

## Geotechnical Information

# Appendix E









SW1628D009

9

402-66-10 "F"

City of Anchorage  
Office of the City Engineer  
Soils Laboratory  
Field Auger Log

Contract Number

District UNIT 10 WATER

Hole Number

1

Location

32<sup>ND</sup> 26+05

Top Elevation

EXISTING GRADE

w=water content  
k=coef of permeability

D<sub>20</sub> = 20% Diameter  
c = unit cohesion

o = ~~λ~~ of int. Friction  
e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification | Summary of Test Results |
|-------------------------|------------------------|-------------------------|
| 0.0 - 1.0               | GM SILTY GRAVEL        |                         |
| 1.0 - 2.0               | GW SAND                |                         |
| 2.0 - 3.5               | SAND                   |                         |
| 3.5 - 4.0               | SW BROWN-RED SAND      |                         |
| 4.0 - 5.5               | SAND                   |                         |
| 5.5 - 6.0               | SW SAND                |                         |
| 6.0 - 7.0               | SAND                   |                         |
| 7.0 - 8.5               |                        |                         |
| 8.5 - 9.0               | ML GRAY SANDY SILT     |                         |
| 9.0 - 10.0              |                        |                         |

Hole Depth 95

# SW1628D010

16

|   |  |
|---|--|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number<br>District            |
|   | Hole Number <u>2</u>                   |
|   | Location <u>32<sup>ND</sup> 25+25</u>  |
|   | Top Elevation<br><u>EXISTING GRADE</u> |

w=water content       $D_{20}$  = 20% Diameter       $\alpha$  = ~~X~~ of int. Friction  
 k=coef of permeability      c = unit cohesion      e = void ratio

| Depth          | M.I. T. Classification | Summary of Test Results |
|----------------|------------------------|-------------------------|
| Sample in feet |                        |                         |
| 1.0            | GP SANDY GRAVEL        |                         |
| 2.0            | SW                     |                         |
| 3.0            | SAND                   |                         |
| 4.0            |                        |                         |
| 5.0            |                        |                         |
| 6.0            |                        |                         |
| 7.0            |                        |                         |
| 8.0            | ML                     |                         |
| 9.0            | GRAY SANDY             |                         |
| 10             | SILT                   |                         |
|                |                        | Hole Depth <u>9.0</u>   |

# SW1628D011



|   |  |
|---|--|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number<br>District            |
|   | Hole Number <b>3</b>                   |
|   | Location <b>32<sup>ND</sup> 24+00</b>  |
|   | Top Elevation<br><b>EXISTING GRADE</b> |

w = water content       $D_{20}$  = 20% Diameter       $\phi$  = ~~λ~~ of int. Friction  
 k = coef of permeability      c = unit cohesion      e = void ratio

| Depth<br>Sample in feet | M.I.T. Classification    | Summary of Test Results |
|-------------------------|--------------------------|-------------------------|
| 1.0                     | GM-ML SILTY GRAVEL       |                         |
| 2.0                     | SW<br>SAND               |                         |
| 3.0                     | SP<br>GRAVELLY<br>SAND   |                         |
| 4.0                     |                          |                         |
| 5.0                     |                          |                         |
| 6.0                     | SW<br>SAND               |                         |
| 7.0                     |                          |                         |
| 8.0                     | ML<br>GRAY SANDY<br>SILT |                         |
| 9.0                     |                          |                         |
| 10                      |                          | Hole Depth <u>95</u>    |

# SW1628D012

12

|   |                                       |
|---|---------------------------------------|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number                       |
|   | District                              |
|   | Hole Number <b>4</b>                  |
|   | Location <b>32<sup>ND</sup> 23725</b> |
| Top Elevation <b>EXISTING GRADE</b>   |                                       |

w=water content  
k=coef of permeability

$D_{20}$  = 20% Diameter  
c = unit cohesion

$\alpha$  = % of int. Friction  
e = void ratio

| Sample | Depth<br>in feet | M. I. T. Classification | Summary of Test Results         |
|--------|------------------|-------------------------|---------------------------------|
|        | 1.0              | <b>GM SILTY GRAVEL</b>  |                                 |
|        | 2.0              |                         |                                 |
|        | 3.0              | <b>GP</b>               |                                 |
|        | 4.0              | <b>SANDY GRAVEL</b>     |                                 |
|        | 5.0              |                         |                                 |
|        | 6.0              |                         |                                 |
|        | 7.0              |                         |                                 |
|        | 8.0              | <b>M</b>                |                                 |
|        | 9.0              | <b>GRAY SANDY</b>       |                                 |
|        | 10               | <b>SILT</b>             |                                 |
|        |                  |                         | Hole Depth <b>9<sup>0</sup></b> |

# SW1628D013

13

|   |  |
|---|--|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number<br>District            |
|   | Hole Number <b>5</b>                   |
|   | Location <b>32<sup>ND</sup> 22+50</b>  |
|   | Top Elevation<br><b>EXISTING GRADE</b> |

w=water content       $D_{20}$  = 20% Diameter       $\phi$  = ~~4~~ of int. Friction  
 k=coef of permeability      c = unit cohesion      e = void ratio

| Sample | Depth<br>in feet | M.I. T. Classification | Summary of Test Results |
|--------|------------------|------------------------|-------------------------|
|        | 0.0              | <b>GM SILTY GRAVEL</b> |                         |
|        | 1.0              | <b>SP</b>              |                         |
|        | 2.0              | <b>GRAVELLY SAND</b>   |                         |
|        | 3.0              | <b>SW</b>              |                         |
|        | 4.0              | <b>SAND</b>            |                         |
|        | 5.0              |                        |                         |
|        | 6.0              |                        |                         |
|        | 7.0              |                        |                         |
|        | 8.0              | <b>ML</b>              |                         |
|        | 9.0              | <b>GRAY SANDY</b>      |                         |
|        | 10.0             | <b>SILT</b>            |                         |

