# U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-335 DATE: BEGIN 7-13-93 PAGE 1 / 1
JOB NO. 146630 COMPLETE 7-13-93 Thin Walled Tube
PROJECT Brazos Island Harbor Project. ■ 3" □ 6"
LOCATION Brownsville ship channel near Brownsville, Tx
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Ardco K 4X4
GROUNDWATER: DEPTH 0 ft., ELEV. ____ ft., at end of Drilling
WEATHER Sunny & Hot
DRILLER Scott Gregurek LOGGER Iraj Mostamand

| DEPTH, FEET | SAMPLE | SAMPLE NO. | PEN./TORVANE SPT.-BLOW COUNT | COLOR | MATERIAL TYPE | CONSIS-TENCY | SECONDARY CONSTITUENTS | STRUCTURAL FEATURES AND COMMENTS |
|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 1.00 | Brown | clay | stiff | | |
| | | 2 | 0.75 | Brown | clay | M.stiff | | -w/Fe Nod |
| 5 | | 3 | 1.25 | Brown | clay | stiff | | -w/organic material |
| | | 4 | 1.25 | Brown | clay | stiff | | -w/organic material |
| | | 5 | 1.50 | Brown | clay | stiff | | -w/Fe Nod & Sa Seams |
| 10 | | 6 | 0.75 | olive gray | clay | M.stiff | Sand | -w/Sa Seams (Border line material. Sandy clay to clayey sand 10'-14' |
| | | 7 | 0.50 | olive gray | clay | M.stiff | Sand | |
| 15 | | 8 | 2.75 | olive gray | clay | Very stiff | Sand | -w/Fe Nod |
| | | 9 | 3.25 | olive gray | clay | very stiff | Sand | -w/Fe Nod |
| | | 10 | 3.75 | olive gray | clay | Very stiff | Sand | -w/Fe Nod |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |
| 35 | | | | | | | | |

GEOTEST ENGINEERING, INC.

JOB NO. 14G634 DATE 8/6/93

PROJECT Brazos Island Harbor Project
Brownsville Shipchannel

AREA near Brownsville, Texas

BORING NO. 93-335 SAMPLE NO. 4 DEPTH 6-8 ft

SPECIMEN NO. 1

CLASSIFICATION
Brown, Clay, Stiff

| | | | |
|---|---|---|---|
| Tare No. | P222 | Height | 5.595 in. |
| Tare plus Wet Specimen | 365.41 gm | Average Diameter | 2.830 in. |
| Tare plus Dry Specimen | 268.60 gm | Initial Area | 6.290 sq in. |
| Water Weight | 96.81 gm | Volume | 35.194 cu in. |
| Tare Weight | 43.01 gm | Volume of Solids | cu in. |
| Wet Specimen | 999.86 gm | Void Ratio | |
| Dry Specimen | 699.62 gm | Saturation | % |
| Water Content | 42.91 % | Dry Density | 75.7 lb/cu ft |
| Specific Gravity of Solids | | | |

