# SUMMARY OF LABORATORY TESTS

Project No. 08.18.920

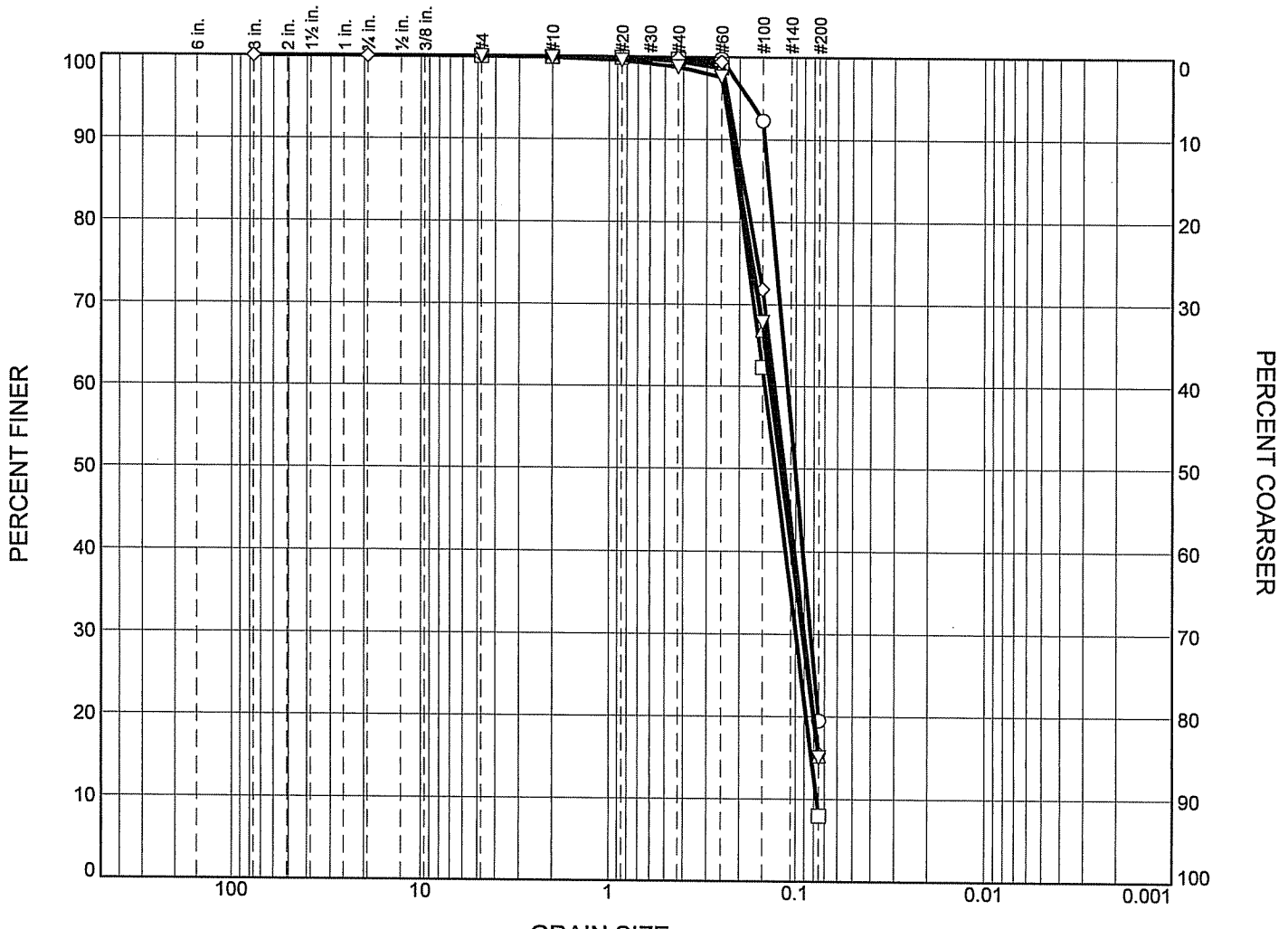
Client: United States Army Corps of Engineers