Hole Depth 10<sup>5</sup>



# SW1628D014

14

|   |  |
|---|--|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number<br>District            |
|   | Hole Number <b>6</b>                   |
|   | Location <b>32<sup>ND</sup> 21+75</b>  |
|   | Top Elevation<br><b>EXISTING GRADE</b> |

w=water content       $D_{20}$  = 20% Diameter       $\alpha$  = % of int. Friction  
 k=coef of permeability      c = unit cohesion      e = void ratio

| Sample | Depth<br>in feet | M.I. T. Classification | Summary of Test Results    |
|--------|------------------|------------------------|----------------------------|
|        | 1.0              | <u>GM SILTY GRAVEL</u> |                            |
|        | 2.0              | SW                     |                            |
|        | 3.0              |                        |                            |
|        | 4.0              | SAND                   |                            |
|        | 5.0              |                        |                            |
|        | 6.0              |                        |                            |
|        | 7.0              |                        |                            |
|        | 8.0              | ML                     |                            |
|        | 9.0              | GRAY SANDY             |                            |
|        | 10               | SILT                   |                            |
|        |                  |                        | Hole Depth <b>12' - 0"</b> |

# SW1628D015

(5)

|   |                                       |
|---|---------------------------------------|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number                       |
|   | District                              |
|   | Hole Number <u>7</u>                  |
|   | Location <u>32<sup>ND</sup> 21+00</u> |
| Top Elevation <u>EXISTING GRADE</u>   |                                       |

w=water content  
k=coef of permeability

$D_{20}$  = 20% Diameter  
c = unit cohesion

$\alpha$  = ~~λ~~ of int. Friction  
e = void ratio

| Depth          | M.I. T. Classification | Summary of Test Results                                |
|----------------|------------------------|--|
| Sample in feet |                        |  |
| 1.0            | GM SILTY GRAVEL        |  |
| 2.0            | SW                     |  |
| 3.0            | SAND                   |  |
| 4.0            |                        |  |
| 5.0            |                        |  |
| 6.0            |                        |  |
| 7.0            | ML                     |  |
| 8.0            | GRAY SANDY SILT        | WW WATER LEVEL<br>(PROBABLY NOT GROUND<br>WATER LEVEL) |
| 9.0            |                        |  |
| 10             |                        | Hole Depth <u>8<sup>0</sup></u>                        |

7KLV ;0/ ILOH GRHV QRW DSSHDU WR KDYH DQ\ VW\OH LQIRU  
EHORZ

---

<sup>3</sup> fl fl, fl  
<sup>3</sup> ,f/ " ,— ,Œ ,Šùf, f/  
<sup>3</sup> /łł...˘/  
- / ł™ /- %o < %o /f — ” ,— f , /ł ’ , Œ /ı %o ł Œ \ /fi Š /ł Œ f [nepelilj^—eh/^eel<^kfn/^h...k  
ik ih [ik [eo \ll p n p l m ,  
<sup>3</sup> u /łł...˘/  
<sup>3</sup> u fl fl, fl

SW1628D

It appears boring 8 (D016) does not exist in the database.

SW1628D017

17

City of Anchorage  
Office of the City Engineer  
Soils Laboratory  
Field Auger Log

Contract Number  
District

Hole Number 9

Location 32<sup>ND</sup> 19+00

Top Elevation  
EXISTING GRADE

w=water content  
k=coef of permeability

D<sub>20</sub> = 20% Diameter  
c = unit cohesion

o = ~~λ~~ of int. Friction  
e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification   | Summary of Test Results |
|-------------------------|--------------------------|-------------------------|
| 0.0 - 1.0               | GM SILTY GRAVEL          |                         |
| 1.0 - 2.0               | SW<br>SAND               |                         |
| 2.0 - 3.0               |                          |                         |
| 3.0 - 4.0               |                          |                         |
| 4.0 - 5.0               |                          |                         |
| 5.0 - 6.0               |                          |                         |
| 6.0 - 7.0               |                          |                         |
| 7.0 - 8.0               |                          |                         |
| 8.0 - 9.0               | ML<br>GRAY SANDY<br>SILT |                         |
| 9.0 - 10.0              |                          |                         |
| 10.0                    |                          |                         |

Hole Depth 12 <sup>0</sup>/<sub>10</sub>

# SW1628D018

City of Anchorage  
 Office of the City Engineer  
 Soils Laboratory  
 Field Auger Log

Contract Number  
 District

Hole Number **10**

Location **32<sup>ND</sup> 18+00**

Top Elevation  
**EXISTING GRADE**

w=water content  
 k=coef of permeability

$D_{20}$  = 20% Diameter  
 c = unit cohesion

$\phi$  = ~~λ~~ of int. Friction  
 e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification | Summary of Test Results |
|-------------------------|------------------------|-------------------------|
| 0.0 - 1.0               | GM SILTY GRAVEL        |                         |
| 1.0 - 9.0               | SW SAND                |                         |
| 9.0 - 10.0              | ML GRAY SANDY SILT     |                         |
|                         |                        | Hole Depth <b>11'</b>   |



# SW1628D019

19

|   |                            |
|---|----------------------------|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number            |
|   | District                   |
|   | Hole Number <b>11</b>      |
|   | Location <b>32ND 17+25</b> |
| Top Elevation <b>EXISTING GROUND</b>  |                            |

w=water content       $D_{20}$  = 20% Diameter       $\phi$  = ~~4~~ of int. Friction  
 k=coef of permeability      c = unit cohesion      e = void ratio

| Depth          | M.L.T. Classification   | Summary of Test Results  |
|----------------|-------------------------|--------------------------|
| Sample in feet |                         |                          |
| 1.0            | SP<br>CORAVELLY<br>SAND |                          |
| 2.0            |                         |                          |
| 3.0            | SW<br>SAND              |                          |
| 4.0            |                         |                          |
| 5.0            |                         |                          |
| 6.0            |                         |                          |
| 7.0            |                         |                          |
| 8.0            |                         |                          |
| 9.0            |                         |                          |
| 10             |                         |                          |
|                |                         | Hole Depth <u>10' 0"</u> |

# SW1628D020

20

|   |   |
|---|---|
| City of Anchorage<br>Office of the City Engineer<br>Soils Laboratory<br>Field Auger Log | Contract Number<br>District             |
|   | Hole Number <b>12</b>                   |
|   | Location <b>32ND 16750</b>              |
|   | Top Elevation<br><b>EXISTING GROUND</b> |

w=water content  
k=coef of permeability

$D_{20}$  = 20% Diameter  
c = unit cohesion

$\alpha$  = % of int. Friction  
e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification | Summary of Test Results          |
|-------------------------|------------------------|----------------------------------|
| 1.0                     | SP<br>GRAVELLY<br>SAND |                                  |
| 2.0                     |                        |                                  |
| 3.0                     |                        |                                  |
| 4.0                     | SW<br>SAND             |                                  |
| 5.0                     |                        |                                  |
| 6.0                     |                        |                                  |
| 7.0                     |                        |                                  |
| 8.0                     |                        |                                  |
| 9.0                     |                        |                                  |
| 10                      |                        |                                  |
|                         |                        | Hole Depth <u>10<sup>2</sup></u> |

