    | 29.5                    |                            |       |                  |      |      |
| 10         | 29.5                 | 30.0  |                       | STIFF REDDISH TAN SANDY CLAY (W/SAND LAYERS @ 29.5 - 30.0) |                |            | 30         | 1300                               | 28.4                    | 86.3                       | 110.8 |                  |      |      |
| 11         | 34.5                 | 35.0  | 32.5                  | STIFF GREENISH GRAY CLAY                                   |                |            |            | 2090                               | 30.5                    | 82.2                       | 107.3 |                  |      |      |
| 12         | 39.5                 | 40.0  | 37.5                  |  |                |            | 40         | 2545                               | 41.6                    | 75.8                       | 107.3 |                  |      |      |
| 13         | 44.5                 | 45.0  |                       | STIFF GRAY CLAY W/SILT LENSES                              |                |            |            |                                    |                         |                            |       |                  |      |      |
| 14         | 49.5                 | 50.0  |                       |  |                |            | 50         | 1890                               | 42.3                    | 73.6                       | 104.7 | 82               | 28   | 54   |
| 15         | 54.5                 | 55.0  |                       |  |                |            |            | 2120                               | 42.0                    | 74.2                       | 105.4 |                  |      |      |
| 16         | 59.5                 | 60.0  |                       |  |                |            | 60         |                                    |                         |                            |       |                  |      |      |
| 17         | 64.5                 | 65.0  |                       |  |                |            |            | 2150                               | 34.0                    | 83.4                       | 111.7 | 57               | 20   | 37   |
| 18         | 69.5                 | 70.0  |                       |  |                |            | 70         | 2210                               | 45.0                    | 71.0                       | 103.0 |                  |      |      |
| 19         | 74.5                 | 75.0  |                       |  |                |            |            | 2150                               | 40.7                    | 74.6                       | 105.0 |                  |      |      |
| 20         | 79.5                 | 80.0  | 78.5                  |  |                |            |            |                                    |                         |                            |       |                  |      |      |
|            |                      |       | 82.0                  | MEDIUM STIFF BROWNISH GRAY ORGANIC CLAY                    |                |            | 80         | 1800                               | 75.0                    | 47.9                       | 83.8  | 147              | 60   | 87   |
| 21         | 84.5                 | 85.0  |                       | MEDIUM STIFF GREENISH GRAY SANDY CLAY                      |                |            |            | 1700                               | 22.4                    | 96.0                       | 117.5 |                  |      |      |
| 22         | 89.5                 | 90.0  |                       |  |                |            | 90         | 760                                | 20.9                    | 95.5                       | 115.5 | 22               | 12   | 10   |
| 23         | 92.5                 | 94.0  | 92.5                  |  | 30 = .4'       | ***        |            |                                    | 19.4                    |                            |       |                  |      |      |
| 24         | 95.0                 | 96.5  |                       |  | 30 = .4'       |            |            |                                    |                         |                            |       |                  |      |      |
| 25         | 98.5                 | 100.0 |                       | VERY DENSE GRAY FINE SAND                                  | 30 = .5'       |            | 100        |                                    | 31.8                    |                            |       |                  |      |      |
| 26         | 103.5                | 105.0 |                       |  | 30 = .2'       |            |            |                                    |                         |                            |       |                  |      |      |
| 27         | 108.5                | 110.0 |                       |  | 30 = .5'       |            | 110        |                                    | 18.7                    |                            |       |                  |      |      |
| 28         | 113.5                | 115.0 |                       |  | 30 = .4'       |            |            |                                    |                         |                            |       |                  |      |      |
| 29         | 118.5                | 120.0 | 120.0                 |  | 30 = .5'       |            | 120        |                                    | 26.7                    |                            |       |                  |      |      |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in. on 2 in. splitspoon sampler after first bottom contact &amp; in

REMARKS: \*equivalent Qu from 1-point triaxial test  
WATER TABLE AT 4.8' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J5441

Boring No. B-3

## LOG OF BORING AND TEST RESULTS

Date of Boring: 7 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION  | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (q <sub>u</sub> ) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|--|----------------|------------|------------|--|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |  |                |            |            |  |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | 0                    | 0.5   | 1.0                   | LOOSE TAN FINE SAND W/SHELL  |                |            |            |  |                         |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 4.0                   | STIFF DARK GRAY CLAY W/SILT  |                |            |            | 2555   | 25.8                    | 91.6                      | 115.2 |                  |      |      |
| 3          | 5.5                  | 6.0   |                       |  |                |            |            | 2620   | 24.8                    | 94.9                      | 118.4 |                  |      |      |
| 4          | 8.5                  | 9.0   |                       | STIFF LIGHT GRAY & REDDISH TAN CLAY W/SILT LENSES (FISSURED AT 8.5 - 9.0') |                |            | 10         | 1755   | 30.3                    | 86.1                      | 112.2 |                  |      |      |
| 5          | 11.5                 | 12.0  |                       |  |                |            |            | 3330   | 18.9                    | 100.8                     | 119.8 |                  |      |      |
| 6          | 14.5                 | 15.0  |                       |  |                |            |            |  |                         |                           |       |                  |      |      |
| 7          | 19.5                 | 20.0  | 18.0                  | MEDIUM DENSE TAN & REDDISH TAN CLAYEY FINE SAND                            |                |            | 20         | 1130*  | 21.7                    | 97.8                      | 119.0 |                  |      |      |
| 8          | 24.5                 | 25.0  | 23.5                  | SOFT LIGHT GRAY & REDDISH TAN SANDY CLAY                                   |                |            |            | 870  | 24.8                    | 95.4                      | 119.1 |                  |      |      |
| 9          | 29.5                 | 30.0  | 27.5                  |  |                |            | 30         | 1315   | 25.4                    | 92.0                      | 115.4 |                  |      |      |
| 10         | 34.5                 | 35.0  |                       | MEDIUM STIFF REDDISH TAN CLAY W/SILT & SAND LAYERS                         |                |            |            |  | 26.8                    |                           |       |                  |      |      |
| 11         | 39.5                 | 40.0  | 36.5                  | STIFF GRAY & REDDISH TAN CLAY W/SAND LENSES                                |                |            | 40         | 2425   | 27.3                    | 90.3                      | 115.0 |                  |      |      |
| 12         | 44.5                 | 45.0  | 43.0                  | MEDIUM STIFF GRAY CLAY W/SAND LENSES                                       |                |            |            | 1100   | 32.3                    | 84.8                      | 112.2 |                  |      |      |
| 13         | 48.5                 | 50.0  | 48.5                  |  | 19             |            | 50         |  | 26.8                    |                           |       |                  |      |      |
| 14         | 51.0                 | 52.5  |                       | MEDIUM DENSE GRAY FINE SAND  | 25             |            |            |  | 22.1                    |                           |       |                  |      |      |
| 15         | 53.5                 | 55.0  |                       |  | 16             |            |            |  |                         |                           |       |                  |      |      |
| 16         | 58.5                 | 60.0  | 60.5                  |  | 12             |            | 60         |  |                         |                           |       |                  |      |      |
| 17         | 64.5                 | 65.0  |                       |  |                |            |            | 4565   | 21.1                    | 101.3                     | 122.7 |                  |      |      |
| 18         | 69.5                 | 70.0  |                       |  |                |            | 70         | 3970   | 21.4                    | 98.4                      | 119.5 | 50               | 17   | 33   |
| 19         | 74.5                 | 75.0  |                       | STIFF TO VERY STIFF GREENISH GRAY CLAY W/SILT CONCRETIONS.                 |                |            |            |  |                         |                           |       |                  |      |      |
| 20         | 79.5                 | 80.0  |                       |  |                |            | 80         | 2985   | 24.1                    | 94.6                      | 117.4 |                  |      |      |
| 21         | 84.5                 | 85.0  |                       |  |                |            |            | 4010   | 21.5                    | 99.3                      | 120.7 |                  |      |      |
| 22         | 89.5                 | 90.0  | 87.0                  | STIFF GRAY CLAY W/SAND LENSES  |                |            | 90         | 3280   | 25.0                    | 93.8                      | 117.3 | 56               | 17   | 39   |
| 23         | 94.5                 | 95.0  |                       |  |                |            |            | 2025   | 25.4                    | 91.8                      | 115.1 |                  |      |      |
| 24         | 96.0                 | 97.5  | 96.0                  | STIFF GRAY CLAY W/SAND LAYERS  | 16             |            |            |  | 30.7                    |                           |       |                  |      |      |
| 25         | 99.5                 | 100.0 | 98.5                  | LOOSE GRAY CLAYEY FINE SAND  |                |            | 100        | 940*   | 23.7                    | 94.4                      | 116.8 | 26               | —    | NP   |
| 26         | 102.5                | 104.0 | 102.5                 |  |                |            |            |  | 32.0                    |                           |       |                  |      |      |
| 27         | 105.5                | 106.0 |                       | STIFF GREENISH GRAY CLAY W/SAND LENSES (FISSURED)                          | 20             |            |            | 1415   | 34.4                    | 82.9                      | 111.4 | 75               | 21   | 54   |
| 28         | 109.5                | 110.0 | 108.0                 |  |                |            | 110        | 2205   | 44.1                    | 72.4                      | 104.4 | 91               | 24   | 67   |
| 29         | 114.5                | 115.0 |                       | STIFF TO VERY STIFF GRAY CLAY W/SAND LENSES                                |                |            |            |  |                         |                           |       |                  |      |      |
| 30         | 119.5                | 120.0 | 120.0                 |  |                |            | 120        | 5000   | 22.7                    | 98.0                      | 120.2 |                  |      |      |



