# FIELD BORING LOG

N13353278.20 E2824975.67

PROJECT NO: 03-859-019

PROJECT NAME: C.O.E. Matagorda Island

CLIENT: C.O.E

DRILL CONTRACTOR: Triangle

BORING NO: 04-194

DATE: 9-20-04

TECHNICIAN: C.M

DRILL EQUIPMENT: Barge

WATER LEVEL DATA:

| TIME (MIN) | T.O.W. (FT) | T.O. | TIME |
|---|---|---|---|
| 5 | water Depth | @ 11:55 | 8.5' |
| 10 | | | |
| 15 | | | |
| E.O.D. | | | |
| 24 HOURS | | | |

FREE WATER DEPTH:

METHOD OF ADVANCE:

AUGER ____ TO ____

WASH 0 TO 50'

TIME BORING BEGAN: 12:01

TIME BORING END: 3:22

| | DEPTH(FT) | SAMPLE SYMBOL | CORE(C) JAR(J) BAG (B) | HAND PENETROMETER READING/ BLOW COUNT | RECOVERY IN INCHES | CONSISTENCY | COLOR | MINOR MATERIAL | MAJOR MATERIAL | CHARACTERISTICS OR MODIFICATIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | X | J | 3,12,11 | 18 | Mdde | G/T SM | Si | Sa | shell fragments |
| 2 | 5 | X | J | 3,6,5 | 14 | MDE | G/T SM | Si | Sa | |
| 3 | 10 | X | J | 5,5,5 | 17 | LO SP-SM | G | Si | Sa | shell fragments (heavy layers |
| 4 | 15 | X | J | 8,28,42 | | VDE | G SP-SM | | Sa | shell fragments |
| 5 | 20 | X | J | 12,27,56-5" | 18" | VDE | G SP-SM | | Sa | " |
| 6 | 25 | X | J | 16,15,21 | 18 | MDE | G SP-SM | | Sa | " |
| 7 | 30 | X | J | 9,25,48 | | VDE | G SP-SM | | Sa | shell fragments & soap kits |
| | 35' | | | | | | | | | |

Tolunay-Wong Engineers Inc

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CLIENT: C.O.E
DRILL CONTRACTOR: Triangle

BORING NO: 04-194
DATE: 9.20.04
TECHNICIAN: C.M
DRILL EQUIPMENT: Barge

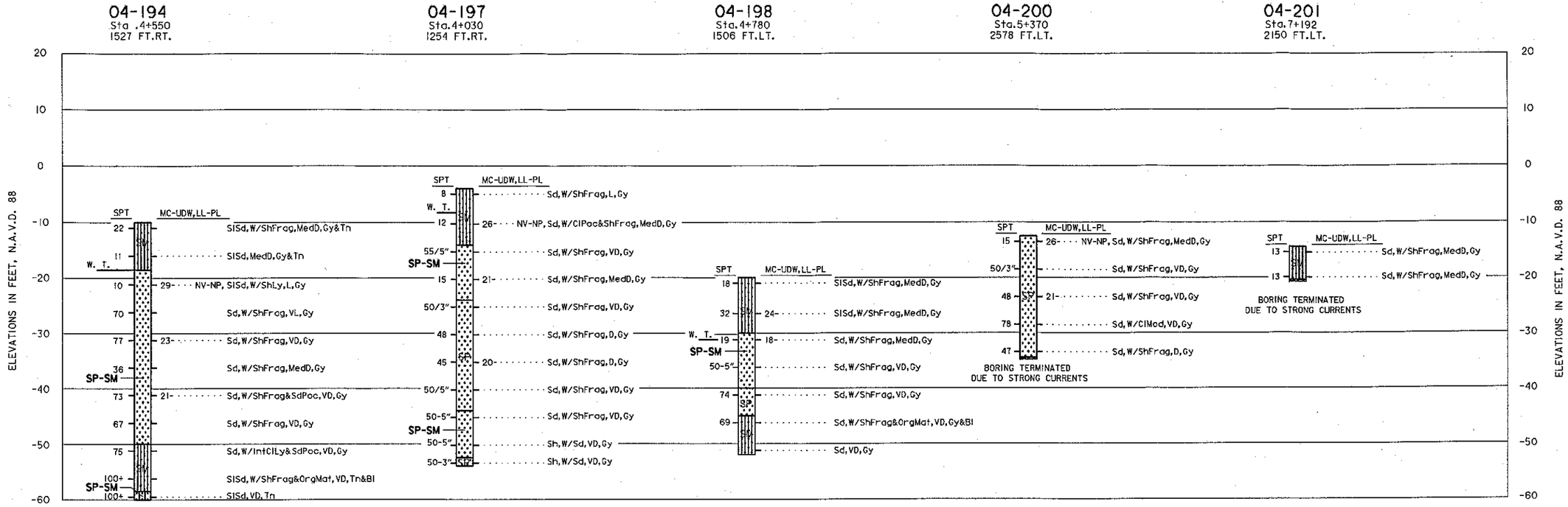
WATER LEVEL DATA:

| TIME (MIN) | T.O.W. (FT) | T.O. | TIME |
|---|---|---|---|
| 5 | | | |
| 10 | | | |
| 15 | | | |
| E.O.D. | | | |
| 24 HOURS | | | |

FREE WATER DEPTH:
METHOD OF ADVANCE:
AUGER ____ TO ____
WASH ____ TO ____
TIME BORING BEGAN:
TIME BORING END: 3:22

| DEPTH(FT) | SAMPLE SYMBOL | CORE(C) JAR(J) BAG (B) | HAND PENETROMETER READING/ BLOW COUNT | RECOVERY IN INCHES | CONSISTENCY | COLOR | MINOR MATERIAL | MAJOR MATERIAL | CHARACTERISTICS OR MODIFICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 8 35 | X | J | 27,26,41 | 18 | VDE | G | SP SM | Sa | shell fragments |
| 9 40 | X | J | 22,33,42 | 18 | VDE | G | SM | shell | interbedded clay layer 3" w/sa pkts |
| 10 45 | X | J | 15,34,50 3½" | 18 | VDE | T, BK | Si | Sa | shell fragments Strong organic odor ~~black water~~ |
| 11 50 | X | J | 22,35,50-5" | 18 | VDE | T | SP SM | " | " trace gravel |

T.D. 50'




NOTES:

1. SOILS HAVE BEEN CLASSIFIED IN ACCORDANCE WITH ASTM 2487-93 "CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOILS CLASSIFICATION SYSTEM)". CONSISTENCY OF SOILS SUCH AS SOFT, MEDIUM, HARD, LOOSE, DENSE, ETC., ARE RELATIVE TERMS BASED ON ESTIMATED UNDISTURBED SHEAR STRENGTH OF THE MATERIAL AS DETERMINED BY VISUAL CLASSIFICATION POCKET PENETROMETER TESTS AND PENETRATION RESISTANCE DURING SAMPLING.

2. FIGURES TO THE RIGHT OF BORING LOGS ARE WATER CONTENTS IN PERCENT OF THE DRY WEIGHT, DRY DENSITY, LIQUID LIMIT, PLASTIC LIMIT, AND BAR LINEAR SHRINKAGE. (MC-UDW),(LL-PL),(B.L.S.)* FIGURES TO THE LEFT OF BORING LOGS ARE BLOWS PER FOOT OF PENETRATION FROM STANDARD PENETRATION TESTING.

3. BORINGS WERE DRILLED USING WET ROTARY DRILLING TECHNIQUES AND UNDISTURBED SAMPLES WERE RECOVERED WITH A 3-INCH DIAMETER THIN WALL SAMPLER WHERE COHESIVE MATERIALS WERE ENCOUNTERED.WHERE COHESIONLESS MATERIALS WERE ENCOUNTERED, DISTURBED SAMPLES WERE TAKEN WITH A SPLIT SPOON SAMPLER DURING PERFORMANCE OF STANDARD PENETRATION TESTING.