SW1628D021

21

City of Anchorage  
Office of the City Engineer  
Soils Laboratory  
Field Auger Log

Contract Number  
District

Hole Number **13**

Location **32<sup>ND</sup> 16+00**

Top Elevation  
**EXISTING GRADE**

w=water content  
k=coef of permeability

D<sub>20</sub> = 20% Diameter  
c = unit cohesion

o = ~~λ~~ of int. Friction  
e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification | Summary of Test Results |
|-------------------------|------------------------|-------------------------|
| 0.0 - 1.0               | ML BROWN SANDY SILT    |                         |
| 1.0 - 2.0               | SW<br>SAND             |                         |
| 2.0 - 3.0               |                        |                         |
| 3.0 - 4.0               |                        |                         |
| 4.0 - 5.0               |                        |                         |
| 5.0 - 6.0               |                        |                         |
| 6.0 - 7.0               |                        |                         |
| 7.0 - 8.0               |                        |                         |
| 8.0 - 9.0               |                        |                         |
| 9.0 - 10.0              |                        |                         |
| 10.0 - 12.0             | ML GRAY SANDY SILT     |                         |

Hole Depth **12'**

# SW1628D022

City of Anchorage  
 Office of the City Engineer  
 Soils Laboratory  
 Field Auger Log

Contract Number  
 District

Hole Number **14**

Location **32ND 15+25**

Top Elevation  
**EXISTING GRADE**

w=water content  
 k=coef of permeability

$D_{20}$  = 20% Diameter  
 c = unit cohesion

$\phi$  = ~~λ~~ of int. Friction  
 e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification | Summary of Test Results |
|-------------------------|------------------------|-------------------------|
| 1.0                     | GP<br>SANDY GRAVEL     |                         |
| 2.0                     | SW                     |                         |
| 3.0                     |                        |                         |
| 4.0                     | SAND                   |                         |
| 5.0                     |                        |                         |
| 6.0                     |                        |                         |
| 7.0                     |                        |                         |
| 8.0                     |                        |                         |
| 9.0                     |                        |                         |
| 10                      |                        |                         |

Hole Depth 9.5

SW1628D023

23

City of Anchorage  
Office of the City Engineer  
Soils Laboratory  
Field Auger Log

Contract Number  
District

Hole Number

15

Location

32ND 1A+50

Top Elevation

EXISTING GRADE

w=water content  
k=coef of permeability

$D_{20}$  = 20% Diameter  
c = unit cohesion

$\phi$  = ~~λ~~ of int. Friction  
e = void ratio

| Depth<br>Sample in feet | M.I. T. Classification | Summary of Test Results           |
|-------------------------|------------------------|-----------------------------------|
| 1.0                     | CP<br>GRAVELLY<br>SAND |                                   |
| 2.0                     |                        |                                   |
| 3.0                     |                        |                                   |
| 4.0                     |                        |                                   |
| 5.0                     |                        |                                   |
| 6.0                     |                        |                                   |
| 7.0                     |                        |                                   |
| 8.0                     |                        |                                   |
| 9.0                     |                        |                                   |
| 10                      | ML GRAY<br>SANDY SILT  | Hole Depth <u>10</u> <sup>0</sup> |