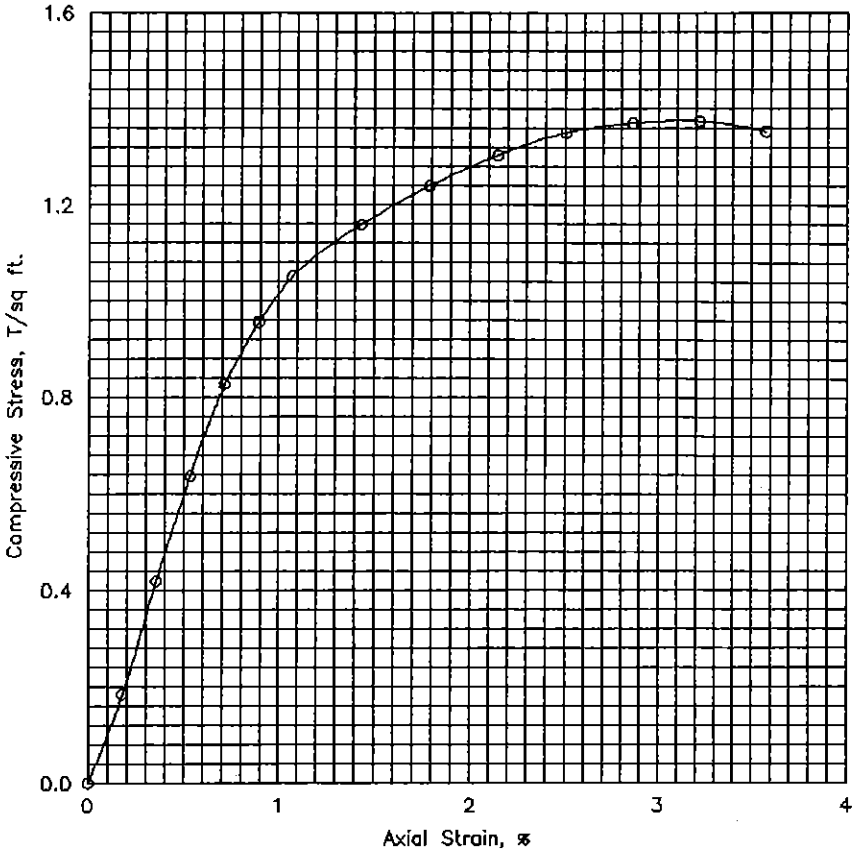
LL = 88 PL = 30 PI = 58

Proving Ring No. 10170
Proving Ring Constant, K = .766 lbs/div.

| Elapsed Time min. | Dial Reading 0.001" | Cumulative Change in. | Proving Ring Dial Reading | Axial Load lb | Axial Strain | Area Corr. sq in. | Compr. Stress tsf |
|---|---|---|---|---|---|---|---|
| .0 | 0. | .000 | .0 | .0 | .000 | 6.29 | .000 |
| .2 | 10. | .010 | 21.0 | 16.1 | .002 | 6.30 | .184 |
| .3 | 20. | .020 | 48.0 | 36.8 | .004 | 6.31 | .419 |
| .5 | 30. | .030 | 73.0 | 55.9 | .005 | 6.32 | .637 |
| .7 | 40. | .040 | 95.0 | 72.8 | .007 | 6.34 | .827 |
| .9 | 50. | .050 | 110.0 | 84.3 | .009 | 6.35 | .956 |
| 1.0 | 60. | .060 | 121.0 | 92.7 | .011 | 6.36 | 1.050 |
| 1.4 | 80. | .080 | 134.0 | 102.6 | .014 | 6.38 | 1.158 |
| 1.7 | 100. | .100 | 144.0 | 110.3 | .018 | 6.40 | 1.240 |
| 2.0 | 120. | .120 | 152.0 | 116.4 | .021 | 6.43 | 1.304 |
| 2.3 | 140. | .140 | 158.0 | 121.0 | .025 | 6.45 | 1.351 |
| 2.6 | 160. | .160 | 161.0 | 123.3 | .029 | 6.48 | 1.371 |
| 2.9 | 180. | .180 | 162.0 | 124.1 | .032 | 6.50 | 1.375 |
| 3.3 | 200. | .200 | 160.0 | 122.6 | .036 | 6.52 | 1.353 |

Job No. 14G634

Failure Sketches




☐ Controlled stress
☒ Controlled strain

| | | | | | | |
|---|---|---|---|---|---|---|
| Test No. | | | 1 | | | |
| Type of Specimen | | | Undisturbed | | | |
| Initial | Water content | $w_0$ | 42.9 % | % | % | % |
| | Void ratio | $e_0$ | | | | |
| | Saturation | $S_0$ | % | % | % | % |
| | Dry density, lb/cu ft | $\gamma_d$ | 75.7 | | | |
| Time to failure, min | | $t_f$ | 2.93 | | | |
| Unconfined compressive strength, T/sq ft | | $q_u$ | 1.37 | | | |
| Undrained shear strength, T/sq ft | | $S_u$ | .69 | | | |
| Sensitivity ratio | | $S_t$ | | | | |
| Initial specimen diameter, in. | | $D_0$ | 2.830 | | | |
| Initial specimen height, in. | | $H_0$ | 5.595 | | | |

Classification Brown, Clay, Stiff

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LL | 88 | PL | 30 | PI | 58 | $G_s$ | |

Remarks

| | |
|---|---|
| Project | Brazos Island Harbor Project |
| | Brownsville Shipchannel |
| Area | near Brownsville, Texas |
| Boring No. 93-335 | Sample No. 4 |
| Depth El 6-8 ft | Date 8/6/93 |
| UNCONFINED COMPRESSION TEST REPORT | |

