

## U.S. ARMY CORPS OF ENGINEERS

| DEPTH, FEET                                                                                           |  | SAMPLE NO. | PEN./TORVANE | SPT.-BLOW COUNT | COLOR                  | MATERIAL TYPE | CONSISTENCY | SECONDARY CONSTITUENTS | STRUCTURAL FEATURES AND COMMENTS                          |
|-------------------------------------------------------------------------------------------------------|--|------------|--------------|-----------------|------------------------|---------------|-------------|------------------------|-----------------------------------------------------------|
| BORING NO. <u>99-7</u> DATE: BEGIN <u>4-30-99</u> PAGE <u>L 12</u>                                    |  |            |              |                 |                        |               |             |                        |                                                           |
| JOB NO. <u>1140114808</u> COMPLETE <u>4-30-99</u> Thin Walled Tube                                    |  |            |              |                 |                        |               |             |                        |                                                           |
| PROJECT <u>Neches River Saltwater Barrier</u> <input type="checkbox"/> 3" <input type="checkbox"/> 6" |  |            |              |                 |                        |               |             |                        |                                                           |
| LOCATION <u>N = 876251.93, E = 3543944.37</u>                                                         |  |            |              |                 |                        |               |             |                        |                                                           |
| ELEVATION OF HOLE <u>1.1</u>                                                                          |  |            |              |                 |                        |               |             |                        |                                                           |
| MANUFACTURER'S DESIGNATION OF DRILL RIG <u>DNR75 w/Barrel Track Buggy</u>                             |  |            |              |                 |                        |               |             |                        |                                                           |
| GROUNDWATER: DEPTH <u>4</u> ft., ELEV. <u>        </u> ft., at end of Drilling                        |  |            |              |                 |                        |               |             |                        |                                                           |
| WEATHER <u>Sunny</u>                                                                                  |  |            |              |                 |                        |               |             |                        |                                                           |
| DRILLER <u>Dumpsey Geomars</u> LOGGER <u>Tracy Mestamand</u>                                          |  |            |              |                 |                        |               |             |                        |                                                           |
| 0                                                                                                     |  | 1          | 0.00         |                 | Gray                   | clay          | V. soft     | silt                   | -w/ Sand seams                                            |
|                                                                                                       |  | J 2        | 0.00         |                 | Gray                   | clay          | V. soft     |                        | -w/ decayed wood sample Bulge on extrusion                |
| 5                                                                                                     |  | 3          | 0.00         |                 | Gray                   | clay          | V. soft     |                        | -w/ decayed wood - set 10' of casing DC                   |
|                                                                                                       |  | 4          | 0.00         |                 | Gray                   | clay          | V. soft     |                        | -w/ decayed wood                                          |
|                                                                                                       |  | X 5        | 3            | 4               | Gray                   | sand          | loose       | silt                   | add 5 more ft of casing @ 10' Total casing below mod line |
| 10                                                                                                    |  |            |              |                 |                        |               |             |                        |                                                           |
|                                                                                                       |  | X 6        | 6            | 9               | Gray                   | sand          | M. Dense    |                        | -w/ Pea gravel                                            |
| 15                                                                                                    |  |            |              |                 |                        |               |             |                        |                                                           |
|                                                                                                       |  | X 7        | 5            | 8               | Gray                   | sand          | M. Dense    |                        | -w/ Pea gravel                                            |
| 20                                                                                                    |  |            |              |                 |                        |               |             |                        |                                                           |
|                                                                                                       |  | X 8        | 7            | 15              | Gray                   | sand          | M. Dense    |                        | -w/ Pea gravel                                            |
| 25                                                                                                    |  | 9          | 4.25         |                 | olive gray             | clay          | Hard        | silt                   | -w/ calc nod & fer stains                                 |
|                                                                                                       |  | 10         | 4.25         |                 | Gray                   | clay          | Hard        | silt                   | -w/ Sa sms & fer stains                                   |
|                                                                                                       |  | 11         | 4.5          |                 | Gray & Yellowish Gray  | clay          | Hard        | silt                   | -w/ Sa sms & fer nod & fer stains                         |
| 30                                                                                                    |  | 12         | 1.75         |                 | Yellowish Brown & Gray | clay          | stiff       | silt                   | -w/ fer stains & Sa sms                                   |
|                                                                                                       |  | 13         | 3.00         |                 | Yellowish Brown & Gray | clay          | V. stiff    | silt                   | -w/ fer stains & Sa sms                                   |
| 35                                                                                                    |  | 14         | 3.00         |                 | Yellowish Brown & Gray | clay          | U. stiff    | silt                   | -w/ fer stains & Silty sand layer                         |

