

BORING LOG NO. B-21

CLIENT: **United States Army Corps of Engineers
Galveston, Texas**

PROJECT: **Contract W912HY-09-D-0021
Addicks and Barker Dams, TO-14**

BORING LOCATION: **N: 13837185.961
E: 3032543.978**

SITE: **Addicks and Barker Reservoirs
Houston, Texas**

| Graphic Log | DESCRIPTION | DEPTH, FEET | SAMPLES | | | | | | TESTS | | | | | | | |
|---|--|-------------|-------------|------|--------------|---------------|--------------------------------|--------------|---------------------|------------------|-----------------|------------------|------------------|---------------------|---------------------------|-------------------|
| | | | USCS SYMBOL | TYPE | RECOVERY, IN | SPT, BLOWS/FT | CALIBRATED HAND PENETROM., TSF | TORVANE, TSF | MOISTURE CONTENT, % | DRY DENSITY, PCF | LIQUID LIMIT, % | PLASTIC LIMIT, % | PLASTICITY INDEX | MINUS #200 SIEVE, % | COMPRESSIVE STRENGTH, TSF | FAILURE STRAIN, % |
| Approx. Surface Elevation: 90.7 feet | | | | | | | | | | | | | | | | |
| 88.7 | FILL: SANDY LEAN CLAY dark gray, brown and tan, very stiff, medium plasticity, dry, with silt seams and scattered roots | 2.0 | CL | ST | 8 | | 2.75 | | 10 | | | | | | | |
| | FAT CLAY w/ SAND light gray and tan, medium stiff to stiff, high plasticity, moist, with sand pockets, and calcareous and ferrous nodules | | CH | ST | 12 | | 1.0 | | 22 | | | | | | | |
| | | | | ST | 15 | | 1.0 | | 24 | | | | | | | |
| | | | | ST | 13 | | 1.25 | | 22 | | | | | | | |
| 82.7 | SANDY LEAN CLAY light gray and tan, stiff to very stiff, medium plasticity, moist, with sand pockets and seams, and calcareous and ferrous nodules | 8.0 | CL | ST | 21 | | 1.75 | | 17 | | | | | | | |
| | | | | ST | 23 | | 1.25 | | | 36 | 13 | 23 | 65 | | | |
| | | | | ST | 11 | | 4.5 | | 13 | 34 | 13 | 21 | 59 | | | |
| | | | | ST | 11 | | 4.5 | | 15 | 121 | 44 | 14 | 30 | 59 | | |
| | | | | ST | 14 | | 4.5 | | | 35 | 15 | 20 | 59 | | | |
| 71.7 | SILTY SAND light gray and tan, medium dense to dense, non-plastic, fine-grained, uniform, damp | 19.0 | SM | ST | 10 | | 1.5 | | | 32 | 14 | 18 | 40 | | | |
| | | | | SS | 12 | 31 | | | | | | | 23 | | | |
| | | | | SS | 17 | 29 | | | 19 | | | | 24 | | | |
| 66.7 | | 24.0 | SP-SM | SS | 24 | 46 | | | | | | | 12 | | | |
| Continued Next Page | | | | | | | | | | | | | | | | |

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 26 feet; wet rotary thereafter.

| WATER LEVEL OBSERVATIONS | | | |
|--------------------------|-----------|-----------|-----------|
| ▽ 24 ft | WD | ▽ 22.5 ft | at 5 min |
| ▽ 22 ft | at 10 min | ▽ 22 ft | at 15 min |



DATE DRILLED
6/4/2012

PROJECT NUMBER
92125125

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EXHIBIT A-47

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|--------------------------------------|---|-------------------------------|-------------|------|--------------|---------------|--------------------------------|--------------|---------------------|------------------|-----------------|------------------|------------------|---------------------|---------------------------|-------------------|-------------------------|--|
| | | | USCS SYMBOL | TYPE | RECOVERY, IN | SPT, BLOWS/FT | CALIBRATED HAND PENETROM., TSF | TORVANE, TSF | MOISTURE CONTENT, % | DRY DENSITY, PCF | LIQUID LIMIT, % | PLASTIC LIMIT, % | PLASTICITY INDEX | MINUS #200 SIEVE, % | COMPRESSIVE STRENGTH, TSF | FAILURE STRAIN, % | CONFINING PRESSURE, PSI | |
| Approx. Surface Elevation: 90.7 feet | | | | | | | | | | | | | | | | | | |
| 60.7 | POORLY GRADED SAND w/ SILT tan and light gray, medium dense to dense, non-plastic, fine-grained, uniform, wet | 27 | SS | 12 | 29 | | | 21 | | | | | 9 | | | | | |
| | | 28 | | | | | | | | | | | | | | | | |
| | | 29 | SS | 11 | 40 | | | | | | | | 7 | | | | | |
| | | 30 | CH | | | | | | | | | | | | | | | |
| | FAT CLAY reddish brown, light gray and tan, medium stiff to hard, medium to high plasticity, moist, with sand pockets, and calcareous and ferrous nodules - with silt seams 30 to 42 feet | 31 | ST | 12 | | 4.5 | | 22 | | | | | | | | | | |
| | | 32 | | | | | | | | | | | | | | | | |
| | | 33 | ST | 6 | | 2.25 | | 21 | | | | | | | | | | |
| | | 34 | | | | | | | | | | | | | | | | |
| | | 35 | SS | 17 | 35 | | | 21 | | | | | | | | | | |
| | | 36 | | | | | | | | | | | | | | | | |
| | | 37 | ST | 7 | | 1.75 | | 21 | | | | | | | | | | |
| | | 38 | | | | | | | | | | | | | | | | |
| | | 39 | ST | 14 | | 3.0 | | 22 | 111 | | | | | | | | | |
| | | 40 | | | | | | | | | | | | | | | | |
| | 41 | ST | 14 | | 4.0 | | 29 | | | | | | | | | | | |
| | 42 | | | | | | | | | | | | | | | | | |
| | 43 | ST | 15 | | 4.5 | | 26 | | | | | | | | | | | |
| | 44 | | | | | | | | | | | | | | | | | |
| | 45 | ST | 12 | | 4.0 | | 25 | | | | | | | | | | | |
| | 46 | | | | | | | | | | | | | | | | | |
| | 47 | ST | 12 | | 4.5 | | 26 | | | | | | | | | | | |
| | 48 | | | | | | | | | | | | | | | | | |
| | 49 | ST | 18 | | 4.5 | | 26 | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | |
| | 50.0 | Boring terminated at 50 feet. | | | | | | | | | | | | | | | | |

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