Project: Galveston Channel and San Jacinto PA
Contract No. DACW64-03-D-0008, Task Order No. 0080

| Boring No. | Sample No. | Depth (ft) | Torvane Shear Test (tsf) | Soil Description | USCS | Water Content (%) | Dry Density (pcf) | Liquid Limit | Plastic Limit | Plast. Index | Finer than #200 Sieve (%) | Uc/UU. Compr. (tsf) | Failure Strain (%) | Conf. Pres. (psi) | Failure Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 18-20 | | Gray and tan FAT CLAY | CH | 53.7 | 67.1 | | | | | | | | |
| 07-204 | | | | | | | | | | | | | | | |
| | 1 | 0-2 | | Gray and tan FAT CLAY | CH | 57.0 | 62.8 | | | | | | | | |
| | 2 | 2-4 | | Gray FAT CLAY | CH | 44.8 | 69.4 | 89 | 26 | 63 | 91.0 | 0.55 | 4.0 | | Slickensided |
| | 3 | 4-6 | | Gray and tan FAT CLAY | CH | 40.1 | 71.7 | | | | | 0.93 | 4.4 | 4.0 | Vertical shear |
| | 4 | 6-7.5 | | Light gray and tan poorly graded SAND with SILT | SP-SM | | | | | | 8.0 | | | | |
| | 5 | 10-12 | | Gray FAT CLAY | CH | 69.1 | 60.0 | | | | | | | | |
| | 6 | 12-14 | 0.14 | Gray FAT CLAY | CH | 77.5 | 60.3 | 69 | 24 | 45 | 98.5 | | | | |
| | 7 | 14-16 | | Gray FAT CLAY | CH | 44.5 | 72.5 | | | | | | | | |
| | 8 | 16-18 | | Gray FAT CLAY | CH | 54.8 | 62.3 | | | | | | | | |
| | 9 | 18-20 | | Gray FAT CLAY | CH | 40.5 | 77.1 | | | | | | | | |
| 07-205 | | | | | | | | | | | | | | | |
| | 1 | 0-2 | | Gray and tan FAT CLAY | CH | 51.8 | 64.7 | | | | | | | | |
| | 2 | 2-4 | | Gray FAT CLAY | CH | 43.5 | 72.6 | 114 | 31 | 83 | 94.9 | 0.57 | 3.4 | | Multiple shear |
| | 3 | 4-6 | | Gray and tan FAT CLAY | CH | 48.7 | 71.5 | | | | | | | | |
| | 4 | 6-7.5 | | Gray and tan SAND with SILT | SP-SM | | | | | | 7.2 | | | | |
| | 5 | 11-12.5 | | Gray and tan FAT CLAY | CH | 50.8 | | | | | | | | | |
| | 6 | 12.5-14 | 0.11 | Gray FAT CLAY | CH | 55.1 | 65.4 | 56 | 19 | 37 | 96.1 | | | | |
| | 7 | 14-16 | | Gray FAT CLAY | CH | 43.9 | 69.3 | | | | | | | | |
| | 8 | 16-18 | | Gray and tan FAT CLAY | CH | 45.4 | 72.3 | | | | | | | | |
| | 9 | 18-20 | | Gray FAT CLAY | CH | 34.4 | 79.8 | | | | | | | | |
| 07-206 | | | | | | | | | | | | | | | |
| | 1 | 0-2 | | Gray and tan FAT CLAY | CH | 55.9 | 64.9 | | | | | | | | |
| | 2 | 2-4 | | Gray FAT CLAY | CH | 51.8 | 67.4 | 98 | 30 | 68 | 95.9 | 0.34 | 2.6 | | Multiple shear |
| | 3 | 4-6 | | Gray and tan FAT CLAY | CH | 54.0 | 64.4 | | | | | 0.76 | 4.1 | 4.0 | Multiple shear |
| | 4 | 6-8 | | Gray and tan FAT CLAY | CH | 55.3 | 66.8 | | | | | | | | |
| | 5 | 8-9.5 | | Tan and gray SILTY SAND | SM | | | | | | 15.2 | | | | |
| | 6 | 13-14.5 | | Gray SILTY SAND | SM | | | | | | 24.4 | | | | |
| | 7 | 15-17 | 0.47 | Gray FAT CLAY | CH | 49.0 | 71.2 | 73 | 23 | 50 | 98.7 | | | | |
| | 8 | 17-19 | | Gray FAT CLAY | CL | 74.6 | 54.9 | | | | | | | | |
| | 9 | 19-20 | | Gray and tan FAT CLAY | CH | 49.1 | 71.1 | | | | | | | | |
| 07-207 | | | | | | | | | | | | | | | |
| | 1 | 0-2 | | Gray and tan FAT CLAY | CH | 8.6 | 94.9 | | | | | | | | |
| | 2 | 2-4 | | Gray FAT CLAY | CH | 52.5 | 66.1 | 90 | 29 | 61 | 98.2 | 0.23 | 4.0 | | Multiple shear |
| | 3 | 4-6 | | Gray and tan FAT CLAY | CH | 66.6 | 60.8 | | | | | 0.40 | 3.7 | | 45 degree |
| | 4 | 6-8 | 0.32 | Gray FAT CLAY | CH | 54.4 | 64.8 | 94 | 29 | 65 | 92.3 | 0.51 | 4.4 | | 45 degree |
| | 5 | 8-9.5 | | Gray and tan SILTY SAND | SM | | | | | | 14.2 | | | | |

