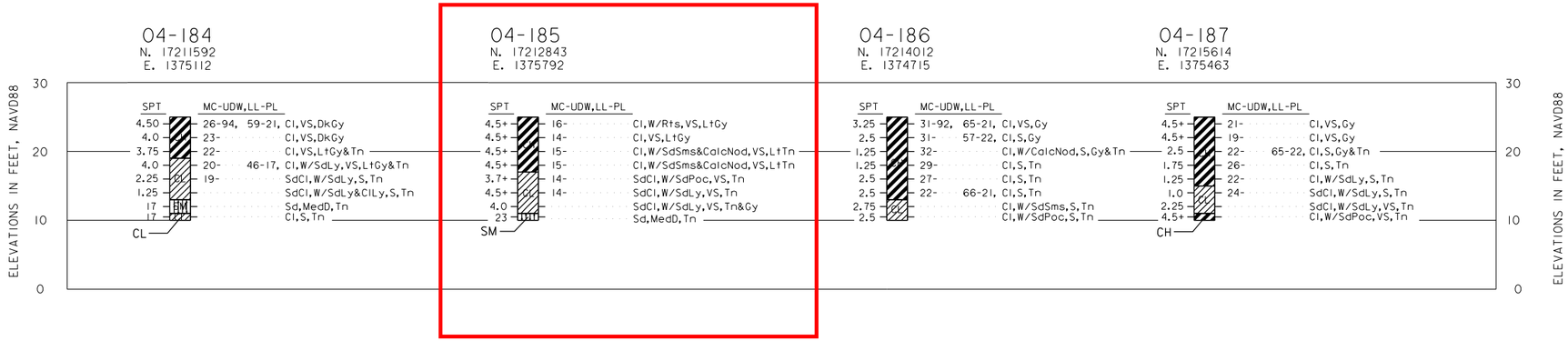
Project No. 03-859-030 Client: United States Army Corps of Engineers

Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension; Contract DACW64-03-D-0008; Delivery Order 0030

| Boring No. | Depth (feet) | Soil Description | USCS | Water Content (%) | Dry Density (pcf) | Liquid Limit | Plastic Limit | Plast. Index | Finer than #200 Sieve (%) | Uc/UU. Compr. (tsf) | Cell Press. (psi) | Failure Strain (%) | Failure Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16-18 | Tan and light gray FAT CLAY | CH | 29.5 | | 91 | 25 | 66 | 99.7 | | | | |
| | 18.5-20 | Light gray and tan SILTY SAND | SM | 13.8 | | | | | 34.6 | | | | |
| 04-181 | | | | | | | | | | | | | |
| | 3.5-5 | Gray SILTY SAND | SM | 27.5 | | | | | | | | | |
| | 8.5-10 | Gray and tan SILTY SAND | SM | 31.3 | | | | | 46.7 | | | | |
| | 13.5-15 | Gray and tan SILTY SAND | SM | 29.6 | | 23 | 23 | NP | | | | | |
| | 18.5-20 | Gray and tan SILTY SAND | SM | 29.1 | | | | | | | | | |
| 04-182 | | | | | | | | | | | | | |
| | 0-1.5 | Gray CLAYEY SAND; few shells | SC | 24.4 | | | | | 24.7 | | | | |
| | 8-10 | FAT CLAY with SAND | CH | 22.8 | 105.3 | 61 | 20 | 41 | 80.3 | | | | |
| | 10-12 | Tan FAT CLAY; traces of calcareous nodules | CH | 21.9 | | | | | | | | | |
| | 12-14 | Tan and light gray FAT CLAY with SAND | CH | 21.7 | | 74 | 24 | 50 | 81.9 | | | | |
| | 14-16 | Tan and light gray FAT CLAY | CH | 22.7 | | | | | | | | | |
| | 16-18 | Tan FAT CLAY | CH | 19.6 | | 62 | 21 | 41 | | | | | |
| 04-183 | | | | | | | | | | | | | |
| | 0-1.5 | Gray and tan FAT CLAY | CH | 33.6 | | | | | | | | | |
| | 2-4 | Tan and gray FAT CLAY | CH | 36.6 | 86.5 | 66 | 20 | 46 | 99.1 | 1.48 | 10 | 6.0 | bulge/vertical |
| | 4-6 | Tan and light gray FAT CLAY, slickenside | CH | 32.4 | | | | | | | | | |
| | 6-8 | Tan and light gray FAT CLAY; few calcareous nodules | CH | 17.1 | | | | | | | | | |
| | 8-10 | Tan and light gray SANDY LEAN CLAY | CL | 18.0 | | 42 | 17 | 25 | 59.9 | | | | |
| | 10-12 | Tan and light gray SANDY LEAN CLAY | CL | 21.5 | | | | | | | | | |
| | 14-16 | Light gray and tan FAT CLAY with SAND; and traces of calcareous and ferrous nodules | CH | 19.4 | | | | | | | | | |
| | 16-18 | Light gray and tan SANDY LEAN CLAY | CL | 16.6 | | | | | | | | | |
| 04-184 | | | | | | | | | | | | | |
| | 0-2 | Dark gray FAT CLAY with SAND | CH | 26.1 | 93.5 | 59 | 21 | 38 | 73.6 | 1.74 | 8 | 7.0 | multi shear |
| | 2-4 | Dark gray FAT CLAY | CH | 22.7 | | | | | | | | | |
| | 4-6 | Dark gray and tan FAT CLAY | CH | 22.2 | | | | | | | | | |
| | 6-8 | Tan and light gray LEAN CLAY | CL | 20.4 | | 46 | 17 | 29 | 97.0 | | | | |
| | 8-10 | Light gray and tan LEAN CLAY; few calcareous nodules | CL | 18.5 | | | | | | | | | |
| 04-185 | | | | | | | | | | | | | |
| | 0-2 | Dark gray LEAN CLAY with SAND; some roots | CL | 15.6 | | | | | | | | | |
| | 2-4 | Gray LEAN CLAY with SAND; traces of calcareous nodules | CL | 14.0 | | | | | | | | | |
| | 4-6 | Light gray and tan LEAN CLAY with SAND; traces of calcareous nodules | CL | 15.4 | | | | | | | | | |
| | 6-8 | Light gray and tan LEAN CLAY with SAND; traces of calcareous nodules | CL | 15.4 | | | | | | | | | |
| | 8-10 | Tan and light gray LEAN CLAY with SAND | CL | 13.8 | | | | | | | | | |
| | 10-12 | Light gray and tan LEAN CLAY with SAND; traces of ferrous nodules | CL | 13.7 | | | | | | | | | |
| 04-186 | | | | | | | | | | | | | |
| | 0-2 | Dark gray FAT CLAY with SAND | CH | 30.6 | 92.2 | 65 | 21 | 44 | 71.2 | | | | |
| | 2-4 | Dark gray FAT CLAY | CH | 30.5 | | 57 | 22 | 35 | | | | | |