\*140 lb. hammer dropped 30 in. on 2 in. splitspoon sampler

REMARKS: \*equivalent Q<sub>u</sub> from 1-point triaxial test  
WATER TABLE AT 5.7' (SEE TEXT)



# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J5441

Boring No. B-4

## LOG OF BORING AND TEST RESULTS

Date of Boring: 7 Oct 1999:

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION  | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qu) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |  |                |            |            |                                   |                         | DET                       | NET   | L.L.             | P.L. | P.I. |
| 1          | 0                    | 0.5   | 1.0                   | STIFF BROWN & TAN CLAY W/SAND & SHELL  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 4.0                   | STIFF DARK GRAY CLAY W/SAND LENSES & PETROLEUM ODOR                          |                |            |            | 2270                              | 27.2                    | 91.2                      | 116.0 |                  |      |      |
| 3          | 5.5                  | 6.0   | 7.0                   | STIFF GREENISH GRAY & REDDISH TAN CLAY                                       |                |            |            | 2855                              | 25.5                    | 94.4                      | 118.5 |                  |      |      |
| 4          | 8.5                  | 9.0   |                       |  |                |            | 10         | 2240                              | 26.6                    | 91.6                      | 116.0 |                  |      |      |
| 5          | 11.5                 | 12.0  |                       | STIFF REDDISH TAN & LIGHT GRAY CLAY W/SILT                                   |                |            |            | 5485                              | 22.0                    | 99.4                      | 121.3 |                  |      |      |
| 6          | 14.5                 | 15.0  |                       | (FISSURED AT 14.5 - 15.0')   |                |            |            | 1735                              | 27.3                    | 91.1                      | 116.0 |                  |      |      |
| 7          | 19.5                 | 20.0  | 17.5                  | STIFF REDDISH TAN & LIGHT GRAY SANDY CLAY                                    |                |            | 20         | 1930                              | 25.1                    | 95.9                      | 120.0 |                  |      |      |
| 8          | 24.5                 | 25.0  | 23.5                  |  |                |            |            | 1360                              | 23.0                    | 93.4                      | 114.9 |                  |      |      |
| 9          | 29.5                 | 30.0  |                       | MEDIUM STIFF TO STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LAYERS (FISSURED) |                |            | 30         |                                   |                         |                           |       |                  |      |      |
| 10         | 34.5                 | 35.0  |                       |  |                |            |            | 815                               | 28.1                    | 84.9                      | 108.8 |                  |      |      |
| 11         | 36.5                 | 38.0  | 36.5                  |  | 20             |            |            |                                   |                         |                           |       |                  |      |      |
| 12         | 38.5                 | 40.0  |                       |  | 13             |            | 40         |                                   | 22.5                    |                           |       |                  |      |      |
| 13         | 43.5                 | 45.0  |                       | MEDIUM DENSE TO DENSE REDDISH TAN FINE SAND                                  | 17             |            |            |                                   | 22.9                    |                           |       |                  |      |      |
| 14         | 48.5                 | 50.0  |                       |  | 16             |            | 50         |                                   |                         |                           |       |                  |      |      |
| 15         | 53.5                 | 55.0  |                       |  | 30 = .9'       |            |            |                                   |                         |                           |       |                  |      |      |
| 16         | 59.5                 | 60.0  | 56.5                  |  |                |            | 60         | 845                               | 24.8                    | 90.9                      | 113.4 |                  |      |      |
| 17         | 64.5                 | 65.0  |                       | STIFF GRAY CLAY W/SAND LENSES (FISSURED)                                     |                |            |            | 3905                              | 22.6                    | 98.9                      | 121.3 | 54               | 15   | 39   |
| 18         | 69.5                 | 70.0  |                       |  |                |            | 70         | 1400                              | 21.2                    | 93.4                      | 113.2 |                  |      |      |
| 19         | 74.5                 | 75.0  | 73.5                  |  |                |            |            |                                   | 18.8                    |                           |       |                  |      |      |
| 20         | 79.5                 | 80.0  |                       |  |                |            | 80         | 3340                              | 24.6                    | 94.5                      | 117.7 |                  |      |      |
| 21         | 84.5                 | 85.0  |                       |  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 22         | 89.5                 | 90.0  |                       | STIFF GREENISH GRAY & REDDISH TAN CLAY W/SHELL FRAGMENTS                     |                |            | 90         | 2185                              | 29.4                    | 85.7                      | 110.9 |                  |      |      |
| 23         | 94.5                 | 95.0  |                       |  |                |            |            | 3770                              | 30.2                    | 85.6                      | 111.5 | 70               | 29   | 41   |
| 24         | 99.5                 | 100.0 |                       |  |                |            | 100        |                                   |                         |                           |       |                  |      |      |
| 25         | 104.5                | 105.0 |                       |  |                |            |            | 3635                              | 30.7                    | 85.3                      | 111.5 |                  |      |      |
| 26         | 109.5                | 110.0 | 108.0                 |  |                |            | 110        | 2150                              | 44.0                    | 73.1                      | 105.2 |                  |      |      |
| 27         | 114.5                | 115.0 |                       | STIFF GRAY CLAY W/SILT & SAND  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 28         | 119.5                | 120.0 | 120.0                 | (FISSURED AT 119.5 - 120.0')   |                |            | 120        | 1775                              | 43.8                    | 72.7                      | 104.6 | 82               | 25   | 57   |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in. on 2 in. split spoon sampler after first being seated 6 in.

### REMARKS:

WATER TABLE: AT 3.2' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

Boring No. B-5

## LOG OF BORING AND TEST RESULTS

Date of Boring: 12 Oct

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. H

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION                                | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |    |
|------------|----------------------|-------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|----|
|            | From                 | To    |                       |  |                |            |            |                                   |                         | DRY                       | WET   | L.L.             | P.L. | P. |
| 1          | .0                   | .5    | .0                    | LOOSE TAN FINE SAND W/SHELL (FILL)                   |                |            |            |                                   |                         |                           |       |                  |      |    |
| 2          | 2.5                  | 3.0   | 1.5                   | STIFF GREENISH GRAY & REDDISH TAN CLAY               |                |            |            | 2510                              | 22.1                    | 97.9                      | 119.5 |                  |      |    |
| 3          | 5.5                  | 6.0   | 4.0                   | STIFF DARK GRAY CLAY W/SILT                          |                |            |            | 2620                              | 23.2                    | 99.8                      | 122.9 |                  |      |    |
| 4          | 8.5                  | 9.0   | 7.0                   | STIFF LIGHT GRAY & REDDISH TAN CLAY (FISSURED)       |                |            | 10         | 2045                              | 25.8                    | 92.5                      | 116.4 |                  |      |    |
| 5          | 11.5                 | 12.0  | 10.0                  | STIFF REDDISH TAN & LIGHT GRAY SANDY CLAY (FISSURED) |                |            |            | 1775                              | 21.7                    | 99.6                      | 121.2 |                  |      |    |
| 6          | 14.5                 | 15.0  | 13.5                  | LOOSE REDDISH TAN & LIGHT GRAY CLAYEY FINE SAND      |                |            |            | 1000                              | 20.9                    | 100.2                     | 121.1 |                  |      |    |
| 7          | 15.5                 | 17.0  | 15.5                  |  | 15             |            |            | 25.6                              |                         |                           |       |                  |      |    |
| 8          | 18.5                 | 20.0  |                       |  | 14             |            | 20         |                                   |                         |                           |       |                  |      |    |
| 9          | 23.5                 | 25.0  |                       | MEDIUM DENSE REDDISH TAN SILTY FINE SAND             | 28             |            |            | 23.2                              |                         |                           |       |                  |      |    |
| 10         | 28.5                 | 30.0  |                       |  | 27             |            | 30         |                                   |                         |                           |       |                  |      |    |
| 11         | 33.5                 | 35.0  |                       |  | 11             |            |            |                                   |                         |                           |       |                  |      |    |
| 12         | 38.5                 | 40.0  |                       |  | 16             |            | 40         | 26.8                              |                         |                           |       |                  |      |    |
| 13         | 43.5                 | 45.0  |                       |  | 13             |            |            |                                   |                         |                           |       |                  |      |    |
| 14         | 49.5                 | 50.0  | 47.0                  | MEDIUM STIFF GRAY CLAY W/SILT                        |                |            | 50         | 1545                              | 43.5                    | 73.4                      | 105.3 |                  |      |    |
| 15         | 54.5                 | 55.0  |                       |  |                |            |            | 1585                              | 45.6                    | 71.8                      | 104.6 | 78               | 34   |    |
| 16         | 59.5                 | 60.0  | 57.0                  | STIFF GREENISH GRAY SANDY CLAY W/MUCH SHELL          |                |            | 60         | 1635                              | 18.5                    | 91.8                      | 108.8 |                  |      |    |
| 17         | 64.5                 | 65.0  |                       |  |                |            |            | 2640                              | 18.8                    | 100.7                     | 119.6 |                  |      |    |
| 18         | 69.5                 | 70.0  |                       |  |                |            | 70         | 1470                              | 21.4                    | 99.3                      | 120.6 | 31               | 20   |    |
| 19         | 70.5                 | 72.0  | 70.5                  | DENSE GREENISH GRAY CLAYEY FINE SAND                 | 31             |            |            |                                   |                         |                           |       |                  |      |    |
| 20         | 74.5                 | 75.0  | 73.0                  | STIFF GREENISH GRAY & REDDISH TAN CLAY               |                |            |            | 3625                              | 30.5                    | 86.8                      | 113.3 |                  |      |    |
| 21         | 79.5                 | 80.0  | 78.0                  | VERY STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY       |                |            | 80         | 4500                              | 20.3                    | 101.2                     | 121.7 |                  |      |    |
| 22         | 84.5                 | 85.0  |                       |  |                |            |            | 6550                              | 18.8                    | 103.3                     | 122.7 | 40               | 15   |    |
| 23         | 89.5                 | 90.0  | 87.5                  | STIFF GREENISH GRAY & REDDISH TAN CLAY               |                |            | 90         | 3040                              | 29.9                    | 86.6                      | 112.5 |                  |      |    |
| 24         | 94.5                 | 95.0  |                       |  |                |            |            |                                   |                         |                           |       |                  |      |    |
| 25         | 99.5                 | 100.0 | 101.0                 |  |                |            | 100        | 1920                              | 31.0                    | 83.7                      | 109.7 | 56               | 27   |    |
| 26         | 104.5                | 105.0 |                       | STIFF GRAY CLAY W/SILT CONCRETIONS                   |                |            |            | 2840                              | 41.4                    | 75.2                      | 106.4 |                  |      |    |
| 27         | 109.5                | 110.0 |                       |  |                |            | 110        |                                   |                         |                           |       |                  |      |    |
| 28         | 114.5                | 115.0 |                       |  |                |            |            | 2245                              | 44.7                    | 72.9                      | 105.5 | 88               | 33   |    |
| 29         | 119.5                | 120.0 | 120.0                 |  |                |            | 120        | 2290                              | 45.8                    | 70.6                      | 102.9 |                  |      |    |