Our letters and reports are for the exclusive use of the CLIENT. This document shall not be reproduced, except in full, without our prior written approval.

# Particle Size Analysis - ASTM D 422



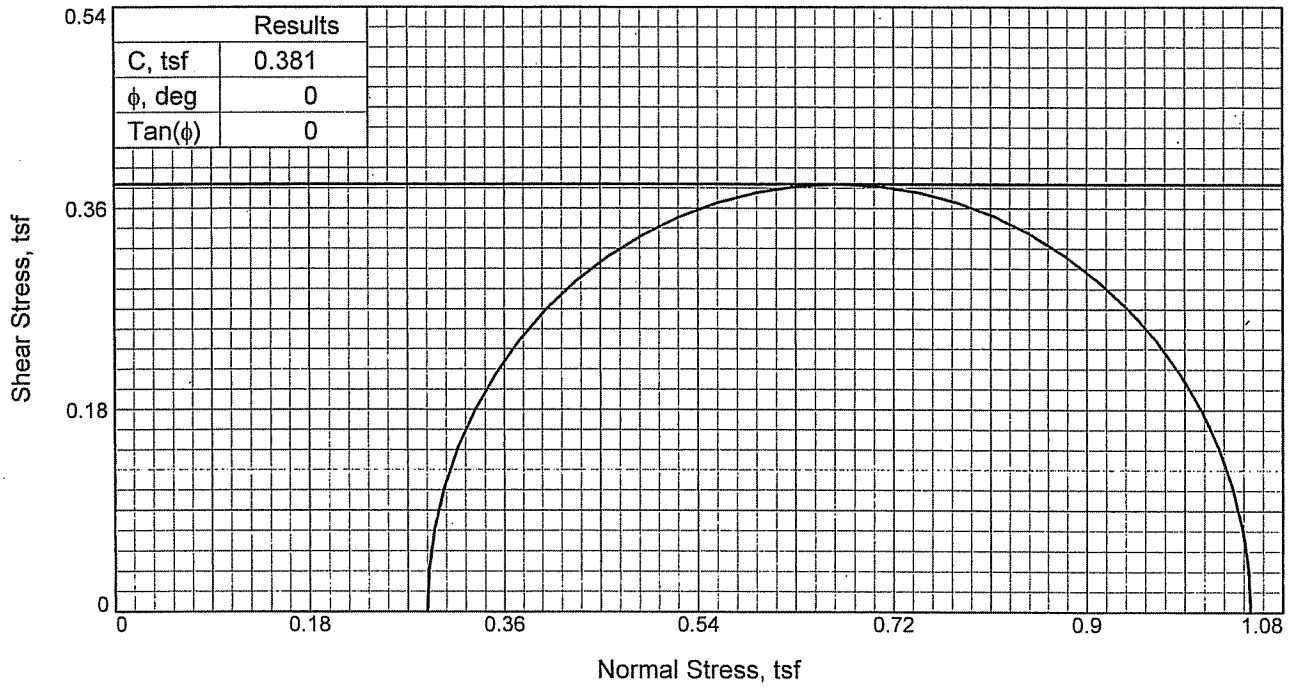

| | % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|---|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| ○ | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 80.4 | 19.5 | |
| □ | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 91.7 | 8.0 | |
| △ | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 84.3 | 15.2 | |
| ◇ | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 84.3 | 15.5 | |
| ▽ | 0.0 | 0.0 | 0.0 | 0.1 | 1.1 | 83.8 | 15.0 | |