(12)

## U.S. ARMY CORPS OF ENGINEERS

| DEPTH, FEET                                                          | SAMPLE NO. | PEN./TORVANE | SPT.-BLOW COUNT | BORING NO. <u>99-7</u> DATE: BEGIN <u>4-30-99</u> PAGE <u>1</u> / <u>2</u>                                                            |               |             |                        |                                  |
|----------------------------------------------------------------------|------------|--------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|------------------------|----------------------------------|
|                                                                      |            |              |                 | JOB NO. <u>1140114808</u> COMPLETE <u>4-30-99</u> Thin Walled Tube <input checked="" type="checkbox"/> 3" <input type="checkbox"/> 6" |               |             |                        |                                  |
| PROJECT <u>Neches River Saltwater Barrier</u>                        |            |              |                 | LOCATION <u>N=876251.03, E=3543944.39</u>                                                                                             |               |             |                        |                                  |
| ELEVATION OF HOLE                                                    |            |              |                 | MANUFACTURER'S DESIGNATION OF DRILL RIG <u>DNR 75 W/Borg - Track Buggy</u>                                                            |               |             |                        |                                  |
| GROUNDWATER: DEPTH <u>4</u> ft., ELEV. _____ ft., at end of Drilling |            |              |                 | WEATHER <u>Sunny</u>                                                                                                                  |               |             |                        |                                  |
| DRILLER <u>Dempsey Gearen</u>                                        |            |              |                 | LOGGER <u>Iraj Mostafaei</u>                                                                                                          |               |             |                        |                                  |
|                                                                      |            |              |                 | COLOR                                                                                                                                 | MATERIAL TYPE | CONSISTENCY | SECONDARY CONSTITUENTS | STRUCTURAL FEATURES AND COMMENTS |
| -35-                                                                 | J 15       |              |                 | Gray & Brown                                                                                                                          | Silt          | Dense       |                        |                                  |
|                                                                      | X 16       | 8 12 15      |                 | Gray & Brown                                                                                                                          | Silt          | Dense       |                        |                                  |
| -40-                                                                 |            |              |                 |                                                                                                                                       |               |             |                        |                                  |
|                                                                      | 17         | 1.5          |                 | Yellowish Brown                                                                                                                       | Clay          | stiff       | silt                   | -w/silt SMS                      |
| -45-                                                                 | 18         | 3.5          |                 | Brown & Gray                                                                                                                          | Clay          | V. stiff    |                        | -w/Fer nod & Fer stains, SLKS    |
|                                                                      | 19         | 3.5          |                 | Reddish Brown & Gray                                                                                                                  | Clay          | V. stiff    |                        | -w/Fer stains, SLKS              |
|                                                                      | 20         | 3.25         |                 | Red & Gray                                                                                                                            | Clay          | V. stiff    |                        | -w/Fer stains, SLKS              |
| -50-                                                                 | 21         | 3.50         |                 | Red & Gray                                                                                                                            | Clay          | V. stiff    |                        | -w/Fer stains, SLKS              |
|                                                                      | 22         | 3.50         |                 | Red & Gray                                                                                                                            | Clay          | V. stiff    |                        | -w/calc nod & Fer stains, SLKS   |
|                                                                      | 23         | 3.50         |                 | Red & Gray                                                                                                                            | Clay          | V. stiff    |                        | -w/calc nod & Fer stains, SLKS   |
| -55-                                                                 | 24         | 3.50         |                 | Red & Gray                                                                                                                            | Clay          | V. stiff    |                        | -w/calc nod & Fer stains, SLKS   |
|                                                                      | 25         | 3.50         |                 | Red & Gray                                                                                                                            | Clay          | V. stiff    |                        | -w/calc nod & Fer stains, SLKS   |
| -60-                                                                 |            |              |                 |                                                                                                                                       |               |             |                        |                                  |
|                                                                      |            |              |                 |                                                                                                                                       |               |             |                        | J: Jar Sample                    |
| -65-                                                                 |            |              |                 |                                                                                                                                       |               |             |                        |                                  |
| -70-                                                                 |            |              |                 |                                                                                                                                       |               |             |                        |                                  |

## SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-98-D-0002 Delivery Order No. 0010

Boring No. 99-7

| S # | Depth<br>(ft) | P P<br>(tsf) | SPT<br>Blows<br>per<br>Foot | Visual<br>Classification                                                        | U S C | Mc<br>(%) | Dry<br>Unit<br>Wt<br>(pcf) | Wet<br>Unit<br>Wt<br>(pcf) | L L<br>(%) | P L<br>(%) | Mechanical Analysis<br>% Passing |       |      |      |      | Specific<br>Gravity | q u<br>(tsf) |
|-----|---------------|--------------|-----------------------------|---------------------------------------------------------------------------------|-------|-----------|----------------------------|----------------------------|------------|------------|----------------------------------|-------|------|------|------|---------------------|--------------|
|     |               |              |                             |                                                                                 |       |           |                            |                            |            |            | #4                               | #10   | #40  | #100 | #200 |                     |              |
| 1   | 0 - 2         | 0.00         |                             | Silty Clay, w/sand seams, Very soft, Gray                                       | C L   | 112.3     |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 2   | 2 - 4         | 0.00         |                             | Clay, w/decayed wood, Very soft, Gray                                           | C H   | 108.9     |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 3   | 4 - 6         | 0.00         |                             | Clay, w/decayed wood, Very soft, Gray                                           | C H   | 101.2     |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 4   | 6 - 8         | 0.00         |                             | Clay, w/decayed wood, Very soft, Gray                                           | C H   | 98.3      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 5   | 8-9.5         |              | 9                           | Sand, w/silt, Loose, Gray                                                       | SP-SM |           |                            |                            |            |            | 99.8                             | 98.1  | 46.5 | 7.8  | 5.7  |                     |              |
| 6   | 13-14.5       |              | 16                          | Sand, w/pea gravel, Medium dense, Gray                                          | SP-SM |           |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 7   | 18-19.5       |              | 17                          | Sand, w/pea gravel, Medium dense, Gray                                          | SP-SM |           |                            |                            |            |            | 100.0                            | 100.0 | 44.9 | 6.3  | 5.2  |                     |              |
| 8   | 23-24.5       |              | 24                          | Sand, w/pea gravel, Medium dense, Gray                                          | SP-SM |           |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 9   | 24.5-26       | 4.25         |                             | Silty Clay, w/calc nod & fer stains, Hard, Olive gray                           | C L   | 17.6      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 10  | 26-28         | 4.25         |                             | Silty Clay, w/fer stains & sand seams, Hard, Gray                               | C L   | 17.5      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 11  | 28-30         | 4.50+        |                             | Silty Clay, w/fer nod & fer stains & sand seams, Hard, Gray & yellowish gray    | C L   | 23.6      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 12  | 30-32         | 1.75         |                             | Silty Clay, w/fer stains & sand seams, Stiff, Yellowish brown & gray            | C L   | 19.7      | 107.3                      | 128.5                      | 28.0       | 16.0       |                                  |       |      |      |      |                     | 1.06         |
| 13  | 32-34         | 3.00         |                             | Silty Clay, w/fer stains & sand seams, Very stiff, Yellowish brown & gray       | C L   | 20.3      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 14  | 34-36         | 3.00         |                             | Silty Clay, w/fer stains & silty sand layer, Very stiff, Yellowish brown & gray | C L   | 20.6      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 15  | 36-38         |              |                             | Silt, Dense, Gray & brown                                                       | M L   |           |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 16  | 38-39.5       |              | 27                          | Silt, Dense, Gray & brown                                                       | M L   |           |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 17  | 42-44         | 1.50         |                             | Silty Clay, w/silt seams, Stiff, Yellowish brown                                | C L   | 22.1      | 102.8                      | 125.5                      | 37.0       | 18.0       |                                  |       |      |      |      |                     |              |
| 18  | 44-46         | 3.50         |                             | Clay, w/fer nod & fer stains, silts, Very stiff, Brown & gray                   | C H   | 32.8      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 19  | 46-48         | 3.50         |                             | Clay, w/fer stains, silts, Very stiff, Reddish Brown & gray                     | C H   | 29.6      |                            |                            |            |            |                                  |       |      |      |      |                     |              |
| 20  | 48-50         | 3.25         |                             | Clay, w/fer stains, silts, Very stiff, Red & gray                               | C H   | 32.3      |                            |                            |            |            |                                  |       |      |      |      |                     |              |