4. WATER TABLE LEVELS SHOWN ON BORING LOGS WERE DETERMINED AFTER DRILLING BORINGS BY MEASURING THE TOP OF FLUID LEVELS IN THE BORINGS. INASMUCH AS WET ROTARY DRILLING TECHNIQUES AND DRILLING MUD WERE USED TO DRILL THE HOLES, THE LEVEL OF DRILLING FLUIDS IN THE BORE HOLES MAY NOT HAVE STABLILIZED TO THE LEVEL OF THE ACTUAL WATER TABLE. ADDITIONALLY, WATER TABLES IN THE FIELD ARE LIKELY TO FLUCTUATE DEPENDING ON WEATHER CONDITIONS. THEREFORE, SOME VARIATION SHOULD BE ANTICIPATED BETWEEN WATER TABLES INDICATED AND WATER TABLES ENCOUNTERED IN THE FIELD.

VISUAL CLASSIFICATIONS:

| | |
|---|---|
| Bl Black | PP Pocket Penetrometer |
| Bn Brown(ish) | test (TSF) |
| Cl Clay(ey) | Poc Pocket(s) |
| D Dense | Rk Rock(s) |
| Frag Fragment(s) | Sd Sand(y) |
| Gv Gravel(ly) | Sh Shell(y) |
| Gy Gray(ish) | Sl Silty |
| Int Interbedded | Sm Small |
| L Loose | Tn Tan(nish) |
| Ly Layer(s) | V Very |
| Mat Material | W With |
| Med Medium | W.T. Water Table |
| Org Organic | |

LABORATORY CLASSIFICATIONS:

CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.

CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS.

SM SILTY SANDS, SAND-SILT MIXTURES.

SP POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.

SW WELL GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.

INVITATION NO. W912HY-04-B-00

US Army Corps of Engineers
Galveston District

| | | |
|---|---|---|
| Drawn by: P.N. | Date: FEBRUARY, 2005 | Rev. — |
| Designed by: J.D. | Scale: AS SHOWN | |
| Checked by: J.D. | | |
| Submitted by: MOHAMED M. MOUSSA, P.E. Dam/Levee/Structure Section | Approved/Recommended: DAVID B. CAMPBELL, P.E. Chief, Engineering Division | |
| Approved by: TERRY F. BAUTISTA, P.E. | | |

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF
STEVEN P. HAUSTEIN, Col., C.E.
DISTRICT ENGINEER

GULF INTRACOASTAL WATERWAY, TEXAS
MATAGORDA ISLAND

LOGS OF BORINGS

Drawing No.:
F-2
Sheet X of X
File No.

...\Projects\iww\Matagorda\F02.dgn 02/07/2005 10:36:59 AM

< 5 SP
> 12 SM
SP-SM

Project No. 03-859-026 Client: United States Army Corps of Engineers

Project: Matagorda Ship Channel; Contract No. DACW64-03-D-0008; Delivery Order No. 0026