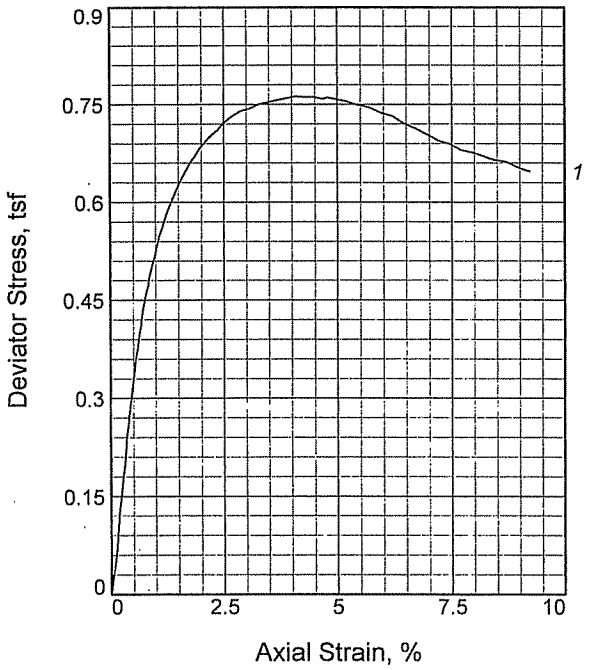
## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | Material Description | USCS |
|---|---|---|---|---|---|
| ○ | 07-203 | 6 | 10-11.5 | Tan and gray SILTY SAND | SM |
| □ | 07-204 | 4 | 6-7.5 | Light gray and tan poorly graded SAND with SILT | SP-SM |
| △ | 07-206 | 5 | 8-9.5 | Tan and gray SILTY SAND | SM |
| ◇ | 07-208 | 5 | 8-9.5 | Gray and tan SILTY SAND | SM |
| ▽ | 07-208 | 7 | 16.5-18 | Gray SILTY SAND | SM |

**Tolunay-Wong Engineers, Inc.**
**Houston, Texas**

**Client:** United States Army Corps of Engineers
**Project:** Galveston Channel and San Jacinto PA
Contract No. DACW64-03-D-0008, Task Order No. 0080
**Project No.:** 08.18.920
**Figure**




| Sample No. | | 1 |
|---|---|---|
| Initial | Water Content, % | 54.0 |
| | Dry Density, pcf | 64.5 |
| | Saturation, % | 90.2 |
| | Void Ratio | 1.6150 |
| | Diameter, in. | 2.71 |
| | Height, in. | 5.62 |
| At Test | Water Content, % | 53.2 |
| | Dry Density, pcf | 64.5 |
| | Saturation, % | 89.0 |
| | Void Ratio | 1.6150 |
| | Diameter, in. | 2.71 |
| | Height, in. | 5.62 |
| Strain rate, %/min. | | 1.00 |
| Back Pressure, tsf | | 0.00 |
| Cell Pressure, tsf | | 0.29 |
| Fail. Stress, tsf | | 0.76 |
| Ult. Stress, tsf | | |
| $\sigma_1$ Failure, tsf | | 1.05 |
| $\sigma_3$ Failure, tsf | | 0.29 |

**Type of Test:**
Unconsolidated Undrained

**Sample Type:** Undisturbed

**Description:** Gray and tan FAT CLAY

**Assumed Specific Gravity=** 2.70

**Remarks:**
Test method: ASTM D 2850
Pocket pen; tsf: 1.00
Failure type: Multiple shear

**Client:** United States Army Corps of Engineers

**Project:** Galveston Channel and San Jacinto PA Contract No. DACW64-03-D-0008, Task Order No. 0080

**Source of Sample:** 07-206 **Depth:** 4-6

**Sample Number:** 3

**Proj. No.:** 08.18.920 **Date Sampled:** 7/29/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

# TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

8/8/2008
11:10 AM

**Date:** 7/29/08
**Client:** United States Army Corps of Engineers
**Project:** Galveston Channel and San Jacinto PA Contract No. DACW64-03-D-0008, Task Order No. 0080
**Project No.:** 08.18.920
**Location:** 07-206
**Depth:** 4-6 **Sample Number:** 3
**Description:** Gray and tan FAT CLAY
**Remarks:**
Test method: ASTM D 2850
Pocket pen; tsf: 1.00
Failure type: Multiple shear
**Type of Sample:** Undisturbed
**Assumed Specific Gravity=**2.70 **LL=** **PL=** **PI=**
**Test Method:** ASTM D 2850