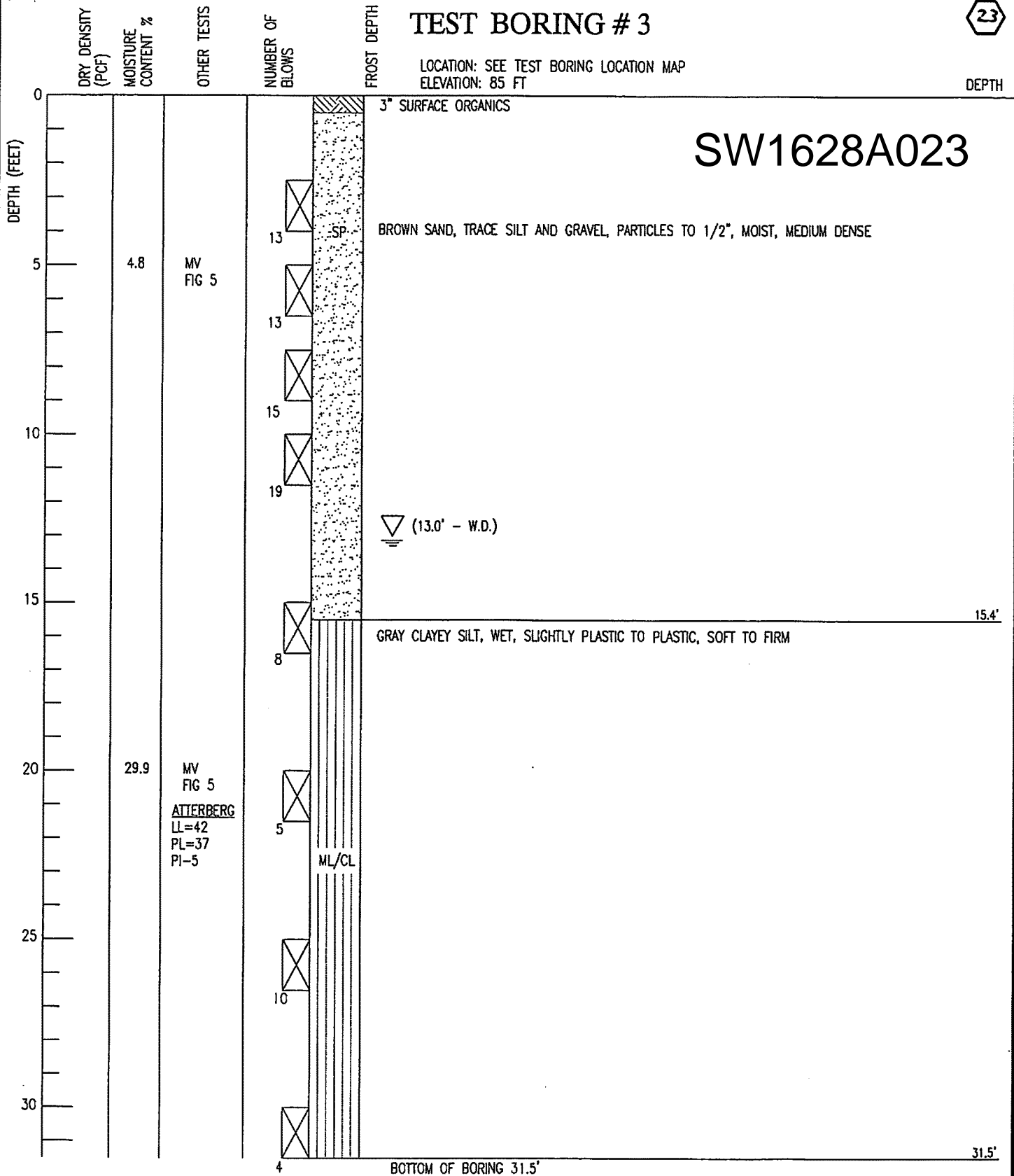


# TEST BORING # 3

LOCATION: SEE TEST BORING LOCATION MAP  
ELEVATION: 85 FT

DEPTH

## SW1628A023



### KEY

LL = LIQUID LIMIT  
 PL = PLASTIC LIMIT  
 PI = PLASTIC INDEX

PP = POCKET PENETROMETER (TSF)  
 MA = MECHANICAL ANALYSIS  
 MV = MOISTURE/VISUAL

☐ = GRAB SAMPLE  
 ☒ = SPT SAMPLE

☒ = SPOON SAMPLE  
 SPOON SIZE: 3" I.D.  
 WEIGHT: 340 #

### ENTERPRISE

ENGINEERING, INC.

5 DEPOT STREET  
 SUITE 23  
 FREEPORT, ME 04032  
 TEL (207) 869-8006  
 FAX (207) 869-8015

2525 GAMBELL STREET  
 SUITE 200  
 ANCHORAGE, AK 99503  
 TEL (907) 563-3835  
 FAX (907) 563-3817

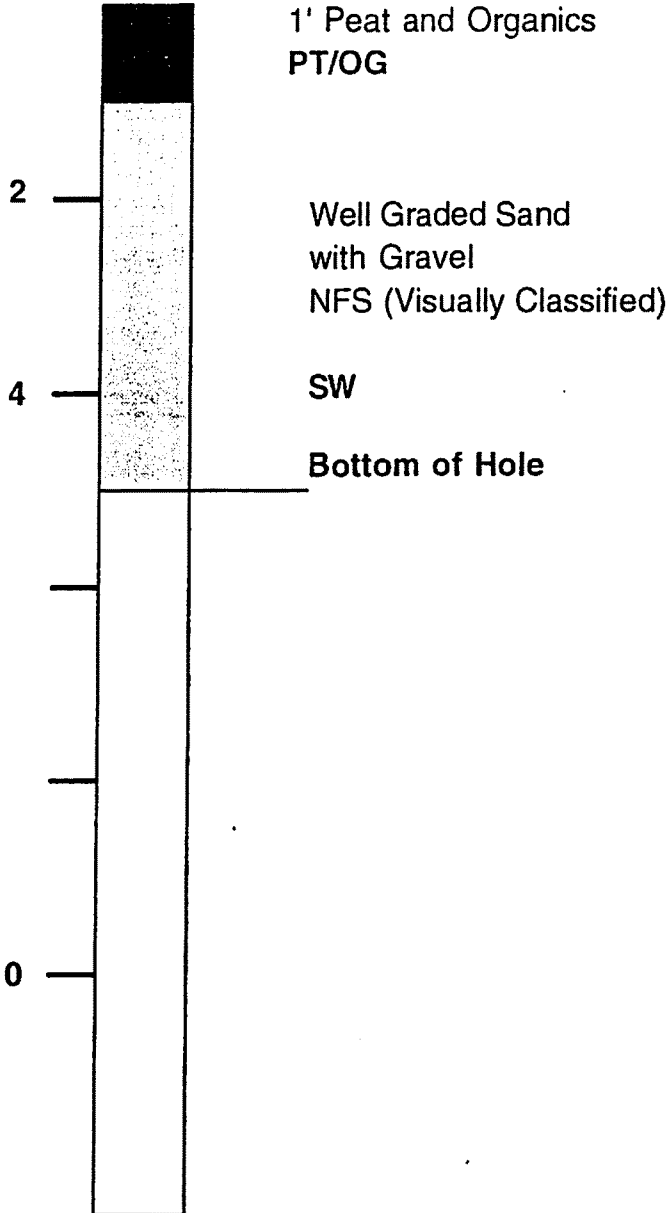
PROJECT: BENSON BUILDING  
 EEJ PROJECT NUMBER: 7872  
 CLIENT: SIMPSON ASSOCIATES, INC.  
 LOGGED BY: DLK  
 CONTRACTOR: DISCOVERY DRILLING  
 EQUIPMENT: CME 75  
 TESTBORING COMPLETED: 11/25/2013

## FIGURE: 4

# SW1628B010 TESTHOLE NO. 5

**LOCATION :** Lot 1, WKM  
Subdivision Approximately 200'  
South of North Property Line  
and 30' East of West Property  
Line.