ENG FORM 1 JUN 65 3659

PLATE XI-2

*Geotest Engineering, Inc.*

JOB NO. 14G634 DATE 8/6/93

PROJECT Brazos Island Harbor Project
Brownsville Shipchannel

AREA near Brownsville, Texas

BORING NO. 93-335 SAMPLE NO. 7 DEPTH 12-14 ft

SPECIMEN NO. 1

CLASSIFICATION
Gray, Clay, Medium stiff, Sandy

| | | | |
|---|---|---|---|
| Tare No. | GE50 | Height | 5.595 in. |
| Tare plus Wet Specimen | 400.27 gm | Average Diameter | 2.830 in. |
| Tare plus Dry Specimen | 337.07 gm | Initial Area | 6.290 sq in. |
| Water Weight | 63.20 gm | Volume | 35.194 cu in. |
| Tare Weight | 43.01 gm | Volume of Solids | cu in. |
| Wet Specimen | 1140.52 gm | Void Ratio | |
| Dry Specimen | 938.76 gm | Saturation | % |
| Water Content | 21.49 % | Dry Density | 101.6 lb/cu ft |
| Specific Gravity of Solids | | | |

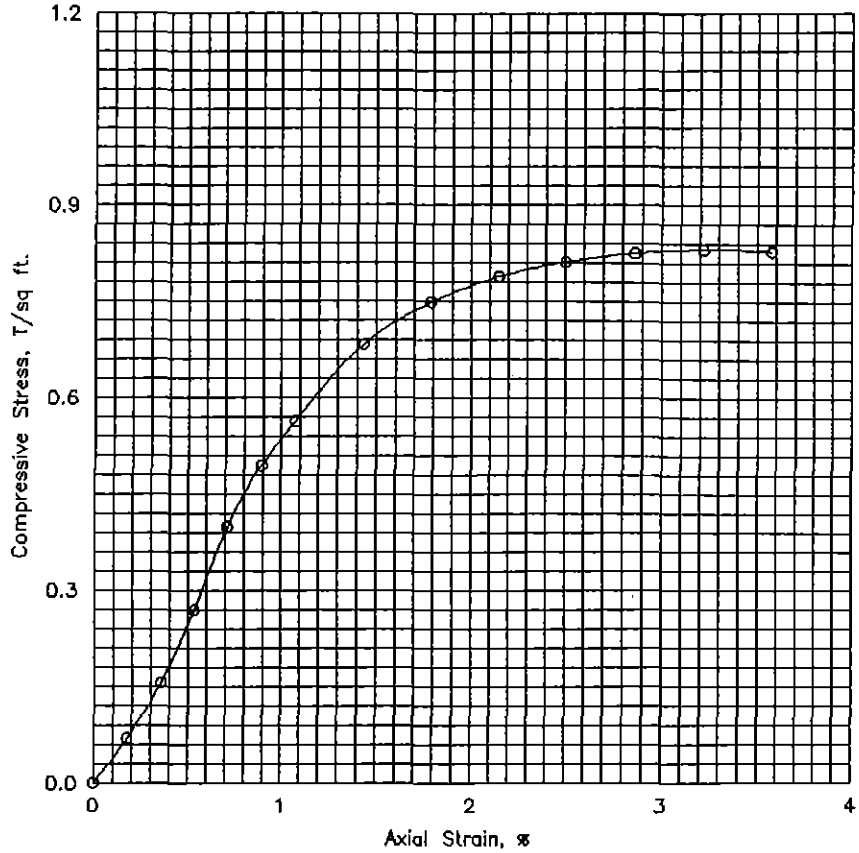
LL = 28 PL = PI =

Proving Ring No. 10170
Proving Ring Constant, K = .766 lbs/div.

| Elapsed Time min. | Dial Reading 0.001" | Cumulative Change in. | Proving Ring Dial Reading | Axial Load lb | Axial Strain | Area Corr. sq in. | Compr. Stress tsf |
|---|---|---|---|---|---|---|---|
| .0 | 0. | .000 | .0 | .0 | .000 | 6.29 | .000 |
| .2 | 10. | .010 | 8.0 | 6.1 | .002 | 6.30 | .070 |
| .3 | 20. | .020 | 18.0 | 13.8 | .004 | 6.31 | .157 |
| .5 | 30. | .030 | 31.0 | 23.7 | .005 | 6.32 | .270 |
| .7 | 40. | .040 | 46.0 | 35.2 | .007 | 6.34 | .400 |
| 1.0 | 50. | .050 | 57.0 | 43.7 | .009 | 6.35 | .495 |
| 1.3 | 60. | .060 | 65.0 | 49.8 | .011 | 6.36 | .564 |
| 1.6 | 80. | .080 | 79.0 | 60.5 | .014 | 6.38 | .683 |
| 2.0 | 100. | .100 | 87.0 | 66.6 | .018 | 6.40 | .749 |
| 2.3 | 120. | .120 | 92.0 | 70.5 | .021 | 6.43 | .789 |
| 2.6 | 140. | .140 | 95.0 | 72.8 | .025 | 6.45 | .812 |
| 2.9 | 160. | .160 | 97.0 | 74.3 | .029 | 6.48 | .826 |
| 3.3 | 180. | .180 | 98.0 | 75.1 | .032 | 6.50 | .832 |
| 3.5 | 200. | .200 | 98.0 | 75.1 | .036 | 6.52 | .829 |

