

# BORING LOG NO. B-16

Page 1 of 1

**PROJECT:** Galveston Bay Sand Reclamation Project

**CLIENT:** Atkins North America, Inc.  
Houston, Texas

**SITE:** Galveston Bay  
Galveston, Texas

| GRAPHIC LOG | LOCATION See Exhibit A-2<br>Latitude: 29.30442° Longitude: -94.82895°                    | DEPTH (Ft.) | WATER LEVEL<br>OBSERVATIONS | SAMPLE TYPE | FIELD TEST<br>RESULTS | STRENGTH TEST |                                  |            | WATER<br>CONTENT (%) | DRY UNIT<br>WEIGHT (pcf) | ATTERBERG<br>LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|------------------------------------------------------------------------------------------|-------------|-----------------------------|-------------|-----------------------|---------------|----------------------------------|------------|----------------------|--------------------------|---------------------------------|---------------|
|             |                                                                                          |             |                             |             |                       | TEST TYPE     | COMPRESSIVE<br>STRENGTH<br>(tsf) | STRAIN (%) |                      |                          |                                 |               |
|             | DEPTH                                                                                    |             |                             |             |                       |               |                                  |            |                      |                          |                                 |               |
|             | <b>SILTY SAND (SM)</b> , gray, very loose                                                |             |                             |             | 1-1-1<br>N=2          |               |                                  |            |                      |                          |                                 |               |
| 2.0         | <b>CLAY</b> , gray, very soft to soft                                                    |             |                             |             | 6-3-1<br>N=4          |               |                                  |            |                      |                          |                                 |               |
| 6.0         | <b>SILTY SAND (SM)</b> , gray, medium dense to dense<br>- with clay pockets 6 to 10 feet |             |                             |             | WOH                   |               |                                  |            |                      |                          |                                 |               |
|             |                                                                                          |             |                             |             | 3-4-7<br>N=11         |               |                                  |            |                      |                          |                                 | 32            |
|             |                                                                                          |             |                             |             | 2-3-7<br>N=10         |               |                                  |            |                      |                          |                                 |               |
|             |                                                                                          |             |                             |             | 7-12-14<br>N=26       |               |                                  |            |                      |                          |                                 |               |
|             |                                                                                          |             |                             |             | 7-10-16<br>N=26       |               |                                  |            |                      |                          |                                 | 15            |
|             |                                                                                          |             |                             |             | 10-17-17<br>N=34      |               |                                  |            |                      |                          |                                 |               |
|             | - with clay pockets and shell fragments 16 to 20 feet                                    |             |                             |             | 7-8-7<br>N=15         |               |                                  |            |                      |                          |                                 | 22            |
|             | - very loose 18 to 20 feet                                                               |             |                             |             | 2-2-1<br>N=3          |               |                                  |            |                      |                          |                                 |               |
| 20.0        | <b>CLAY</b> , gray, very soft to stiff<br>- with shell fragments 20 to 24 feet           |             |                             |             | 2.0 (HP)              |               |                                  |            |                      |                          |                                 |               |
|             |                                                                                          |             |                             |             | WOH                   |               |                                  |            |                      |                          |                                 |               |
|             | - reddish brown and light gray, with ferrous nodules below 24 feet                       |             |                             |             | 3-4-5<br>N=9          |               |                                  |            |                      |                          |                                 |               |
| 26.0        | <b>Boring Terminated at 26 Feet</b>                                                      |             |                             |             |                       |               |                                  |            |                      |                          |                                 |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Dry augered to 16 feet; wet rotary thereafter.

Abandonment Method:  
Not applicable

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

Notes:  
- WOH = Weight of Hammer.  
- Water depth of about 6 feet at the time of our field program.