**DATE:** March 20, 2002



**LOT 1, WKM  
SUBDIVISION**

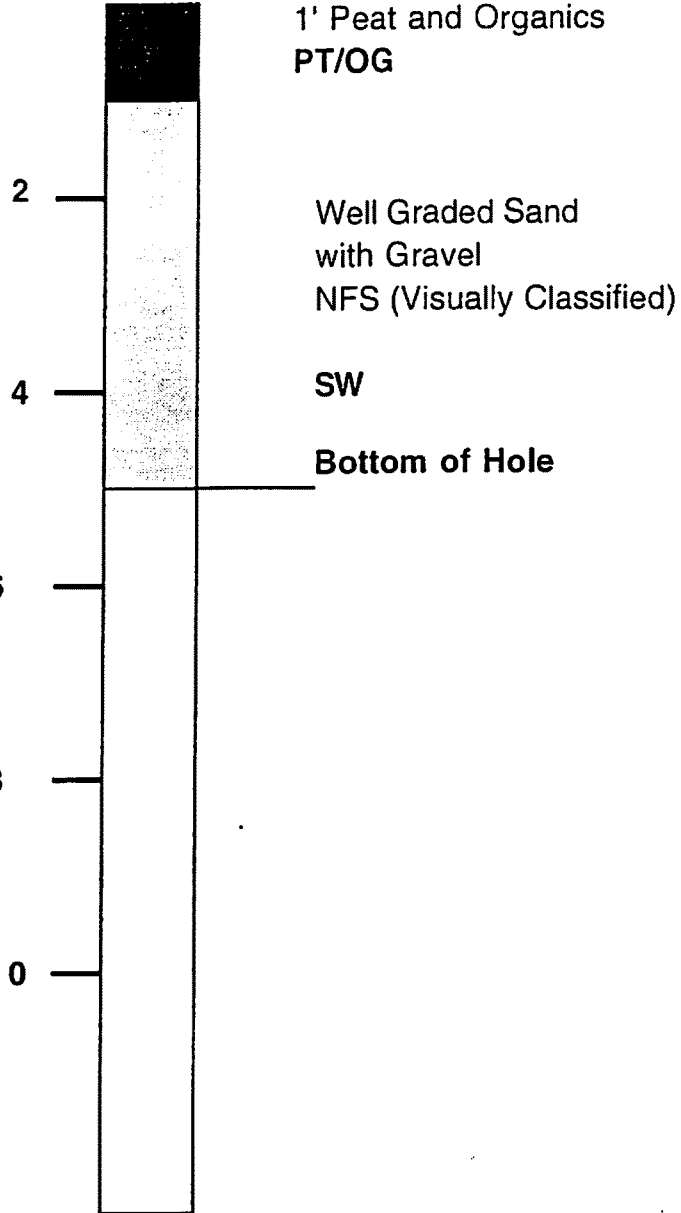


# SW1628B011

## TESTHOLE NO. 6

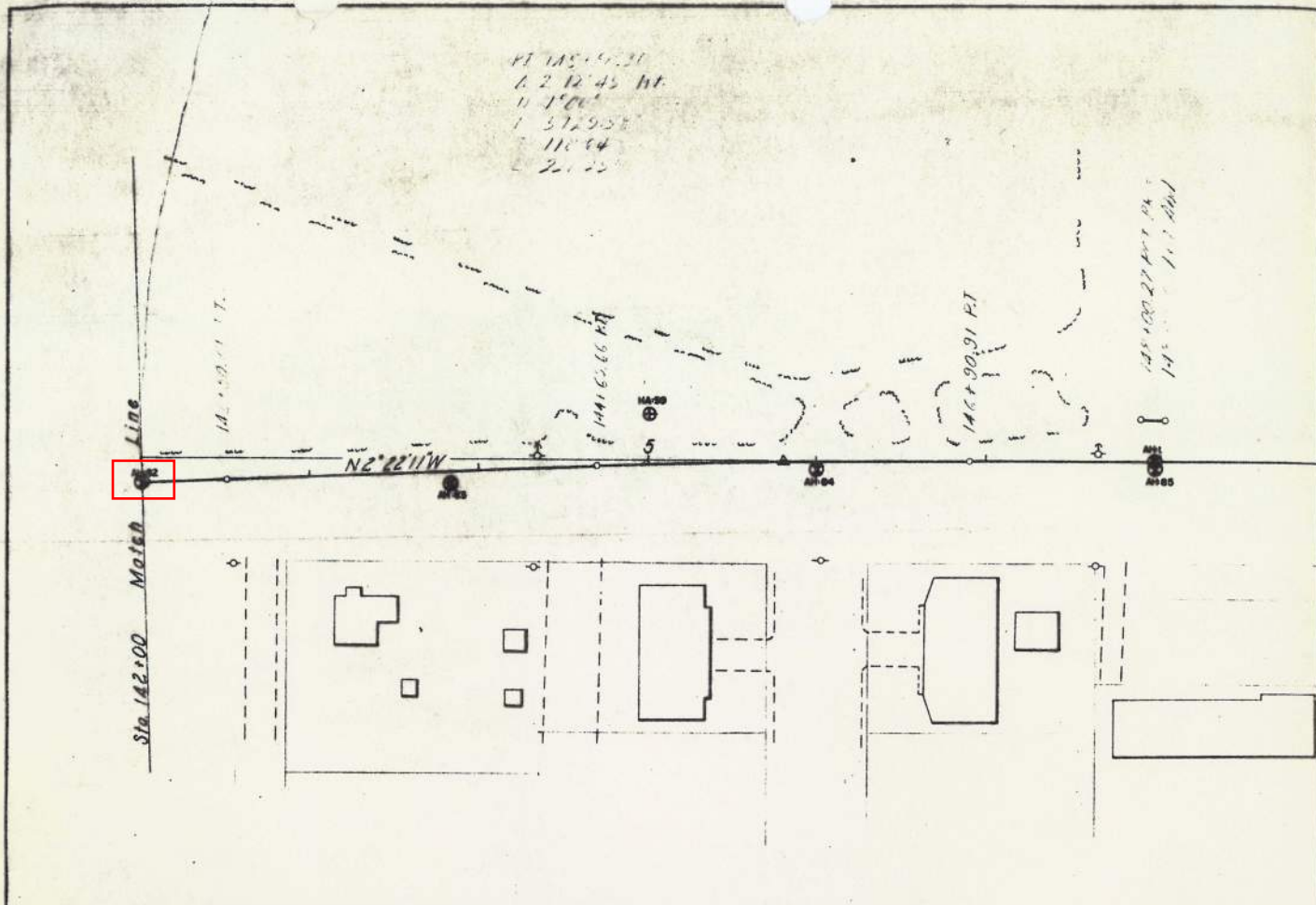
**LOCATION :** Lot 1, WKM  
Subdivision Approximately 230'  
South of North Property Line  
and 130' East of West Property  
Line.