## Parameters for Specimen No. 1

| Specimen Parameter | Initial | Final |
|---|---|---|
| Moisture content: Moist soil+tare, gms. | 104.750 | 105.900 |
| Moisture content: Dry soil+tare, gms. | 78.730 | 79.710 |
| Moisture content: Tare, gms. | 30.520 | 30.490 |
| Moisture, % | 54.0 | 53.2 |
| Moist specimen weight, gms. | 841.9 | |
| Diameter, in. | 2.71 | |
| Area, in.$^2$ | 5.75 | |
| Height, in. | 5.62 | |
| Wet Density, pcf | 99.2 | |
| Dry density, pcf | 64.5 | |
| Void ratio | 1.6150 | |
| Saturation, % | 90.2 | |

## Test Readings for Specimen No. 1

**Membrane modulus =** .130 kN/cm$^2$
**Membrane thickness =** .031 cm
**Cell pressure =** 4.00 psi (0.288 tsf)
**Back pressure =** 0.00 psi (0.000 tsf)
**Strain rate, %/min. =** 1.00
**Fail. Stress =** 0.762 tsf **at reading no.** 56

## Test Readings for Specimen No. 1

| No. | Def. Dial in. | Load Dial | Load lbs. | Strain % | Deviator Stress tsf | Minor Princ. Stress tsf | Major Princ. Stress tsf | 1:3 Ratio | P tsf | Q tsf |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.3190 | 0.000 | 0.0 | 0.0 | 0.000 | 0.288 | 0.288 | 1.00 | 0.288 | 0.000 |
| 1 | 0.3260 | 5.120 | 5.1 | 0.1 | 0.064 | 0.288 | 0.352 | 1.22 | 0.320 | 0.032 |
| 2 | 0.3277 | 7.198 | 7.2 | 0.2 | 0.090 | 0.288 | 0.378 | 1.31 | 0.333 | 0.045 |
| 3 | 0.3290 | 8.919 | 8.9 | 0.2 | 0.112 | 0.288 | 0.400 | 1.39 | 0.344 | 0.056 |
| 4 | 0.3302 | 10.429 | 10.4 | 0.2 | 0.130 | 0.288 | 0.418 | 1.45 | 0.353 | 0.065 |
| 5 | 0.3320 | 11.847 | 11.8 | 0.2 | 0.148 | 0.288 | 0.436 | 1.51 | 0.362 | 0.074 |
| 6 | 0.3332 | 13.332 | 13.3 | 0.3 | 0.167 | 0.288 | 0.455 | 1.58 | 0.371 | 0.083 |
| 7 | 0.3344 | 14.404 | 14.4 | 0.3 | 0.180 | 0.288 | 0.468 | 1.62 | 0.378 | 0.090 |
| 8 | 0.3363 | 15.922 | 15.9 | 0.3 | 0.199 | 0.288 | 0.487 | 1.69 | 0.387 | 0.099 |
| 9 | 0.3375 | 17.581 | 17.6 | 0.3 | 0.220 | 0.288 | 0.508 | 1.76 | 0.398 | 0.110 |
| 10 | 0.3388 | 19.304 | 19.3 | 0.4 | 0.241 | 0.288 | 0.529 | 1.84 | 0.409 | 0.121 |
| 11 | 0.3407 | 20.762 | 20.8 | 0.4 | 0.259 | 0.288 | 0.547 | 1.90 | 0.418 | 0.130 |
| 12 | 0.3419 | 21.951 | 22.0 | 0.4 | 0.274 | 0.288 | 0.562 | 1.95 | 0.425 | 0.137 |
| 13 | 0.3431 | 23.035 | 23.0 | 0.4 | 0.287 | 0.288 | 0.575 | 2.00 | 0.432 | 0.144 |
| 14 | 0.3450 | 24.176 | 24.2 | 0.5 | 0.301 | 0.288 | 0.589 | 2.05 | 0.439 | 0.151 |
| 15 | 0.3462 | 25.419 | 25.4 | 0.5 | 0.317 | 0.288 | 0.605 | 2.10 | 0.446 | 0.158 |
| 16 | 0.3480 | 26.822 | 26.8 | 0.5 | 0.334 | 0.288 | 0.622 | 2.16 | 0.455 | 0.167 |