\*140 lb. hammer dropped 30 in.  
on 2 in. split-spore sampler  
after first blow tested & inREMARKS: \*equivalent  $Q_u$  from 1-point triaxial test  
WATER TABLE AT 4.2' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441

Boring No. B-6

## LOG OF BORING AND TEST RESULTS

Date of Boring: 13 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER &amp; ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION                                      | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qu) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |  |                |            |            |                                   |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | .0                   | .5    | 0.0                   | SAND & SHELL (FILL)  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 1.5                   | STIFF GRAY CLAY W/SILT                                     |                |            |            | 3385                              | 19.2                    | 99.3                      | 118.4 |                  |      |      |
| 3          | 5.5                  | 6.0   | 4.0                   | MEDIUM STIFF DARK GRAY CLAY W/SILT LENSES & PETROLEUM ODOR |                |            |            | 1145                              | 23.1                    | 89.6                      | 110.3 |                  |      |      |
| 4          | 8.5                  | 9.0   | 7.0                   | STIFF LIGHT GRAY & REDDISH TAN CLAY (FISSURED)             |                |            | 10         | 1820                              | 23.5                    | 96.3                      | 118.9 |                  |      |      |
| 5          | 11.5                 | 12.0  |                       |  |                |            |            | 2355                              | 26.5                    | 93.5                      | 118.3 |                  |      |      |
| 6          | 14.5                 | 15.0  |                       |  |                |            |            | 3685                              | 20.8                    | 101.2                     | 122.2 |                  |      |      |
| 7          | 18.0                 | 19.5  | 18.0                  | MEDIUM DENSE REDDISH TAN FINE SAND                         | 22             |            |            |                                   | 27.5                    |                           |       |                  |      |      |
| 8          | 19.5                 | 21.0  | 21.5                  |  | 18             |            |            |                                   | 18.5                    |                           |       |                  |      |      |
| 9          | 24.5                 | 25.0  |                       | MEDIUM STIFF REDDISH TAN SANDY CLAY W/CLAY LAYERS          |                |            |            | 1330*                             | 24.1                    | 95.9                      | 119.0 |                  |      |      |
| 10         | 29.5                 | 30.0  |                       |  |                |            | 30         | 1735                              | 24.9                    | 95.3                      | 119.0 | 57               | 14   | 43   |
| 11         | 34.5                 | 35.0  |                       |  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 12         | 39.5                 | 40.0  |                       |  |                |            | 40         | 1045                              | 25.0                    | 95.4                      | 119.2 |                  |      |      |
| 13         | 44.5                 | 45.0  |                       |  |                |            |            | 1175                              | 25.4                    | 92.3                      | 115.7 | 41               | 14   | 27   |
| 14         | 49.5                 | 50.0  | 47.0                  | MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LENSES & LAYERS     |                |            | 50         | 1425                              | 34.5                    | 80.8                      | 108.7 |                  |      |      |
| 15         | 54.5                 | 55.0  |                       |  |                |            |            | 2445                              | 34.7                    | 81.9                      | 110.3 | 55               | 19   | 36   |
| 16         | 59.5                 | 60.0  | 57.0                  | STIFF GREENISH GRAY SILTY CLAY W/MUCH SHELL                |                |            | 60         |                                   | 19.9                    |                           |       |                  |      |      |
| 17         | 64.5                 | 65.0  |                       |  |                |            |            | 3100                              | 17.8                    | 100.1                     | 117.9 |                  |      |      |
| 18         | 69.5                 | 70.0  | 68.5                  | STIFF GREENISH GRAY SANDY CLAY                             |                |            | 70         | 2245                              | 19.7                    | 92.5                      | 110.7 |                  |      |      |
| 19         | 73.0                 | 74.5  | 73.0                  |  | 30 = .7"       |            |            |                                   | 21.2                    |                           |       |                  |      |      |
| 20         | 75.5                 | 77.0  |                       | DENSE GREENISH GRAY CLAYEY SAND                            | 30 = .9"       |            |            |                                   |                         |                           |       |                  |      |      |
| 21         | 79.5                 | 80.0  | 79.0                  | VERY STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY (FISSURED)  |                |            | 80         | 4925                              | 18.1                    | 103.6                     | 122.4 |                  |      |      |
| 22         | 84.5                 | 85.0  |                       |  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 23         | 89.5                 | 90.0  |                       |  |                |            | 90         | 1735                              | 30.3                    | 84.5                      | 110.1 | 39               | 17   | 22   |
| 24         | 94.5                 | 95.0  | 91.5                  | STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT LENSES       |                |            |            | 2930                              | 32.6                    | 81.8                      | 108.5 |                  |      |      |
| 25         | 99.5                 | 100.0 |                       |  |                |            | 100        | 2635                              | 33.2                    | 81.5                      | 108.6 |                  |      |      |
| 26         | 104.5                | 105.0 | 103.0                 | STIFF GRAY CLAY W/SILT LENSES                              |                |            |            | 3560                              | 43.6                    | 73.6                      | 105.7 |                  |      |      |
| 27         | 109.5                | 110.0 |                       |  |                |            | 110        |                                   |                         |                           |       |                  |      |      |
| 28         | 114.5                | 115.0 |                       |  |                |            |            | 2240                              | 48.6                    | 69.4                      | 103.2 | 95               | 30   | 65   |
| 29         | 119.5                | 120.0 | 120.0                 |  |                |            | 120        | 2560                              | 51.1                    | 68.1                      | 102.9 |                  |      |      |



CLAY
 SILT
 SAND
 ORGANIC

\*140 lb. hammer dropped 30 in. on 2 in. splitspoon sampler after first being seated 6 in.