**DATE:** March 20, 2002

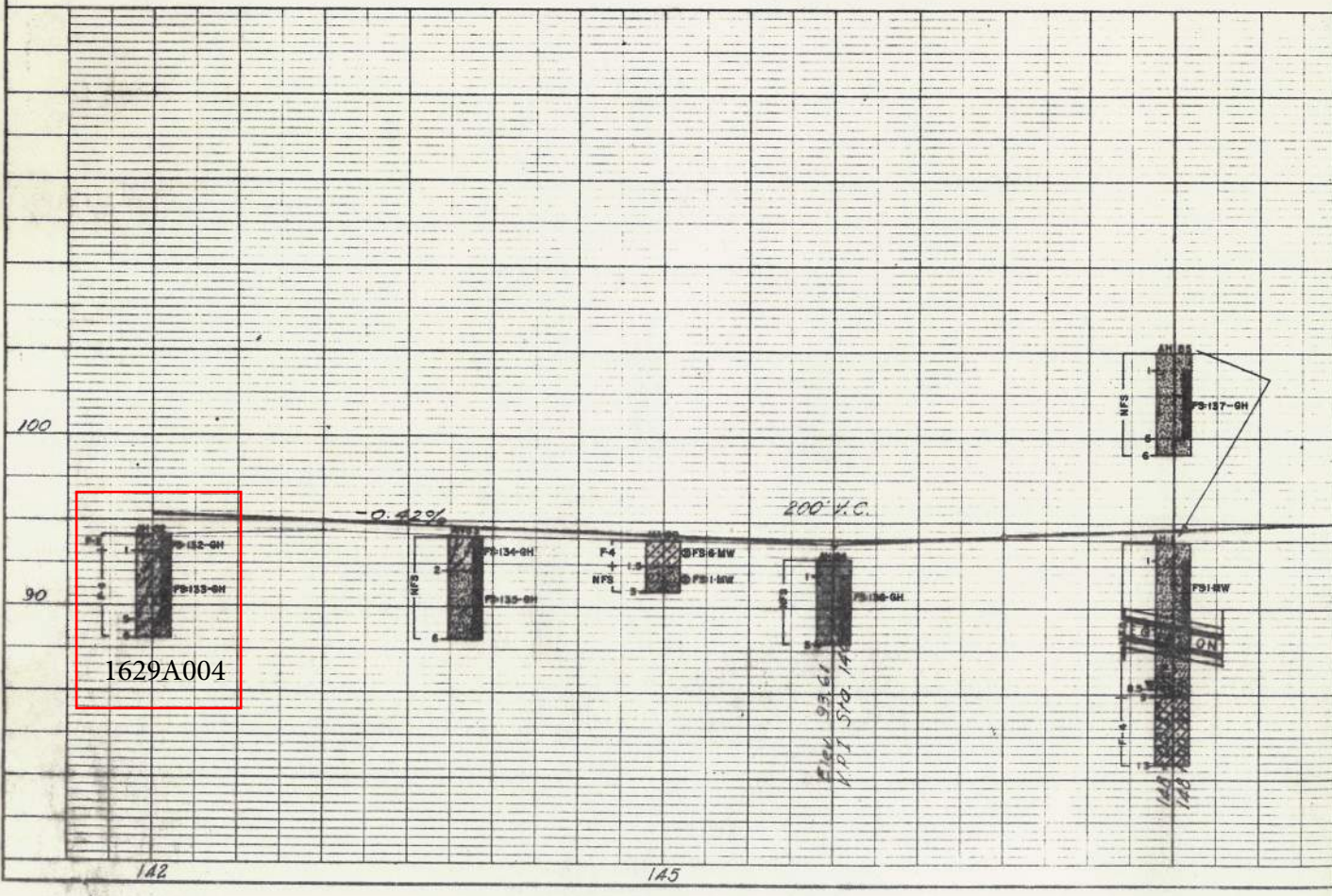


**LOT 1, WKM  
SUBDIVISION**

|      |                    |      |
|------|--------------------|------|
| PLAN | JURISDICTION       | DATE |
|      | NOTE BOOK NO.      | BY   |
|      | CHECKED            | 8-65 |
|      | RT. OF WAY CHECKED |      |
|      | NO.                |      |



|         |      |
|---------|------|
| PROFILE | DATE |
|         | BY   |
|         | 8-65 |
|         |      |
|         |      |



1629A004

## BERG2 Modeling of Lois Drive & 32<sup>nd</sup> Ave Road Sections

The current conditions are 0 to 2 feet of silty gravel above well-graded sand with gravel. The sand and gravel interval extends to a minimum depth of 6.5 feet BGS (maximum depth is 10.5 feet BGS). Below the sand and gravel is silt. I assume that the top 2 feet of existing soils will be removed before constructing the road section.

Insulated Section:

- 2 inches of asphalt
- 2 inches of leveling course
- 16 inches of MOA Type II-A classified material
- 2 inches of rigid board insulation (R4.5 per inch minimum)
- 6 inches of MOA Type II classified material
- Separation geotextile
- Subgrade (native sand and gravel)

Total section thickness: 28 inches (2.33 feet)

Minimum depth to unsuitable soils, including constructed section: 6.83 feet (This brings the road surface to about 4 inches above OG. Minimum thickness of the native sands and gravels is 4.5 feet)

Modeled frost depth: **4.63 feet** – freezing does not reach silt

BERG2 Results: All program defaults were used, except the moisture content of the gravel was increased to 6% for all gravel layers.