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.

# PLACEMENT AREA NO. 14




NOTE:
SEE DRAWING C-2 FOR BORING LOCATIONS.

BORING 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.

LABORATORY CLASSIFICATION

CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.

CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS.
CL-ML OR ML-CL CLAY AND SILT MIXTURES WITH SLIGHT PLASTICITY

ML INORGANIC SILTS AND VERY FINE SANDS, WITH SLIGHT PLASTICITY.

SC CLAYEY SANDS, SAND-CLAY MIXTURES.
SC-SM SLIGHTLT SILTY AND CLAYEY SAND, SAND WITH SILTS AND CLAYS.

SM SILTY SANDS, SAND-SILT MIXTURES.

SP POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
SP-SM SLIGHTLY SILTY SANDS, SANDS WITH SOME SILTS.

VISUAL CLASSIFICATIONS:

| | | |
|---|---|---|
| Bn Brown(ish) | Gv Gravel(ly) | Si Silty |
| Calc Calcareous | H Hard | Sms Seams |
| Cl Clay(ey) | L Loose | So Soft |
| D Dense | Lt Light | Sta Stain(s) |
| Dk Dark | Med Medium | Tn Tan(nish) |
| Fer Ferrous | Nod Nodules | Tr Trace(s) |
| Fi Fine(s) | Poc Pocket(s) | V Very |
| F Firm | S Stiff | W With |
| Frag Fragment(s) | Sd Sand(y) | W.S. Water Surface |
| Gr Grained | Sh Shell(y) | |
| Gy Gray(ish) | Siks Slicken Sides | |

SOLICITATION NO.
W912HY-
09-B-00

US Army Corps of Engineers
Galveston District

| Rev. | Description | Date | By |
|---|---|---|---|

TIME:$TIME$ DATE:$DATE$ BY:$USER$

Drawn by: P.N. Date: July, 2009 Rev. --
Designed by: R.B./J.D.
Checked by: W.M. Scale: AS SHOWN
Submitted by: LORIK, THOMAS, P.E. Chief, Getech/Structure Section
Approval Recommended: HARRISON T. SUTCLIFFE, P.E. Chief, Engineering Branch
Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division

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

PREPARED UNDER THE DIRECTION OF
DAVID C. WESTON, Col., C.E.
DISTRICT COMMANDER

CORPUS CHRISTI SHIP CHANNEL, TEXAS
CHANNEL IMPROVEMENT PROJECT
LA QUINTA CHANNEL EXTENSION -
PLACEMENT AREA NO. 14

LOGS OF BORINGS P.A. NO.14,
BORING NOTES, & LEGEND

Drawing No.:
F-4
Sheet 8 of 13

File:$FILE$

File No. NUECES 803-334