S #: Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content  
q u : Unconfined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

## SUMMARY OF LABORATORY TEST RESULTS

Boring No. 99-7

[illegible]

pc7.excel.ith24.xls

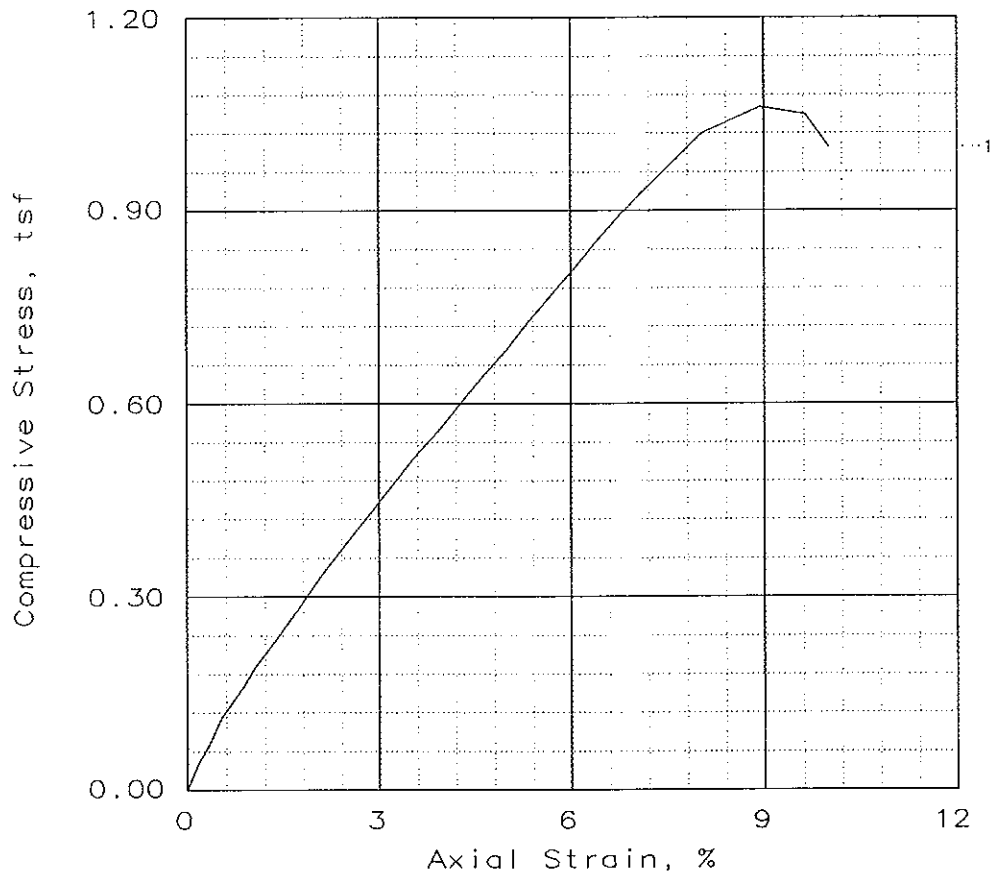
# SUMMARY OF LABORATORY TEST RESULTS

Project: Neches river Saltwater barrier  
Contract No. DACW64-98-D-0002

| Boring No. | S# | Visual Classification                              | U S C | Mechanical Analysis |        |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |
|------------|----|----------------------------------------------------|-------|---------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|
|            |    |                                                    |       | % Passing           |        |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |
|            |    |                                                    |       | #2                  | #1 1/2 | #1    | #1/2  | #3/4  | #3/8  | #4    | #8    | #10   | #16   | #20   | #30  | #40  | #50  | #70  | #100 | #140 | #200 |
| 99-1       | 5  | Sandy Silt,w/decayed wood & sand,very loose,gray   | ML    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.9 | 99.8 | 99.6 | 98.2 | 87.4 | 68.3 | 50.3 |
| 99-1       | 8  | Sand,w/decayed wood & silt,loose, gray             | SP-SM | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.8  | 95.6  | 82.3  | 54.9 | 27.1 | 14.4 | 10.4 | 9.1  | 8.3  | 7.6  |
| 99-2       | 9  | Sand,w/decayed wood,medium dense,gray              | SP    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.6  | 98.2  | 94.7 | 80.1 | 38.6 | 7.6  | 4.3  | 3.7  | 3.3  |
| 99-3       | 8  | Sand,w/pea gravel,medium dense,gray                | SP    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.9  | 99.8  | 98.9  | 96.6  | 90.3 | 74.7 | 43.5 | 5.5  | 1.7  | 1.3  | 1.2  |
| 99-4       | 8  | Silty Sand,w/roots,loose,gray                      | SM    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.9  | 99.3  | 97.4  | 89.7 | 69.7 | 46.7 | 33.0 | 27.8 | 23.7 |      |
| 99-5       | 7  | Sand,medium dense,gray                             | SP    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.5  | 97.3  | 88.3  | 63.6 | 28.4 | 6.7  | 4.5  | 4.0  | 3.7  |      |