| Boring No. | Sample Number | Sample Depth (ft) | Soil Description | USCS | Water Content (%) | Liquid Limit | Plastic Limit | Plast. Index | Finer than #200 Sieve (%) |
|---|---|---|---|---|---|---|---|---|---|
| 04-188 | | | | | | | | | |
| | 2 | 5-6.5 | Light gray and tan POORLY GRADED SAND with SILT; traces of shell | SP | 18.9 | | | | |
| | 3 | 10-11.5 | Light gray and tan WELL GRADED SAND with shells | SW | 15.5 | NV | NP | NP | 2.4 |
| | 5 | 20-21.5 | Gray SILTY SAND | SM | 22.0 | | | | |
| | 6 | 25-26.5 | Gray and light gray WELL GRADED SAND with GRAVEL | SW | 9.7 | | | | 1.9 |
| 04-189 | | | | | | | | | |
| | 3 | 10-11.5 | Gray SILTY SAND | SM | 24.2 | | | | |
| | 5 | 20-21.5 | Gray and light gray SILTY SAND; mostly shell | SM | 15.4 | | | | |
| | 8 | 35-36.5 | Gray and light gray POORLY GRADED SAND with GRAVEL | SP | 14.0 | NV | NP | NP | 1.4 |
| 04-190 | | | | | | | | | |
| | 2 | 5-6.5 | Gray and tan SILTY SAND | SM | 19.0 | | | | |
| | 4 | 15-16.5 | Gray WELL GRADED SAND with GRAVEL | SW | 19.9 | NV | NP | NP | 2.4 |
| | 6 | 25-26.5 | Gray SILTY SAND with shells | SM | 24.7 | | | | |
| 04-191 | | | | | | | | | |
| | 3 | 10-11.5 | Tan SILTY SAND with shells | SM | 22.5 | | | | |
| | 4 | 15-16.5 | Tan POORLY GRADED SAND | SP | 17.9 | | | | 1.0 |
| | 5 | 20-21.5 | Light gray and gray SILTY SAND with shells | SM | 23.7 | | | | |
| 04-192 | | | | | | | | | |
| | 1 | 0-1.5 | Tan SANDY SILT with GRAVEL | ML | 1.7 | | | | |
| | 3 | 10-11.5 | Gray POORLY GRADED SAND; traces of shells | SP | 20.6 | | | | 2.7 |
| | 6 | 25-26.5 | Gray POORLY GRADED SAND | SP | 24.1 | | | | 3.2 |
| 04-193 | | | | | | | | | |
| | 2 | 5-6.5 | Gray SILTY SAND | SM | 26.8 | | | | |
| | 6 | 25-26.5 | Gray WELL GRADED SAND with GRAVEL and SHELLS | SW | 11.8 | | | | 3.3 |
| 04-194 | | | | | | | | | |
| | 3 | 10-11.5 | Gray POORLY GRADED SAND with SILT; traces of shell | SP-SM | 29.2 | NV | NP | NP | 9.2 |
| | 5 | 20-21.5 | Gray POORLY GRADED SAND with SILT | SP-SM | 22.8 | | | | |
| | 7 | 30-31.5 | Gray POORLY GRADED SAND with SILT | SP-SM | 20.9 | | | | |
| 04-195 | | | | | | | | | |
| | 2 | 5-6.5 | Gray POORLY GRADED SAND | SP | 26.6 | NV | NP | NP | 3.0 |
| | 4 | 15-16.5 | Gray SILTY SAND | SM | 25.7 | | | | |
| | 6 | 25-26.5 | Gray POORLY GRADED SAND with SILT | SP-SM | 21.7 | | | | |
| 04-196 | | | | | | | | | |
| | 4 | 15-16.5 | Gray SILTY SAND | SM | 21.1 | | | | |
| | 7 | 30-31.5 | Gray SILTY SAND; clay pockets and traces of shells | SM | 20.0 | | | | |
| | 9 | 40-41.5 | Gray SANDY SILT; traces of shells | ML | 26.9 | | | | |
| 04-197 | | | | | | | | | |
| | 2 | 5-6.5 | Gray SILTY SAND; traces of shells | SM | 26.4 | NV | NP | NP | 14.9 |
| | 4 | 15-16.5 | Gray SILTY SAND | SM | 21.3 | | | | |
| | 7 | 30-31.5 | Gray SILTY SAND | SM | 19.9 | | | | |
| 04-198 | | | | | | | | | |
| | 2 | 5-6.5 | Gray SILTY SAND | SM | 23.6 | | | | 47.5 |
| | 3 | 10-11.5 | Gray SILTY SAND; traces of shells | SM | 18.4 | | | | |