| LOCATION   | THAW N          | FREZ N | MAAT  | THAW °F | DAY   | FREZ °F | DAY   | THAW DAYS | FREZ DAYS |
|--|-----------------|--------|-------|---------|-------|---------|-------|-----------|-----------|
| ANCHORAG   | 1.70            | 1.00   | 35    | 4000    |       | 3200    |       | 198       | 167       |
|  |                 |        |       | 1       | 2     | 3       | 4     | 5         | 6         |
| T<br>H<br>A<br>C<br>W<br>L<br>E  | FROZEN % MOIS.  | 0.0    | 6.0   | 0.0     | 6.0   | 6.0     | 10.0  |           |           |
|  | FROZEN DENS.    | 138.0  | 130.0 | 1.8     | 130.0 | 110.0   | 90.0  |           |           |
|  | LATENT HEAT     | 0      | 1123  | 0       | 1123  | 950     | 1296  |           |           |
|  | FROZEN HEAT CAP | 28.00  | 26.00 | 3.00    | 26.00 | 22.00   | 19.80 |           |           |
|  | FROZEN COND.    | 0.86   | 1.58  | 0.02    | 1.58  | 0.82    | 0.45  |           |           |
|  | THAWED % MOIS.  | 0.0    | 6.0   | 0.0     | 6.0   | 6.0     | 10.0  |           |           |
|  | THAWED DENS.    | 138.0  | 130.0 | 1.8     | 130.0 | 110.0   | 90.0  |           |           |
|  | THAWED HEAT CAP | 28.00  | 29.90 | 3.00    | 29.90 | 25.30   | 24.30 |           |           |
|  | THAWED COND.    | 0.86   | 1.57  | 0.02    | 1.57  | 0.99    | 0.46  |           |           |
|  | INITIAL THICK   | 0.17   | 1.50  | 0.17    | 0.50  | 4.50    | 3.00  |           |           |
| AMOUNT THAWED  | 0.17            | 1.50   | 0.17  | 0.50    | 4.50  | 1.02    |       |           |           |
| CONSOLIDATION  | ----            | ----   | ----  | ----    | ----  | ----    |       |           |           |
| FINAL THICK  | 0.17            | 1.50   | 0.17  | 0.50    | 4.50  | 3.00    |       |           |           |
| F<br>R<br>Y<br>E<br>C<br>E<br>L<br>Z<br>E<br>E   | LATENT HEAT     | 0      | 1123  | 0       | 1123  | 950     | 1296  |           |           |
|  | FROZEN DENS.    | 138.0  | 130.0 | 1.8     | 130.0 | 110.0   | 90.0  |           |           |
|  | FROZEN HEAT CAP | 28.00  | 26.00 | 3.00    | 26.00 | 22.00   | 19.80 |           |           |
|  | FROZEN COND.    | 0.86   | 1.58  | 0.02    | 1.58  | 0.82    | 0.45  |           |           |
|  | INITIAL THICK   | 0.17   | 1.50  | 0.17    | 0.50  | 4.50    | 3.00  |           |           |
|  | AMOUNT FROZEN   | 0.17   | 1.50  | 0.17    | 0.50  | 2.29    | 0.00  |           |           |
| ESTIMATED THAW= 7.86                      FREEZE= 4.63                      PRINT LOCATION SOIL QUIT |                 |        |       |         |       |         |       |           |           |



Location Data:

```

vDos - Initial test
FAIRBANKS      ANCHORAGE      JUNEAU         MCKINLEY PARK
NORTHWAY      DILLINGHAM     POINT BARROW   BETHEL
KOTZEBUE      GULKANA        CENTRAL        USER INPUT

LOCATION NAME..... ANCHORAGE
THAW N FACTOR..... 1.7
FREEZE N FACTOR..... 1
DESIGN AIR THAWING INDEX °DAYS..... 4000
DESIGN AIR FREEZING INDEX °DAYS..... 3200
MEAN AIR THAWING INDEX °DAYS..... 3500
MEAN AIR FREEZING INDEX °DAYS..... 2300
MEAN ANNUAL AIR TEMP. °F..... 35.3
AMPL. OF AIR TEMP. SINE WAVE..... 24.7

DESIGN SURFACE THAWING INDEX °DAYS..... 6800
DESIGN SURFACE FREEZING INDEX °DAYS..... 3200
MEAN SURFACE THAWING INDEX °DAYS..... 5950      THAW SEASON   FREEZE SEASON
MEAN SURFACE FREEZING INDEX °DAYS..... 2300      LENGTH       LENGTH
MEAN ANNUAL SURFACE TEMP. °F..... 42           AIR  198      167
AMPL. OF SURFACE TEMP. SINE WAVE..... 34       SURF 217.2   147.8

INPUT FIRST LETTER OF DESIRED LOCATION
OR USE CURSOR CONTROL KEYS TO MOVE CURSOR AND CHANGE DATA

F1-COLOR  F2-SAVE  F3-LOAD  F4-DISK  S-SOILS  R-RUN  L-NEW SCREEN  Q-QUIT
  
```

Soil Layer Data:

| Layer | Material   | Thickness (in) | Thickness (ft) | Notes  |
|-------|------------|----------------|----------------|--|
| L1    | Asphalt    | 2              | 0.17           | All default values   |
| L2    | Gravel     | 18             | 1.5            | Includes 2" leveling course and 16" fill; MC increased to 6% |
| L3    | Insulation | 2              | 0.17           | All default values   |
| L4    | Gravel     | 6              | 0.5            | MC increased to 6%   |
| L5    | Sand       |                | 4.5            | Native soils; All default values                             |
| L6    | Silt       |                | 3              | Native soils; All default values                             |

```
LAYER NUMBER 1 OF 6
1:GRAVEL 2:SAND 3:SILT 4:ASPHALT 5:CONCRETE 6:INSULATION 7:USER MATERIAL

MATERIAL NUMBER..... 4
THICKNESS OF LAYER (FT)..... .17
.....THAW CYCLE.....
FROZEN % MOISTURE..... 0
FROZEN DENSITY OF LAYER (LB/FT^3)..... 138
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 28
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... .86
LATENT HEAT (BTU/FT^3)..... 0
THAWED % MOISTURE..... 0
THAWED DENSITY OF LAYER (LB/FT^3)..... 138
THAWED HEAT CAPACITY (BTU/FT^3·F°)..... 28
THAWED CONDUCTIVITY (BTU/FT·HR·F°)..... .86
.....FREEZE CYCLE.....
LATENT HEAT OF FUSION (BTU/FT^3)..... 0
FROZEN DENSITY (LB/FT^3)..... 138
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 28
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... .86

USE F1 - F8 TO SELECT A LAYER #, USE F10 TO SET TOTAL # OF LAYERS = LAYER #
OR MOVE CURSOR TO MODIFY DATA          L-LOCATION R-RUN Q-QUIT
```

```
LAYER NUMBER 2 OF 6
1:GRAVEL 2:SAND 3:SILT 4:ASPHALT 5:CONCRETE 6:INSULATION 7:USER MATERIAL

MATERIAL NUMBER..... 1
THICKNESS OF LAYER (FT)..... 1.5
.....THAW CYCLE.....
FROZEN % MOISTURE..... 6
FROZEN DENSITY OF LAYER (LB/FT^3)..... 130
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 26
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... 1.58
LATENT HEAT (BTU/FT^3)..... 1123
THAWED % MOISTURE..... 6
THAWED DENSITY OF LAYER (LB/FT^3)..... 130
THAWED HEAT CAPACITY (BTU/FT^3·F°)..... 29.9
THAWED CONDUCTIVITY (BTU/FT·HR·F°)..... 1.57
.....FREEZE CYCLE.....
LATENT HEAT OF FUSION (BTU/FT^3)..... 1123
FROZEN DENSITY (LB/FT^3)..... 130
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 26
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... 1.58

USE F1 - F8 TO SELECT A LAYER #, USE F10 TO SET TOTAL # OF LAYERS = LAYER #
OR MOVE CURSOR TO MODIFY DATA          L-LOCATION R-RUN Q-QUIT
```

```
LAYER NUMBER 3 OF 6
1:GRAVEL 2:SAND 3:SILT 4:ASPHALT 5:CONCRETE 6:INSULATION 7:USER MATERIAL

MATERIAL NUMBER..... 6
THICKNESS OF LAYER (FT)..... .17
.....THAW CYCLE.....
FROZEN % MOISTURE..... 0
FROZEN DENSITY OF LAYER (LB/FT^3)..... 1.8
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 3
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... .02
LATENT HEAT (BTU/FT^3)..... 0
THAWED % MOISTURE..... 0
THAWED DENSITY OF LAYER (LB/FT^3)..... 1.8
THAWED HEAT CAPACITY (BTU/FT^3·F°)..... 3
THAWED CONDUCTIVITY (BTU/FT·HR·F°)..... .02
.....FREEZE CYCLE.....
LATENT HEAT OF FUSION (BTU/FT^3)..... 0
FROZEN DENSITY (LB/FT^3)..... 1.8
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 3
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... .02

USE F1 - F8 TO SELECT A LAYER #, USE F10 TO SET TOTAL # OF LAYERS = LAYER #
OR MOVE CURSOR TO MODIFY DATA          L-LOCATION R-RUN Q-QUIT
```

```
LAYER NUMBER 4 OF 6
1:GRAVEL 2:SAND 3:SILT 4:ASPHALT 5:CONCRETE 6:INSULATION 7:USER MATERIAL

MATERIAL NUMBER..... 1
THICKNESS OF LAYER (FT)..... .5
.....THAW CYCLE.....
FROZEN % MOISTURE..... 6
FROZEN DENSITY OF LAYER (LB/FT^3)..... 130
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 26
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... 1.58
LATENT HEAT (BTU/FT^3)..... 1123
THAWED % MOISTURE..... 6
THAWED DENSITY OF LAYER (LB/FT^3)..... 130
THAWED HEAT CAPACITY (BTU/FT^3·F°)..... 29.9
THAWED CONDUCTIVITY (BTU/FT·HR·F°)..... 1.57
.....FREEZE CYCLE.....
LATENT HEAT OF FUSION (BTU/FT^3)..... 1123
FROZEN DENSITY (LB/FT^3)..... 130
FROZEN HEAT CAPACITY (BTU/FT^3·F°)..... 26
FROZEN CONDUCTIVITY (BTU/FT·HR·F°)..... 1.58

USE F1 - F8 TO SELECT A LAYER #, USE F10 TO SET TOTAL # OF LAYERS = LAYER #
OR MOVE CURSOR TO MODIFY DATA          L-LOCATION R-RUN Q-QUIT
```

```

x86_64 - Internet
LAYER NUMBER 5 OF 6
1:GRAVEL 2:SAND 3:SILT 4:ASPHALT 5:CONCRETE 6:INSULATION 7:USER MATERIAL

MATERIAL NUMBER..... 2
THICKNESS OF LAYER (FT)..... 4.5
.....THAW CYCLE.....
FROZEN % MOISTURE..... 6
FROZEN DENSITY OF LAYER (LB/FT^3)..... 110
FROZEN HEAT CAPACITY (BTU/FT^3.F°)..... 22
FROZEN CONDUCTIVITY (BTU/FT.HR.F°)..... .82
LATENT HEAT (BTU/FT^3)..... 950
THAWED % MOISTURE..... 6
THAWED DENSITY OF LAYER (LB/FT^3)..... 110
THAWED HEAT CAPACITY (BTU/FT^3.F°)..... 25.3
THAWED CONDUCTIVITY (BTU/FT.HR.F°)..... .99
.....FREEZE CYCLE.....
LATENT HEAT OF FUSION (BTU/FT^3)..... 950
FROZEN DENSITY (LB/FT^3)..... 110
FROZEN HEAT CAPACITY (BTU/FT^3.F°)..... 22
FROZEN CONDUCTIVITY (BTU/FT.HR.F°)..... .82

USE F1 - F8 TO SELECT A LAYER #, USE F10 TO SET TOTAL # OF LAYERS = LAYER #
OR MOVE CURSOR TO MODIFY DATA          L-LOCATION R-RUN Q-QUIT

```

```

x86_64 - Internet
LAYER NUMBER 6 OF 6
1:GRAVEL 2:SAND 3:SILT 4:ASPHALT 5:CONCRETE 6:INSULATION 7:USER MATERIAL

MATERIAL NUMBER..... 3
THICKNESS OF LAYER (FT)..... 3
.....THAW CYCLE.....
FROZEN % MOISTURE..... 10
FROZEN DENSITY OF LAYER (LB/FT^3)..... 90
FROZEN HEAT CAPACITY (BTU/FT^3.F°)..... 19.8
FROZEN CONDUCTIVITY (BTU/FT.HR.F°)..... .45
LATENT HEAT (BTU/FT^3)..... 1296
THAWED % MOISTURE..... 10
THAWED DENSITY OF LAYER (LB/FT^3)..... 90
THAWED HEAT CAPACITY (BTU/FT^3.F°)..... 24.3
THAWED CONDUCTIVITY (BTU/FT.HR.F°)..... .46
.....FREEZE CYCLE.....
LATENT HEAT OF FUSION (BTU/FT^3)..... 1296
FROZEN DENSITY (LB/FT^3)..... 90
FROZEN HEAT CAPACITY (BTU/FT^3.F°)..... 19.8
FROZEN CONDUCTIVITY (BTU/FT.HR.F°)..... .45

USE F1 - F8 TO SELECT A LAYER #, USE F10 TO SET TOTAL # OF LAYERS = LAYER #
OR MOVE CURSOR TO MODIFY DATA          L-LOCATION R-RUN Q-QUIT

```