REMARKS: \*equivalent  $Q_u$  from 1-point triaxial test  
WATER TABLE AT 3.9' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441

Boring No. B-7

## LOG OF BORING AND TEST RESULTS

Date of Boring: 15 Oct 1995

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
 FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
 LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No.        | SAMPLE Depth in Feet |      | STATION Depth in feet | VISUAL CLASSIFICATION                                  | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qu) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |     | ATTERBERG LIMITS |      |      |
|-------------------|----------------------|------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-----|------------------|------|------|
|                   | From                 | To   |                       |  |                |            |            |                                   |                         | DRY                       | WET | L.L.             | P.L. | P.I. |
| 1                 | .0                   | .5   | .0                    |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 2                 | 1.5                  | 2.0  | 3.5                   | LOOSE TAN FINE SAND W/MUCH SHELL & CLAY (FILL)         |                | •••        |            | 12.0                              | 9.6                     |                           |     |                  |      |      |
| 3                 | 3.5                  | 4.0  | 5.0                   | STIFF DARK GRAY CLAY W/SHELL                           |                |            |            | 31.6                              |                         |                           |     | 62               | 16   | 46   |
| 4                 | 5.5                  | 6.0  |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 5                 | 7.5                  | 8.0  |                       | STIFF GREENISH GRAY & REDDISH TAN CLAY                 |                |            |            | 26.5                              |                         |                           |     |                  |      |      |
| 6                 | 9.5                  | 10.0 | 10.0                  |  |                |            | 10         | 32.0                              |                         |                           |     |                  |      |      |
| Boring Number B-8 |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 1                 | .0                   | .5   | .0                    | LOOSE TAN FINE SAND                                    |                | •••        |            | 11.2                              |                         |                           |     |                  |      |      |
| 2                 | 1.5                  | 2.0  | 3.0                   | LOOSE BROWN FINE SAND W/SHELL                          |                | •••        |            | 7.5                               |                         |                           |     |                  |      |      |
| 3                 | 3.5                  | 4.0  |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 4                 | 5.5                  | 6.0  |                       | STIFF DARK GRAY CLAY                                   |                |            |            | 27.8                              |                         |                           |     |                  |      |      |
| 5                 | 7.5                  | 8.0  | 7.0                   |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 6                 | 9.5                  | 10.0 | 10.0                  | STIFF GREENISH GRAY & REDDISH TAN CLAY                 |                |            | 10         | 34.0                              |                         |                           |     |                  |      |      |
| Boring Number B-9 |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 1                 | .0                   | .5   | .0                    | LOOSE REDDISH TAN FINE SAND (FILL)                     |                | •••        |            | 11.0                              |                         |                           |     |                  |      |      |
| 2                 | 1.5                  | 2.0  | 1.5                   |  |                |            |            | 12.8                              |                         |                           |     |                  |      |      |
| 3                 | 3.5                  | 4.0  | 3.0                   | BLACK CINDERS  |                |            |            | 19.1                              |                         |                           |     |                  |      |      |
| 4                 | 5.5                  | 6.0  |                       | STIFF DARK GRAY SILTY CLAY                             |                |            |            | 21.6                              |                         |                           |     | 37               | 18   | 19   |
| 5                 | 7.5                  | 8.0  | 7.0                   |  |                |            |            |                                   |                         |                           |     |                  |      |      |
| 6                 | 9.5                  | 10.0 | 10.0                  | MEDIUM STIFF TO STIFF GREENISH GRAY & REDDISH TAN CLAY |                |            | 10         | 20.7                              |                         |                           |     |                  |      |      |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in.  
 on 2 in. split spoon sampler  
 after first blow noted & in.

REMARKS:

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J-544

Boring No. B-10

## LOG OF BORING AND TEST RESULTS

Date of Boring: 12 Oct 199

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION                             | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT? (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTENBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|---|----------------|------------|------------|-----------------------------------|--------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |   |                |            |            |                                   |                          | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | 0                    | 0.5   | 1.0                   | SHELL (FILL)                                      |                |            |            |                                   |                          |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 7.0                   | STIFF DARK GRAY CLAY                              |                |            |            | 1800                              | 32.3                     | 82.5                      | 109.1 |                  |      |      |
| 3          | 5.5                  | 6.0   |                       |   |                |            |            | 2130                              | 30.8                     | 86.4                      | 113.0 |                  |      |      |
| 4          | 8.5                  | 9.0   |                       |   |                |            | 10         | 2005                              | 25.8                     | 94.7                      | 119.1 |                  |      |      |
| 5          | 11.5                 | 12.0  | 17.0                  | STIFF LIGHT GRAY & REDDISH TAN CLAY W/SILT        |                |            |            | 2200                              | 28.8                     | 91.1                      | 117.4 |                  |      |      |
| 6          | 14.5                 | 15.0  |                       |   |                |            |            | 3670                              | 26.7                     | 93.3                      | 118.2 |                  |      |      |
| 7          | 19.5                 | 20.0  |                       | MEDIUM DENSE REDDISH TAN & TAN CLAYEY FINE SAND   |                |            | 20         | 1280*                             | 23.4                     | 93.8                      | 115.8 |                  |      |      |
| 8          | 22.0                 | 23.5  | 22.0                  | MEDIUM DENSE REDDISH TAN SILTY FINE SAND          | 25             |            |            |                                   | 23.4                     |                           |       |                  |      |      |
| 9          | 24.5                 | 26.0  | 26.5                  |   | 19             |            |            |                                   | 24.9                     |                           |       |                  |      |      |
| 10         | 29.5                 | 30.0  | 37.5                  | STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES |                |            | 30         | 2990                              | 36.1                     | 82.0                      | 111.6 |                  |      |      |
| 11         | 34.5                 | 35.0  |                       | (FISSURED AT 34.5 - 35.0')                        |                |            |            | 1505                              | 31.3                     | 84.6                      | 111.1 |                  |      |      |
| 12         | 39.5                 | 40.0  |                       |   |                |            | 40         | 2665                              | 41.6                     | 75.9                      | 107.5 |                  |      |      |
| 13         | 44.5                 | 45.0  | 82.0                  | MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LENSES     |                |            |            |                                   |                          |                           |       |                  |      |      |
| 14         | 49.5                 | 50.0  |                       |   |                |            | 50         | 2400                              | 43.3                     | 73.9                      | 105.9 | 88               | 23   | 65   |
| 15         | 54.5                 | 55.0  |                       |   |                |            |            | 1645                              | 47.1                     | 70.0                      | 102.9 |                  |      |      |
| 16         | 59.5                 | 60.0  |                       |   |                |            | 60         | 2065                              | 29.6                     | 85.6                      | 110.9 |                  |      |      |
| 17         | 64.5                 | 65.0  |                       |   |                |            |            |                                   |                          |                           |       |                  |      |      |
| 18         | 69.5                 | 70.0  |                       |   |                |            | 70         | 2005                              | 45.4                     | 72.1                      | 104.8 | 96               | 24   | 72   |
| 19         | 74.5                 | 75.0  |                       |   |                |            |            |                                   |                          |                           |       |                  |      |      |
| 20         | 79.5                 | 80.0  |                       |   |                |            | 80         | 2270                              | 52.6                     | 66.5                      | 101.5 |                  |      |      |
| 21         | 84.5                 | 85.0  |                       | STIFF BROWN ORGANIC CLAY                          |                |            |            | 3015                              | 74.4                     | 51.3                      | 89.5  | 148              | 56   | 92   |
| 22         | 87.0                 | 88.5  | 87.0                  | DENSE TO VERY DENSE GRAY FINE SAND                | 30 = .7"       |            | 90         |                                   | 26.0                     |                           |       |                  |      |      |
| 23         | 90.0                 | 91.5  |                       |   | 30 = .4"       |            |            | 19.9                              |                          |                           |       |                  |      |      |
| 24         | 93.5                 | 95.0  |                       |   | 30 = .4"       |            |            |                                   |                          |                           |       |                  |      |      |
| 25         | 98.5                 | 100.0 |                       |   | 30 = .5"       |            | 100        | 20.6                              |                          |                           |       |                  |      |      |
| 26         | 103.5                | 105.0 |                       |   | 30 = .3"       |            |            |                                   |                          |                           |       |                  |      |      |
| 27         | 108.5                | 110.0 |                       |   | 30 = .4"       |            | 110        | 21.5                              |                          |                           |       |                  |      |      |
| 28         | 113.5                | 115.0 |                       |   | 30 = .4"       |            |            |                                   |                          |                           |       |                  |      |      |
| 29         | 118.5                | 120.0 |                       |   | 30 = .3"       |            | 120        | 25.6                              |                          |                           |       |                  |      |      |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in. on 2 in. splitspoon sampler after first being seated 6 in.