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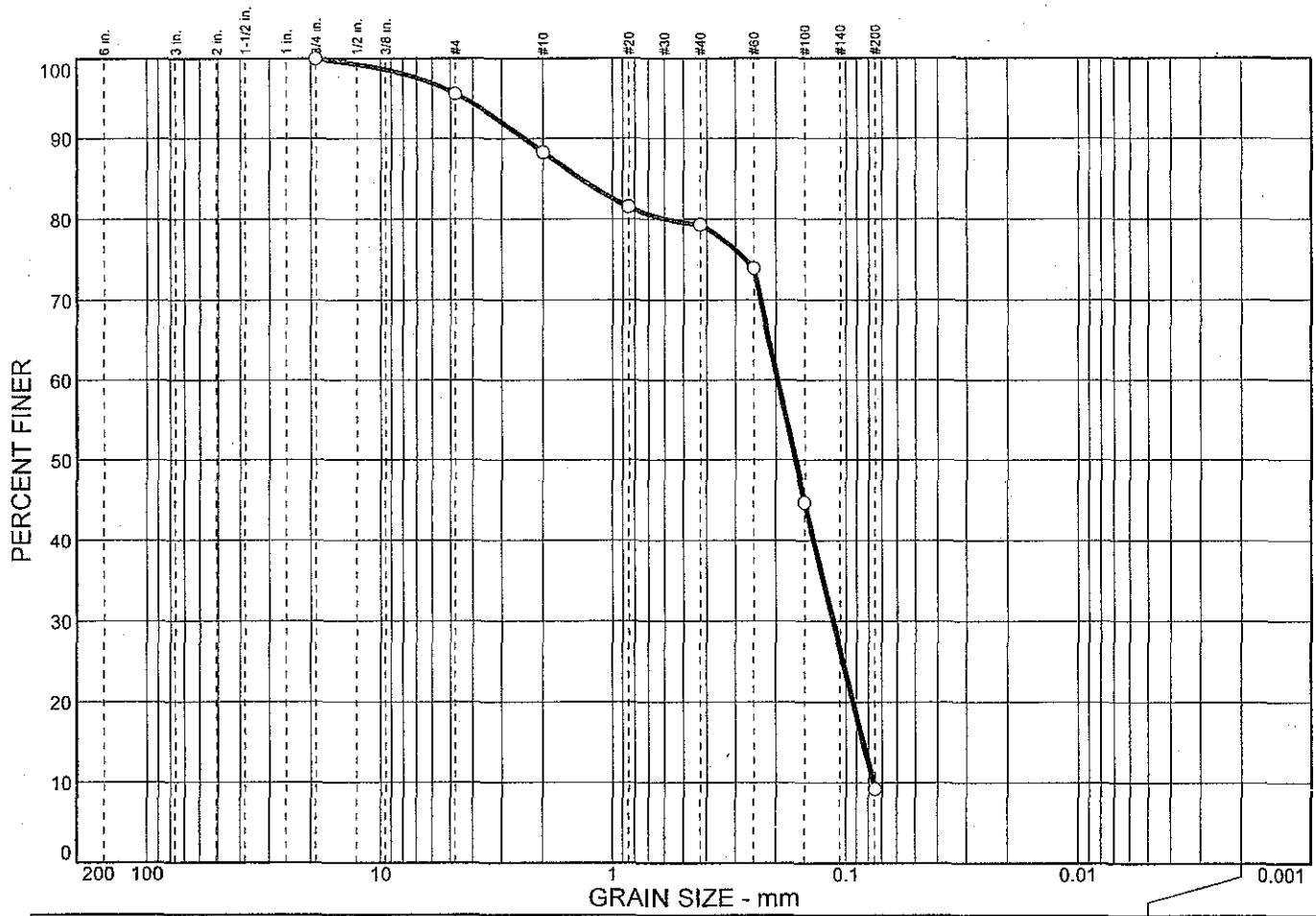
# Particle Size Analysis (ASTM D 422)




| | % + 3" | % GRAVEL | | % SAND | | | % FINES | |
|---|---|---|---|---|---|---|---|---|
| | | CRS. | FINE | CRS. | MEDIUM | FINE | SILT | CLAY |
| ○ | 0.0 | 0.0 | 4.4 | 7.3 | 9.0 | 70.1 | 9.2 | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | DESCRIPTION | USCS |
|---|---|---|---|---|---|
| ○ | 04-194 | 3 | 10-11.5 | Gray POORLY GRADED SAND with SILT; traces of shell | SP-SM |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Particle Size Analysis (ASTM D 422)

**Tolunay-Wong Engineers, Inc.**

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

**Project:** Matagorda Ship Channel; Contract No. DACW64-03-D-0008; Delivery Order No. 0026

**Project No.:** 03-859-026