| 99-5       | 8  | Sand,w/pea gravel,medium dense,gray                | SP    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 99.6  | 98.9  | 98.4  | 98.1  | 95.7  | 87.7  | 66.6 | 37.6 | 16.1 | 5.6  | 3.7  | 3.3  | 3.1  |
| 99-6       | 11 | Sand,w/decayed wood & pea gravel,medium dense gray | SP    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 99.5  | 98.0  | 97.1  | 91.3  | 83.2  | 69.8 | 53.8 | 31.6 | 10.3 | 6.4  | 5.1  | 3.9  |
| 99-7       | 5  | Sand,w/silt,loose,gray                             | SP-SM | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 99.8  | 98.6  | 98.1  | 95.4  | 87.4  | 69.6 | 46.5 | 28.1 | 13.8 | 7.8  | 6.3  | 5.7  |
| 99-7       | 7  | Sand,w/silt & pea gravel, medium dense, gray       | SP-SM | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 98.7  | 92.3  | 73.1 | 44.9 | 23.0 | 9.9  | 6.3  | 5.6  | 5.2  |
| 99-8       | 5  | Sand,w/pea gravel, loose, gray                     | SP    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 99.7  | 98.8  | 98.1  | 93.0  | 79.7  | 53.1 | 28.1 | 18.1 | 10.6 | 6.3  | 5.4  | 4.9  |
| 99-8       | 7  | Sand, w/decayed wood & gravel,medium dense, gray   | SP-SM | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.8  | 98.5  | 91.2  | 77.4  | 54.4 | 32.2 | 17.8 | 10.2 | 8.1  | 7.1  | 6.5  |
| 99-8       | 15 | Clayey Silt,w/sand,medium dense,yellowish gray     | ML    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.9 | 99.9 | 99.8 | 99.5 | 93.3 | 82.2 | 64.6 |
| 99-10      | 6  | Sand,loose,gray                                    | SP-SM | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 98.2  | 92.6  | 78.6 | 50.2 | 27.4 | 14.1 | 8.4  | 6.5  | 5.4  |
| 99-10      | 8  | Sand,w/silt,clay pockets,medium dense,gray         | SP-SM | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 98.1  | 91.3  | 71.5 | 42.1 | 20.2 | 10.9 | 9.0  | 8.0  | 7.2  |
| 99-10      | 13 | Silt,medium dense,yelllowish brown & gray          | ML    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.9 | 99.9 | 99.9 | 99.9 | 99.9 | 99.8 | 98.7 |
| 99-11      | 6  | Sity Sand,medium dense,gray                        | SM    | 100.0               | 100.0  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.9 | 99.3 | 96.4 | 76.6 | 32.5 | 18.7 | 14.3 |