Job No. 14G634

Failure Sketches




☐ Controlled stress
☒ Controlled strain

| | | | | | | |
|---|---|---|---|---|---|---|
| Test No. | | | 1 | | | |
| Type of Specimen | | | Undisturbed | | | |
| Initial | Water content | $w_0$ | 21.5 % | % | % | % |
| | Void ratio | $e_0$ | | | | |
| | Saturation | $S_0$ | % | % | % | % |
| | Dry density, lb/cu ft | $\gamma_d$ | 101.6 | | | |
| Time to failure, min | | $t_f$ | 3.30 | | | |
| Unconfined compressive strength, T/sq ft | | $q_u$ | .83 | | | |
| Undrained shear strength, T/sq ft | | $S_u$ | .42 | | | |
| Sensitivity ratio | | $S_t$ | | | | |
| Initial specimen diameter, in. | | $D_0$ | 2.830 | | | |
| Initial specimen height, in. | | $H_0$ | 5.595 | | | |

Classification Gray, Clay, Medium stiff, Sandy

| | | | |
|---|---|---|---|
| LL 28 | PL | PI | $G_s$ |

Remarks

| | |
|---|---|
| Project Brazos Island Harbor Project | |
| Brownsville Shipchannel | |
| Area near Brownsville, Texas | |
| Boring No. 93-335 | Sample No. 7 |
| Depth El 12-14 ft | Date 8/6/93 |
| UNCONFINED COMPRESSION TEST REPORT | |

ENG FORM 1 JUN 65 3659

PLATE XI-2

*Geotest Engineering, Inc.*

B.I.H. DISPOSAL AREA NO. 8

| | CORE BORING | COORDINATES X | Y | N.G. ELEV. |
|---|---|---|---|---|
| 1 | 93-320 | 2363789.02 | 103773.22 | 12.56 |
| 2 | 93-321 | 2364323.55 | 103856.25 | 9.41 |
| 3 | 93-322 | 2364764.46 | 104067.99 | 17.49 |
| 4 | 93-323 | 2365237.93 | 104221.76 | 17.20 |
| 5 | 93-324 | 2365607.00 | 104552.24 | 15.75 |
| 6 | 93-325 | 2366123.53 | 104592.72 | 20.84 |
| 7 | 93-326 | 2366578.71 | 104834.40 | 15.89 |
| 8 | 93-327 | 2367088.58 | 104956.07 | 22.68 |
| 9 | 93-328 | 2367537.78 | 105191.97 | 23.08 |
| 10 | 93-329 | 2368014.21 | 105329.11 | 20.39 |
| 11 | 93-330 | 2368466.83 | 105561.97 | 12.21 |
| 12 | 93-331 | 2368574.14 | 104635.29 | 14.01 |
| 13 | 93-332 | 2368510.00 | 103633.81 | 14.13 |
| 14 | 93-333 | 2368542.26 | 102633.47 | 12.65 |
| 15 | 93-334 | 2368568.39 | 101634.32 | 11.91 |
| 16 | 93-335 | 2368538.72 | 100684.38 | 10.40 |
| 17 | 93-336 | 2368042.63 | 100675.22 | 10.87 |
| 18 | 93-337 | 2367237.44 | 100708.14 | 10.50 |
| 19 | 93-338 | 2367249.00 | 101707.25 | 10.60 |
| 20 | 93-339 | 2367245.36 | 102206.57 | 10.8 |
| 21 | 93-340 | 2367221.53 | 102747.93 | 13.44 |
| 22 | 93-341 | 2366605.67 | 102743.50 | 12.20 |
| 23 | 93-342 | 2365903.77 | 102710.82 | 12.98 |
| 24 | 93-343 | 2365205.46 | 102690.67 | 12.29 |