REMARKS: \*equivalent Q<sub>u</sub> from 1-point triaxial test

FREE WATER AT 6' (SEE TEXT)

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441

Boring No. B-11

## LOG OF BORING AND TEST RESULTS

Date of Boring: 11 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION                                 | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|---|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |   |                |            |            |                                   |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | .0                   | .5    | .0                    | LOOSE TAN FINE SAND (FILL)                            |                | ***        |            |                                   |                         |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 1.5                   | STIFF DARK GRAY CLAY W/SAND                           |                |            |            | 2210                              | 29.3                    | 84.8                      | 109.6 |                  |      |      |
| 3          | 5.5                  | 6.0   |                       |   |                |            |            | 3285                              | 26.1                    | 93.6                      | 118.0 |                  |      |      |
| 4          | 8.5                  | 9.0   | 7.0                   | STIFF LIGHT GRAY & REDDISH TAN CLAY                   |                |            | 10         | 2350                              | 33.6                    | 84.1                      | 112.4 |                  |      |      |
| 5          | 11.5                 | 12.0  | 10.0                  | STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT         |                |            |            | 2200                              | 31.4                    | 87.3                      | 114.7 |                  |      |      |
| 6          | 14.5                 | 15.0  |                       |   |                |            |            | 3010                              | 32.7                    | 85.0                      | 112.8 |                  |      |      |
| 7          | 19.5                 | 20.0  | 17.0                  | STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY             |                |            | 20         | 2035                              | 25.2                    | 90.7                      | 113.5 |                  |      |      |
| 8          | 24.5                 | 25.0  |                       |   |                |            |            |                                   |                         |                           |       |                  |      |      |
| 9          | 29.5                 | 30.0  |                       | (FISSURED @ 29.5 - 30.0')                             |                |            | 30         | 1170                              | 27.1                    | 91.3                      | 116.0 |                  |      |      |
| 10         | 31.0                 | 32.5  | 31.0                  | MEDIUM DENSE LIGHT GRAY & REDDISH TAN SILTY FINE SAND | 15             |            |            |                                   | 29.5                    |                           |       |                  |      |      |
| 11         | 33.5                 | 35.0  |                       |   | 10             |            |            |                                   | 20.7                    |                           |       |                  |      |      |
| 12         | 37.5                 | 38.0  | 35.5                  | MEDIUM STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY      |                |            |            | 1215                              | 27.9                    | 90.5                      | 115.7 | 31               | 19   | 12   |
| 13         | 38.5                 | 40.0  | 38.5                  | MEDIUM DENSE LIGHT GRAY & REDDISH TAN SILTY FINE SAND | 12             |            | 40         |                                   | 21.1                    |                           |       |                  |      |      |
| 14         | 41.0                 | 42.5  |                       |   | 13             |            |            |                                   |                         |                           |       |                  |      |      |
| 15         | 43.5                 | 45.0  | 45.0                  | (FISSURED @ 43.5 - 45.0')                             | 10             |            |            |                                   | 21.7                    |                           |       |                  |      |      |
| 16         | 49.5                 | 50.0  |                       |   |                |            | 50         | 935                               | 38.6                    | 79.5                      | 110.2 |                  |      |      |
| 17         | 54.5                 | 55.0  |                       | MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LAYERS         |                |            |            | 2870                              | 41.6                    | 76.3                      | 108.1 |                  |      |      |
| 18         | 59.5                 | 60.0  |                       |   |                |            | 60         |                                   |                         |                           |       |                  |      |      |
| 19         | 64.5                 | 65.0  |                       |   |                |            |            | 2355                              | 45.0                    | 73.1                      | 106.0 | 82               | 25   | 57   |
| 20         | 69.5                 | 70.0  |                       |   |                |            | 70         |                                   |                         |                           |       |                  |      |      |
| 21         | 74.5                 | 75.0  |                       |   |                |            |            | 2235                              | 45.5                    | 71.8                      | 104.5 |                  |      |      |
| 22         | 79.5                 | 80.0  | 76.5                  | STIFF GREENISH GRAY SANDY CLAY                        |                |            | 80         | 2565                              | 21.7                    | 98.6                      | 120.0 |                  |      |      |
| 23         | 84.5                 | 85.0  |                       |   |                |            |            | 3340                              | 21.1                    | 99.4                      | 120.4 | 27               | 15   | 12   |
| 24         | 87.0                 | 88.5  | 87.0                  | DENSE GRAY FINE SAND                                  | 31             |            | 90         |                                   | 22.8                    |                           |       |                  |      |      |
| 25         | 89.5                 | 91.0  |                       |   | 29             |            |            |                                   | 20.4                    |                           |       |                  |      |      |
| 26         | 93.5                 | 95.0  |                       |   | 30 = .8'       |            |            |                                   |                         |                           |       |                  |      |      |
| 27         | 98.5                 | 100.0 | 100.0                 |   | 30 = .6'       |            | 100        |                                   | 21.8                    |                           |       |                  |      |      |



\*140 lb. hammer dropped 30 in. on 2 in. splitspoon sampler after first being seated 6 in.

REMARKS: WATER TABLE AT 6.2' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J-544

Boring No. B-12

## LOG OF BORING AND TEST RESULTS

Date of Boring: 8 Oct 199

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER &amp; ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATON Depth in feet | VISUAL CLASSIFICATION  | *Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qu) (lbs/sq. ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu. ft.) |       | ATTENBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|--|-----------------|------------|------------|------------------------------------|-------------------------|----------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |  |                 |            |            |                                    |                         | DRY                        | WET   | L.L.             | P.L. | P.I. |
| 1          | .0                   | .5    | .0                    | LOOSE TAN FINE SAND W/SHELL  |                 | • • •      |            |                                    |                         |                            |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 2.0                   | STIFF GRAY CLAY W/SAND LENSES (FISSURED)   |                 | • • •      |            | 1190                               | 29.6                    | 83.6                       | 108.4 |                  |      |      |
| 3          | 5.5                  | 6.0   | 4.5                   | MEDIUM STIFF GREENISH GRAY & REDDISH TAN CLAY                                      |                 | • • •      |            | 950                                | 33.1                    | 81.8                       | 108.9 |                  |      |      |
| 4          | 8.5                  | 9.0   | 9.0                   | VERY STIFF GREENISH GRAY & REDDISH TAN CLAY  |                 | • • •      | 10         | 1865                               | 29.2                    | 88.5                       | 114.4 | 75               | 21   | 54   |
| 5          | 11.5                 | 12.0  |                       |  |                 | • • •      |            | 4375                               | 22.0                    | 98.8                       | 120.5 |                  |      |      |
| 6          | 14.5                 | 15.0  | 13.5                  | MEDIUM STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY                                   |                 | • • •      |            | 1780                               | 21.4                    | 98.8                       | 120.0 |                  |      |      |
| 7          | 19.5                 | 20.0  | 18.0                  | LOOSE LIGHT GRAY & REDDISH TAN CLAYEY FINE SAND                                    |                 | • • •      | 20         | 650*                               | 22.4                    | 95.9                       | 117.4 | 22               | —    | NP   |
| 8          | 24.5                 | 25.0  | 23.5                  | STIFF REDDISH TAN & GREENISH GRAY CLAY W/SAND                                      |                 | • • •      |            | 3160                               | 24.1                    | 95.6                       | 118.6 |                  |      |      |
| 9          | 29.5                 | 30.0  | 26.0                  |  |                 | • • •      |            |                                    |                         |                            |       |                  |      |      |
| 10         | 34.5                 | 35.0  |                       | MEDIUM STIFF TO STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY W/SAND LAYERS (FISSURED) |                 | • • •      | 30         | 1325                               | 22.8                    | 97.2                       | 119.4 |                  |      |      |
|            |                      |       |                       |  |                 | • • •      |            | 865                                | 19.3                    | 94.6                       | 112.8 |                  |      |      |
| 11         | 38.0                 | 39.5  | 38.0                  |  | 14              | • • •      | 40         |                                    | 23.1                    |                            |       |                  |      |      |
| 12         | 41.0                 | 42.5  |                       | MEDIUM DENSE REDDISH TAN FINE SAND   | 18              | • • •      |            |                                    |                         |                            |       |                  |      |      |
| 13         | 43.5                 | 45.0  |                       |  | 21              | • • •      |            |                                    | 23.3                    |                            |       |                  |      |      |
| 14         | 49.5                 | 50.0  | 47.0                  |  |                 | • • •      | 50         | 1860                               | 41.0                    | 75.0                       | 105.7 |                  |      |      |
| 15         | 54.5                 | 55.0  |                       | MEDIUM STIFF GRAY CLAY W/SHELL FRAGMENTS   |                 | • • •      |            | 1925                               | 36.5                    | 81.3                       | 111.0 |                  |      |      |
| 16         | 59.5                 | 60.0  | 58.0                  |  |                 | • • •      | 60         |                                    |                         |                            |       |                  |      |      |
| 17         | 64.5                 | 65.0  |                       | STIFF GREENISH GRAY SANDY CLAY W/MUCH SHELL  |                 | • • •      |            |                                    | 20.9                    |                            |       | 38               | 17   | 21   |
| 18         | 69.5                 | 70.0  | 67.5                  |  |                 | • • •      | 70         | 1610                               | 23.7                    | 95.0                       | 117.5 |                  |      |      |
| 19         | 74.5                 | 75.0  |                       |  |                 | • • •      |            | 1445                               | 22.2                    | 95.7                       | 116.9 |                  |      |      |
| 20         | 79.5                 | 80.0  |                       |  |                 | • • •      | 80         |                                    |                         |                            |       |                  |      |      |
| 21         | 84.5                 | 85.0  |                       |  |                 | • • •      |            | 1185                               | 23.9                    | 88.9                       | 110.1 | 48               | 19   | 29   |
| 22         | 89.5                 | 90.0  |                       | STIFF GREENISH GRAY & REDDISH TAN CLAY (FISSURED)                                  |                 | • • •      | 90         | 2270                               | 31.2                    | 83.6                       | 109.7 |                  |      |      |
| 23         | 94.5                 | 95.0  |                       |  |                 | • • •      |            |                                    |                         |                            |       |                  |      |      |
| 24         | 99.5                 | 100.0 |                       |  |                 | • • •      | 100        | 1610                               | 28.1                    | 81.6                       | 104.5 |                  |      |      |
| 25         | 104.5                | 105.0 |                       |  |                 | • • •      |            | 2505                               | 28.0                    | 89.0                       | 113.9 |                  |      |      |
| 26         | 109.5                | 110.0 |                       |  |                 | • • •      | 110        | 3985                               | 31.0                    | 84.9                       | 111.2 |                  |      |      |
| 27         | 114.5                | 115.0 | 114.0                 |  |                 | • • •      |            | 2465                               | 41.9                    | 74.3                       | 105.4 | 85               | 29   | 56   |
| 28         | 119.5                | 120.0 | 120.0                 | STIFF GRAY CLAY W/SILT   |                 | • • •      | 120        | 2045                               | 44.0                    | 71.8                       | 103.4 |                  |      |      |