| 17 | 0.3492 | 27.971 | 28.0 | 0.5 | 0.349 | 0.288 | 0.637 | 2.21 | 0.462 | 0.174 |
| 18 | 0.3504 | 29.055 | 29.1 | 0.6 | 0.362 | 0.288 | 0.650 | 2.26 | 0.469 | 0.181 |
| 19 | 0.3523 | 30.018 | 30.0 | 0.6 | 0.374 | 0.288 | 0.662 | 2.30 | 0.475 | 0.187 |
| 20 | 0.3535 | 31.023 | 31.0 | 0.6 | 0.386 | 0.288 | 0.674 | 2.34 | 0.481 | 0.193 |
| 21 | 0.3547 | 31.858 | 31.9 | 0.6 | 0.397 | 0.288 | 0.685 | 2.38 | 0.486 | 0.198 |
| 22 | 0.3566 | 32.987 | 33.0 | 0.7 | 0.411 | 0.288 | 0.699 | 2.43 | 0.493 | 0.205 |
| 23 | 0.3578 | 33.910 | 33.9 | 0.7 | 0.422 | 0.288 | 0.710 | 2.47 | 0.499 | 0.211 |
| 24 | 0.3590 | 34.953 | 35.0 | 0.7 | 0.435 | 0.288 | 0.723 | 2.51 | 0.505 | 0.217 |
| 25 | 0.3609 | 35.678 | 35.7 | 0.7 | 0.444 | 0.288 | 0.732 | 2.54 | 0.510 | 0.222 |
| 26 | 0.3621 | 36.366 | 36.4 | 0.8 | 0.452 | 0.288 | 0.740 | 2.57 | 0.514 | 0.226 |
| 27 | 0.3633 | 37.020 | 37.0 | 0.8 | 0.460 | 0.288 | 0.748 | 2.60 | 0.518 | 0.230 |
| 28 | 0.3652 | 37.696 | 37.7 | 0.8 | 0.468 | 0.288 | 0.756 | 2.63 | 0.522 | 0.234 |
| 29 | 0.3664 | 38.481 | 38.5 | 0.8 | 0.478 | 0.288 | 0.766 | 2.66 | 0.527 | 0.239 |
| 30 | 0.3676 | 39.267 | 39.3 | 0.9 | 0.488 | 0.288 | 0.776 | 2.69 | 0.532 | 0.244 |
| 31 | 0.3695 | 40.060 | 40.1 | 0.9 | 0.497 | 0.288 | 0.785 | 2.73 | 0.537 | 0.249 |
| 32 | 0.3719 | 40.958 | 41.0 | 0.9 | 0.508 | 0.288 | 0.796 | 2.76 | 0.542 | 0.254 |
| 33 | 0.3750 | 42.073 | 42.1 | 1.0 | 0.522 | 0.288 | 0.810 | 2.81 | 0.549 | 0.261 |
| 34 | 0.3762 | 42.745 | 42.7 | 1.0 | 0.530 | 0.288 | 0.818 | 2.84 | 0.553 | 0.265 |
| 35 | 0.3781 | 43.424 | 43.4 | 1.1 | 0.538 | 0.288 | 0.826 | 2.87 | 0.557 | 0.269 |
| 36 | 0.3793 | 44.076 | 44.1 | 1.1 | 0.546 | 0.288 | 0.834 | 2.90 | 0.561 | 0.273 |
| 37 | 0.3824 | 44.803 | 44.8 | 1.1 | 0.555 | 0.288 | 0.843 | 2.93 | 0.565 | 0.277 |
| 38 | 0.3896 | 47.301 | 47.3 | 1.3 | 0.585 | 0.288 | 0.873 | 3.03 | 0.581 | 0.293 |
| 39 | 0.3950 | 48.670 | 48.7 | 1.4 | 0.602 | 0.288 | 0.890 | 3.09 | 0.589 | 0.301 |
| 40 | 0.4010 | 50.155 | 50.2 | 1.5 | 0.619 | 0.288 | 0.907 | 3.15 | 0.598 | 0.310 |
| 41 | 0.4064 | 51.354 | 51.4 | 1.6 | 0.633 | 0.288 | 0.921 | 3.20 | 0.605 | 0.317 |
| 42 | 0.4119 | 52.434 | 52.4 | 1.7 | 0.646 | 0.288 | 0.934 | 3.24 | 0.611 | 0.323 |
| 43 | 0.4179 | 53.659 | 53.7 | 1.8 | 0.660 | 0.288 | 0.948 | 3.29 | 0.618 | 0.330 |
| 44 | 0.4234 | 54.466 | 54.5 | 1.9 | 0.670 | 0.288 | 0.958 | 3.33 | 0.623 | 0.335 |
| 45 | 0.4294 | 55.522 | 55.5 | 2.0 | 0.682 | 0.288 | 0.970 | 3.37 | 0.629 | 0.341 |
| 46 | 0.4408 | 56.960 | 57.0 | 2.2 | 0.698 | 0.288 | 0.986 | 3.42 | 0.637 | 0.349 |