S#: Sample Number, U S C: Unified Soil Classification

# UNCONFINED COMPRESSION TEST



|                               |        |  |  |  |
|-------------------------------|--------|--|--|--|
| SAMPLE NO.:                   | 1      |  |  |  |
| Unconfined strength, tsf      | 1.06   |  |  |  |
| Undrained shear strength, tsf | 0.53   |  |  |  |
| Failure strain, %             | 8.9    |  |  |  |
| Strain rate, %/min            | 1.07   |  |  |  |
| Water content, %              | 19.7   |  |  |  |
| Wet density, pcf              | 128.5  |  |  |  |
| Dry density, pcf              | 107.3  |  |  |  |
| Saturation, %                 | 94.4   |  |  |  |
| Void ratio                    | 0.5588 |  |  |  |
| Specimen diameter, in         | 2.83   |  |  |  |
| Specimen height, in           | 5.60   |  |  |  |
| Height/diameter ratio         | 1.98   |  |  |  |

Description: Silty Clay, w/fer stains & so sms, S, Yish Bn & Gy

LL = 28    PL = 16    PI = 12    ASS. GS = 2.68    Type: Undisturbed

Project No.: 1140114810

Date: 6-04-99

Remarks:

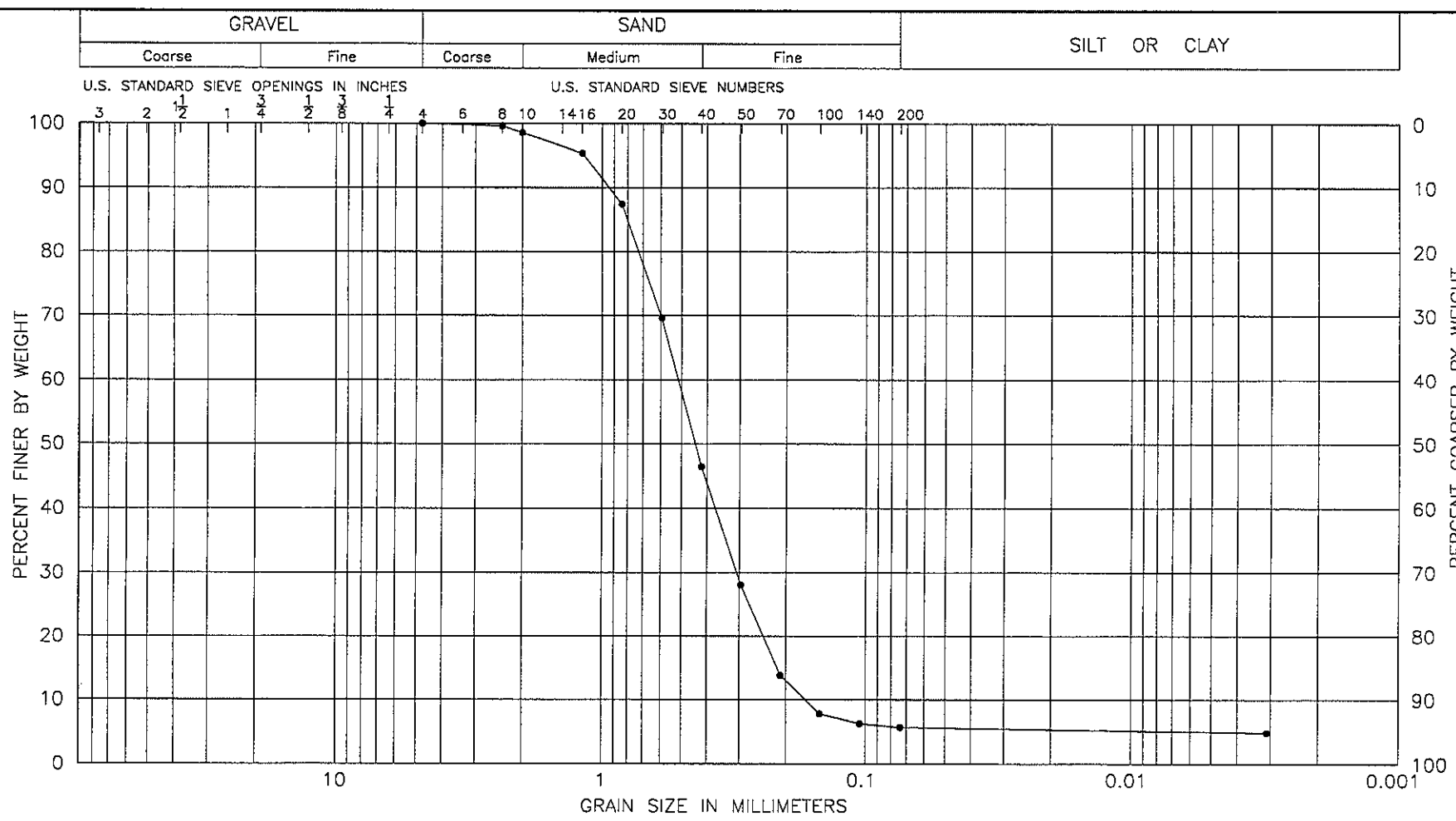
Assumed Specific gravity

Fig. No.: \_\_\_\_\_

Client: U.S Army Corps of Engineers  
Galveston office District  
Project: Neches River Saltwater Barrier