## WATER LEVEL OBSERVATIONS

Not applicable

**Terracon**  
551 League City Pkwy Ste F  
League City, TX

Boring Started: 07-14-2017

Drill Rig: Truck

Project No.: 91175047

Boring Completed: 07-14-2017

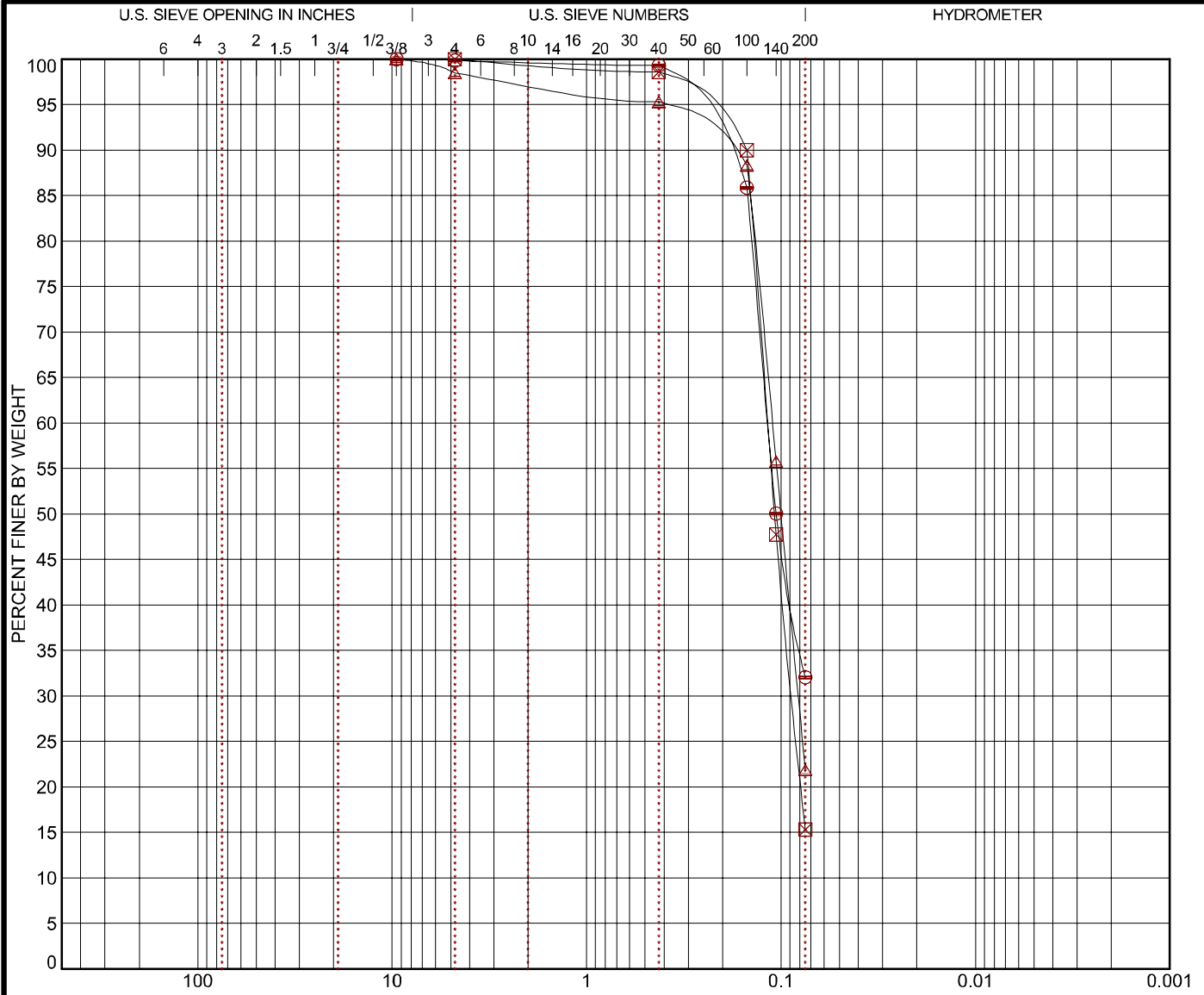
Driller: Van and Sons

Exhibit: A-18

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 91175047 REV1 GALVESTON BAY SAN.GPJ TERRACON\_DATATEMPLATE.GDT 11/2/17

# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| Boring ID | Depth     | USCS Classification |                 |                 |                 | WC (%)  | LL    | PL    | PI     | Cc    | Cu |
|-----------|-----------|---------------------|-----------------|-----------------|-----------------|---------|-------|-------|--------|-------|----|
| ⊖ B-16    | 6.5 - 8   | SILTY SAND (SM)     |                 |                 |                 |         |       |       |        |       |    |
| ⊠ B-16    | 12.5 - 14 | SILTY SAND (SM)     |                 |                 |                 |         |       |       |        |       |    |
| △ B-16    | 16.5 - 18 | SILTY SAND (SM)     |                 |                 |                 |         |       |       |        |       |    |
|           |           |                     |                 |                 |                 |         |       |       |        |       |    |
| Boring ID | Depth     | D <sub>100</sub>    | D <sub>85</sub> | D <sub>50</sub> | D <sub>10</sub> | %Gravel | %Sand | %Silt | %Fines | %Clay |    |
| ⊖ B-16    | 6.5 - 8   | 9.5                 | 0.149           | 0.106           |                 | 0.2     | 67.8  |       | 32.1   |       |    |
| ⊠ B-16    | 12.5 - 14 | 4.75                | 0.144           | 0.108           |                 | 0.0     | 84.7  |       | 15.3   |       |    |
| △ B-16    | 16.5 - 18 | 9.5                 | 0.145           | 0.1             |                 | 1.5     | 76.6  |       | 21.9   |       |    |
|           |           |                     |                 |                 |                 |         |       |       |        |       |    |

PROJECT: Galveston Bay Sand Reclamation Project

SITE: Galveston Bay  
Galveston, Texas

**Terracon**  
551 League City Pkwy Ste F  
League City, TX

PROJECT NUMBER: 91175047

CLIENT: Atkins North America, Inc.  
Houston, Texas

EXHIBIT: A-33