## Test Readings for Specimen No. 1

| No. | Def. Dial in. | Load Dial | Load lbs. | Strain % | Deviator Stress tsf | Minor Princ. Stress tsf | Major Princ. Stress tsf | 1:3 Ratio | P tsf | Q tsf |
|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 0.4522 | 58.135 | 58.1 | 2.4 | 0.711 | 0.288 | 0.999 | 3.47 | 0.644 | 0.356 |
| 48 | 0.4576 | 58.842 | 58.8 | 2.5 | 0.719 | 0.288 | 1.007 | 3.50 | 0.648 | 0.360 |
| 49 | 0.4691 | 59.939 | 59.9 | 2.7 | 0.731 | 0.288 | 1.019 | 3.54 | 0.653 | 0.365 |
| 50 | 0.4806 | 60.766 | 60.8 | 2.9 | 0.739 | 0.288 | 1.027 | 3.57 | 0.658 | 0.370 |
| 51 | 0.4920 | 61.223 | 61.2 | 3.1 | 0.743 | 0.288 | 1.031 | 3.58 | 0.660 | 0.372 |
| 52 | 0.5034 | 61.883 | 61.9 | 3.3 | 0.750 | 0.288 | 1.038 | 3.60 | 0.663 | 0.375 |
| 53 | 0.5142 | 62.263 | 62.3 | 3.5 | 0.753 | 0.288 | 1.041 | 3.61 | 0.664 | 0.376 |
| 54 | 0.5257 | 62.669 | 62.7 | 3.7 | 0.756 | 0.288 | 1.044 | 3.63 | 0.666 | 0.378 |
| 55 | 0.5371 | 63.042 | 63.0 | 3.9 | 0.759 | 0.288 | 1.047 | 3.64 | 0.668 | 0.380 |
| 56 | 0.5486 | 63.450 | 63.4 | 4.1 | 0.762 | 0.288 | 1.050 | 3.65 | 0.669 | 0.381 |
| 57 | 0.5600 | 63.498 | 63.5 | 4.3 | 0.761 | 0.288 | 1.049 | 3.64 | 0.669 | 0.381 |
| 58 | 0.5716 | 63.613 | 63.6 | 4.5 | 0.761 | 0.288 | 1.049 | 3.64 | 0.669 | 0.381 |
| 59 | 0.5830 | 63.522 | 63.5 | 4.7 | 0.758 | 0.288 | 1.046 | 3.63 | 0.667 | 0.379 |
| 60 | 0.5884 | 63.788 | 63.8 | 4.8 | 0.761 | 0.288 | 1.049 | 3.64 | 0.668 | 0.380 |
| 61 | 0.5998 | 63.680 | 63.7 | 5.0 | 0.758 | 0.288 | 1.046 | 3.63 | 0.667 | 0.379 |
| 62 | 0.6112 | 63.558 | 63.6 | 5.2 | 0.755 | 0.288 | 1.043 | 3.62 | 0.665 | 0.377 |
| 63 | 0.6257 | 63.237 | 63.2 | 5.5 | 0.749 | 0.288 | 1.037 | 3.60 | 0.663 | 0.375 |
| 64 | 0.6395 | 63.102 | 63.1 | 5.7 | 0.746 | 0.288 | 1.034 | 3.59 | 0.661 | 0.373 |
| 65 | 0.6534 | 62.568 | 62.6 | 5.9 | 0.737 | 0.288 | 1.025 | 3.56 | 0.657 | 0.369 |
| 66 | 0.6679 | 62.293 | 62.3 | 6.2 | 0.732 | 0.288 | 1.020 | 3.54 | 0.654 | 0.366 |
| 67 | 0.6817 | 61.515 | 61.5 | 6.5 | 0.721 | 0.288 | 1.009 | 3.50 | 0.648 | 0.360 |
| 68 | 0.6962 | 61.000 | 61.0 | 6.7 | 0.713 | 0.288 | 1.001 | 3.48 | 0.644 | 0.356 |
| 69 | 0.7100 | 60.412 | 60.4 | 7.0 | 0.704 | 0.288 | 0.992 | 3.45 | 0.640 | 0.352 |
| 70 | 0.7244 | 59.714 | 59.7 | 7.2 | 0.694 | 0.288 | 0.982 | 3.41 | 0.635 | 0.347 |
| 71 | 0.7383 | 59.464 | 59.5 | 7.5 | 0.689 | 0.288 | 0.977 | 3.39 | 0.633 | 0.345 |
| 72 | 0.7527 | 58.823 | 58.8 | 7.7 | 0.680 | 0.288 | 0.968 | 3.36 | 0.628 | 0.340 |
| 73 | 0.7665 | 58.646 | 58.6 | 8.0 | 0.676 | 0.288 | 0.964 | 3.35 | 0.626 | 0.338 |
| 74 | 0.7804 | 58.294 | 58.3 | 8.2 | 0.670 | 0.288 | 0.958 | 3.33 | 0.623 | 0.335 |
| 75 | 0.7949 | 57.965 | 58.0 | 8.5 | 0.665 | 0.288 | 0.953 | 3.31 | 0.620 | 0.332 |
| 76 | 0.8087 | 57.898 | 57.9 | 8.7 | 0.662 | 0.288 | 0.950 | 3.30 | 0.619 | 0.331 |
| 77 | 0.8231 | 57.265 | 57.3 | 9.0 | 0.653 | 0.288 | 0.941 | 3.27 | 0.615 | 0.327 |
| 78 | 0.8370 | 56.923 | 56.9 | 9.2 | 0.647 | 0.288 | 0.935 | 3.25 | 0.612 | 0.324 |