CLAY
 SILT
 SAND
 ORGANIC

\*140 lb. hammer dropped 30 in. on 2 in. split spoon sampler after first being seated 6 in.

REMARKS: \*equivalent  $Q_u$  from 1-point triaxial test  
WATER TABLE AT 2.1' (SEE TEXT)

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J-5441

Boring No. B-13

## LOG OF BORING AND TEST RESULTS

Date of Boring: 14 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATUM Depth in feet | VISUAL CLASSIFICATION   | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTENDING LIMITS |      |      |
|------------|----------------------|-------|-----------------------|---|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |   |                |            |            |                                   |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | .0                   | .5    | 0.0                   | MEDIUM STIFF REDDISH TAN SILTY CLAY W/SHELL   |                |            |            |                                   |                         |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 1.5                   | MEDIUM DENSE GRAY CLAYEY FINE SAND  |                |            |            | 1960*                             | 6.5                     | 94.6                      | 100.8 |                  |      |      |
| 3          | 5.5                  | 6.0   | 4.0                   | MEDIUM STIFF GRAY CLAY W/SILT   |                |            |            | 1955                              | 22.1                    | 99.3                      | 121.2 |                  |      |      |
| 4          | 8.5                  | 9.0   | 8.0                   | STIFF GREENISH GRAY & REDDISH TAN CLAY W/SAND   |                |            | 10         | 2885                              | 25.3                    | 94.9                      | 118.9 |                  |      |      |
| 5          | 11.5                 | 12.0  |                       |   |                |            |            | 3885                              | 19.9                    | 101.3                     | 121.5 | 37               | 14   | 23   |
| 6          | 14.5                 | 15.0  |                       |   |                |            |            | 2000                              | 20.9                    | 101.1                     | 122.2 |                  |      |      |
| 7          | 19.5                 | 20.0  | 17.0                  | LOOSE REDDISH TAN CLAYEY FINE SAND  |                |            | 20         | 980                               | 22.6                    | 95.4                      | 117.0 |                  |      |      |
| 8          | 23.5                 | 25.0  | 23.5                  | MEDIUM DENSE REDDISH TAN FINE SAND  | 11             |            |            |                                   |                         |                           |       |                  |      |      |
| 9          | 26.0                 | 27.5  |                       |   | 22             |            |            |                                   |                         |                           |       |                  |      |      |
| 10         | 28.5                 | 30.0  |                       |   | 25             |            | 30         |                                   |                         |                           |       |                  |      |      |
| 11         | 34.5                 | 35.0  | 32.5                  | LOOSE REDDISH TAN & LIGHT GRAY FINE SAND W/CLAY LAYERS  |                |            |            | 860                               | 25.0                    | 93.4                      | 116.8 |                  |      |      |
| 12         | 39.5                 | 40.0  | 37.0                  | MEDIUM STIFF LIGHT GRAY & REDDISH TAN CLAY (FISSURED)   |                |            | 40         | 810                               | 19.5                    | 101.8                     | 121.7 |                  |      |      |
| 13         | 44.5                 | 45.0  | 43.0                  | STIFF GRAY CLAY W/SAND LENSES & LAYERS  |                |            |            | 2270                              | 30.8                    | 86.7                      | 113.4 |                  |      |      |
| 14         | 49.5                 | 50.0  | 47.5                  | MEDIUM STIFF GRAY CLAY W/SILT LENSES  |                |            | 50         | 1660                              | 40.6                    | 77.6                      | 109.1 |                  |      |      |
| 15         | 55.5                 | 56.0  |                       |   |                |            |            | 1535                              | 43.5                    | 73.5                      | 105.5 |                  |      |      |
| 16         | 59.5                 | 60.0  | 57.5                  | STIFF GREENISH GRAY CLAY W/MUCH SHELL   |                |            | 60         |                                   | 17.3                    |                           |       |                  |      |      |
| 17         | 64.5                 | 65.0  | 63.5                  | STIFF GREENISH GRAY SANDY CLAY W/SHELL & SHELL FRAGMENTS (FISSURED @ 69.5 - 70.0')                          |                |            |            | 3385                              | 18.2                    | 100.5                     | 118.8 |                  |      |      |
| 18         | 69.5                 | 70.0  |                       |   |                |            | 70         | 1510                              | 22.3                    | 89.9                      | 109.9 | 27               | 20   | 7    |
| 19         | 74.5                 | 75.0  | 72.0                  | STIFF GREENISH GRAY & REDDISH TAN CLAY  |                |            |            | 2840                              | 22.9                    | 87.5                      | 107.5 |                  |      |      |
| 20         | 79.5                 | 80.0  | 76.5                  | STIFF TO VERY STIFF REDDISH TAN & GREENISH GRAY CLAY W/SAND LAYERS<br><br>(LARGE SAND LAYER @ 89.5 - 90.0') |                |            | 80         | 4620                              | 35.9                    | 81.2                      | 110.3 |                  |      |      |
| 21         | 84.5                 | 85.0  |                       |   |                |            |            |                                   |                         |                           |       |                  |      |      |
| 22         | 89.5                 | 90.0  |                       |   |                |            | 90         | 1340*                             | 22.9                    | 90.9                      | 111.7 | 33               | 18   | 15   |
| 23         | 94.5                 | 95.0  |                       |   |                |            |            |                                   |                         |                           |       |                  |      |      |
| 24         | 99.5                 | 100.0 | 100.0                 |   |                |            | 100        | 2305                              | 29.3                    | 86.2                      | 111.4 |                  |      |      |



\*140 lb. hammer dropped 30 in. on 2 in. split spoon sampler after first being seated 6 in.

REMARKS: \*equivalent  $Q_u$  from 1-point triaxial test

WATER TABLE AT 4.4' (SEE TEXT)



## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441

Boring No. B-14

## LOG OF BORING AND TEST RESULTS

Date of Boring: 14 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER &amp; ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |       | STRATON Depth in feet | VISUAL CLASSIFICATION  | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|-------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To    |                       |  |                |            |            |                                   |                         | DTY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | 0                    | 1.5   | 1.0                   | MEDIUM STIFF TAN & BROWN CLAY W/SHELL                                      |                |            |            |                                   |                         |                           |       |                  |      |      |
| 2          | 2.5                  | 3.0   | 4.0                   | STIFF REDDISH TAN & BROWN CLAY W/SILT LAYERS                               |                |            |            | 2245                              | 20.0                    | 97.7                      | 117.2 |                  |      |      |
| 3          | 5.5                  | 6.0   | 7.0                   | LOOSE TAN SILTY FINE SAND  |                |            |            |                                   | 3.8                     |                           |       |                  |      |      |
| 4          | 8.5                  | 9.0   |                       |  |                |            | 10         | 1685                              | 31.3                    | 87.3                      | 114.6 |                  |      |      |
| 5          | 11.5                 | 12.0  |                       | STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (FISSURED)                   |                |            |            | 2575                              | 24.9                    | 96.7                      | 120.8 | 42               | 16   | 26   |
| 6          | 14.5                 | 15.0  |                       |  |                |            |            | 5420                              | 21.9                    | 101.6                     | 123.9 |                  |      |      |
| 7          | 19.5                 | 20.0  | 17.5                  | MEDIUM STIFF REDDISH TAN SILTY CLAY  |                |            | 20         | 1705                              | 23.8                    | 95.0                      | 117.6 |                  |      |      |
| 8          | 20.5                 | 22.0  | 20.5                  |  | 12             |            |            |                                   |                         |                           |       |                  |      |      |
| 9          | 23.5                 | 25.0  | 26.0                  | MEDIUM DENSE REDDISH TAN FINE SAND   | 21             |            |            |                                   |                         |                           |       |                  |      |      |
| 10         | 29.5                 | 30.0  |                       |  |                |            | 30         | 1510                              | 31.8                    | 84.4                      | 111.2 |                  |      |      |
| 11         | 34.5                 | 35.0  |                       | STIFF LIGHT GRAY & REDDISH TAN CLAY W/SILT (FISSURED)                      |                |            |            | 1400                              | 30.7                    | 85.1                      | 111.2 |                  |      |      |
| 12         | 39.5                 | 40.0  | 37.5                  |  |                |            | 40         | 2450                              | 36.5                    | 80.0                      | 109.2 |                  |      |      |
| 13         | 44.5                 | 45.0  |                       |  |                |            |            | 3690                              | 38.3                    | 78.4                      | 108.4 |                  |      |      |
| 14         | 49.5                 | 50.0  |                       | MEDIUM STIFF TO STIFF GRAY CLAY W/SILT LENSES & LAYERS                     |                |            | 50         |                                   |                         |                           |       |                  |      |      |
| 15         | 54.5                 | 55.0  |                       |  |                |            |            | 1670                              | 48.5                    | 69.4                      | 103.0 | 84               | 28   | 56   |
| 16         | 59.5                 | 60.0  |                       |  |                |            | 60         |                                   |                         |                           |       |                  |      |      |
| 17         | 64.5                 | 65.0  |                       |  |                |            |            | 1590                              | 45.7                    | 71.0                      | 103.4 |                  |      |      |
| 18         | 69.5                 | 70.0  | 67.0                  |  |                |            | 70         | 1840                              | 21.2                    | 91.8                      | 111.3 |                  |      |      |
| 19         | 74.5                 | 75.0  |                       | STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) |                |            |            | 2855                              | 21.1                    | 99.4                      | 120.4 | 39               | 15   | 24   |
| 20         | 79.5                 | 80.0  | 77.0                  |  |                |            | 80         | 4400                              | 23.1                    | 90.7                      | 111.7 |                  |      |      |
| 21         | 84.5                 | 85.0  | 82.0                  | VERY STIFF GREENISH GRAY & REDDISH TAN CLAY                                |                |            |            |                                   |                         |                           |       |                  |      |      |
| 22         | 89.5                 | 90.0  |                       |  |                |            | 90         | 3690                              | 25.9                    | 92.3                      | 116.2 |                  |      |      |
| 23         | 94.5                 | 95.0  |                       | STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES                          |                |            |            | 2555                              | 26.9                    | 91.0                      | 115.5 | 47               | 25   | 22   |
| 24         | 99.5                 | 100.0 | 100.0                 |  |                |            | 100        | 2070                              | 25.5                    | 90.1                      | 113.1 |                  |      |      |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in.  
on 2 in. splitspoon sampler  
after first being seated 6 in.

## REMARKS:

WATER TABLE AT 1.3' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J-544

Boring No. B-15

## LOG OF BORING AND TEST RESULTS

Date of Boring: 15 Oct 199

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No.                     | SAMPLE Depth in Feet |      | STRATUM Depth in feet | VISUAL CLASSIFICATION                              | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |     | ATTENBERG LIMITS |      |      |    |
|--------------------------------|----------------------|------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-----|------------------|------|------|----|
|                                | From                 | To   |                       |  |                |            |            |                                   |                         | DRY                       | WET | L.L.             | P.L. | P.I. |    |
|                                |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 1                              | 0                    | 0.5  | 0.0                   | LOOSE TAN FINE SAND (1/4 WOOD # 1.5-2.0)           |                |            |            | 7.9                               |                         |                           |     |                  |      |      |    |
| 2                              | 1.5                  | 2.0  | 3.0                   |  |                |            |            | 11.1                              |                         |                           |     |                  |      |      |    |
| 3                              | 3.5                  | 4.0  |                       |  |                |            |            | 29.2                              |                         |                           |     |                  | 56   | 26   | 30 |
| 4                              | 5.5                  | 6.0  |                       |  |                |            |            | 33.9                              |                         |                           |     |                  |      |      |    |
| 5                              | 7.5                  | 8.0  | 9.0                   |  |                |            |            | 10                                | 29.5                    |                           |     |                  |      |      |    |
| 6                              | 9.5                  | 10.0 | 10.0                  | STIFF REDDISH TAN & LIGHT GRAY CLAY                |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| WATER TABLE AT 5.3' (SEE TEXT) |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| Boring Number B-16             |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 1                              | 0                    | 0.5  | 0.0                   | SHELL  |                |            |            | 22.7                              |                         |                           |     |                  |      |      |    |
| 2                              | 1.5                  | 2.0  | 1.0                   | MEDIUM STIFF GRAY CLAY W/SHELL                     |                |            |            | 42.9                              |                         |                           |     |                  |      |      |    |
| 3                              | 3.5                  | 4.0  |                       |  |                |            |            | 33.1                              |                         |                           |     |                  |      |      |    |
| 4                              | 5.5                  | 6.0  | 7.5                   |  |                |            |            | 10                                | 43.2                    |                           |     |                  |      |      |    |
| 5                              | 7.5                  | 8.0  |                       | STIFF GREENISH GRAY & REDDISH TAN CLAY             |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 6                              | 9.5                  | 10.0 | 10.0                  |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| WATER TABLE AT 1.0' (SEE TEXT) |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| Boring Number B-17             |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 1                              | 0                    | 0.5  | 0.0                   | LOOSE TAN FINE SAND                                |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 2                              | 1.5                  | 2.0  | 1.0                   | STIFF REDDISH TAN & LIGHT GRAY CLAY W/SHELL & SAND |                |            |            | 21.4                              |                         |                           |     | 49               | 13   | 36   |    |
| 3                              | 3.5                  | 4.0  | 3.0                   |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 4                              | 5.5                  | 6.0  |                       | LOOSE TAN FINE SAND                                |                |            |            | 21.5                              |                         |                           |     |                  |      |      |    |
| 5                              | 7.5                  | 8.0  | 6.5                   | MEDIUM STIFF GRAY CLAY W/SAND LENSES               |                |            |            | 26.2                              |                         |                           |     |                  |      |      |    |
| 6                              | 9.5                  | 10.0 | 10.0                  |  |                |            |            | 10                                |                         |                           |     |                  |      |      |    |
| WATER TABLE AT 5.7' (SEE TEXT) |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| Boring Number B-18             |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 1                              | 0                    | 0.5  | 0.0                   | SHELL  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 2                              | 1.5                  | 2.0  | 1.0                   | STIFF GREENISH GRAY & REDDISH TAN CLAY             |                |            |            | 23.5                              |                         |                           |     |                  |      |      |    |
| 3                              | 3.5                  | 4.0  | 3.0                   |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |
| 4                              | 5.5                  | 6.0  |                       | LOOSE GREENISH GRAY CLAYEY FINE SAND               |                |            |            | 21.6                              |                         |                           |     |                  |      |      |    |
| 5                              | 7.5                  | 8.0  | 7.0                   |  |                |            |            | 17.7                              |                         |                           |     | 19               | --   | NP   |    |
| 6                              | 9.5                  | 10.0 | 10.0                  | LIME-LIKE MATERIAL                                 |                |            |            |                                   |                         |                           |     |                  |      |      |    |
|                                |                      |      |                       |  |                |            |            |                                   |                         |                           |     |                  |      |      |    |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in.  
on 2 in. splitspoon sampler  
after first being seated 6 in.

## REMARKS:

WATER TABLE AT 6.0' (SEE TEXT)