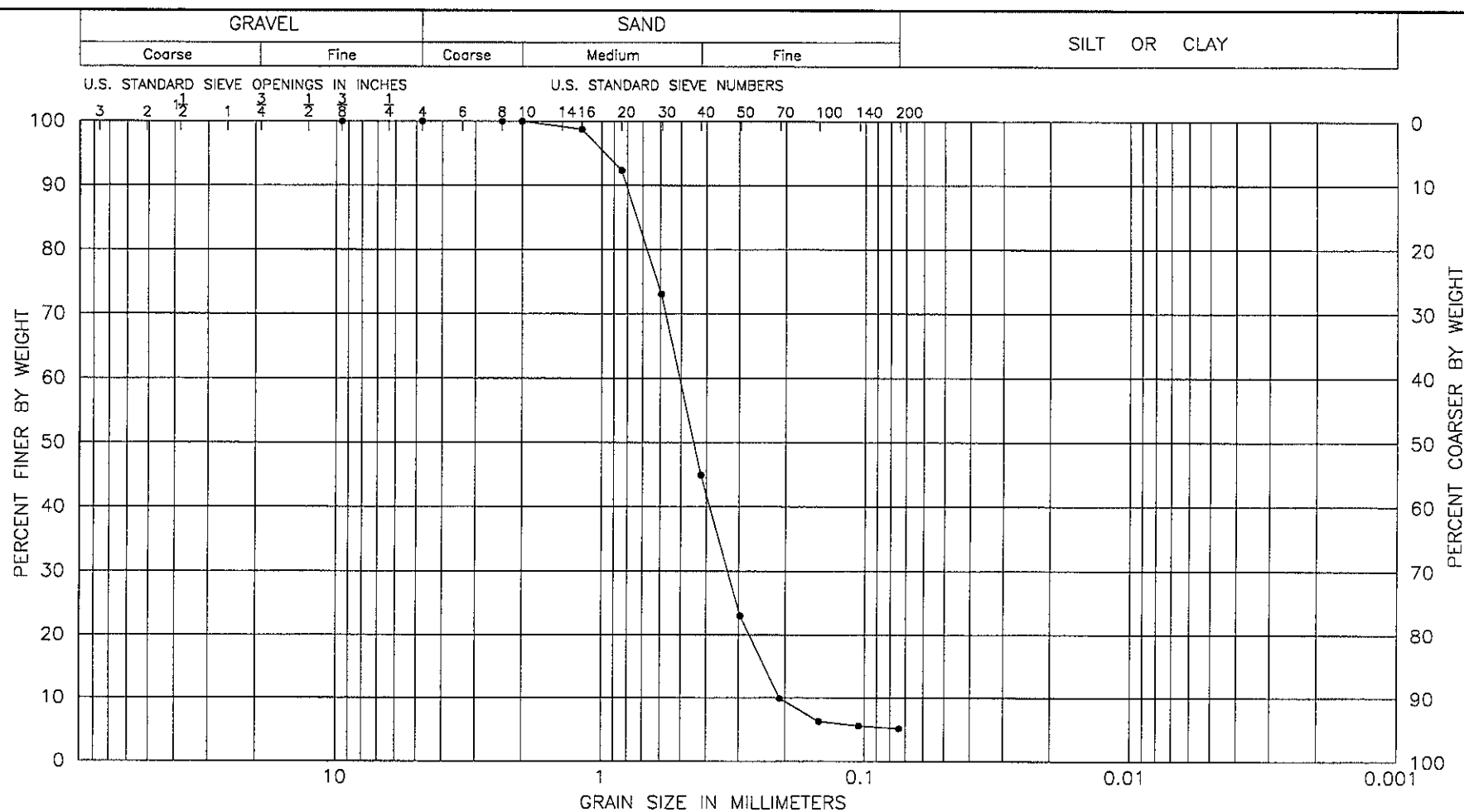
Location: Boring No. 99-7  
Sample No. 12    Depth: 30-32 ft

UNCONFINED COMPRESSION TEST  
**GEOTEST ENGINEERING, INC.**



| LEGEND | BORING NO. | SAMPLE NO. | DEPTH FT. | SAMPLE DESCRIPTION        |
|--------|------------|------------|-----------|---------------------------|
| •••••  | 99-7       | 5          | 8-9.5     | Sand, w/silt, loose, gray |

GRAIN SIZE DISTRIBUTION CURVES



| LEGEND | BORING NO. | SAMPLE NO. | DEPTH FT. | SAMPLE DESCRIPTION                            |
|--------|------------|------------|-----------|-----------------------------------------------|
| •••••  | 99-7       | 7          | 18-19.5   | Sand, w/silt & pea gravel, medium dense, gray |

GRAIN SIZE DISTRIBUTION CURVES