

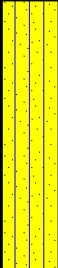
# BORING LOG NO. B-12

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><br>Latitude: 29.30936° Longitude: -94.83288°                                     | 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 | PERCENT FINES |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|-----------------------------|-----------------------------------------------------------------------------------|-----------------------|---------------|----------------------------------|------------|----------------------|--------------------------|---------------------|---------------|
|                                                                                   |                                                                                                               |             |                             |                                                                                   |                       | TEST TYPE     | COMPRESSIVE<br>STRENGTH<br>(tsf) | STRAIN (%) |                      |                          | LL-PL-PI            |               |
| DEPTH                                                                             |                                                                                                               |             |                             |                                                                                   |                       |               |                                  |            |                      |                          |                     |               |
|  | <b>CLAY</b> , gray, very soft                                                                                 |             |                             |  | WOH                   |               |                                  |            |                      |                          |                     |               |
| 4.0                                                                               |                                                                                                               |             |                             |  | WOH                   |               |                                  |            |                      |                          |                     |               |
|  | <b>SILTY SAND (SM)</b> , gray, loose to medium dense, with shell fragments<br>- with clay pockets 4 to 6 feet | 5           |                             |  | 4-4-4<br>N=8          |               |                                  |            |                      |                          |                     |               |
|                                                                                   |                                                                                                               |             |                             |  | 4-2-6<br>N=8          |               |                                  |            |                      |                          |                     | 20            |
| 10.0                                                                              |                                                                                                               |             |                             |  | 5-6-9<br>N=15         |               |                                  |            |                      |                          |                     |               |
|  | <b>CLAY</b> , tan and light gray, very stiff, with ferrous and calcareous nodules                             | 10          |                             |  | 3.0 (HP)              |               |                                  |            |                      |                          |                     |               |
| 12.0                                                                              |                                                                                                               |             |                             |                                                                                   |                       |               |                                  |            |                      |                          |                     |               |
|                                                                                   | <b>Boring Terminated at 12 Feet</b>                                                                           |             |                             |                                                                                   |                       |               |                                  |            |                      |                          |                     |               |

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

Hammer Type: Automatic

Advancement Method:  
Dry augered to 10 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 13 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

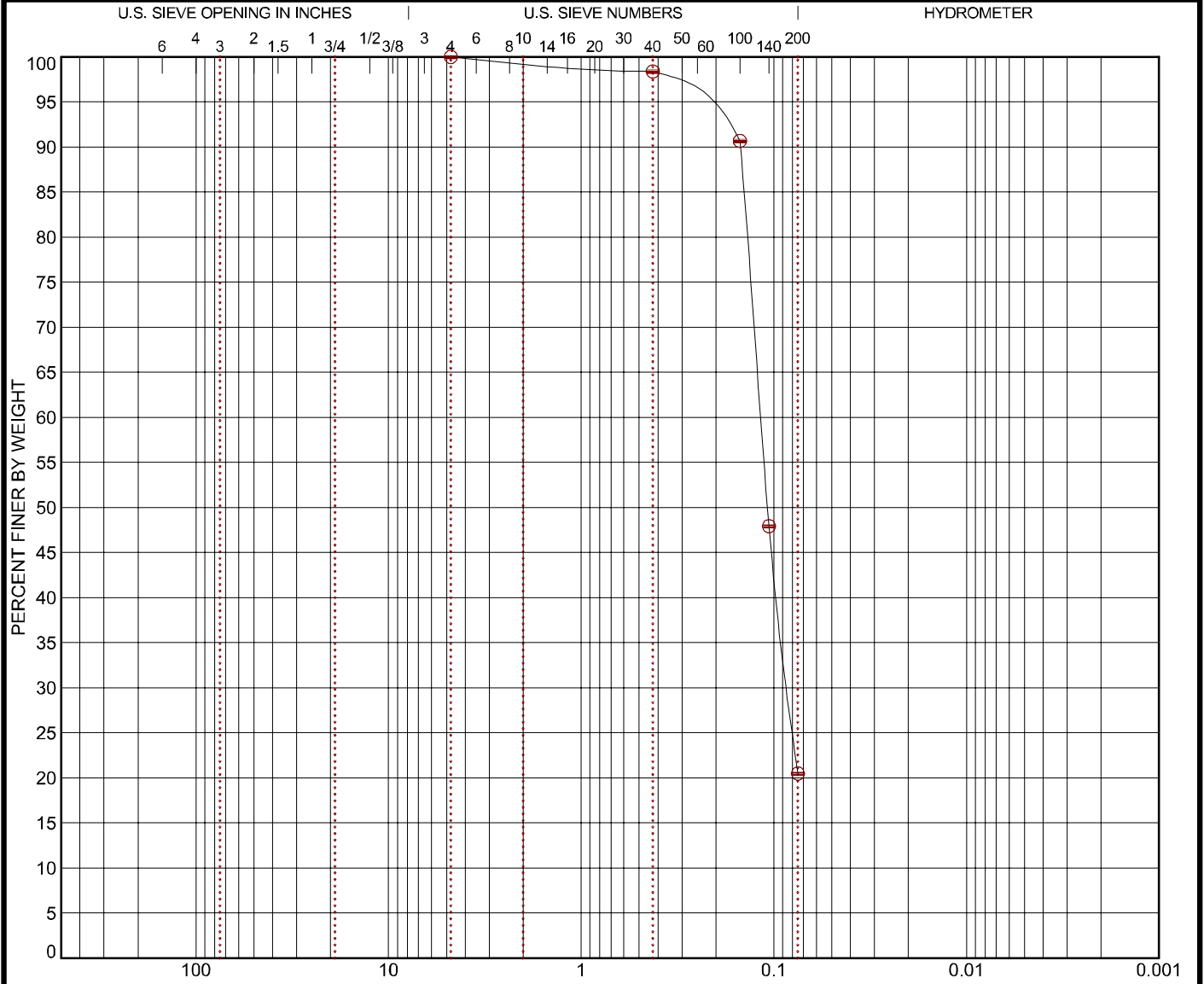
Driller: Van and Sons

Exhibit: A-14

# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. 91175091\_ATKINS\_NORTH\_GRAINSIZE\_TEMP\_91175047 GALVESTON BAY SAN.GPJ TERRACON\_DATATEMPLATE.GDT 11/6/17



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

| Boring ID | Depth   | USCS Classification |                 |                 |                 | WC (%)  | LL    | PL    | PI     | Cc    | Cu |
|-----------|---------|---------------------|-----------------|-----------------|-----------------|---------|-------|-------|--------|-------|----|
| B-12      | 6.5 - 8 | 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-12      | 6.5 - 8 | 4.75                | 0.143           | 0.108           |                 | 0.0     | 79.5  |       | 20.5   |       |    |
|           |         |                     |                 |                 |                 |         |       |       |        |       |    |
|           |         |                     |                 |                 |                 |         |       |       |        |       |    |
|           |         |                     |                 |                 |                 |         |       |       |        |       |    |

|                                                 |  |  |  |                                                      |  |  |  |
|-------------------------------------------------|--|--|--|------------------------------------------------------|--|--|--|
| PROJECT: Galveston Bay Sand Reclamation Project |  |  |  | PROJECT NUMBER: 91175047                             |  |  |  |
| SITE: Galveston Bay<br>Galveston, Texas         |  |  |  | CLIENT: Atkins North America, Inc.<br>Houston, Texas |  |  |  |
|                                                 |  |  |  | EXHIBIT: A-29                                        |  |  |  |

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