Hole No. 07-206

| BORING LOG | DISTRICT | INSTALLATION | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT<br>Galveston Channel and San Jacinto PA | 7. ELEVATION OF HOLE |
| 2. LOCATION (Coordinates or Station)<br>N=13691719 E=3317093 | 8. DATUM FOR ELEVATION |
| 3. DRILLING AGENCY<br>Dempsey (Geotest Engineering, Inc.) | 9. ELEVATION OF GROUNDWATER<br>TOD: 24-HR: |
| 4. LABORATORY TESTING AGENCY<br>Tolunay-Wong Engineers, Inc. | 10. DRILLING DATE and TIME<br>STARTED: 4/17/08 COMPLETED: 4/17/08 |
| 5. DEPTH OF WATER<br>TOD: 24-HR: | 11. CLASSIFICATION REFERENCE |
| 6. DEPTH OF HOLE<br>20 ft | 12. ENGINEER |

| DEPTH (ft) | ELEVATION (ft) | GRAPHIC LOG | MATERIAL DESCRIPTION | SAMPLE TYPE | NUMBER | RECOVERY (%) | SPT (N) | PENETROMETER (tsf) | DRY UNIT WT. (pcf) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PLASTICITY INDEX | FINES CONTENT (% <200) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **FAT CLAY(CH)**, very soft, brown & gray | | 1 | | | 0.25 | 64.9 | 55.9 | | | | |
| | | | | | 2 | | | 0.25 | 67.4 | 51.8 | 98 | 30 | 68 | 95.9 |
| 5 | | | -soft @ 4' - 6' | | 3 | | | 0.50 | 64.4 | 54.0 | | | | |
| | | | -firm below 6' | | 4 | | | 0.75 | 66.8 | 55.3 | | | | |
| | | | **SILTY SAND (SM)**, very loose, gray | | 5 | | 6 | | | | | | | 15.2 |
| 10 | | | | | | | | | | | | | | |
| | | | | | 6 | | 9 | | | | | | | 24.4 |
| 15 | | | **FAT CLAY(CH)**, very soft, gray | | 7 | | | 0.0 | 71.2 | 49.0 | 73 | 23 | 50 | 98.7 |
| | | | -w/ sand seams @ 18' | | 8 | | | 0.25 | 54.9 | 74.6 | | | | |
| | | | -soft, brown below 19' | | 9 | | | 0.50 | 71.1 | 49.1 | | | | |
| 20 | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | |

SWG 1836 BOR 08.18.920.GPJ TOLUNAY-WONG ENGINEERS.GDT 11/10/08

ENG FORM: SWG 1836 BOR