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441












Boring No. B-19

## LOG OF BORING AND TEST RESULTS

Date of Boring: 15 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No.                     | SAMPLE Depth in Feet |      | STRATUM Depth in feet | VISUAL CLASSIFICATION                  | Blows per Foot | Symbol Log   | Scale (ft) | UNCONFINED COMP. (qs) (lbs./sq. ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu. ft.) |       |      |      |      | ATKINSON LIMITS |  |  |
|--------------------------------|----------------------|------|-----------------------|--|----------------|--|------------|-------------------------------------|-------------------------|----------------------------|-------|------|------|------|-----------------|--|--|
|                                | From                 | To   |                       |  |                |  |            |                                     |                         | DRY                        | WET   | L.L. | P.L. | P.I. |                 |  |  |
| 1                              | 0.0                  | 0.5  | 0.0                   | LOOSE TAN FINE SAND W/SHELL            |                |    |            |                                     | 10.3                    |                            |       |      |      |      |                 |  |  |
| 2                              | 1.5                  | 2.0  | 3.0                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 3                              | 3.5                  | 4.0  | 7.0                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 4                              | 5.5                  | 6.0  | 9.0                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 5                              | 7.5                  | 8.0  | 10.0                  | STIFF LIGHT GRAY & REDDISH TAN CLAY    |                |    |            |                                     | 29.7                    |                            |       |      |      |      |                 |  |  |
| 6                              | 9.5                  | 10.0 | 10.0                  | STIFF REDDISH TAN & LIGHT GRAY CLAY    |                |    | 10         |                                     | 27.9                    |                            |       |      |      |      |                 |  |  |
| WATER TABLE AT 3.0' (SEE TEXT) |                      |      |                       |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| Boring Number B-20             |                      |      |                       |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 1                              | 0.0                  | 0.5  | 0.0                   | LOOSE TAN FINE SAND                    |                |    |            |                                     | 13.0                    |                            |       |      |      |      |                 |  |  |
| 2                              | 1.5                  | 2.0  | 1.0                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 3                              | 3.5                  | 4.0  | 5.5                   | LOOSE GRAY FINE SAND W/CLAY LAYERS     |                |    |            |                                     | 16.3                    |                            |       |      |      |      |                 |  |  |
| 4                              | 5.5                  | 6.0  | 5.5                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 5                              | 7.5                  | 8.0  | 9.0                   | VERY SOFT GREENISH GRAY CLAY W/SAND    |                |    |            |                                     | 35.6                    |                            |       |      |      |      |                 |  |  |
| 6                              | 9.5                  | 10.0 | 10.0                  | STIFF REDDISH TAN & LIGHT GRAY CLAY    |                |    | 10         | 230                                 | 35.3                    | 79.5                       | 107.5 | 52   | 13   | 39   |                 |  |  |
| WATER TABLE AT 7.2' (SEE TEXT) |                      |      |                       |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| Boring Number B-21             |                      |      |                       |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 1                              | 0.0                  | 0.5  | 0.0                   | LOOSE TAN FINE SAND                    |                |  |            |                                     | 12.0                    |                            |       |      |      |      |                 |  |  |
| 2                              | 1.5                  | 2.0  | 3.0                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 3                              | 3.5                  | 4.0  | 5.0                   | LOOSE GRAY FINE SAND W/CLAY LENSES     |                |  |            |                                     | 13.3                    |                            |       |      |      |      |                 |  |  |
| 4                              | 5.5                  | 6.0  | 5.0                   |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |
| 5                              | 7.5                  | 8.0  | 9.0                   | MEDIUM STIFF GRAY CLAY W/SAND LENSES   |                |  |            |                                     | 23.0                    |                            |       |      |      |      |                 |  |  |
| 6                              | 9.5                  | 10.0 | 10.0                  | STIFF REDDISH TAN & GREENISH GRAY CLAY |                |  | 10         |                                     | 31.3                    |                            |       |      |      |      |                 |  |  |
| WATER TABLE AT 2.0' (SEE TEXT) |                      |      |                       |  |                |  |            |                                     |                         |                            |       |      |      |      |                 |  |  |



ORGANIC

\*140 lb. hammer dropped 30 in.  
on 2 in. split spoon sampler  
after first blow tested 4 in.

REMARKS:

## GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441

Boring No. B-26

## LOG OF BORING AND TEST RESULTS

Date of Boring: 6 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER &amp; ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |      | STRATON Depth in feet | VISUAL CLASSIFICATION  | Blows per Foot | Symbol Log | Scale (ft) | UNCONFINED COMP. (qu) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|------|-----------------------|--|----------------|------------|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To   |                       |  |                |            |            |                                   |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | 0                    | 0.5  | 1.0                   | STIFF BROWN & TAN SILTY CLAY                                   |                |            |            |                                   |                         |                           |       |                  |      |      |
| 2          | 1.5                  | 2.0  | 3.5                   | MEDIUM STIFF DARK GRAY CLAY W/SAND & BRICK (PETROLEUM ODOR)    |                |            |            | 820                               | 23.6                    | 90.5                      | 111.9 |                  |      |      |
| 3          | 3.5                  | 4.0  | 7.0                   | STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (PETROLEUM ODOR) |                |            |            | 2475                              | 22.1                    | 96.2                      | 117.4 |                  |      |      |
| 4          | 5.5                  | 6.0  | 11.0                  | MEDIUM STIFF TAN & BROWN SILTY CLAY ODOR                       |                |            | 10         | 2135                              | 22.7                    | 91.6                      | 112.4 |                  |      |      |
| 5          | 7.5                  | 8.0  | 13.5                  | MEDIUM STIFF GRAY CLAY W/SAND LEN. & LAYS.                     |                |            |            | 480                               | 19.4                    | 88.7                      | 105.9 |                  |      |      |
| 6          | 9.5                  | 10.0 |                       |  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 7          | 11.5                 | 12.0 |                       |  |                |            |            |                                   |                         |                           |       |                  |      |      |
| 8          | 14.5                 | 15.0 |                       |  |                |            |            | 3130                              | 22.4                    | 98.3                      | 120.3 |                  |      |      |
| 9          | 19.5                 | 20.0 |                       | STIFF TO VERY STIFF REDISH TAN & TAN CLAY W/SAND LAYERS        |                |            | 20         | 4470                              | 19.5                    | 99.8                      | 119.3 |                  |      |      |
| 10         | 21.5                 | 23.0 | 21.5                  |  | 22             |            |            |                                   |                         |                           |       |                  |      |      |
| 11         | 24.0                 | 25.5 | 27.0                  | MEDIUM DENSE REDDISH TAN FINE SAND                             | 23             |            |            |                                   |                         |                           |       |                  |      |      |
| 12         | 29.5                 | 30.0 | 30.0                  | MEDIUM STIFF REDDISH TAN SILTY CLAY W/SILT (FISSURED)          |                |            | 30         | 355                               | 31.1                    | 79.6                      | 104.3 |                  |      |      |



CLAY



SILT



SAND



ORGANIC

\*140 lb. hammer dropped 30 in.  
on 2 in. split spoon sampler  
after about 100 blows needed to

## REMARKS:

WATER TABLE AT 5.5' (SEE TEXT)

# GORE ENGINEERING, INC.

Soil and Foundation Investigations  
Metairie, Louisiana

J\*5441








Boring No. B-27

## LOG OF BORING AND TEST RESULTS

Date of Boring: 6 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS  
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS  
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

| Sample No. | SAMPLE Depth in Feet |      | STRATON Depth in feet | VISUAL CLASSIFICATION   | Blows per Foot | Symbol Log   | Scale (ft) | UNCONFINED COMP. (qs) (lbs/sq.ft) | WATER CONTENT (percent) | UNIT WEIGHT (lbs./cu.ft.) |       | ATTERBERG LIMITS |      |      |
|------------|----------------------|------|-----------------------|---|----------------|--|------------|-----------------------------------|-------------------------|---------------------------|-------|------------------|------|------|
|            | From                 | To   |                       |   |                |  |            |                                   |                         | DRY                       | WET   | L.L.             | P.L. | P.I. |
| 1          | 0                    | 0.5  | 1.0                   | LOOSE TAN FINE SAND   |                | ***  |            |                                   |                         |                           |       |                  |      |      |
| 2          | 1.5                  | 2.0  | 1.0                   | STIFF TAN & GRAY CLAY W/SAND W/PETROLEUM ODOR                   |                |  |            | 2400                              | 18.1<br>9.0             | 85.4                      | 100.8 |                  |      |      |
| 3          | 3.5                  | 4.0  | 5.0                   | MEDIUM STIFF DARK GRAY CLAY W/SILT                              |                |  |            |                                   |                         |                           |       |                  |      |      |
| 4          | 5.5                  | 6.0  | 7.0                   | MEDIUM STIFF GRAY CLAY (W/PETROLEUM ODOR)                       |                |  | 10         | 1340                              | 23.0                    | 92.7                      | 114.0 |                  |      |      |
| 5          | 7.5                  | 8.0  |                       |   |                |  |            | 1290                              | 23.7                    | 91.0                      | 112.6 |                  |      |      |
| 6          | 9.5                  | 10.0 |                       |   |                |  |            |                                   |                         |                           |       |                  |      |      |
| 7          | 11.5                 | 12.0 | 13.0                  | STIFF GREENISH GRAY & REDDISH TAN SANDY CLAY W/SILT CONCRETIONS |                |  |            | 3120                              | 17.9                    | 102.7                     | 121.1 |                  |      |      |
| 8          | 14.5                 | 15.0 | 18.0                  |   | 18             |  | 20         |                                   |                         |                           |       |                  |      |      |
| 9          | 18.0                 | 19.5 |                       |   | 17             |  |            |                                   |                         |                           |       |                  |      |      |
| 10         | 20.5                 | 22.0 |                       | MEDIUM DENSE GREENISH GRAY FINE SAND                            | 21             |  |            |                                   |                         |                           |       |                  |      |      |
| 11         | 23.5                 | 25.0 | 25.5                  |   |                |  |            |                                   |                         |                           |       |                  |      |      |
| 12         | 29.5                 | 30.0 | 30.0                  | STIFF REDDISH TAN CLAY W/SILT LAYERS                            |                |  | 30         | 955                               | 29.6                    | 84.8                      | 109.9 |                  |      |      |



\*140 lb. hammer dropped 30 in. on 2 in. split spoon sampler after first being seated 6 in.

**REMARKS:**

WATER TABLE AT 4.7' (SEE TEXT)